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Bidding for Business: The Efficacy of Local Economic Development Incentives in a Metropolitan Area

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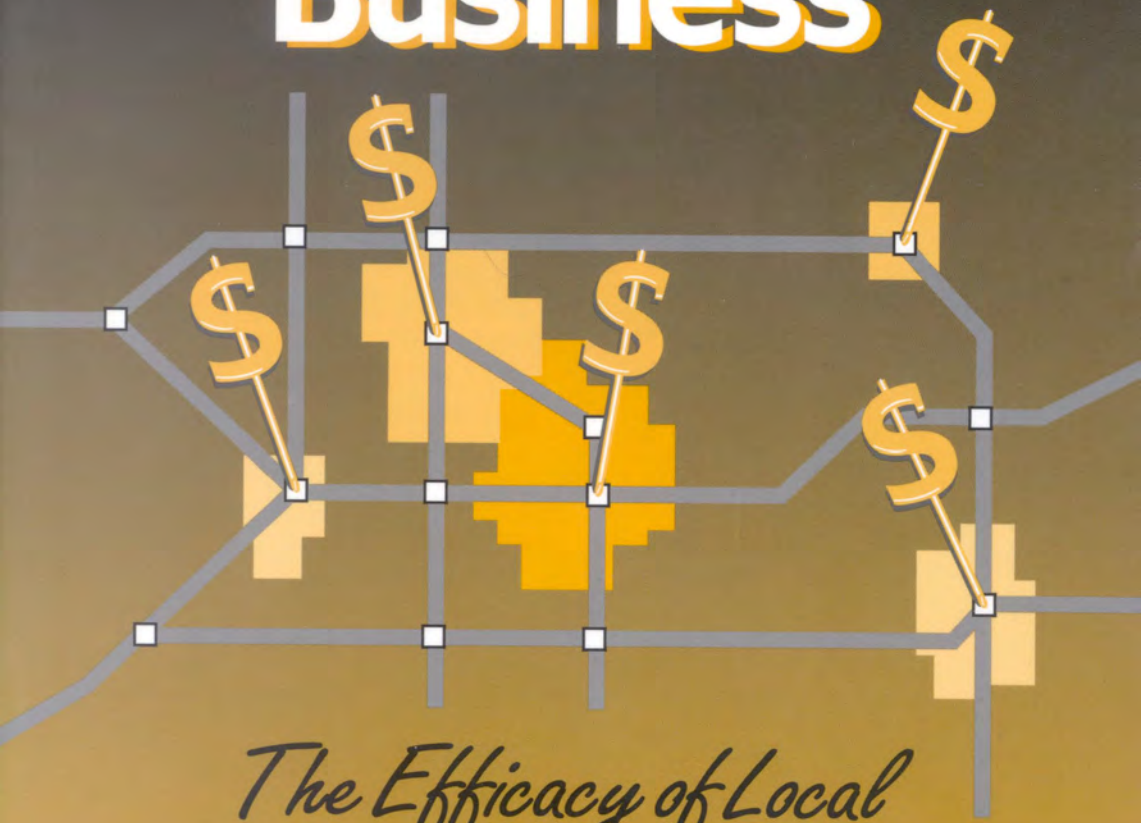
Bidding for Business



The Efficacy of Local Economic Development Incentives in a Metropolitan Area

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R.W.W.

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We have borrowed the phrase "bidding for business" from Testa and Allardice (1988).

The Authors

John Anderson earned his Ph.D. in economics at the Claremont Graduate School in 1977. As a graduate student he received a Lincoln Institute of Land Policy fellowship, which enabled him to study urban economics and public finance under the direction of Colin Wright. He has taught economics at Eastern Michigan University and Michigan State University. Dr. Anderson is currently a Professor of Economics and Director of Graduate Studies in Economics at the University of Nebraska-Lincoln. He was awarded the College of Business Administration Distinguished Teaching Award in 1995 and the Omicron Delta Epsilon Economics Professor of the Year Award in 1997. In addition to teaching and research, Dr. Anderson has public policy interests, principally illustrated by his service as the Deputy Treasurer of the State of Michigan during 1985 and 1986. He is a frequent consultant to federal and state government agencies on issues of tax policy and an active member of the National Tax Association. Dr. Anderson also served as Senior Tax Policy Advisor for the Fiscal Reform Project in the former Soviet Republic of Moldova during 1998 and 1999, advising the government on general tax policy issues, fiscal decentralization, state and local intergovernmental fiscal relations, and property taxation. He edited *Fiscal Equalization for State and Local Government Finance*, published by Praeger in 1994.

Robert Wassmer received his Ph.D. in Economics from Michigan State University in 1989. Before completing his doctorate, Wassmer worked summers in Michigan's Department of Commerce and Treasury (under the direction of John Anderson). In 1988–1989, he was a visiting economics instructor at Eastern Michigan University. From 1989 to 1995, Dr. Wassmer was an Assistant Professor of Economics and a Coordinate Faculty of the College of Urban, Labor, and Metropolitan Affairs at Wayne State University. He currently is an Associate Professor in the Graduate Program in Public Policy and Administration at California State University, Sacramento. Dr. Wassmer is also affiliated with the Center for California Studies and is director of the system-wide California State University Faculty Fellows Applied Research Program. In 2000, Blackwell published Wassmer's edited volume on *Readings in Urban Economics: Issues and Public Policy.*

Professors Anderson and Wassmer have also published "The Decision to 'Bid for Business': Municipal Behavior in Granting Property Tax Abatements" in *Regional Science and Urban Economics*, and they have completed a second paper, "Municipal Use of Property Tax Abatements."

Preface

The year is 1973. The Chrysler Corporation wants to rehabilitate the Mack Street Stamping Plant in the city of Detroit. Management had thought that it would spend $50 million (in 1973 dollars) for the upgrade, but suddenly declares that it needs government assistance in order to make the central-city project feasible. Five thousand people are currently employed in the plant. Chrysler officials meet with city representatives and explain the rehabilitation plans and remind the group of the plant's large employment base. The corporation then inquires as to whether the city can offer assistance in keeping these jobs within the city's limits. Detroit's policymakers, who since the 1960s have faced an ever-declining population and manufacturing base, wish to do all they can to retain the 5,000 jobs.

Officials from the city believe that if they could reduce the burden of the city's high rate of property taxation, Chrysler would have the assistance that it claims to need to accomplish the plant renovation. At the time state law offered the city no authority to reduce a specific firm's property tax payments. City officials approach the state of Michigan, and discussions ensue between representatives from the central city, the auto manufacturer, and the state. The talks produce a draft of a bill that is introduced into the legislature in early 1974 by a representative from Detroit. The appropriate committees in Michigan's legislature review the proposed bill and make only minor amendments. There is little opposition to the concept of giving cities the authority to grant property tax abatements to retain employment. The legislation passes the House without a single dissenting vote, and on July 9, 1974, Public Act 198 (Plant Rehabilitation and Industrial Development Districts Act) is signed into law. The act addresses the specific situation facing Detroit and the Chrysler Corporation but does not limit the offering of property tax abatements to only Michigan's largest city.

By the late 1970s, other cities, villages, and townships in metropolitan Detroit and across Michigan use the authority granted by Public Act 198 to provide local property tax abatements to manufacturing firms wishing to locate new facilities in their jurisdiction or to rehabili-

tate existing facilities. Michigan is not the only state to allow local property tax abatements. Other states grant similar authority to their local governments, and property tax abatements come to be viewed as an important and even necessary element in the package of local incentives offered to attract new firms or to retain existing ones.

Meanwhile, a nearly unnoticed irony develops in Michigan. In the spring of 1980, the Mack Street Plant closes as part of the massive federal government bailout of the Chrysler Corporation. A combination of economic forces, including foreign competition and a failure to produce fuel-efficient vehicles during a time of rapidly rising gasoline prices, overwhelmed the benefits received from the city's property tax abatements. Despite the generous economic development package put together by the city, the plant closed, and the 5,000 jobs were lost.

This story is part of the historical backdrop against which we ask the major questions raised in this book. How effective are local incentives in a metropolitan environment? Do they succeed in attracting and retaining jobs, or are they simply corporate welfare?

It is next to impossible to get reliable information on the degree to which incentives are being offered by each local government in a state. Even so, anecdotal observation, the scattered research that has been conducted, and the limited data available all point to the increased use of local incentives in the United States. The experience of cities in metropolitan Detroit in regard to local incentive use is not unique. What is distinctive about the Detroit metropolitan area is how early it became involved in the incentive game, the variety of local offerings available, and the extent to which these inducements are used. All of these factors make the Detroit area an appropriate laboratory in which to examine the ability of local incentives to redirect economic and employment activity in a metropolitan area.

1 Local Economic Development Incentives in the United States

> *The jury is still out on whether economic development policies have any effect at all.*
>
> —Therese J. McGuire (1992)

One of the most important policy issues facing major metropolitan areas in the United States now—and for at least the past three decades—is economic development. The overall distribution of business activity within a metropolitan area, the retention of existing economic activity, and the attraction of new economic activity to central cities and inner suburbs are all of concern. The concern stems from the relationships that exist between many of the most pressing urban problems, such as crime, poverty, unemployment, blight, deteriorating infrastructure, and fiscal stress and from the continued redistribution of employment and residence from central cities and inner suburbs to outer suburbs and rural areas.[1] Redistribution of economic activity within most metropolitan areas has also created the labor market issue of a spatial mismatch between low-skilled employees residing in central cities and inner suburbs and potential employers located increasingly farther out in urban areas.

Policymakers of affected cities have not been content to let this shift in economic activity go uncontested and have responded with a host of incentives designed to alter location decisions. Local business incentives have taken a number of forms: tax forgiveness, tax increment finance authorities (TIFAs), industrial development bonds (IDBs), municipal land acquisition, establishment of development authorities and zones, and other related activities.[2] Since the 1970s, the use of such locally initiated incentives has increased dramatically throughout the United States. While most of these incentives are aimed at lowering the cost of business capital within a specific jurisdiction, they are also offered in a desire to increase employment opportunities for city residents. After all, who has not heard the three reasons

most often cited by politicians to justify a local economic development incentive program: jobs, jobs, and jobs.

Bartik (1991a and 1994) has offered an equity- and efficiency-based argument in favor of local incentives to business. The equity side concerns business location responses to intrametropolitan tax differentials that impose greater costs on some communities. Due to high property taxation and inadequate business services, many firms choose not to locate in a community that is also likely to have a greater number of poor people within its boundaries. The result is a higher level of local taxes paid by the poor, a lower level of local public services provided to them, and reduced employment opportunities for those most in need. An offering of local development incentives may counteract this regressive chain of events.

The efficiency side of Bartik's argument is the use of local economic incentives to correct the market failure of the mispricing of the value of an additional local job in a city experiencing high unemployment. In a perfectly efficient world, workers in any city are paid a wage equal to the value they place on alternative uses of their time. In this efficient world, an additional job generates local tax revenue equivalent to the increase in local public services that accompany the new job. Bartik argues that, in the real world, cities that have high unemployment may enjoy greater social benefits from an additional local job than cities with low unemployment. High unemployment cities are also more likely to have underused public infrastructure (streets and parks) and services (police and firefighters). An additional job poses little additional public cost to such a city. Bartik argues that a local incentive that redirects a job from a low unemployment city to a high unemployment city is efficient in the sense of correcting the mispriced market signal that exists without it.

As states have provided their local governments with the ability to grant economic development incentives, local tax revenue has been foregone in an effort to attract business capital and employment. Success in the use of development incentives could be defined as directing economic development to areas where it would not otherwise have occurred. If local incentives achieve this goal, the foregone revenue may well be justified. If not, communities have simply given away tax revenue to the benefit of the business recipients' bottom line. Furthermore, if such inducements have become the primary way that commu-

nities compete with one another to attract capital and employment—as is more likely to be the case within a metropolitan area—it is appropriate to ask whether such competition is good public policy. It may be quite reasonable from the point of view of policymakers in one community to grant a tax incentive in hopes of attracting productive capital and employment within its boundaries. However, if all other communities in the region grant the same identical incentive, there is no redirection of business activity.

This book is a detailed examination of the use and effectiveness of local economic development incentives within a region or metropolitan area. Our analysis focuses on an important and large U.S. metropolitan area, that of Detroit. We have made this choice because, for over 20 years, the Detroit area has grappled with the use of a wide array of local economic development incentives. Metropolitan Detroit provides a rich laboratory in which to investigate the adoption, use, and effectiveness of such incentives. Our experience in conducting research on urban fiscal issues leads us to believe that our methodology, findings, and policy suggestions are relevant to other U.S. metropolitan areas as well.

Our goal is to enrich the public policy debate on the degree to which local economic development incentives have helped to create economic opportunities in cities. We are also interested in revealing the factors that drive one city to offer more of a particular form of a local economic development incentive than what another city is offering. Our intended audience is educated laypersons, policymakers, and researchers. We employ the appropriate economic theory and statistical methods but place particularly technical procedures in appendixes so that the body of the monograph is accessible to the nontechnician. We have structured this study to emphasize clear policy appraisals and recommendations. If one is not particularly interested in a detailed account of earlier research on local economic development incentives and spatial mismatch, we recommend that Chapter 2 be skipped or just briefly reviewed.

As readers of policy tracts ourselves, we have always found it enticing to sample major results without having to plow through an entire book. For the Detroit metropolitan area, we find that the offering of most local economic development incentives (holding all else constant) has increased over time. A city providing more of one type of

such incentives is also more likely to offer more of other types of local incentives. We find little to support the notion that increased manufacturing or commercial property value in a city in a metropolitan area (holding all else constant) raises the employment rate of residents in a city. However, we do see evidence that increased manufacturing or commercial property value in a city decreases the percentage of the city's residents that live in poverty. If increased manufacturing or commercial property value reduces a city's poverty rate, then perhaps a local economic development incentive that increases nonresidential property value can be used to counteract spatial mismatch and to decrease local poverty. We do in fact find that the establishment of a TIFA or a downtown development authority (DDA) district in the average city in the Detroit area in any of the observed years increased the commercial value of property in the city. In addition, the granting of property tax abatements to manufacturing property prior to 1977 exerted a positive influence on local manufacturing property value. The use of manufacturing property tax abatements in other years, and of IDBs and commercial property tax abatements in any year, exerted no positive influence on local nonresidential property values. The remainder of this book is about the details and policy implications associated with these broad findings.

The next section of this introductory chapter contains a brief background on economic development incentives in the United States. We review only local incentives that are designed to reduce the cost of doing business in a city. We do not consider local activities to increase the human capital of a city's residents, regenerate mature industries, and/or apply new technology. These tools of economic development are not the focus of the book.[3] This chapter also contains a discussion of why intraregional local incentive offers merit independent study, evidence on the intraregional use of incentives in the United States and metropolitan Detroit, and an outline of the contents of remaining chapters.

U.S. ECONOMIC DEVELOPMENT INCENTIVES

> *The widespread use of direct financial incentives by the states demonstrates the degree to which they have become partners with private business in the development process.*
>
> —National Association of State Development Agencies (1991)

Although the active use of state-sanctioned incentives to attract economic development began in the mid 1970s, local governments have always devoted a portion of their borrowing ability and infrastructure expenditure to activities that benefit business.[4] Early initiatives of this type were primarily directed to accommodating the growth of population into undeveloped areas and facilitating the commerce that followed.

By creating the Balance Agriculture with Industry Program in 1936, Mississippi was the first state to actively encourage private industrial development through publicly sanctioned activity. The incentive employed was the issuance of industrial development bonds. A state or local government issues the IDBs, but the revenue stream of the private project backs the bonds. This arrangement takes advantage of the tax-exempt status granted municipal debt. Although initially challenged in courts, IDBs have been upheld as constitutionally appropriate. By the 1960s, most states had authorized the use of IDBs in some form to attract business investment. Since 1968, Congress has increasingly placed restrictions on the ability of state and local governments to issue private purpose IDBs. In response, a few states in the late 1980s allowed the state issue of taxable IDBs.[5] In 1991, Mississippi and South Carolina were the only states that recognized the local issue of a taxable bond backed by the assets of a private endeavor.

By 1991, the options available to states for the inducement of economic development had grown to the list provided in Table 1.1. In addition to allowing IDBs, three states (Louisiana, North Dakota, and Tennessee) permitted the use of general obligation bonds by local governments to finance private industrial development. The full faith and credit of the issuing government back general obligation bonds. In Michigan, this form of municipal bond can only be used for state-sanc-

tioned private projects. General obligation bonds issued by governments for private purposes have primarily been used by communities desiring to establish a labor-intensive manufacturing base, or, as in the case of Michigan, to retain large manufacturers.

To facilitate the attraction and retention of small businesses, in 1991 nine states used an *umbrella*, or composite, issue of one industrial development bond. The proceeds of such an issue are used by the state to meet the financing needs of more than one enterprise. Another bond innovation was the guarantee by six states to pay outstanding principal and interest on bond issues in case of default. To address constitutional questions raised by this backing, the full faith and credit of the state are not committed to the guarantee. A separate reserve account is instead established.

According to the National Association of State Development Agencies (NASDA 1991), second to IDBs, in terms of the number of states that allow them, are direct loans or grants by a state or local government. Similar to the criteria for a private loan, an application and

Table 1.1 Economic Development Incentives Offered within the United States

Manufacturing revenue bonds (tax exempt)
Manufacturing revenue bonds (taxable)
General obligation bonds
Umbrella bonds
Manufacturing revenue bond guarantees
Direct state loans
Loan guarantees
State-funded interest subsidies
State-funded equity/venture capital corporations
Privately sponsored development credit corporations
Customized manufacturing training
Tax incentives
Enterprise zones

SOURCE: NASDA (1983 and 1991).

independent evaluation are required. In the 24 states that facilitate economic activity this way, resources include the umbrella issue of an IDB, a one-time appropriation from the state general fund, or a revolving fund in which new loans are financed through prior loan repayments. A similar business incentive was created in the 20 states that guarantee private loans or offer interest subsidies.

Start-up companies have a greater risk associated with achieving success, but they also offer the prospect of greater employment opportunities. As a result, 18 states had established state-funded or state-chartered equity/venture capital corporations by 1991. In addition, 10 states had created privately sponsored credit corporations that assist small businesses. Although credit corporations are mostly funded from private sources, they are authorized by state legislation and follow state guidelines.

In one way or another, the incentive programs described thus far are all geared to attract economic development to a state by reducing the business cost of machinery, buildings, and land. As a result of the increasing sophistication required of labor in most current production processes, 45 states have also designed state-run manufacturing training programs as a way to recruit new manufacturing activity. Criteria for eligibility for most of these programs stipulate that employees volunteer and that the employer has job openings of the type sought by the newly trained.

The most direct method by which a state reduces the cost of doing business within its boundaries is through a tax incentive. In the United States, these have taken the form of tax exemptions, credits, abatements, and special treatments. In 1991, every state had the option of providing relief from at least one of its major taxes. For example, 34 states provide that the inventory held by a business can be at least partially exempt from property taxation. Minnesota, North Dakota, and New Jersey also offer some form of exemption or credit toward the state corporate income tax. Efforts to conserve energy are granted special tax treatment in 27 states, while 38 states offer preferable tax treatment for pollution-control equipment. A state-based investment tax credit exists in at least 25 states. The same number of states offer a business tax credit or exemption for new job creation.

Local governments could abate or exempt business property from taxation in 33 states by 1991. State and/or local governments could

also exempt a business from sales and use taxes in Illinois, Minnesota, and New Jersey. Another form of tax incentive, begun in California in 1952, is the tax increment finance authority. An authority is established and a specific zone within the community is designated where incremental property tax revenue attributed to the development activity of the authority is used to fund the purchase and maintenance of the zone's infrastructure. Sometimes the authority also sets up an economic development program office. The stated goal of a TIFA is increased economic development within a designated geographic area of a community. Huddleston (1984) noted that at least 28 states in 1982 allowed cities to establish their own TIFAs. Chapman (1996) recorded more recently that at least 44 states and nearly 5,500 local agencies now use this tool to encourage local economic development.

The final form of direct business incentive offered by states is the enterprise zone (EZ), which targets activity in designated areas of a state. These incentives are usually restricted to areas that have had a slow rate of development, high unemployment, and/or high welfare payments per capita. Tax concessions, tax credits, employee training programs, and/or the relaxation of environmental or workplace rules are offered to businesses choosing to locate within these zones. In 1991, NASDA reported that 28 states had created EZs of some sort. Subsequently, Ladd (1994) reported that 37 states plus the District of Columbia had formed EZs.

Our focus is on local government incentives offered within a specified substate region. Of the menu of available incentives offered in the states in Table 1.1, only a few are under the autonomous control of local governments. These include the issuance of local manufacturing revenue bonds, the issuance of local general obligation bonds, the abatement and exemption of local property taxes or sales/use taxes, and the establishment of TIFAs. In most cases, the offering of a local incentive is also subject to approval of the state. Even in the absence of the requirement of specific state approval, states still have a constitutional right to intervene and to restrict the offering of local incentives by communities that abuse the practice. Considering the anecdotal evidence observed in Michigan and other states, in most cases the approval of a local incentive by a state agency is a rubber-stamp process. This is not surprising given the strong tradition of local autonomy and home rule that exists in the United States.

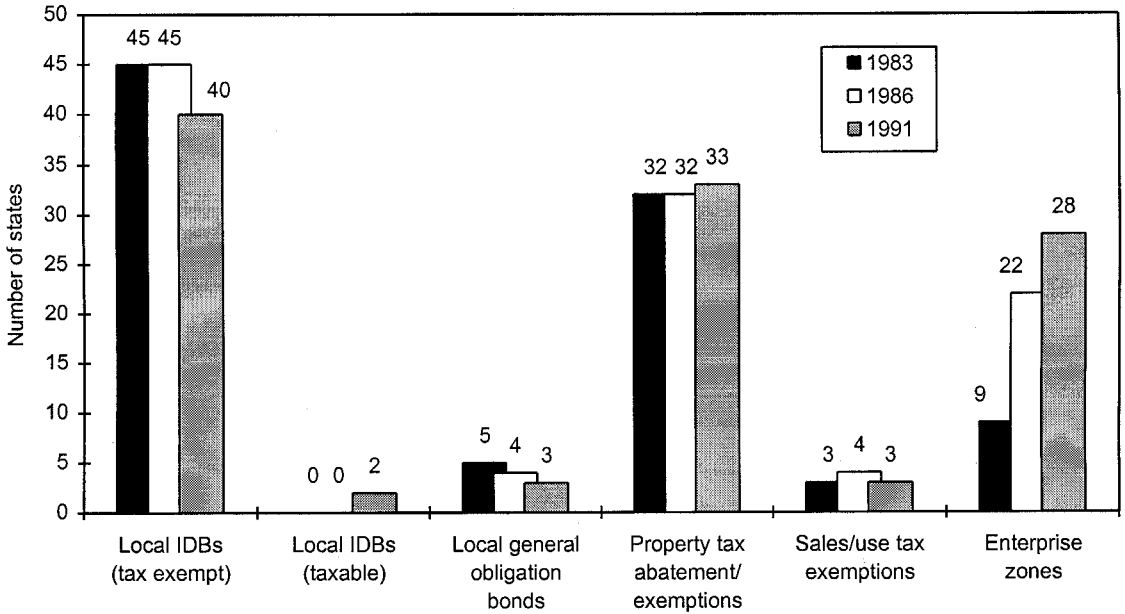
As a final piece of background on the use of local incentives in the United States, Figure 1.1 shows the number of states that allowed six specific types of incentive programs in 1983, 1986, and 1991. These years were chosen because they correspond to the published dates for the NASDA Directory of Incentives for Business Investment and Development in the United States. This directory offers the only known reliable source on the use of economic development incentives in the entire country. Notice that by 1983 the use of tax-exempt IDBs, general obligation bonds, and property tax or sales/use tax exemptions had become well established. There was little or no growth in the use of these local incentives by additional states through the early 1990s. The innovation of IDBs only began in the late 1980s. Although EZs in the United States are not a locally controlled incentive, they are also shown in Figure 1.1 to document their recent rapid rise in popularity. This increase is discussed in our final policy suggestions.

DIFFERENCES IN LOCAL INCENTIVE OFFERS

> *[Economic development] programs aimed at individual towns or suburbs within a metropolitan area raise different issues.*
>
> —Timothy J. Bartik (1991)

In *Who Benefits from State and Local Economic Development Policies?* (Bartik 1991b), the author concluded that state and local economic development incentives may increase productivity, redistribute jobs to areas in most need of employment, and increase national employment. Bartik made this claim based on a summary of previous research and on his own study of subnational incentive policies designed to influence economic activity inside a region (either a state or metropolitan area). He used the tentative "may" in his conclusion because the direct empirical evidence on whether competition for economic development causes productivity gains, employment redistribution to needy areas, and national employment increases was sparse in 1991 (Bartik 1991b, p. 201). An important issue, for which there is

Figure 1.1 Number of States That Allowed Specific Incentives in a Given Year



SOURCE: NASDA (1983, 1986, and 1991)

still not enough empirical support, is whether competition for economic development causes economic growth in the most needy areas.

The tactic taken here is to examine the effects of incentive offers made by local governments within a specific metropolitan area. As Bartik has noted, this approach raises issues that can be ignored if the unit of analysis is the entire metropolitan area or state. We believe, however, that it is a mistake to ignore these intrametropolitan issues if one wishes to know whether local incentives do redirect economic activity to needy areas. In the 1990s, the places in most need of economic revitalization in the United States are central cities and the surrounding inner suburbs. The concern is not just whether one metropolitan area or state offers greater (or fewer) development incentives than others, but how the incentive offers are distributed throughout jurisdictions within a metropolitan area. Assuming that incentives can redirect economic activity, a necessary condition for redirection of activity toward needy areas is that needy areas offer more incentives.

The important difference in incentive offers made by local governments within a metropolitan area can be derived from the anecdote told in one form or another by economic development practitioners across the country. The management of a business new to a metropolitan area, or of one already located in the area, is about to make a location decision. Management gives the local government leaders an impression of seriously considering a site within the area's inner cities, while the existing business already resides there. In order to attract the new business or to retain the existing business, an inner city puts together an incentive package of local tax breaks, IDBs, and other incentives. Of course, the cost of doing business in the inner city is likely to be greater due to higher crime rates, higher taxes, and lower public service quality. The inner city policymaker finds it necessary to offer an incentive package as a form of compensating differential. The mobile business firm presents the inner city's incentive offer to a suburban municipality and asks for a matching offer. The firm is able to provide a fiscal surplus, or an excess of local tax payments over the cost of local services provided, to the suburban city. The firm also extends the promise of additional jobs for the suburban community. The inner city's offer is matched by the suburban city, and the firm locates in the suburb,[6] the same place it would have most likely gone without the incentive.

Such a scenario can also be played out between two states or metropolitan areas competing for a major manufacturing facility. This occurred repeatedly in the battles for the locations of auto manufacturing plants such as Saturn, Toyota, and Mitsubishi.[7] The difference in local incentive offers is that the situation of an offer/counteroffer is more likely to occur between two competing jurisdictions in a metropolitan region. There is more than one reason for this. First, the nonfiscal factors that influence a firm's location decision are prone to be constant across cities within a region. Thus, the manipulation of fiscal factors through incentive offers carries greater weight. Second, the arsenal of local incentive tools is necessarily the same between competing cities in a metropolitan region in the same state. The excuse that the state does not allow the city to match the competing incentive offer is not credible. Third, the proximity of cities within a metropolitan region makes the transmission of information and the bargaining process much easier to accomplish. A firm shopping for a new site can negotiate with an inner city in the morning, present the offer to the outer suburban city in the afternoon, and call for a response by the suburban city council at its meeting that evening. These three factors combine to force local policymakers to take the threat of alternative sites and competing incentive packages very seriously.

The unique aspect of communities within a substate area competing with each other to attract economic development has been recognized by other researchers as well. Wolman and Spitzley (1996) have provided an extensive review of the literature on the politics of local economic development. The researchers point out that many local officials perceive their city's economic performance as being held hostage to the ease of capital mobility between border cities. Incentives offer a tool to combat this mobility. An environment of uncertainty and turbulence surrounds most local economic development projects and also creates the opportunity for officials to pursue *credit-claiming* activities. A local elected official claims credit for a desirable firm location decision by offering an incentive that then is attributed as the key factor in the choice.

Wassmer (1993) pursues a more economic approach that considers communities in a metropolitan area to be providers of land for business use. The issue is whether cities compete or collude with each other in the provision of land for business use. It is in the collective interest of

cities in a metropolitan area to cooperate and to pursue joint incentive policies through cartel-like allowance of land for business use. In so doing, cities maximize the total fiscal surplus extracted from business in the metropolitan area, although it is still in the interest of any one city to pursue a noncooperative strategy and to independently offer local incentives to business. Wassmer provides empirical evidence that the norm in the Detroit metropolitan area has not been collusion in local incentive offers, but local competition that has steadily increased over time.

INTRAREGIONAL USE OF INCENTIVES

> *Although much of the extant literature on public sector competition for economic development is set at the state level or examines the competition between major cities, the fiercest competition for private investment is often between neighboring cities or cities within the same region.*
>
> —Edward Goetz and Terrence Kayser (1993)

The previous section presented arguments as to why it is important to examine the redistribution of economic activity caused by incentive offers of cities within a metropolitan area. Next, we review the available evidence on the degree to which communities in major U.S. metropolitan areas have the potential and have chosen to compete with each other for economic development by offering incentives. It is unfortunate, however, that there really is little direct information to offer. A 1991 study of interjurisdictional tax and policy competition (Advisory Commission on Intergovernmental Relations 1991) concluded that evidence on this issue is lacking due to definition and measurement problems that make it difficult to assess the degree of competition.

Given the lack of direct data on intrametropolitan incentive competition in the United States, an alternate method is to ask how much competition for local economic development could exist between municipalities in the largest U.S. metropolitan areas? A key tenet of

economic theory is that competition is only possible if there are a substantial number of suppliers and demanders of the good or service under consideration.[8] If cities are the suppliers of land for business use, and business firms are the demanders of that land, then the competitive requirement is satisfied on the demand side, as there are many business firms in large metropolitan areas of the United States.

Fischel (1981) examined the competitive requirement on the supply side by applying the notion of concentration ratios to local governments in large U.S. metropolitan areas. In the field of economics known as industrial organization, a common technique is to measure the percentage of sales in an industry captured by the four largest firms in the industry (four-firm concentration ratio). A high percentage indicates greater concentration and hence a lack of competition. For the 25 largest urbanized areas in the United States in 1970, Fischel calculated two forms of concentration ratio for the four largest suburbs in each region. The first was the total square miles of the four largest cities divided by the urbanized land area of the Standard Metropolitan Statistical Area (SMSA). The second was the total square miles of the four largest cities divided by the land area of the SMSA outside the central city. His results (excluding Washington, D.C.) are reproduced in Table 1.2.[9]

The central cities listed in italic type in Table 1.2 exist in metropolitan areas where the two concentration ratios are both less than 40 percent. In these metropolitan areas, the four largest suburban cities comprise less than 40 percent of the urbanized land, and less than 40 percent of the suburban land in the total metropolitan area. A concentration ratio of less than 40 percent is often regarded as a necessary condition for competition to exist in an industry. A further condition for competition is a large number of cities in the metropolitan area. As shown in Table 1.2, the metropolitan areas containing the 11 most populated cities in the United States (New York to Minneapolis) satisfy the concentration condition and contain from 58 to 399 cities in their respective metropolitan areas. By most standards, this is adequate evidence that these metropolitan areas exhibit competitive markets for manufacturing and commercial business location. In addition, the smaller metropolitan areas of Milwaukee and Cincinnati also meet the two requirements of low concentration ratios (less than 40 percent) and a large number of cities.

In order to assure competition, not only must the structure of local governments be competitive, but local governments must also have the capacity to offer local incentives. Table 1.2 indicates that all the metropolitan areas that were competitive in structure in 1970 also had the state-granted ability in 1991 to offer at least one form of local incentive. Ten of the metropolitan areas were in states that allowed the offer of two or more forms of these incentives. The most prevalent type of local incentive in the large U.S. metropolitan areas defined as competitive was the capability to issue property tax abatements or exemptions. The comparison between Fischel's calculation of 1970 concentration ratios and the 1991 ability to offer local incentives should pose little problem. Subsequent change in the number of local governments in these metropolitan areas has been minor.[10]

There is evidence of the potential for the competitive use of local incentives to attract business to specific jurisdictions within the largest U.S. metropolitan areas. What about more tangible information on the degree to which incentives are actually used by localities in large metropolitan areas? Such material is harder to obtain. A search of the literature has yielded only a few examples. An early review of the subject by Bahl (1980) reported that the practice of giving local government tax abatements to stimulate commercial and industrial development in blighted areas was growing. Parker (1982) recorded in the *City Almanac* that New York City had already foregone $200 million in annual property tax revenue due to abatements. Glastris (1989) in *U.S. News and World Report* called Hoffman Estates, Illinois, "the latest loser in the tax incentive wars" when it gave an incentive package of land, infrastructure, tax abatements, and worker training valued at $240 million to attract the Sears Corporation from Chicago. Burnier (1992) provided background on local tax abatement policy in Ohio and on its implementation in the city of Chillicothe. She concluded that officials view tax incentives as a tool of competitiveness that they do not intend to relinquish. Reinhard and Scott (1993) reported estimates from the International Downtown Association of at least 1,000 Downtown Management Districts in North America at the time. These districts act to spur central business district development as special tax assessments are used to provide services and infrastructure designed to retain and attract commercial business. Finally, in a recent summary of tax increment financing activity in California, Chapman (1996) indi-

Table 1.2 Suburban Fragmentation and Local Incentives in Large U.S. Metropolitan Areas

Metro area's central city	Number of local govt's in area[a]	Four largest suburbs concentration ratio (1970)		Availability of a specific local incentive within the metropolitan area's state (1991)[b]		
		% of metro area's urbanized land[c]	% of metro area's suburban land[d]	Local IDBs (tax exempt)	Property tax abatement/ exemption	Sales/use tax exemption
New York[e]	399	10	12	No	Yes	Yes
Los Angeles	104	6	10	Yes	No	No
Chicago	178	5	7	Yes	Yes	Yes
Philadelphia	166	11	13	Yes	Yes	Yes
Detroit	97	16	19	Yes	Yes	No
San Francisco	58	17	21	Yes	No	No
Boston	78	11	12	No	Yes	No
Cleveland	91	15	17	Yes	Yes	No
St. Louis	116	11	13	Yes	Yes	No
Pittsburgh	180	12	14	Yes	Yes	No
Minneapolis	89	20	23	No	Yes	Yes
Houston	30	19	72	Yes	Yes	No
Baltimore	4	75	100	Yes	Yes	No
Dallas	23	29	48	Yes	Yes	No

Milwaukee	41	30	38	Yes	No	No
Seattle	29	50	69	Yes	No	No
Miami	22	78	80	Yes	Yes	No
San Diego	12	32	74	Yes	No	No
Atlanta	26	51	74	Yes	No	No
Cincinnati	79	14	19	Yes	Yes	No
Kansas City	46	31	86	Yes	Yes	No
Buffalo	26	28	35	No	Yes	No
Denver	25	21	31	Yes	Yes	No
San Jose	15	27	47	Yes	No	No

SOURCE: Fischel (1981, Table 1) and NASDA (1991).

[a] This is the number of local governments with final zoning authority.

[b] None of the cities in these 24 metropolitan areas were able to offer taxable local IDBs or local general obligation bonds.

[c] The urbanized portion of an SMSA by definition has population density exceeding 1,000 people per square mile.

[d] The suburban portion of an SMSA is all non-central-city land area.

[e] The central cities in italics have concentration ratios less than 40 percent.

cated that in 1950 there were only two TIFA redevelopment areas in the state. By 1990, the number had grown to 658 project areas. The assessed value captured by Californian TIFAs in 1990 was nearly 8 percent of the total assessed value of all property in the state.

Wolkoff (1985) noted that, because local incentives are largely regarded by states as a community matter, few reliable statewide estimates of their use exist. Researchers who have surveyed local governments directly have obtained some of the best sources of information. Cable, Feiock, and Kim (1993) offered the results of a survey of U.S. cities with populations over 50,000, to which 219 cities responded. Of the replying officials, 42 percent of the officials indicated that they offered tax abatements; 32 percent offered loan subsidies of some sort; 47 percent offered direct loans; 34 percent used cash contributions; and 62 percent offered employee training as local incentives. Bowman (1988) surveyed 84 public and private sector economic development officials in 31 southeastern cities in the United States. Her purpose was to gauge the extent and style of interjurisdictional incentive competition among these cities. Respondents were given the choices of very competitive, fairly competitive, and not competitive. Eighty-two percent of the aggregate group of mayors, business editors, commerce and economic development staff responded that the level of competition for economic development in their city was very competitive. Respondents were given the choices of high, medium, or low to rate the level of competition with surrounding suburbs. Forty-seven percent of the mayors responded high, while 35 percent of the business editors, 19 percent of the chamber staff, and 39 percent of the economic development staff did the same.

A Goetz and Kayser (1993) survey deserves special attention. In 1991, these researchers attempted to contact an economic development official in all 140 municipalities in the Twin Cities (Minneapolis and St. Paul) metropolitan area. In total, 109 surveys on local economic development practices were returned, of which only 15 reported no formal local economic development practices. Of the remaining 31 nonrespondents, 81 percent had populations less than 10,000. Goetz and Kayser concluded that the majority of nonrespondents were likely to have had no formal organization to encourage local economic development. Thus, nearly 70 percent of the communities in this metropoli-

tan area were engaged in local efforts designed to attract and retain economic activity.

An aspect of the Goetz and Kayser survey results that warrants mention here is that 85 percent of the respondents agreed or strongly agreed with the statement that competition for economic development exists within the region. However, only about one-half of the respondents said that they were doing well in their competitive efforts to attract and retain local economic activity. This is not surprising if economic development activity in a region is a zero-sum game. A telling finding is that the cities responding as doing well experienced greater population growth in the last 20 years. Development officials who responded that their jurisdictions were not doing well pointed to negative city characteristics as the cause of their disadvantage. Most officials in this situation thought that the appropriate strategy is greater effort directed at intrametropolitan economic development competition in the future.

Of special interest in the Goetz and Kayser analysis of the Twin City survey data was an attempt to determine which cities compete with each other in a spatial sense. When asked to name their prime competitors, nearly every city chose cities nearby and within a narrowly defined subregion in the metropolitan area. A number of inner cities and first-ring suburbs said that their competition for local economic development was primarily second-ring suburbs. Interestingly, second-ring suburbs viewed their competitors differently and saw their adversaries as other second-ring suburbs within their subregion. Goetz and Kayser also used simple correlation analysis and found that municipalities were more likely to compete with cities of the same population and tax revenue size. Ultimately, 80 percent of the economic development officials thought that their own local development efforts provided benefits to the entire Twin Cities region. At the same time, only 39 percent thought that local economic development activity ought to be regionally coordinated. Considering that an innovative tax base-sharing plan has long existed in the Twin Cities metropolitan area, this is a discouraging finding. It offers little reassurance for potential metropolitan-wide coordination of local incentive offers even in a region that is notable for its cooperation.

LOCAL INCENTIVES IN METROPOLITAN DETROIT

> *Most [property tax] abatement activity has occurred in the counties that have served as the traditional sources of Michigan's economic strength . . . Wayne County, the state's most populous, has had the largest volume of abatement activity within it.*
>
> —Michael J. Wolkoff (1982)

As demonstrated in the previous section, there is circumstantial evidence that most large U.S. metropolitan areas possess the local government structure and the state-granted capability to compete with each other through local incentive offers. Except for some noteworthy survey evidence, there is only anecdotal information on the degree to which specific types of local incentives have been offered by communities within U.S. metropolitan areas. Fortunately, the state of Michigan and the Detroit metropolitan area are anomalies in this regard.[11] Michigan has a longer-than-average history of allowing local jurisdictions to choose among a large array of local incentives. Information on the use of these incentives has been recorded and reported by various state agencies, planning, and watchdog groups.[12]

The menu of local incentives available to Michigan communities includes industrial development bonds, manufacturing and commercial property tax abatements, tax increment financing, and downtown development authorities. The first IDB offered by a city in metropolitan Detroit occurred in 1967. As required by the Internal Revenue Service (IRS), the state treasurer's office has kept a record of all locally offered IDBs. Manufacturing property tax abatement has been available to Michigan communities since 1974. Commercial property tax abatement was available to Michigan cities between 1978 and 1988. The State Tax Commission, within the treasurer's office, grants final approval on each local property tax abatement and collects data on abatements granted.[13]

Two other local incentives available in Michigan are the TIFA and the DDA. Michigan municipalities have been able to establish TIFAs since 1980 and DDAs since 1974. DDAs are authorized to create and implement an economic development plan within a city's central busi-

ness district. They often use tax increment financing as a source of funding. Groups like the Citizen's Research Council of Michigan (1986) and the Southeast Michigan Council of Governments (1990) have kept track of the establishment of TIFAs and DDAs within Michigan jurisdictions.

Using simple descriptive statistics and correlation analysis, Wassmer (1993) found empirical evidence of increasing competition in the use of local incentives in the Detroit metropolitan area over time. Over the 10- to 15-year period that local incentives had been available, there was an average eightfold increase in the mean local use of incentives and a decrease in the coefficient of variation in use for all forms of incentives except IDBs.

In 1995, we published a formal duration analysis of the adoption of manufacturing property tax abatements by Detroit area municipalities (Anderson and Wassmer 1995). Duration analysis allows for the calculation of the probability that a specific jurisdiction will begin to offer manufacturing property tax abatements provided that it has not yet chosen to provide this incentive. In our statistical analysis, we employed time-varying covariates and controlled for local characteristics that could influence a city's decision to offer its first manufacturing property tax abatement. The clear finding from this research is that, the longer a municipality waits to grant a property tax abatement, the greater the probability that it will offer its first incentive in the next period. As time passes, economic and political forces cause a community to be increasingly more likely to make an incentive offer. We attribute this result to the strategic motivations involved with incentive offers as a metropolitan-wide game similar to the prisoner's dilemma.[14] The finding of greater incentive emulation over time provides evidence that the likelihood that a city in a metropolitan area will match a competing city's inducement increases with the length of time since the incentive program began.

SUMMARY

This chapter has provided an overview of economic development incentives offered by local jurisdictions within U.S. metropolitan areas.

Our study of this issue is motivated by the relationship between many of the nation's most pressing social and economic problems and the unprecedented redistribution of residency and economic activity that has occurred in the last 40 years from most of the nation's inner cities to their outer suburbs. As described in detail in O'Sullivan (1999, Chap. 10), the percentage of the U.S. metropolitan population living in central cities fell from 64 percent in 1948 to 39 percent in 1990. The loss in manufacturing employment over the same period was from 67 percent to 45 percent, while wholesale, retail, and service employment in central cities fell even further. In an effort to alter this flow, inner cities have responded with an arsenal of local fiscal incentives, apparently matched in numerous cases by the outer suburbs.

We have also tried to provide reasons why there has been very little formal testing of the efficacy of local incentive offers made within a metropolitan area and to emphasize the importance of studying this issue further. We began with a broad background on the types of subnational economic development incentives available in the United States. Among these, only industrial development bonds, general obligation bonds, property tax abatement, sales tax exemption, and tax increment financing are locally initiated. There is little direct data on the use of these incentives in U.S. metropolitan areas, although an examination of the largest of these areas showed that they exhibit a competitive government structure and possess the ability to issue at least one form of local incentive. Both anecdotal material and survey evidence in support of the existence of intrametropolitan competition were provided.

In addition, we gave a brief description of local incentive use in Michigan, specifically in metropolitan Detroit. A primary reason for the choice of this area as the subject of our empirical study is the availability of information on local incentive offers. In addition, the Detroit area exhibits a competitive local government structure, a greater-than-average number of types of state-sanctioned incentives for local governments, and the ability to offer these incentives for a period longer than the average observed in most other states. Earlier statistical analyses confirm the competitive nature of local incentives in the Detroit metropolitan area.

Chapter 2 provides the reader with a retrospective on previous work. This includes the determinants of local economic activity, previ-

ous attempts to assess the efficacy of local incentive offers, the issue of a spatial mismatch between employees and employers in a metropolitan area, and an explanation of how these topics are related in our study. Chapter 3 gives a descriptive overview of the types of local incentives employed in the Detroit metropolitan area and statistical evidence on a possible spatial mismatch in the area's labor market. Chapter 4 reviews economic models and their implications for the effectiveness of local incentives on employment and capital allocation decisions by business in a substate region. A system of simultaneously determined equations is presented as a framework within which to examine the effectiveness of local incentives. The results of regression estimation of the simultaneous system, and some relevant simulations that use the regression findings, are in Chapter 5. Chapter 6 contains a summary and provides policy recommendations.

Notes

1. As presented in the 1995 *Statistical Abstract of the United States*, published by the U.S. Department of Commerce, 15.6 percent of the U.S. population in 1970 lived in cities with populations of 500,000 or more. By 1990, this percentage had fallen to 12.1. See Downs (1994) for a full description of the relationship between suburbanization and urban problems in the United States. As Downs points out, an additional benefit of the reconcentration of economic activity in a metropolitan area is less urban sprawl, with less traffic congestion and less air polution.
2. The incentive programs listed are the major ones traditionally offered to business. Newer forms of economic development programs became popular in the 1980s and include providing government services to assist in business decisions. Since these *new wave* economic development policies are more likely to be initiated at the state level, and data on their local use are difficult to acquire, this book concentrates on the use of traditional incentives. The National Association of State Development Agencies (NASDA 1983, pp. 13–20) offers a concise description of the various forms of nonfinancial assistance offered within states.
3. Consult Fosler (1988) for a thorough discussion of these alternatives.
4. Netzer (1991) makes this point.
5. NASDA (1991, pp. 773–778) provides a list of all the states offering the various forms of incentives described here.
6. Bartik (1994) recognizes this by concluding, "Competition for jobs among jurisdictions within the same metropolitan area uses public resources without changing overall labor market opportunities in the metropolitan area" (p. 857).
7. See Bartik (1987) for an example.

8. Eberts and Gronbert (1988) have tested the hypothesis that an increased number of local governments per person leads to a more competitive structure and hence less expenditure per person (holding all else constant). They find the expected result that, the greater the government fragmentation in a metropolitan area, the lower the local government expenditures per capita within Standard Metropolitan Statistical Areas.
9. Fischel (1981) also calculated concentration ratios for the Washington, D.C. metropolitan area. These are excluded from Table 1.2 due to the area's overlap with two states.
10. See Wassmer and Fisher (1997) for a description of city formation in large US. metropolitan areas and evidence on the minor degree of change between 1980 and 1990.
11. Throughout this book, the Detroit metropolitan area is defined as Macomb, Oakland, and Wayne counties. This is the same as the 1970 U.S. Census definition of Detroit's SMSA. In 1990, the U.S. Census defined the Detroit Metropolitan Statistical Area (MSA) as containing Lapeer, Livingston, Macomb, Monroe, Oakland, St. Claire, and Wayne counties. We have chosen the more limited 1970 definition because it better accounts for a region where communities are more likely to compete with each other for the location of many of the same businesses.
12. A complete description of the local incentives offered in the Detroit metropolitan area is contained in Chapter 3.
13. Wolkoff (1985) has already used this information to provide a summary of manufacturing tax abatement awards in Michigan counties up to the mid 1980s.
14. The prisoner's dilemma is a widely discussed game in the social sciences demonstrating that, given the inability to coordinate decisions among individuals, the self-interested choice made by one is not in the interest of all.

2 Evidence on the Influence of Local Economic Development Incentives

This is a lucrative arrangement for Campbell's, but the advantages [of keeping Campbell's in Sacramento] far outweigh the problems that would occur if they pull out.

—Paul Hahn, Sacramento County Economic Development Coordinator (1996)

We are a publicly held company and we have to act on behalf of our shareholders.

—Kevin Lowery, Campbell Soup spokesman (1996)

The goal of this book is to assess the effectiveness of local incentive use within a metropolitan area. We define effectiveness as the redistribution of economic activity to areas where it would not be without for the offering of incentives. Before describing our own research, it is appropriate to provide a brief review of the previous literature related to this topic. This chapter is devoted to such a review.

We begin with a summary of the basic economic theory explaining determinants of the intrametropolitan distribution of economic activity. This theory allows for the possibility that local government taxes and expenditures exert an influence on business location in a metropolitan region. Empirical evidence in support of this claim is also given. If the fiscal activity of governments can influence intrametropolitan business location, then perhaps so can local incentives designed to reduce the bite of local taxes. We provide a synopsis of earlier empirical assessments of the actual influence of local economic development incentive offers.

In human terms, a real benefit of redirecting economic activity within a metropolitan region is the employment of individuals who otherwise would be without work or earn lower wages and hence would more likely be poor. This benefit could occur if incentives are

effective in reducing unemployment that is spatially concentrated within a metropolitan area. The case for intrametropolitan unemployment concentration and poverty has been made based on a spatial mismatch between low-skilled employees living in some cities, usually inner cities, and potential employers located in other cities, usually outer suburban cities. Economists have developed theories regarding this phenomenon and have conducted empirical studies to test those theories, examining both the existence and extent of the spatial mismatch. Since we want to measure whether local incentive offers could possibly alleviate a spatial mismatch between employees and employers in a metropolitan area, we also examine some of the existing research on this issue.

DETERMINANTS OF LOCAL ECONOMIC ACTIVITY

> *When a firm considers whether to remain in a central business district or to move several dozen miles into suburbia, it is considering an option that has been made possible by an array of technologies—the automobile, the limited-access highway, low-cost electronic communication, closed circuit TV, facsimile transmission, and high performance general aviation aircraft.*
>
> —John M. Levy (1981)

Most large cities in the United States and their surrounding metropolitan areas, except perhaps for some cities in the West and Southwest, began as monocentric entities.[1] Monocentric cities developed in the late 19th and early 20th centuries due to transportation technology tied to a central node. A rail terminal, seaport, or other transportation node was the basis for manufacturers to ship their output and to receive their nonlabor inputs. A hub-and-spoke streetcar system was typically built that converged at the central city. The necessity of face-to-face contact in commercial transactions drove high-density development of central cities. Due to technological changes in transportation and communication, metropolitan areas are no longer so strongly oriented with a focus on the central city. Mieszkowski and Mills (1993) report that, “The

United States [on average] is approaching the time when only about one-third of the residents within an MSA will live in central cities and about 40 percent of the MSA jobs will be located there" (p. 135).

Economists have attributed the suburbanization of manufacturing to an increase in the use of trucks for intra-city and inter-city shipping and to the use of automobiles as the dominant mode of transportation to work. New production technologies that require single-story or land-intensive facilities and the growing use of suburban airports for shipping have also been important factors. The movement of residences to the suburbs has been driven by a reduction in the cost of commuting, a desire to escape central city fiscal and social problems, and a need to follow employers. Retail and office activities have also followed suburban population growth.

In light of these historic trends, one may question what currently determines the level of economic activity in a specific jurisdiction within a metropolitan area. For an answer, it is best to consider the market for local business sites in a metropolitan area. As with any market, there is a demand side driven by business location decisions, and there is a supply side driven by community zoning decisions allowing or disallowing local sites for manufacturing or commercial uses.

Demand for Local Business Sites

> *Whenever a company moves its headquarters, the commute of the chief executive officer always become shorter.*
>
> —Joel Garreau (1991)

Webber (1986) suggested three types of business decisions that drive the demand for nonresidential sites within a locality. First, a firm may be involved in a decision to begin new production, relocate, or build additional capacity. Second, a business reorganization may not require additional capacity, but rather, a shifting of some production from one location to another. Finally, a decision may be needed to reduce capacity, or to wholly close down an enterprise. These are pure investment decisions, based on the perceived opportunities at each potential site. Appropriately, economic theory has treated these

choices as driven by the desire to maximize profit through a business choice among alternate locations. As the Campbell's Soup representative stated at the opening of this chapter, the profit motive is not a personal whim selected by a company's management. Rather, it is imposed on the firm by shareholders and by the forces of market competition. Garreau (1991) observes that it may appear that business location decisions in a metropolitan area are driven by executives' decisions to shorten their commutes, but this is more likely to be simply coincidental to the profit objective.

A firm considering a new site first selects a number of feasible locations. For each of these possibilities, it then determines the likely quantity of output that could be sold at each one, the total production cost, and the expected sales revenue. After this information is produced for each site, the locations are compared, and the site yielding the highest anticipated profit is most likely chosen. Schmenner (1982) has formalized this decision process in a five-step procedure. The first step is the recognition of the need for a new location. Blair (1995) points out that inertia based on a long-term current location often makes this first step difficult. The second step is formation of a site-selection team. In the third step, the site-selection team develops a list of criteria required of a new site. Once the criteria have been established, the next step is to winnow and focus the search to a short list of possible locations meeting the criteria. In the fourth step, or *market stage*, the firm chooses to locate in a particular region of the country, or region of a state, based upon the market characteristics of that region.[2] In the *site stage*, the fifth step in the business location process, a firm chooses a specific site to serve the chosen regional market.

The demand for local business sites within a metropolitan area does not arise until the site stage. The business, at this point, has chosen the metropolitan area as its desired market and now wishes to pick a specific site within a city in that market area. As with any choice, trade-offs exist. Due to the relative ease of employee commuting between cities in a metropolitan area, local residential amenities and differences in labor costs are usually not major issues as a business evaluates potential sites in a metropolitan area.[3] It is possible, however, that if a majority of a firm's employees (especially management) are located far from its point of production, there may be reason enough to consider an intrametropolitan location change.[4] In making

an intrametropolitan site choice, transportation issues arise because of the desire for a central location served by an adequate road system. Local infrastructure (such as the ease of tying into utility services) also plays a part in the selection of a specific city. Finally, the fiscal climate is a local characteristic that can conceivably play a large role in the demand for a community's business sites.

That local fiscal policy can exert a strong influence at the site stage of location selection was recognized as early as Floyd (1952). The Advisory Commission on Intergovernmental Relations (1967) reiterated Floyd's reasoning by observing that "in almost every metropolitan area there exists wide local property tax differentials—a cost consideration that can become a 'swing' factor in the final selection of a particular location" (p. 78). Of course, taxation is only one side of the local fiscal equation important to business location. Firms are also concerned about the quantity and quality of local services provided. These services have an impact on the crime rate, the expected response time for police and fire provision, street lighting, sidewalk and road maintenance, utility provision, and other factors important to the firm.

Capitalization of local characteristics into land values is another important issue related to the demand for business sites within a community. If the land available for industrial development is fixed within a community, and the community lowers its rate of taxation on manufacturing property, then the demand for its available manufacturing property increases. This change in demand raises the rental rate, tending to offset at least partially the benefit of the lower rate of property taxation. Capitalization results in an inverse relationship between local rental rates for land and local property taxes. In the long-run competitive manufacturing case, if all manufacturing firms are identical and there is perfect capitalization, a typical manufacturing firm will earn zero economic profit no matter where it chooses to locate in the metropolitan area.[5] In such a situation, local property taxes and other local fiscal characteristics would exert no influence on business location. Bartik (1991a) notes that this argument is incomplete, in the sense that not only are all manufacturing firms not identical, but producers in low property tax (and high land rent) communities will substitute capital inputs for land, to the extent possible in production. He concludes (p. 73) that, "This 'substitution effect' can easily result in taxes having a major impact on a community's capital base." In sup-

port, empirical evidence from studies of property tax capitalization, such as that in Yinger et al. (1988), indicates that local taxes are less than perfectly capitalized.

Supply of Local Business Sites

> *Before undertaking further tests, it seems imperative to make further progress in model specification . . . One major advance over present models would be to incorporate the fact that manufacturing location is jointly determined by the behavior of firms and host communities.*
>
> —William H. Oakland (1978)

Cities influence intrametropolitan business activity through their zoning practices. After all, even if a business firm desires to locate in a given city, it can only do so if it finds compatible regulations that allow the desired land use. Zoning regulations on local land use are used extensively in the United States. As documented by Fischel (1985), "A community [in the United States] can establish whatever standards it wants, so it is possible with a little forethought (and sometimes just afterthought) to exclude most manufacturing and commercial activities" (p. 23). The existence of bedroom communities in most American suburbs is evidence enough of this ability.

Oakland (1978) reviewed much of the earlier research on this topic and, as indicated in the previous quotation, concluded that firms and host communities jointly determine manufacturing location. White (1975) and Fischel (1975) were the first economists to derive a theory of the influence of local zoning and the supply side of the market on intrametropolitan business location.[6] Since their work is similar in many ways, we focus on only White's approach.

White's model of a community's willingness to supply firm sites is based on local property taxes being used to fund the provision of local services. In her model, firm entry occurs only after residential entry. Using so-called neutral fiscal zoning, a community imposes a minimum property requirement upon a nonpolluting firm equal to the yearly value of local services provided to the firm, divided by the property tax rate. Her concept of pollution zoning accounts for the fact that

the entry of some firms creates a reduction in local environmental quality. In this case, a community then requires a citizen-determined property tax payment greater than the amount necessary to provide the business with local services.[7] Holding other location factors constant, a firm chooses a community (and is chosen by the community) where its property tax payment, conditional on the amount of pollution it emits, is minimized. Both this model and Fischel's predict that polluting and nonpolluting firms are often excluded from certain cities.

Early empirical examinations of determinants of intrametropolitan location decisions largely ignored the influence that communities exert through land-use controls. Overlooking this important factor led authors of many of these studies to conclude that local tax and expenditure differences had little or no impact on intrametropolitan business location decisions, a conclusion rejected in the majority of more recent empirical work.

EARLIER ASSESSMENTS OF LOCAL INCENTIVES

> *There is an enormous amount of literature on the effectiveness of state and local economic development policies . . . the existing literature reflects a great deal of effort that could have been better spent asking different questions.*
>
> —Paul N. Courant (1994)

If fiscal incentives offered by communities in a metropolitan area are to have any effect on the distribution of business activity or employment locally, the fiscal variables upon which the incentives are based must exert an influence. There are two related ways to investigate this issue. The first is to check whether local taxes discourage business activity, or whether local expenditures on activities that benefit firms encourage business activity. Of course, the more direct assessment is to ask whether the offering of local incentives stimulates business. Researchers have done both, using survey methodology and regression analysis.

An alternative method of evaluation is based on a simulation approach. Using this technique, a researcher attempts to duplicate the location decision-making process of a firm by measuring the difference in expected profit levels at each potential site. This research is difficult because of the large number of factors influencing site choice that must be measured, and the effect of each factor on the firm's profit must be accurately modeled. Cameron (1969) conducted an early study of this type and found substantial differences in profit levels across communities in a metropolitan area due primarily to differences in local property taxation. Her study did not account for public service differences across cities, however, and assumed plant sites of equal quality and cost in all cities. The best examples of simulations that assess the influence of government-controlled variables on plant location are those of Papke and Papke (1986), Papke (1987), and Bartik et al. (1987). Unfortunately, all of these studies were conducted at an interstate level of comparison.

Surveys

> *. . . such questionnaires usually are turned over for response to the person in the organization whose job it is to analyze tax differentials . . . The tax agent who reports taxes as being of little influence would in effect be saying that the job is not important.*
>
> —Gary C. Cornia, William A. Testa, and Frederick D. Stocker (1978)

One way to examine the potential influence local fiscal variables and incentives exert on business location decisions is to ask business decision makers to rank the factors that influence their location choices. For example, the work of Schmitt et al. (1985) surveyed 950 companies that were randomly drawn from the membership of the Michigan Chamber of Commerce. Of those surveyed, 406 firms responded, 39 percent of which had expanded in Michigan within the last five years and 44 percent of which had opened a new facility during the same period. Businesses were given a list of 34 factors that might be expected to influence a business expansion or relocation decision and were asked to rank the importance of each on a 6-point scale

(6 being the most important, 1 being not important). The average rank assigned to each factor by all 406 respondents was then calculated. The survey results are reported in Table 2.1. Factors are listed in the order of importance attached to them by the responding firms.

We only consider the results in Table 2.1 that concern a location choice among communities in a metropolitan area. When making a location decision within a metropolitan region, the firm likely draws upon the same labor force in all places and encounters the same employment regulations, state taxes, fiscal health of the state, and water supply. For most manufacturing firms, the distance to material inputs is also unlikely to vary widely among possible intrametropolitan alternatives. Since employees of the firm do not have to reside in the city where the firm is located, state and local taxes on individuals and their cost of living should not vary by site within the metropolitan region.

The factors listed in italic type in Table 2.1 are those that can be important to a metropolitan site choice. The greatest importance was attached to a city's general business climate or attitude toward industry, reflected in a score of 4.32 on the scale of 6. This is a comprehensive category that encompasses the city's fiscal, zoning, and regulatory climate, along with its propensity to "cut a break" for business. Local business taxes were reported as the second most important factor, with a score of 4.10. The next two factors were distance to customers, with a score of 3.78, and cost of property, with a score of 3.69. These factors are largely out of the control of local policymakers, although restrictive nonresidential zoning practices can drive up the price of property. With an average importance score of 3.52, financial inducements were the next most important location factor.

The reviews of Cornia, Testa, and Stocker (1978) and Bartik (1991b) note that the results of the Schmitt et al. (1985) survey are not unique. In the minds of business decision makers, the fiscal and regulatory actions of local governments do exert some influence on intrametropolitan business location decisions. Interpretation of survey results beyond this simple conclusion is not possible. This is due to two methodological flaws inherent in all survey research. First, factors are almost always ranked on an ordinal scale, which does not permit calculating the precise size of the influence of a variable. Second, firms can be expected to use such surveys as a means of lobbying local

Table 2.1 Factors Relating to Business Expansion and Relocation[a]

Factor	Average importance
Productivity of workers	4.53
Labor relations	4.47
Cost of workers' compensation	4.45
Wage rates	4.35
Business climate (attitude toward industry)[b]	4.32
Cost of unemployment compensation	4.31
State taxes on business	4.25
Local taxes on business	4.10
Extent of worker unionization	4.03
Distance to customers	3.78
Availability and cost of energy	3.70
Cost of property and construction	3.69
Availability of skilled workers	3.68
State and local taxes on individuals	3.56
State and *local financial inducements to new business*	3.52
Availability of unskilled or semiskilled workers	3.41
Transportation facilities for materials and products	3.40
Zoning and other regulations	3.31
Availability of technical or professional workers	3.27
Ample area for future expansion	3.24
Crime rate	3.24
Environmental protection requirements	3.21
Distance to services	3.20
Cost of living	3.16
Distance to materials	3.13
Style of living for employees	3.07
Fiscal health of state	3.01
Personal preferences of company executives	2.97

Table 2.1 (continued)

Factor	Average importance
Local sources of financing	2.94
Water supply and costs	2.93
Distance to other facilities of the company	2.63
Transportation facilities for people	2.54
Marketing facilities	2.47
Size of city or town	2.45

[a] This table contains factors thought to influence the location decisions of business. As derived by Schmitt et al. (1985), average importance represents the average ranking given by 406 business respondents on a 6-point scale (6 being the most important).

[b] The factors given in italic are the ones expected to vary across cities in a metropolitan area.

governments for lower taxes, reduced business regulation, and/or greater expenditures on business services. Since policymakers look to the results of these surveys for guidance, there is a strong incentive for the respondent to amplify the relative importance of government policy in firm location decisions.

Surveys of local economic development officials have also been conducted in order to determine what these individuals think about the process. Wolman and Spitzley (1996) provide a summary of this work. They conclude that most elected officials find economic development to be an important policy area. In a 1987 survey of local economic development officials, 70 percent responded that local government activity could play a major role in improving a city's tax base (Bowman 1987). Although viewed as important, the process was characterized by ambiguity and uncertainty by most local economic development officials (Rubin 1987). Given this situation, surveys show that local officials respond by adopting routines and by setting decision-making rules when considering incentives. Rubin observed that local economic development officials "shoot anything that flies, and claim anything that falls." Surveys have shown that the credit-claiming power of incentive offers are valued by city officials as important to their electoral success.

Regression Analysis

> *The "better" econometric studies appear to have reached some consensus about the effects of [economic development] policies on a local economy.*
>
> —Timothy J. Bartik (1991b)

Bartik (1991b) undertook an extensive examination of previous regression studies measuring the effect of state and local fiscal policies on economic development. He concludes that a multitude of recent studies point to a consensus view on this issue.[8] The general perspective is that state and local taxes and expenditures do exert a statistically significant influence on the level of economic activity observed in a state, region, or locality. Furthermore, this impact increases in magnitude as one compares inter-area studies to intra-area studies. We focus on some recent findings from intra-area studies.

Wassmer (1990a) notes that the consensus among researchers who studied the relationship between state and local fiscal activity and business location in the late 1970s was just the opposite. Early empirical research regularly indicated that nonfiscal characteristics such as local agglomeration economies, labor availability, and land prices do influence intrametropolitan firm location, while local fiscal variables do not. The major problem with the early empirical research, however, is that it made no attempt to account for the influence that host communities exert on the location decision of firms. The theory of fiscal zoning, as in White (1975), indicates how this could occur.

The empirical work of Wasylenko (1980) and Fox (1981) was among the first to account for fiscal zoning by excluding communities from the analysis if they zoned out industry. Previous to Wasylenko and Fox, empirical researchers attempted to estimate the firm's demand for an average community's location sites in a metropolitan area by using data sets that contained every community in the area. If this is done, the local property tax rate and level of firm activity cannot be used to estimate a demand curve. The correspondence between these two variables represents the interaction of both supply and demand forces.[9] As White (1975) suggested, a community's tax rate may encourage a larger-than-optimal number of firms

to enter and hence the community zones out some firms.[10] An elementary solution used by Fox was to use a data set that only included communities with greater than 1 percent of their property devoted to industry.[11] He then regressed the percentage of local tax base devoted to manufacturing on explanatory variables. In doing so, he properly recognized that tax rate, land price, business services, and capital-to-land ratios are endogenously determined.[12] Fox calculated the long-run property tax elasticity of manufacturing activity in the Cleveland metropolitan area to be –4.43. This estimate indicates that, after complete adjustment, a 1 percent increase in local property taxes will reduce the percentage of local property devoted to manufacturing by nearly 4.5 percent. He also found that a 1 percent increase in local police and fire expenditure per capita increased local manufacturing activity by 2.78 percent. Empirical research by Wasylenko (1980) yielded similar results.[13]

The empirical innovations of Wasylenko (1980) and Fox (1981) accounted for the influence of local government on observed economic activity within a jurisdiction and for the endogeneity of some of the variables used to explain economic activity. These are two of the more important attributes of a better econometric study.[14] Bartik (1991a) adds that empirical studies of taxation and intrametropolitan business location should also include a lagged measure of business activity if attempting to explain current changes in business activity, a variable indicating the availability of local labor (since it is not always reasonable to assume that it is the same in each city in a metropolitan area), and a measure of local public services that benefit business. If these factors do not vary within a jurisdiction over time, they can be considered jurisdiction fixed effects. Such permanent differences between jurisdictions need to be controlled for in an empirical investigation of the efficacy of local incentives in a metropolitan area. When using a pooled data set that includes observations over a group of cities over time, a set of city dummy variables appropriately controls for these fixed effects.

Bartik's review of regression studies published between 1979 and 1990 found 10 intra-area studies that use specific community data (Bartik 1991b, Table 2.3). In seven of these studies, the researchers found at least one statistically significant negative local tax effect. The median tax elasticity of business location in those studies having a neg-

ative tax effect was –1.95.[15] Bartik also found 14 studies that did not use specific community values, but in most cases compared a central city to all suburbs. In 57 percent of those studies not using community values, researchers reported at least one statistically significant negative local tax effect. The median tax elasticity of business location reported in those studies was the smaller –1.59. Local taxation exerts a greater negative influence on intrametropolitan site location decisions among all cities in the region than it does between the central city and its suburbs.

Bartik did not discuss the statistical significance or estimated values of local public service variables included in studies of intrametropolitan business location. The reason for his omission is that researchers used widely varying measures as a proxy for local public services benefiting business. Wassmer's (1990a) survey of research on local fiscal variables and intrametropolitan location found two studies, one by Charney (1983) and one by McHone (1986), that indicated a statistically significant local expenditure variable and a reported elasticity.

Charney (1983) conducted a regression analysis of the number of manufacturing firms that moved into 110 of the 126 zip codes in the Detroit metropolitan area between 1970 and 1975. Sixteen zip codes were excluded because they had no manufacturing activity. She estimated a sewer-acre per square mile elasticity of business location equal to 0.48. Charney's estimate implies that a 10 percent increase in the local provision of sewers resulted in a 4.8 percent increase in the number of new manufacturing firms per square mile.[16] McHone (1986) used regression analysis and a 1970 cross section of suburban Philadelphia communities to estimate separate equations that represented a community's willingness to supply firm sites to manufacturing and the average firm's demand for the manufacturing sites offered by the communities. In a full simulation that used both the supply and demand regression coefficients, he found that a 10 percent increase in total local expenditure resulted in an 8 percent increase in local manufacturing employment per capita. A 10 percent increase in local police and fire expenditure resulted in a smaller, 2 percent increase in manufacturing activity per local resident.[17]

Who Benefits from State and Local Economic Development Policies? (Bartik 1991b) offers a pre-1991 survey of regression studies

specifically examining the influence of particular economic development policies. Most of the research cited in this survey dealt with the influence of enterprise zones and incentives on inter-area business activity. Bartik (1991b, p. 18) concluded that "enterprise zones, research parks, location incentives, such as property tax abatements, and export promotion programs make some difference to state or local economic growth." Bartik found only one study that dealt with the influence of special tax and financial incentives on intra-area growth rates. McHone (1984) examined a set of 26 multistate Standard Metropolitan Statistical Areas (SMSAs) and each of their major manufacturing counties. He used shift-share analysis to break down employment growth from 1970 to 1979 in each SMSA and its manufacturing county into a component attributable to national average growth rates for industries and a component due to the comparative advantage or disadvantage of the area (a competitive component). McHone initially regressed the difference between the manufacturing county's competitive coefficient and the SMSA's competitive coefficient against factors thought to be of influence, one of these being the ability of local governments to initiate different incentives. He found that the ability to offer different incentives exerted no significant influence on the differential in the competitive component. He then redefined the dependent variable as a dichotomous variable, equal to 1 if the competitive differential was positive and zero if negative, and estimated a logit regression. Using this procedure, McHone found that the presence of an industrial development bond (IDB) program, property tax exemptions, and accelerated depreciation of manufacturing equipment all exerted a positive influence on the conditional probability of a county's chances of experiencing a competitive growth component greater than the SMSA's.[18] State and local taxes as a percentage of income were also found to exert a statistically significant negative influence.

While the Bartik (1991b) review comprehensively covers all studies through approximately 1990, we should also consider developments in intrametropolitan regression research that have occurred since 1990. A direct extension of the Bartik regression literature review is the meta-regression analysis performed by Phillips and Goss (1995). A meta-regression analysis provides a formal method of estimating factors responsible for differences in the estimated tax elasticities found in a literature survey. This was accomplished by regressing the tax elas-

ticities reported by Bartik against dummy variables that represent factors thought to compose a better econometric study. Dichotomous variables were included indicating whether fixed effects and public service controls were incorporated in each study. Phillips and Goss also used a third dichotomous variable showing whether the study was based on an intrametropolitan analysis of business activity. Their findings are reproduced in Table 2.2.

The intercept value of –0.216 reported in Table 2.2 is a tax elasticity for inter-area studies that do not control for fixed effects and public services. The average tax elasticity in an intrametropolitan study grows from the average intercept value of –0.216 to a value of –1.250 (–0.216 – 1.034). If this average intrametropolitan study controls for local public services that benefited business, the tax elasticity of business activity grows to –1.482 (–1.250 – 0.232). Whether or not this average intrametropolitan study controlled for fixed effects was found to be statistically unimportant to the reported tax elasticity.

Phillips and Goss went on to analyze up to 14 different factors that were hypothesized to cause differences in reported tax elasticities. Their findings are not directly applicable to the issue of intrametropolitan tax effects because they drop all intra-area tax elasticities from their more extended analyses. It is interesting to note, however, that among inter-area regression studies reporting an estimated tax elasticity, the only statistically significant factors are a public service control variable (a negative influence) and a control representing business activity as a capital measure, as opposed to an income or employment measure. The use of a capital measure exerts a positive influence on an average

Table 2.2 Meta-Regression Analysis of Tax Elasticities of Business Activity Summarized by Bartik[a]

Variable	Coefficient	*t*-Statistic
Intercept	–0.216	–2.245**
Fixed effects dummy	–0.051	–0.304
Public service control dummy	–0.232	–2.156**
Intrametropolitan study dummy	–1.034	–2.038**

SOURCE: Phillips and Goss (1995, Table II); tax elasticities from Bartik (1991b).
[a] $N = 69$; $R^2 = 0.253$.
** = Coefficient is statistically significant at the 95 percent level (in a one-tailed test).

tax elasticity that is negative. Besides these two factors, other differences in study characteristics do not appear to bias the reported tax elasticities in any consistent manner.[19]

Following Bartik's (1991b) summary of regression studies for intrametropolitan business activity, Anderson (1990) tested the hypothesis that communities adopting tax increment finance authorities have faster growth in property value than those not adopting TIFAs. Data from 255 cities in Michigan in the 1970s and 1980s were used for the test. Of the 255 cities in his Michigan sample, only 63 had adopted TIFAs. A reduced-form probit model was first used to explain the likelihood of TIFA adoption. The second stage of the analysis involved estimation of the rate of growth in property value in the cities. The estimation revealed several important factors affecting the rate of growth in a city's property value. For cities having adopted a TIFA, the important factors were the change in city population, the level of city population, and the percentage of property value in the commercial class. The larger the city population, the greater the rate of change in property value; the greater the rate of change in population, the greater the rate of change in property value; and the more commercial the city, the greater the rate of change in property value. A variable was included in Anderson's model to distinguish between central cities and suburban cities. That variable was not significant, enabling Anderson to reject the hypothesis that central cities have different rates of property value growth.

Anderson's (1990) model also included a sample selection bias variable to determine whether TIFA cities had property value growth that was different from non-TIFA cities. That variable's coefficient was negative and significantly different from zero, indicating that cities with a TIFA had higher property value rates of growth than non-TIFA cities. That is, the average rate of growth of total property value for cities with given characteristics and with TIFAs was higher than the average rate of growth for similar cities that had not adopted TIFAs. For non-TIFA cities, the same explanatory variables were important in explaining the rate of growth of property value, with one exception: the central city variable had an estimated coefficient that was negative and significant. Non-TIFA central cities had lower rates of property value growth. Anderson's TIFA adoption equation indicated that changing population, the level of overall population, and the difference in esti-

mated property value growth under TIFA and non-TIFA regimes are important explanatory variables in predicting which cities adopt TIFAs.

The positive and significant effect of the difference in city property value growth on TIFA adoption by a city deserves further comment. The view that TIFAs are adopted to stimulate growth is consistent with the observed outcome. The more cynical perspective that TIFAs are merely adopted to capture anticipated growth in the property tax base is also consistent with this observation. Unfortunately, the statistical evidence does not clearly distinguish between the two alternatives, although there is plenty of anecdotal evidence to indicate that the more cynical view may be correct.

Wassmer (1989, 1992) conducted a regression study of the influence of local property tax abatements on local variables in a metropolitan area. The model consisted of a constrained median voter choosing local manufacturing, commercial, and housing property tax base, and the level of local government expenditure per capita, in order to maximize utility. Desired values for the property tax bases were modeled as long-run choices through a stock-adjustment model. In addition, all manufacturing (or commercial) firms were assumed to be identical profit-maximizing entities that are fully mobile between all communities in the metropolitan area in the long run. Communities offer manufacturing (or commercial) property tax abatements to compensate for local characteristics that can cause a firm to earn a lower profit. Wassmer assumed that local abatement levels move to a long-run value that allows the typical firm to earn a normal (zero economic) profit in any community. He justified that assumption by supposing cartel-like behavior among communities in the metropolitan area, or a state regulator not allowing local abatements to exceed the level necessary to compensate firms for undesirable local characteristics.[20] Other endogenous variables included in Wassmer's simultaneous regression estimation were the median home value, population, grants/user charges, students per capita, crime rate, property tax rate, and local government expenditures on services provided to firms.

Wassmer used a pooled sample of 47 of the largest communities in the Detroit metropolitan area in 1977, 1982, and 1987, reporting two-stage regression estimates for 13 structural equations. He found that communities with higher local property tax rates and greater crime per

capita offer greater property tax abatements. Communities that spend more on local services that benefit firms and communities that have larger highway networks were found to offer less in the way of property tax abatements. In order to assess the effect of a 1 percent increase in the offering of local manufacturing or commercial property tax abatements, a simulation was conducted making use of all of the endogenous relationships in the model. A summary of the simulation results is provided in Table 2.3.

The results indicate that an increase in the manufacturing property tax abatements exerts a positive, but inelastic, influence on the manufacturing property tax base. However, property tax abatements are not completely beneficial. A rise in local commercial property tax abatements decreases the value of local homes, decreases local expenditure per capita, and increases the rate of grants/user charges. Since part of the increase in grants/user charges is due to an increase in state grants, all state residents are subsidizing abatements. An increase in local manufacturing abatements also reduces the value of local homes (by encouraging greater manufacturing activity). Wassmer concluded that, when assessing the desirability of local property tax abatements, policymakers must also consider negative secondary effects. The presumption that community policymakers only offer tax abatements to compensate for negative local characteristics needs to be explored further. This book does so.

Table 2.3 Results for Fiscal Variables in Wassmer's Property Tax Abatement Simulations[a]

Property tax abatement type	Property tax base			Property tax rate	Grants & user charges	Median home value	Local government expenditure per capita
	Manuf.	Commer.	Housing				
Commercial	–0.08	0.11	0.00	0.02	0.21	–0.03	–0.12
Manufacturing	0.28	0.00	0.00	0.00	0.08	–0.03	0.08

SOURCE: Wassmer (1992, Table 3). Based on data drawn from 1977, 1982, and 1987.

[a] The values recorded in each cell represent the percentage change in the respective fiscal variable five years after a 1 percent increase in the type of firm property tax abatements listed at the left.

Wassmer (1994) is another study of the influence of local economic development programs in a metropolitan area. In that work, he developed a methodology intended to isolate the purely additive effect of a local incentive program. Earlier, Wassmer (1992) found that local manufacturing and commercial tax abatements were positively related to their respective property tax bases. Nevertheless, the question still remained as to whether their offering added to the nonresidential tax base, or was merely positively correlated with growth in the tax base that would have occurred anyway. Wassmer used a pooled regression methodology applied to a data set from the Detroit metropolitan area. Local economic development was measured in several ways.[21] The regression was used to explain a measure of a city's local economic development and its change over time with a structural macro variable, a business cycle variable, a city-specific temporal trend variable, and variables measuring the business incentives offered by the city. Manufacturing property tax abatements and IDBs were expected to affect local manufacturing activity. Establishment of a downtown development authority, a TIFA, or the use of commercial property tax abatements were anticipated to influence local commercial activity. Data for the dependent variables were drawn from the U.S. Census of Manufacturers. Due to limited data availability, Wassmer was only able to put together data from 9 of these censuses, 8 Detroit area cities for manufacturing activity, and 25 Detroit area cities for retail and service activity.[22]

Wassmer then checked whether local incentive offers *pull* a city's long-term trend in business activity above what it would have been without the offer. This pull is considered a desired additive effect. Of 6 different regression estimates, there were 16 possibilities where an incentive could demonstrate an additive influence. In 4 of the 16 possibilities, the regression coefficient on a local incentive was found to have no statistically significant impact. In 7 of the 16 possibilities, the incentive was found to exert a statistically significant negative influence. In only 5 of the 16 possibilities (31 percent) were the regression coefficients significantly different from zero and positive.[23] These results do not offer strong support to the usual premise of policymakers that a local incentive offer always exerts a positive additive influence on local economic activity. Wassmer's research also indicates that it is wrong for policymakers to assume that local incentives always have

the same influence in all types of cities. For some types of inducements, the desired additive effect was found only in cities that had a combination of characteristics that made them highly unattractive to manufacturers without an incentive offer.

Finney (1994) offered a research note describing a conditional logit regression analysis of the probability of firms locating in 1 of 10 school districts in Harris County (Houston), Texas. He used data on 921 manufacturing plant openings over the years 1980, 1984, 1986, 1987, and 1988. Explanatory variables included the mean property tax rate, income, manufacturing land price, population density, land area, a water transport dummy variable, distance to central business district, and an interstate highway dummy variable. Unfortunately, Finney made no attempt to control for the endogenous determination of the local property tax rate and manufacturing land price. He found that a 1 percent increase in the local tax rate reduced the probability of a firm locating in the district by 0.14 percent. Finney puzzled over an estimated negative coefficient for the local income variable. It was likely due to higher-income school districts placing more restrictive zoning requirements on firms, a supply-side influence discussed earlier.

Luce (1994) conducted an ambitious and well-executed study of the influence of local taxes and public services on the intrametropolitan location of both firms and households. He properly modeled the intraregional location decisions of firms and households as being simultaneously determined and adjusting toward a long-run equilibrium. His regression analysis used 1970 and 1980 data from the 314 communities in the Philadelphia metropolitan area. The level of employment in a community was modeled as a function of access to labor and output markets, local taxes, local business services, and the price and availability of local land. Luce used total employment and six disaggregated measures of employment as dependent variables. For total employment he estimated short- and long-run property tax elasticities of –0.37 and –1.00, respectively. The wage-tax elasticity of total employment was estimated to be –0.20 in the short run and –0.60 in the long run. He found that local expenditure exerted no significant influence on total employment. When he disaggregated total employment into its 1980 values for manufacturing, services, and wholesale trade, however, he found that a 1 percent increase in 1970 local and county spending on public safety/works exerted a 0.37 percent increase in

manufacturing employment, a 0.30 percent increase in service employment, and a 0.69 percent increase in wholesale employment. A 1 percent increase in other 1970 local and county expenditures (excluding public schools) were found to exert a 0.51 percent and 0.33 percent increase on employment in the finance sector and the "other" sector (not manufacturing, service, retail or wholesale trade, or finance), respectively. Using these responses, Luce estimated that the fiscal policies pursued by the city of Philadelphia in the 1970s would result in a loss of nearly 130,000 jobs. This number resembles that city's actual employment drop between 1970 and 1985.

We have also tested the notion that communities in a metropolitan area offer incentives to compensate for local characteristics that repel businesses (Anderson and Wassmer 1995).[24] Using a duration model of the time to adoption of the first manufacturing property tax abatement offered by Detroit area municipal governments, we found evidence of positive duration dependence, or an emulation effect. A city was more likely to offer its first manufacturing property tax abatement (holding all else constant) the longer that it waited to offer its first abatement. This occurred after controlling for local characteristics that could influence the timing of a first incentive offer. This result shows that communities offer abatements, at least in part, not as a compensating differential that allows them to compete on equal grounds with other communities, but simply because those other communities are offering more abatements over time. This finding does not support the concept of a noncompetitive pact among communities and indicates that the long-run efficacy of local incentives, in terms of redirecting economic activity where it would not have otherwise gone, is questionable.

An additional piece of empirical research on local incentive offers and intrametropolitan firm location is found in Anderson and Wassmer (1996). This research is a further extension of our work with Detroit area data and is an attempt to model and understand how cities in a metropolitan area interact with respect to manufacturing property tax abatement offers. Our earlier work showed that the interaction was not likely to be cooperative; hence, the model developed in this case is a noncooperative differential game in which policymakers consider offering manufacturing abatements over time. At the beginning of the program's availability, a city chooses its optimal abatement path over

time, based upon the expected abatement actions of other cities, conditional on the level of potential manufacturing capital that can be attracted in the region. The game-theory model yields a Nash-equilibrium abatement strategy that is dependent upon preferences for abatement-induced capital and manufacturing property tax revenue.[25] A simulation of the optimal abatement trajectories shows that the percentage of manufacturing property granted abatement rises over time in a nonlinear fashion. Of course, the abatement levels depend upon parameter values as well, especially the rate of decay in the regional capital stock.

The implications from the game-theory model were then used to design a two-step empirical test.[26] A two-step empirical test is needed because a community first decides whether to offer any level of local incentives. If the community decides to offer an incentive, then in a second step it decides how much to offer. In the first step, a probit regression model was used to determine the factors important to offering any level of local manufacturing property tax abatements.[27] The factors expected to be important are median voter characteristics, fiscal and nonfiscal characteristics of the community, political pressure, and the prevalence of this local incentive among all communities in the metropolitan area. The dichotomous regression revealed that the rate of local property taxation, the percentage of manufacturing property base, the distance to Detroit's central business district, and a city's population all exerted a positive influence on the probability of offering a manufacturing tax abatement. Median city income exerted a positive influence as well. Also, the value of the coefficients on the time dummies for each cross section rose over time, indicating as we found earlier (Anderson and Wassmer 1995) that the likelihood of a city offering any abatement increased with time.

Once the decision to offer any abatement has been made, the second step of the process is to decide when and how much of the local manufacturing property should be granted abatement. The game-theoretic model indicated that the number of years since the first incentive was offered, community factors important to business location choices, and local preferences for the use of incentives should all exert an influence on this second step. We implemented a second-stage regression with a Heckman (1979) selectivity control and found that the local property tax rate, distance to Detroit's central business district, and the

use of a TIFA all exerted the expected positive influence on the magnitude of manufacturing property tax abatements offered. Perhaps most interesting from the perspective of our noncooperative game-theory approach to this issue is the finding that the magnitude of abatements rose an average of 11.8 percent each year after a community offered its first abatement. This nonlinear increase is precisely the prediction of the differential game solution simulation.

Our 1996 results indicate that the probability of offering abatements and the magnitude of abatement usage increases over time, holding constant other factors that may influence such activity. An explanation for this result is that, once an abatement program becomes available, municipalities and firms view the propensity of a city to offer incentives as a characteristic important to the location of business—or to the *business climate* often cited as influential by corporate leaders in location surveys. Consequently, if a city refuses to offer incentives, believing that it already has enough positive attributes, the use of incentives by other cities makes the city's stance a negative location characteristic. Eventually the abstaining city is forced to enter the incentive game.

The decision to use a TIFA in an area of a city is likely determined in part by the area's previous experiences with nonresidential economic activity, and expectations on what the future holds in this regard. This makes an accurate program evaluation of TIFAs difficult. If the growth in local economic activity increases after a TIFA adoption, is it due to the adoption, or rather is the adoption due to anticipated growth? Dardia (1998) does not address this issue directly, but provides evidence on the efficacy of tax increment finance programs to spur growth in property values within their designated area. To test the claim that greater growth will occur in a given parcel if it is contained within a TIFA district, he matched census blocks within a California city's tax increment finance district with comparable city census blocks not contained within the district. The variables used to match these census blocks were the percentage of vacant units, the percentage of units built more than 30 years earlier, median rent, and the percentage of the population in poverty. Assessed values of parcels in the census blocks within TIFAs were then compared with the assessed values of parcels in matched census blocks for 1983 and 1986. The relative growth in assessed values in TIFA project areas and matched areas was used as

an estimate of the TIFA effect on growth. The mean assessed value increase in a TIFA was 270 percent over the 13-year period examined. For non-TIFA parcels, the mean assessed value growth was only 144 percent. Two-thirds of the 38 TIFA project areas examined outgrew their matches in property value. But, because the TIFA project areas kept on average more than 80 percent of the increase in property taxes after the TIFA was established, they had to grow much faster than their comparative control area to be considered self-financing. Dardia found that only 4 of the 38 areas grew at a sufficient rate to be considered self-financing.

INTRAMETROPOLITAN LABOR MARKETS AND SPATIAL MISMATCH

> *Has the movement of people and firms from central-city areas to the suburbs during the past several decades caused growing employment problems for those who continue to live in the inner cities, especially Blacks?*
>
> —Harry J. Holzer (1991)

The question just posed is the opening statement in Holzer's (1991) survey of research on the spatial mismatch hypothesis. Holzer summarizes the empirical evidence garnered for or against the existence of this mismatch, and for or against the effects that could conceivably occur of a mismatch. These consequences are primarily a reduced employment rate and wage for workers in the central and inner suburban cities. In this section, we present a survey similar to Holzer's and also include a review of recent work that has occurred since. Because the issue of spatial mismatch is raised here as only a potential justification for the use of local incentives, and it is not the primary focus of this book, the following literature review is not as detailed as our previous discussion of local incentives.

Theory of Spatial Mismatch

> *The argument is that decentralization relocates job sites to White suburban communities far from the CBD [central business district], and that Blacks are unable, for a number of reasons, to move their residences near the new workplaces.*
>
> —Jan K. Brueckner and Richard W. Martin (1995)

In the post–World War II era, there has been an increasing trend toward suburbanization of population and employment in the United States. This trend, combined with racial discrimination in suburban housing markets and the practice of fiscal zoning that precludes low-income families from buying a home in many suburban communities, has resulted in Latinos and African Americans making up an increasing percentage of the population of most large central cities.[28] Downs (1994) documented the situation and made a persuasive argument that this increased concentration has resulted in many of the social and economic problems observed in America's central cities. Other social commentators, including Wilson (1987), have argued that a concentration of low-skilled people (without a concentration of low-skill jobs) goes a long way toward explaining the increased poverty observed among minority groups in the United States.

Economists have debated this possibility ever since the pioneering work of Kain (1968). Kain was the first to provide a model of intrametropolitan labor markets that predicted the negative effects of employment decentralization in a metropolitan area. Sjoquist (1995) presented a stylized description of Kain's model that we summarize next. Suppose that there are two geographic labor markets in a metropolitan area, one in a core, or inner city, and one in the periphery, or outer suburbs. For simplicity, assume that the residential population and skill levels are identical in both markets. Initially, the number of employers is the same in both labor markets. Next, some firms leave the inner city and relocate to the suburbs. This increases labor demand in the suburbs and reduces labor demand in the inner city. Without commuting between the inner city and suburbs, wages and employment necessarily fall in the inner city. Even with commuting, there is a

cost for inner city residents to get to suburban jobs. If this cost is represented as c, while the equilibrium wage paid in the suburb is w, the wage paid in the central city is $w - c$. The lower wage is all that is needed to compensate a worker in the city when the only alternative is a job in the suburbs requiring a commute.

In the long run, some firms will return to the inner city to take advantage of the lower wage that can be paid there, while households will move to the suburbs seeking higher wages. The adjustment occurs provided that other production factors are the same between the inner city and suburbs and that relocation costs are minimal. This set of forces drives up the wage paid in the inner city and drives down the wage paid in the suburbs. When the wage is equalized between the two labor markets and employment opportunities per person are equal, the movement of business firms back to the inner city ceases.

There are a few problems to consider, however, before we conclude that intrametropolitan labor markets always return to their long-run equilibrium. The assumption that other production considerations, besides the wage differential, are equal between the suburbs and inner city is questionable because unfavorable production factors in the inner city are what drove the firms to the suburbs in the first place. Only if this initial change is reversed can the long-run equilibrium occur.[29] In addition, if workers in the inner city have lower skills than required by suburban firms, those suburban firms will not return to the inner city. Inner city residents may also have limited information on employment opportunities in the suburbs. If city residents at the core do not know about the suburban jobs, they cannot commute to them, or change their residence to take advantage of them. Even if inner city residents desire to move to the suburbs, they may not be able to move. Racial discrimination in the housing market or fiscal zoning could make suburban housing out of reach. Finally, if inner city residents are more likely to be Latino or African American, and employment discrimination exists in the suburbs, the choice between inner city and suburban employment for a resident in a metropolitan area's core is severely constrained.

Any of these problems can prevent an equalization of wages and employment opportunities for all metropolitan residents after firms leave the inner city and move to the suburbs. If this equalization does not occur, then a spatial mismatch exists in the intrametropolitan labor

market. Brueckner and Martin (1995) were among the first to develop a theoretical model that formally addressed an urban equilibrium with a suburban employment center where African Americans in the workforce are prevented from living in the suburbs. In their model, inner city residents are allowed to commute to the suburban jobs, but they cannot move near them. As a result of this constraint, the wage paid to inner city African Americans is depressed. As described in Sjoquist's (1995) model, it would remain at the going metropolitan wage (w) less the commuting cost (c). For the jobs that are available in the central city and suburbs, there is an oversupply of workers in the central city and an undersupply in the suburbs. The lack of residential mobility by African Americans allows this to continue.

Empirical Tests of a Spatial Mismatch

> *It seems fair to say, therefore, that the preponderance of evidence from data of the last decade shows that spatial mismatch has a significant effect on black employment.*
>
> —Harry J. Holzer (1991)

The empirical literature on intrametropolitan job accessibility began with Kain (1968). In this initial work, Kain advanced three hypotheses relating to the issue. Briefly, the hypotheses are as follows: 1) the geographic distribution of African-American employment is influenced by residential housing segregation; 2) the difficulty that African Americans find with living in many U.S. suburbs increases this group's unemployment; and 3) the suburbanization of jobs magnifies the effect that housing segregation has on African-American unemployment. To investigate these hypotheses, Kain used 1952 data from metropolitan Detroit and 1956 data from metropolitan Chicago. Both areas were highly segregated, with 93 and 96 percent of the area's minorities, respectively, living in a concentrated ghetto region. Kain divided each metropolitan area into zones. The percentage of employment in a zone held by African Americans was regressed against the percentage of zone residents who were African American and the distance of the zone to the central city's principal minority ghetto. As expected, for both Detroit and Chicago, the estimated coefficient on the

African-American percentage of zone residents was positive and statistically significant. The estimated coefficient for the distance of the zone to the ghetto was negative and significant. Both of these results support Kain's first hypothesis of a sheltered workplace. Kain went on to test his second and third hypotheses through regression-based simulations and determined that the job loss of African Americans attributable to residential segregation was about 25,000 for Chicago and 9,000 for Detroit. Offner and Saks (1971) and Masters (1974), however, have properly criticized these claims.

Ihlanfeldt (1992b) observed that Kain's original research only provided legitimate evidence that household segregation influences the geographic distribution of minority employment in two large metropolitan areas. Ihlanfeldt believed that Kain's first hypothesis is much less interesting than his second and third hypotheses because these two deal with the level rather than with the distribution of minority employment in a metropolitan area. As a prelude to his own work, Ihlanfeldt reviewed the 30 different empirical studies of Kain's hypotheses that had been conducted prior to 1991. Based upon his extensive review of the literature, Ihlanfeldt found support for the idea that the geographic distribution of African-American employment in U.S. metropolitan areas was influenced by residential housing segregation. With regard to the propositions that housing segregation increases African-American unemployment, and that suburbanization of jobs magnifies the effect that housing segregation has on black unemployment, Ihlanfeldt's review was less conclusive. He discovered, however, that many of the studies employed flawed regression methodologies, resulting in simultaneous-equations and errors-in-variables biases. He concluded, "If we dismiss the studies obviously plagued by one or both of these problems and focus on only the remaining research, the empirical evidence is no longer contradictory; rather, it provides strong and consistent support for Kain's second and third hypotheses" (see Ihlanfeldt 1992b, p. 57).

In his own research, Ihlanfeldt documented the negative employment and education effects that spatial mismatch has had on African-American teenagers and on other young adults in the central city of Philadelphia. For African-American teenagers who were not enrolled in high school, a five-minute reduction in their expected commuting time to a job caused a 28 percent increase in the mean employment rate

of this group (from 0.29 to 0.37). In addition, the same five-minute reduction in commuting time would have the advantage of increasing the enrollment rate of teenagers in high school by nearly 10 percent, regardless of family income level.

In another study, Ihlanfeldt (1992a) calculated the 1980 intra-urban wage gradients for workers in Philadelphia, Detroit, and Boston. For most Caucasian workers, he found the expected result that wages decline at a decreasing rate as place of work moves away from the central city (for commuters that drive to the central city). African-American blue-collar and service workers living in Philadelphia and all African Americans living in Detroit were found to be net out-commuters of the central city. Out-commuting would normally result in greater wages being paid as the place of employment moves farther away from the central city. The explanation is that central city residents need to be compensated for the additional distance being driven. Ihlanfeldt finds just the opposite result, attributing it to a surplus of resident minority labor in these central cities.

McMillen (1993) addressed the issue of whether African Americans can earn more in the suburbs. His innovation was to control for the selection bias inherent to a minority resident in the central city choosing a suburban job. In many cases, this is done only if the resident possesses unobservable characteristics that allow the individual to earn more outside the city. Hence, there is a built-in bias toward central city minority residents of equal observable characteristics earning more if they work outside their place of residence. Using 1980 census data from the city of Detroit, McMillen found evidence of this bias and appropriately corrected for it in his regression analysis. His research indicated that many African-American workers have not taken higher paying suburban jobs because they do not have the characteristics that are valued in that labor market. This cannot be considered a spatial mismatch. He determined that it is not possible for central-city minority residents to automatically increase their wage by taking a suburban job; he also found evidence that African Americans in general earn less than Caucasians with similar characteristics.

Holzer, Ihlanfeldt, and Sjoquist (1994) used search theory to develop a model of hunting for work and commuting time for inner-city residents. Their model yielded a set of six simultaneous equations that were estimated using data from the 1982 National Longitudinal

Survey of Youth and data from the respondent's designated metropolitan area. They found that African-American youths on average spend more time traveling to work than Caucasians, although they cover less distance. Most important to spatial mismatch, the researchers found that central city residents do not offset greater suburbanization of employment with greater distance traveled to either search for work or commute to a job. This result suggests that central city residents perceive a low benefit from hunting extensively in the suburbs for a job.

Fernandez (1994) undertook an empirical analysis of spatial mismatch in intra-urban labor markets that is especially worthy of attention due to its unique approach. Fernandez conducted a longitudinal study of employment in a food-processing plant for which the decision was made to move from Milwaukee's central business district to a greenfield suburban site 10.5 driving miles, or 25 minutes, away. The motivation for this study was Fernandez's critique of earlier research by Zax (1989, 1990) and Zax and Kain (1991). The Zax and Kain studies examined eight years of employment data for a service firm that employed 800 people and moved from Detroit's central business district to the border suburban city of Dearborn in the early 1980s.[30] Zax and Kain looked at the effect of the relocation on the employees' moves, quits, and commuting adjustments. Consistent with the spatial mismatch hypothesis, they found evidence that residential segregation severely constrained the options of African Americans in adjusting to this displacement.

Fernandez suggests several possible problems with the Zax and Kain methodology. First, workers who quit after the relocation were never followed. Consequently, there is no way to assess their new work-housing match, and there is no investigation of whether the higher proportion of African Americans who quit did equally as well in their new jobs. Second, workers themselves were never interviewed, and hence important individual characteristics that influence opinions on workplace and residence choice were never considered. Third, it is unclear whether a firm's relocation choice is truly exogenous to space and race. Did the Detroit service firm move to distance itself from all minority workers (who are more concentrated in the central city), to be closer to suburban minority workers (who are more concentrated in the suburbs), or did the move have nothing to do with where the minority workforce resides? Fernandez fittingly argues that is hard to under-

stand why space matters if we do not know what is motivating a business to move to the suburbs.

The Fernandez investigation of the suburban relocation of a Milwaukee firm dealt with each of these concerns. His study followed workers that left the company. He also surveyed all workers employed before and after the move, obtaining personal characteristics and opinions. Finally, Fernandez presented convincing evidence that the firm was not moving to change its workforce. His 1994 paper only contained information on workers employed at the firm's central city location and on the expected effects of the suburban move. He successfully showed that the relocation produced mismatches between the current employees' residential locations and the firm's new location that fell disproportionately on minority (African-American and Latino) males and on all females. In quantifying the dollar cost of the plant relocation to specific minority groups, he found that African Americans who were hourly workers faced the greatest average loss due to increased commuting time, at 6.5 percent of their annual wages.

Finally, a recent study of spatial mismatch in the San Francisco Bay area of California by Raphael (1998) offers convincing evidence in support of the theory and its intrametropolitan labor market consequences. Raphael introduces his own research by highlighting the two shortcomings of previous work. The first is that most of it is based on spatial variation in employment levels rather than on employment growth. The second is that previous empirical studies failed to adequately characterize a neighborhood's location relative to all others in the local labor market. Employing some innovative methodologies, Raphael accounts for these shortcomings in his own regression research and finds that accessibility to employment opportunities explains 30 to 50 percent of the differences in neighborhood employment rates between African- American and white youths in Bay area census blocks. Considering that the Bay area is only moderately segregated and has experienced changes in the spatial configuration of industry similar to other large U.S. metropolitan areas, Raphael concluded that "one would expect a more stark mismatch in such hypersegregated cities as Chicago and Detroit" (p. 109).

BRINGING IT ALL TOGETHER

> *Rather than focusing on getting central city minorities to suburban jobs, an alternative policy is to redevelop the central city.*
>
> —David L. Sjoquist (1995)

This chapter provides a review of the previous literature on the efficacy of local economic development incentives offered in a metropolitan area. Efficacy is defined as a redirection of business activity to a jurisdiction where it would not have gone without the incentives. The survey's intent was to provide background material for readers unfamiliar with this topic and a solid footing on which to anchor the study described in the upcoming pages.

We began by describing economic theory related to the intrametropolitan location of business enterprises. That theory accounts for the demand for municipal sites by firms and the supply of sites by municipalities, and the possibility that local fiscal variables (tax and spending levels) influence business location choice. Moreover, the influence of such fiscal variables is expected to be greater at an intra-area level of analysis, as compared to an inter-area level, because more of the variables that influence location are held constant. It follows that, if local fiscal variables can influence intrametropolitan firm location, then a strategy of offering local incentives designed to reduce local taxes and increase spending or services that firms desire may be able to do the same. An empirical inquiry is necessary to resolve this issue.

Therefore, we also reviewed empirical studies that examined the effects of local fiscal variables and direct offers of local fiscal incentives on the intrametropolitan location of business activity. The result of a typical survey of business decision makers showed that a community's business climate and local rate of taxation ranked high among the factors considered important when making site choices in a metropolitan area. Survey results offer no way of making precise conclusions on this issue, however. Hence, we turned to the findings of studies employing regression models. We were fortunate to be able to draw upon a thorough review of such research in Bartik (1991b). After

examining the results of studies that used the appropriate econometric methods, Bartik concludes that a consensus has been reached on this issue. State and local taxes do exert a statistically significant negative influence on the location choice of firms. Furthermore, this effect increases in magnitude as the size of the area under consideration diminishes. A median property tax elasticity of intrametropolitan business activity of approximately –1.95 is suggested by the literature.

In addition, empirical research on this topic that followed Bartik's (1991b) review was discussed in this chapter. One study used a broad simultaneous equation estimation to measure the impact of local property tax abatements on local fiscal and nonfiscal variables in a metropolitan area. The study's conclusion was that local property tax abatements exert a positive but inelastic influence on the value of local nonresidential property tax bases. A caveat, however, is that the same abatements (holding all else constant) reduce the value of local homes and local government expenditure per capita and increase the rate of crime. A different study tried to isolate the additive effect of abatements in pulling a city positively away from its long-term trend in economic development. For local policymakers who assume that abatements always exert this effect, the findings are not good. In only about one-third of the possible cases was this additive effect found, and then only for some incentives and in cities with other negative location characteristics.

Two other post-Bartik studies concluded that the intrametropolitan location of firms is influenced by local fiscal variables. A study of the Houston area during the 1980s showed that the probability of a newly locating firm choosing which school district to reside in is negatively impacted by the local property tax rate. A more thorough study of the Philadelphia metropolitan area demonstrated that local tax and public service levels affected the intra-area location of both people and firms. Evidence was also presented based on metropolitan Detroit data that a community is more likely to offer its first property tax abatement the longer it waits to do so. This positive duration dependence indicates that cities in a metropolitan area are likely to begin offering abatements because other communities offer them. This evidence of copycat behavior does not bode well for the idea that communities with negative characteristics can attract business through abatement offers. A further attempt to model this copycat behavior among cities in a metro-

politan area also found that, the longer it has been since a community offered its first abatement, the greater the amount of abatement it is likely to offer.

The issues related to a spatial mismatch between available workers and available jobs in a metropolitan area were also examined. The mismatch could occur due to the decentralization of employment that most U.S. metropolitan areas experienced in the last half of the 20th century, and because of the racial discrimination in housing and fiscal zoning that keeps many low-skilled minorities from residing in suburbs. The empirical evidence on this issue is spotty, but one reviewer found that the better studies have provided consistent evidence in support of the mismatch idea and of Kain's three hypotheses.

We conclude that there are both theoretical and empirical reasons to believe that local taxes, business-related expenditures, and economic development incentives can influence the intrametropolitan location of business firms. There is also empirical evidence of the negative effects of intrametropolitan spatial mismatch in local labor markets. As a result, it is reasonable to bring these two issues together and to ask whether local incentives can do anything to affect local residential rates of employment and/or local poverty levels. If such incentives can be effectively used to raise local overall rates of employment, or that of the low skilled, hence reducing a city's poverty rate, then perhaps local incentives can be used to help alleviate spatial mismatch. These are the primary issues that we address in the remainder of the book.

Notes

1. For a thorough description of the monocentric model and the suburbanization that made it largely obsolete for the United States, see O'Sullivan (1999, Chapters 8 and 10).
2. Floyd (1952) was the first to use the language of a market and site stage.
3. The possible exception is the ability of some in the inner city to commute to the suburbs (spatial mismatch). It should be noted that in some metropolitan areas, lower wages in the suburbs have become a dominant force pulling certain firms away from the core. This is especially true for back-office activities.
4. The Chrysler Corporation's 1995 decision to move its world headquarters from the Highland Park enclave, within the city of Detroit, to the affluent and residential edge city of Auburn Hills is a good example of this force at work.
5. "Zero economic profit" is the concept of a firm earning a positive accounting profit, but only enough to keep it in business.

6. McGuire (1983) offers a more rigorous extension of White and Fischel's use of Tiebout's (1956) theory to explain firm location in a metropolitan area.
7. The citizen determination of the payment is modeled as being made by the median voter. If voters are ordered from most negative to most positive on an issue, the median voter would be in the middle. To obtain a majority in a democratic election, this is the voter that the politician needs to attract.
8. For examples of other reviews of the econometric studies of state and local fiscal policy and economic development, see Newman and Sullivan (1988) and Wassmer (1990a).
9. This is the classic econometric problem of identifying the supply curve from the demand curve.
10. The firms that are zoned out either require greater local services than are covered by their local property tax payments or they emit a level of pollution that is too great given their level of property tax payments and service requirements.
11. Fox's (1981) implicit assumption is that if a community has greater than 1 percent of its property devoted to manufacturing, it is not practicing fiscal zoning.
12. An endogenously determined explanatory variable is one whose value is not fully independent of the values of other variables included in the regression analysis. If this is the case, and it is not properly handled through instrumentation, the regression coefficients are biased.
13. Wasylenko (1980) chose to examine the number of firms that moved from the central city of Milwaukee to a particular suburban city, divided by the total number of firms that left the central city for one of the 56 possible suburban locations. He calculated this dependent variable for six different manufacturing classifications. For manufacturing he found a property tax rate elasticity of –1.29. Wasylenko also found that police and fire expenditure per capita and street and sanitation expenditure per capita do not exert a significant influence on intrametropolitan manufacturing relocation decisions.
14. Newman and Sullivan's (1988) survey of the literature relating to the econometric analysis of business tax impacts on intrametropolitan and interstate business location offers a similar recipe for a better econometric study.
15. Fox's (1981) determination of a tax elasticity of business location equivalent to –4.43 is cited as the outlier among the 10 studies Bartik found.
16. Charney (1983) controlled for the endogeneity of sewer lines by using the amount present before the new manufacturing firms chose to locate in a zip code.
17. McHone (1986) did not account for the possible endogenous determination of local expenditure and manufacturing activity.
18 Conditional probability refers to the chance of something happening, holding the other factors controlled for in the analysis constant.
19. The other characteristics included in Phillips and Goss's (1995) most extensive non-intrametropolitan metaregression analysis included dichotomous dummy variables if the study 1) included a wage variable, 2) controlled for endogeneity, 3) used micro firm data, 4) controlled for welfare spending, 5) used change in business activity as its dependent variable, 6) used a specific measure of business

taxes, 7) used education spending, 8) used energy cost, 9) used a measure of climate, 10) used union strength, or 11) controlled for population density. These were all found to exert no statistically significant influence on the tax elasticities derived in different non-intrametropolitan studies.

20. This assumption is later tested in Anderson and Wassmer (1995, 1996) and found to be unlikely.
21. Wassmer (1994) uses separate measures of a community's manufacturing employment and value added, retail employment and sales, and service employment and receipts.
22. Data are available from the 1947, 1954, 1963, 1967, 1972, 1977, 1982, and 1987 editions of the *Census of Manufactures, Census of Service Industries,* and *Census of Retail Trade*.
23. IDBs did exert a positive pull on the long-term trend in manufacturing employment in Highland Park and River Rouge. IDBs exerted the same influence on manufacturing value added in Detroit and Highland Park. Manufacturing property tax abatements also had a positive influence on manufacturing value added in Detroit and Highland Park. See Table 2 in Wassmer (1994, p. 1262) for details. In addition, the establishment of a tax increment finance district created a positive pull away from the long-term trend in retail employment for all 25 cities in the sample. Commercial property tax abatements had the same influence on service employment in only the city of Hamtramck. See Tables 3 and 4 of Wassmer (1994, pp. 1265–1267).
24. Recall that Wassmer's (1992) research assumed that this was the case and could conceivably be enforced through a noncompetitive cartel agreement among communities in a metropolitan area, or through a state agency that would only approve local incentive offers made to compensate for negative local characteristics.
25. A Nash equilibrium between interacting entities is characterized by a set of outcomes from all entities that will not change unless the behavior of one or more of the entities changes.
26. The formal econometric procedure to properly model this two-step process and the sample-selection bias that it creates is attributable to Heckman (1979).
27. The decision to offer a manufacturing property tax abatement is similar and related to the decision by a city to zone or allow local sites for manufacturing use. The issue of fiscal zoning and the supply of firm sites by a community is discussed earlier in this chapter.
28. "Fiscal zoning" refers to the practice of suburban communities setting housing and residential lot standards so high as to preclude the building of small and inexpensive houses in the community. This is fiscal zoning because such a house would not pay property taxes high enough to cover the cost of city services provided to it.
29. This is the role that local incentives offered by inner cities, and not by the suburbs, can play. See the final section of this chapter for a full description.
30. Although Zax (1989, 1990) and Zax and Kain (1991) never explicitly mention the name of the firm, anyone familiar with the metropolitan Detroit area knows that it

was a J.L. Hudson's department store. The controversy over this move was in part due to the fact that this department store was the last one within the city of Detroit's boundaries. Between 1983 and 1999, there has been no major department store in this U.S. city—quite an amazing occurrence considering that the city had a population slightly greater than 1 million in 1990.

3 Local Incentive Programs and Spatial Mismatch in Metropolitan Detroit

Manufacturing incentives have long been used as a mechanism to induce regional development. Until recently, most manufacturing subsidies were given in the South. However, as the Sun Belt became an increasingly more attractive location for industrial development, the manufacturing states of the North and East began to use fiscal incentives as a way of maintaining their manufacturing bases . . . Michigan is no stranger to subsidy programs. Currently over one dozen programs are aimed at economic development in this state, many of which offer fiscal incentives.

—Michael J. Wolkoff (1982)

Major economic development incentives available to metropolitan Detroit communities are surveyed in this chapter. These incentives include manufacturing and commercial property tax abatements, downtown development authorities (DDAs), tax increment finance authorities (TIFAs), and industrial development bonds (IDBs). First, we provide an overview of the incentives and their use over the period from 1974 to 1992. Then, we consider each incentive in detail, covering its origin and the subsequent trend in its use. We also examine combinations of incentives assembled into economic development packages by communities. In addition, we provide some simple statistical evidence to support the claim that a possible spatial mismatch exists between potential employees and employers in the Detroit metropolitan area. Evidence is in the form of a comparison of descriptive statistics of relevant variables calculated separately for the central city and inner suburbs, and separately for the remaining outer suburbs in metropolitan Detroit.

To begin our examination of local incentives and a possible spatial mismatch in the Detroit metropolitan area, we provide the reader with

the layout of the metropolitan area (Figure 3.1). The map identifies the location of Macomb, Oakland, and Wayne Counties and some of the larger suburban cities in the metro area.

Table 3.1 provides descriptive statistics on overall incentive use by all Detroit area municipalities between the years 1977 and 1992. Manufacturing and commercial property tax abatement use is measured as the total value of local property granted a full property tax abatement divided by the full value of the local property tax base in that class, including both property granted an abatement and property not granted an abatement.[1] Use of DDAs and TIFAs is measured as the percentage of the communities that adopted each type of authority.

Each cell of Table 3.1 reports the mean of the incentive's use, the standard deviation directly below in parentheses, and the coefficient of variation (the standard deviation divided by the mean) below the standard deviations. We have chosen to observe the offering of the different types of incentives among all 112 cities and townships in the Detroit area over four 5-year intervals, beginning in 1977 and ending in 1992.[2] The mean equals the sum of values for all 112 communities in a given year divided by 112. The initial period was selected to closely follow the first major incentive program in Michigan: manufacturing abatements that began in 1974. The five-year increment is chosen to allow for substantial change in the observed use of incentives and to coincide with census data availability.

Table 3.1 shows that municipalities (cities, villages, and townships) generally increased their use of local incentives across the metropolitan Detroit region over the time period under observation. The largest increase in incentive use was in manufacturing property tax abatements. In 1977, just three years after this incentive became available, the average municipality had abated away 2.1 percent of its manufacturing property tax base. That average grew to 34.7 percent by 1992. The establishment of DDAs also rose at a fast pace. In 1977, only 3.6 percent of the Detroit area municipalities had a DDA, but that share had grown to 32.1 percent by 1992. Similarly, the use of TIFAs was growing: 6.3 percent of the municipalities had a TIFA in 1982, while 10 years later, 25.9 percent of the Detroit area municipalities had established them. Table 3.1 indicates that the use of commercial property tax abatements grew over time, but that these were still the least

Figure 3.1 Map of Counties and Selected Municipalities in the Detroit Metropolitan Area

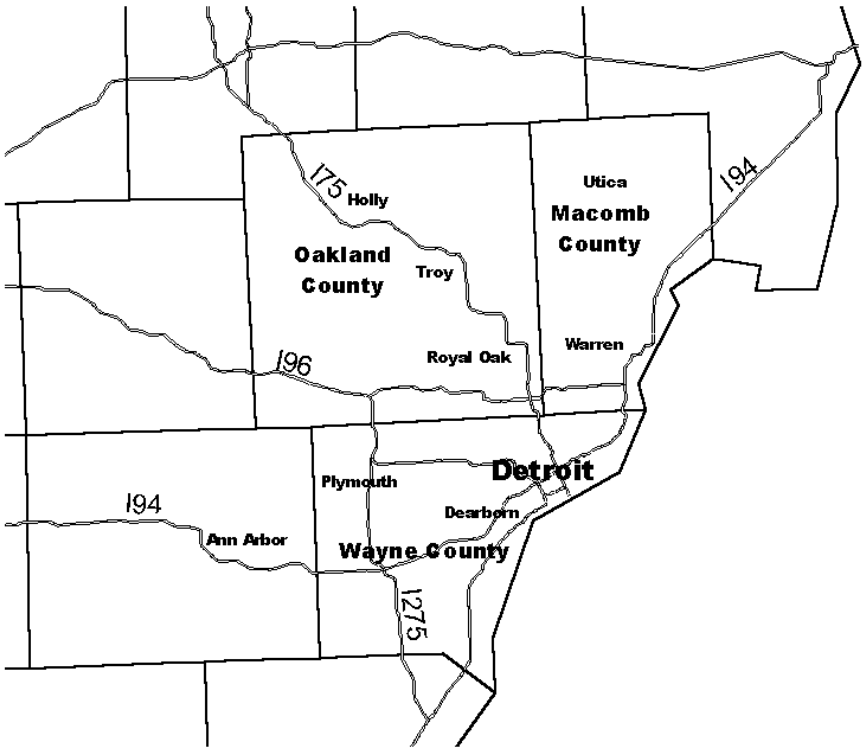


Table 3.1 Means (%), Standard Deviations (%), and Coefficients of Variation for Incentives in Detroit Area Municipalities

Incentive type	Year incentive initiated/ended	1977	1982	1987	1992
Manufacturing property tax abatements	1974 / still continuing in 1999	2.06[a] (6.13) 2.98	14.33 (22.41) 1.56	26.74 (30.00) 1.12	34.68 (35.52) 1.02
Commercial property tax abatements	1978 / 1986	0.00 (0.00) 0.00	0.62 (21.8) 3.52	2.47 (6.25) 2.53	2.15 (5.72) 2.66
Downtown development authorities	1974 / still continuing in 1999	3.57 (18.56) 5.20	11.61 (32.03) 2.76	25.00 (43.30) 1.73	32.14 (46.70) 1.45
Tax increment financing authorities	1980 / still continuing in 1999	0.00 (0.00) 0.00	6.25 (24.21) 3.87	22.32 (41.64) 1.87	25.89 (43.80) 1.69

SOURCE: MPTAs and CPTAs: Michigan Property Tax Commission, Dept. of Treasury, Lansing. DDAs and TIFAs: Citizen's Research Council of Michigan (1986) and Southeast Michigan Council of Governments (1990).

[a] The first entry for each year and row is the mean. Directly below that is the standard deviation (in parentheses). The coefficient of variation is given below the standard deviation; the coefficient of variation is the standard deviation divided by the mean.

used incentive. This form of local incentive is no longer available in Michigan.

While overall levels of incentive usage were rising over the period from 1977 to 1992, variability in their use was declining. Consider, for example, the standard deviation of manufacturing abatement usage. While the mean grew from 2.1 percent in 1977 to 34.7 percent in 1992, the standard deviation of abatement usage rose 6.1 percent to 35.5 percent over the same time period. The coefficient of variation (a measure of variability) was 2.98 in 1977 but fell to 1.02 in 1992. Variability was greatest in the early years of the incentive's availability, when it had been adopted by just a few municipalities. As time went on, however, more municipalities provided the incentive, and variability declined. For manufacturing abatements, DDAs and TIFAs, the coefficient of variation fell over the time period analyzed. For commercial

abatements, variability in use fell between 1982 and 1987 but rose slightly between 1987 and 1992. The increase is attributable to the fact that municipalities could no longer adopt commercial abatements after 1987.

A pattern of adopting the abatements in copycat fashion, or as more communities in the area offer them, is evident in the data. This result is consistent with the evidence of strategic adoption of manufacturing abatements by communities reported in Anderson and Wassmer (1995, 1996). The implication of this pattern is that incentive variability is greatest in the early years of the incentive's availability. A local incentive offer is more likely to exert a distinct marginal influence on the intrametropolitan location decision of a firm earlier in the incentive's availability. As time goes on, and more cities adopt the incentives, the marginal influence is diluted through the increased probability that other communities will offer a similar inducement. We will return to this issue in the specification of our regression analysis, through an allowance for different degrees of influence being exerted by incentives, depending on the year in which they were offered.

MANUFACTURING PROPERTY TAX ABATEMENTS

> *Michigan's Plant Rehabilitation and Industrial Development District Act provides property tax incentives to industry for the construction of new plants and for renovations and expansions of aging manufacturing facilities.*
>
> —Michigan Department of Commerce (1985)

To provide for the local offering of manufacturing property tax abatements, Michigan adopted the Plant Rehabilitation and Industrial Development Districts Act (Public Act 198) in 1974. As noted in the Introduction, this legislation was implemented to facilitate the construction of a particular project in the city of Detroit. The Chrysler Corporation wished to refurbish its Mack Street stamping plant, investing $50 million and retaining 5,000 jobs at the site. The firm asked the city for assistance in making this investment. City officials turned to

the state for help and the state legislature passed the law with little resistance.

Under Public Act 198, the state granted local municipalities, townships, or villages the authority to grant property tax abatements to companies that invested in new facilities or rehabilitated existing, but obsolete, facilities. To accomplish this, the jurisdiction must first designate a redevelopment district. These districts could be established with the permission of the owners of three-quarters of the property value in the district. While that requirement might appear to restrict the formation of districts, Michigan's Plant Rehabilitation and Industrial Development Act contained no limit on the size of its redevelopment districts. Therefore, a single manufacturing property owner could ask the local government unit to configure a district for that property alone.

After the district was established, the firm could apply for an exemption certificate for property tax abatements for up to 12 years. In the large majority of cases, exemptions have been given for this maximum time period. Public Act 198 was written so that those projects that had begun a year before the law was adopted could apply for grandfathering into the program. At the end of 12 years, a renewal of the property tax exemption is available by request. For a new facility, the certificate provides for the abatement of half of the *ad valorem* taxes on the property (both real and personal property). After the granting of this abatement, the property tax rates for all government units are reduced to one-half their normal level. For a rehabilitated facility, the assessed valuation of the property is frozen at its prerehabilitation level and all accretion to value due to the investment project is tax exempt.

Local governments have been given wide latitude in establishing districts and in granting manufacturing property tax abatements. If the amount of property involved with the establishment of an abatement district exceeds 5 percent of the total manufacturing property in the jurisdiction, the district is required to prepare a report indicating that the abatement will not impair the fiscal health of the jurisdiction. Wolkoff (1982) recorded that, in 1978, more than one-third of the 277 Michigan jurisdictions granting abatements exceeded the 5 percent requirement. Nonetheless, this stipulation appears to have never slowed the establishment of redevelopment districts.

Michigan jurisdictions are also required to assure state officials that there is a *reasonable likelihood* that employment is created or retained through the granting of the abatement. Since the law contains no specific definitions of reasonable or likely, this requirement has also offered little hindrance to the formation of districts and granting of abatements. Unlike the clawback provisions that exist for some state abatement programs, this provision acts as no obstacle to firms closing plants and eliminating jobs at plants that had earlier benefited from the granting of property tax abatements.[3]

Under Public Act 198, the local governmental unit approves the application for an exemption, and the State Tax Commission at the Michigan Department of Treasury reviews the application and grants the certificate. The role of the State Tax Commission is to ensure that all conditions of this law are followed. Although the commission does possess the ultimate ability to veto a local abatement, this capability is rarely (if ever) used. To avoid the escalation of job wars between state jurisdictions, Public Act 198 also includes a provision that, if an abatement were to cause employment to be transferred between two Michigan communities, the exemption certificate will not be granted unless the community losing employment approves.[4] To squelch what could be considered unnecessary abatements, in 1988 an amendment was added to deny applications for certificates on projects for which construction had already begun or was completed. The amendment required that, once a district was formed, property tax abatements had to be granted within six months of the beginning of construction.

Communities in metropolitan Detroit have used the ability to grant manufacturing property tax abatements to widely varying degrees. Table 3.2 provides descriptive information on the number and cumulative percentage distributions of city-specific abatements granted up to 1977. Over the first four years of the incentive's availability (1974 to 1977), only 14 percent of the communities in the metropolitan area granted any manufacturing property tax abatements. The greatest number (five) of new abatements offered by a community during this period fell between $1 million and $5 million in real 1990 dollars. One city, Detroit, offered abatements that totaled $160–180 million to manufacturing property between 1974 and 1977.

Table 3.2 Total Real Value of New Manufacturing Property Tax Abatements Offered by Municipalities in Metropolitan Detroit, 1974–1977

Total real value (1990 $)	No. of communities	Cumulative %
0	96	85.71
500,000	0[a]	85.71
1,000,000	1	86.61
5,000,000	5	91.07
10,000,000	2	92.86
20,000,000	2	94.64
40,000,000	1	95.54
60,000,000	0	95.54
80,000,000	0	95.54
100,000,000	1	96.43
120,000,000	0	96.43
140,000,000	0	96.43
160,000,000	0	96.43
180,000,000	1	97.32
200,000,000	0	97.32
>200,000,000	3	100.00

[a] The zero listed next to $500,000 indicates that no communities between 1974 and 1977 offered new manufacturing abatements that were greater than zero dollars and less than or equal to $500,000. A similar interpretation applies to other value categories and to the other tables in this series.

The five-year period between 1978 and 1982 was marked by a great expansion in the number of communities granting manufacturing property tax abatements. During this time, the number of jurisdictions granting new manufacturing abatements grew from 16 to 49 of the 112 communities in metropolitan Detroit (Table 3.3). In 1982, only a little more than half of the jurisdictions in metropolitan Detroit refrained from offering any manufacturing property tax abatements. However, the cumulative percentage distribution of new abatements granted between 1978 and 1982 is similar to that of the previous period. In

Table 3.3 Total Real Value of New Manufacturing Property Tax Abatements Offered by Municipalities in Metropolitan Detroit, 1978–1982

Total real value (1990 $)	No. of communities	Cumulative %
0	63	56.25
500,000	3	58.93
1,000,000	2	60.71
5,000,000	12	71.43
10,000,000	2	73.21
20,000,000	10	82.14
40,000,000	6	87.50
60,000,000	4	91.07
80,000,000	0	91.07
100,000,000	1	91.96
120,000,000	0	91.96
140,000,000	0	91.96
160,000,000	0	91.96
180,000,000	0	91.96
200,000,000	1	92.86
>200,000,000	8	100.00

1990 dollars, 29 of the 49 communities offering new abatements granted less than $20 million in total community abatements. Another 10 communities granted new abatements that totaled between $20 million and $60 million for each city. One community granted new abatements in excess of $80 million but less than $100 million, while eight communities granted new abatements in excess of $200 million (Sterling Heights, Warren, Pontiac, Rochester Hills, Dearborn, Detroit, Livonia, and Trenton).

As shown by Table 3.4, the offering of new manufacturing abatements during the 1983–1987 period grew again. In the previous five-year period, 49 communities chose to play the manufacturing abatement game. By this period, the number had grown to 69. The greatest number of abatements occurred in the range of $1 million to $5 mil-

Table 3.4 Total Real Value of New Manufacturing Property Tax Abatements Offered by Municipalities in Metropolitan Detroit, 1983–1987

Total real value (1990 $)	No. of communities	Cumulative %
0	43	38.39
500,000	6	43.75
1,000,000	4	47.32
5,000,000	18	63.39
10,000,000	8	70.54
20,000,000	12	81.25
40,000,000	6	86.61
60,000,000	1	87.50
80,000,000	1	88.39
100,000,000	2	90.18
120,000,000	2	91.96
140,000,000	0	91.96
160,000,000	1	92.86
180,000,000	0	92.86
200,000,000	2	94.64
>200,000,000	6	100.00

lion in real 1990 dollars. This finding is the same for the previous two periods observed. From 1983 to 1987, the number of communities choosing to offer greater than $200 million in new manufacturing abatements fell to six (Sterling Heights, Auburn Hills, Pontiac, Dearborn, Ecorse, and Flat Rock). The cities of Sterling Heights, Pontiac, and Dearborn remained in this category from the previous five-year period examined.

The final time period, 1988 through 1992, saw a reduced reliance on local manufacturing property tax abatements, although the cumulative percentage distribution looked similar to earlier ones. Of the 112 communities in metropolitan Detroit, 60 offered no new manufacturing abatements during this last time span (Table 3.5). Of the remaining 52

Table 3.5 Total Real Value of New Manufacturing Property Tax Abatements Offered by Municipalities in Metropolitan Detroit, 1988–1992

Total real value (1990 $)	No. of communities	Cumulative %
0	60	53.57
500,000	4	57.14
1,000,000	3	59.82
5,000,000	9	67.86
10,000,000	3	70.54
20,000,000	7	76.79
40,000,000	8	83.93
60,000,000	3	86.61
80,000,000	4	90.18
100,000,000	2	91.96
120,000,000	0	91.96
140,000,000	0	91.96
160,000,000	1	92.86
180,000,000	0	92.86
200,000,000	1	93.75
>200,000,000	7	100.00

communities offering new abatements, 34 offered abatements of less than $40 million. Another nine communities offered between $40 million and $100 million in abatements. At the top of the abatement distribution were seven communities offering more than $200 million in new manufacturing property tax abatements. During this last period, Detroit and Livonia made abatement offers of around $660 million each. The cities of Sterling Heights, Auburn Hills, and Wixom all made offers that each totaled at least $300 million.

COMMERCIAL PROPERTY TAX ABATEMENTS

> *Michigan's Commercial Redevelopment Act provides property tax benefits to companies that rehabilitate obsolete commercial facilities or build new commercial structures in previously developed areas or in sections of a community characterized by obsolete property.*
>
> —Michigan Department of Commerce (1985)

Local governments were granted the ability to offer property tax abatements for commercial enterprises[5] when the Michigan legislature enacted the Commercial Redevelopment Districts Act (Public Act 255) in 1978. A 10-year sunset clause was written into the original legislation, and in 1988 the legislature chose to not renew the bill. The purpose of commercial abatements was to assist communities engaged in redevelopment efforts beyond manufacturing. Michigan communities were given the ability to grant property tax abatements to companies that rehabilitated obsolete commercial facilities or built new facilities in previously developed areas, or areas characterized by obsolete property. Public Act 255 was in many ways analogous to the earlier legislation for manufacturing facilities (Public Act 198). It was proposed, debated, and ultimately passed in the legislature on the flawed argument that, if manufacturing enterprises have an abatement program, then it is only fair that commercial enterprises enjoy equal treatment. While this approach is cast in equity terms, the logic of economic efficiency is quite different. Manufacturing firms are more "footloose" than commercial firms. In most cases, a manufacturing enterprise is not tied to a location within driving distance of the customers to whom it provides a product, whereas as a commercial enterprise by definition is so tied. Thus, a commercial firm will probably locate within a metropolitan area where it can best serve its desired market, and the offering of a local property tax abatement is likely to carry little weight in this decision. Perhaps the logic of economic efficiency eventually prevailed when the ability to offer commercial property tax abatements in Michigan was eliminated in 1988.

Supported by Michigan's Commercial Redevelopment Act, a local government unit (city, village, or township) could adopt a resolution that established a commercial redevelopment district. Commercial companies within the district, or planning to build there, could then apply for a Commercial Facilities Exemption Certificate that exempted them from property taxes for up to 12 years. Companies would apply for this certificate at the municipal government level. The city, township, or village unit would then review the application and approve or deny the request. Once a local government unit granted a certificate, a copy of that certificate was sent to the State Tax Commission for procedural verification.

In place of the property tax, the company was required to pay a Commercial Facilities Tax (CFT). For a restoration project, the CFT was equal to the *ad valorem* property tax based on the value of the facility frozen at its level before improvements were made. For a new or substituted facility, the CFT was based on the market value of the property, but only half of the total local property rate (assessed by the municipality, school district, special district, and county) was applied to that value. Facilities covered by Michigan's Commercial Redevelopment Act were those affiliated with the operation of a commercial business enterprise. This included offices, engineering, research and development, warehouses, parts distribution centers, and retail sales areas. The exemptions were applied to buildings, building improvements, and fixed building equipment assessed as real property (not personal property).

During the first years of the commercial abatement program, between 1978 and 1982, just 25 of the communities in the Detroit area granted any commercial property tax abatements (Table 3.6). Of those, only one community (the central city of Detroit) granted total commercial property tax abatements in excess of $160 million (1990 dollars). Thirteen communities granted commercial property tax abatements that totaled over $1 million and less than or equal to $5 million. The vast majority of metropolitan Detroit area communities, 78 percent, did not grant commercial abatements during the first five years of their availability.

Over the next five years that commercial abatements were available to Michigan communities, 1983 to 1987, the number that granted at least one new commercial property tax abatement grew from 25 to

Table 3.6 Total Real Value of New Commercial Property Tax Abatements Offered by Municipalities in Metropolitan Detroit, 1978–1982

Total real value (1990 $)	No. of communities	Cumulative %
0	87	77.68
500,000	7	83.93
1,000,000	1	84.82
5,000,000	13	96.43
10,000,000	2	98.21
20,000,000	0	98.21
40,000,000	1	99.11
60,000,000	0	99.11
80,000,000	0	99.11
100,000,000	0	99.11
120,000,000	0	99.11
140,000,000	0	99.11
160,000,000	0	99.11
180,000,000	1	100.00
200,000,000	0	100.00
>200,000,000	0	100.00

42 communities (Table 3.7). Sixty-nine percent of the communities offering new commercial property tax abatements during this period were offering a total amount of $5 million or less. Between 1983 and 1987, 12 communities granted new commercial abatements that totaled more than $5 million but less than or equal to $60 million. The cumulative percentage distributions for the periods of 1978 to 1982, and 1983 to 1987, look very similar. The commercial abatement program officially ended in 1988.

Table 3.7 Total Real Value of New Commercial Property Tax Abatements Offered by Municipalities in Metropolitan Detroit, 1983–1987

Total real value (1990 $)	No. of communities	Cumulative %
0	70	62.50
500,000	10	71.43
1,000,000	2	73.21
5,000,000	17	88.39
10,000,000	6	93.75
20,000,000	2	95.54
40,000,000	2	97.32
60,000,000	2	99.11
80,000,000	0	99.11
100,000,000	1	100.00
120,000,000	0	100.00
140,000,000	0	100.00
160,000,000	0	100.00
180,000,000	0	100.00
200,000,000	0	100.00
>200,000,000	0	100.00

DOWNTOWN DEVELOPMENT AUTHORITIES

> *The purpose of a DDA is to prevent deterioration and promote economic development within a business district by developing, adopting, and implementing development plans . . . The plan may include proposals for construction, renovation, repair, remodeling, or rehabilitation of a public facility, an existing building, or a multiple-family dwelling unit that aids economic growth in the downtown district.*
>
> —Citizen's Research Council of Michigan (1986)

DDAs have been available to Michigan communities since 1975 under Public Act 197. The legislative body of a city, township, or vil-

lage designates the boundaries of one downtown district for which the authority is allowed to exercise its power of a development plan. A board of directors that contains between 8 and 12 members manages the authority. One of these members must be the local government's chief executive officer. To implement a development plan, the authority is granted the right to construct or alter any building within the downtown district for public or private use. A commanding tool granted the authority is the power of eminent domain. All DDA activities are financed by either a local property tax (up to a maximum of 1 percent of market value of taxable real and personal property within the district, limited to one-half percent in Detroit), revenues from assets or IDBs, tax increment financing receipts, or state and federal grants.

Initially, the adoption of DDAs by metropolitan Detroit area communities was slow. In 1977, three years after the authorities became available, less than 5 percent of the 112 communities in metropolitan Detroit had established DDAs. The rate of DDA adoption increased dramatically in the late 1970s and early 1980s. In 1982, nearly 13 percent of the communities had adopted DDAs, and, by 1987, 26 percent had DDAs. The rate of DDA adoption slowed in the late 1980s and early 1990s. By 1992, about one-third of the communities in metropolitan Detroit had established a DDA.

TAX INCREMENT FINANCE AUTHORITIES

> *Encouraging private development is the goal of tax increment financing. It allows local units of government to make public improvements necessary for manufacturing, commercial, and residential construction. The financing of the public improvements comes from the increase in property tax revenues generated by new private development.*
>
> —Michigan Department of Commerce (1985)

Since the Michigan legislature's adoption of Public Act 450 in 1980, municipalities in the state have been authorized to establish a

TIFA for issuing debt to finance an economic development project. The jurisdiction establishes the geographic boundaries of such an authority, along with the designation of a managing board of directors. Only one TIFA can be established in a municipality, although its boundaries can be altered at any time after a public hearing is held on the issue. A TIFA's board of directors takes one of two forms: 1) a 7- to 13-member group appointed by the local government's chief executive and subject to approval by the city's legislative body, or 2) the same board that runs the city's downtown development corporation.

While a TIFA and DDA may share the same board of directors in a Michigan municipality, there are two clear differences between them. First, a TIFA can be located anywhere within a municipality, whereas a DDA is restricted to the downtown area. Second, a TIFA has no separate taxing ability, while the DDA can establish a property tax levy distinct from the municipality.

A TIFA operates on funds from bonds issued for the purpose of economic development. The bonds issued by the TIFA are secured by a future stream of property tax revenue captured by the authority. This future stream is established by a benchmark value of property in the district at the time it is created. All property taxes resulting from increases in property value above that benchmark may be captured by the authority and used as a revenue stream against which the bonds sold at the beginning of the project are repaid. The tax-increment-finance mechanism is typically used to pay for infrastructure improvements for specific economic development projects, but the range of expenditures funded by this local finance mechanism is staggering. Everything from sidewalk planters, to fire engines, to parking garages has been financed with TIFAs.

A major element of contention in the use of tax increment financing stems from the overlapping nature of local government units under the U.S. federalist system. TIFAs are controversial because the enabling legislation in a state typically permits one unit of local government to capture the tax base that would have otherwise gone to another unit of local government, without the approval of the losing unit. For example, suppose a city adopts a TIFA within its downtown commercial district; this revitalizes the district and causes new shops and restaurants to open. As a result, there is increased nonresidential flow throughout the district and perhaps even the city, and the need for

a greater police presence. New residents who have children and who like the idea of a revitalized downtown may decide to move into the municipality. The predicament is that only the tax increment district itself captures the increased property tax base due to its revitalization. The local police department and public school district invariably find this arrangement unacceptable. The police face an increased demand for their services without the additional revenue to pay for it. The local school district may find that it must provide education to a larger population of school-age children, yet the local property tax base needed to support the extra students has been acquired by the district to underwrite its development effort. While a few states permit the capture to be shared by all local government units, in Michigan, the TIFA district receives all of the incremental property tax revenue.

TIFAs were made available to Michigan communities beginning in 1980. By 1982, just over 6 percent of metropolitan Detroit area communities had established a TIFA. The use of TIFAs exploded in the mid 1980s. By 1987, the proportion of communities with TIFAs grew to over 22 percent. After that era, the rate of local TIFA adoption slowed. In 1992, 26 percent of the Detroit area communities had adopted an authority.

INDUSTRIAL DEVELOPMENT BONDS

> *Proceeds of municipal manufacturing revenue bonds (IDBs) are used in Michigan and most other states to finance selected manufacturing and commercial development. These bonds carry below-market interest charges because the interest paid on them is exempt from federal and state income tax laws. The objective of the authorities issuing IDBs is to induce business firms to locate new plants or retain renovated or expanded existing ones within their jurisdictions.*
>
> —Ann R. Thomas (1982)

Three Michigan programs are relevant for our consideration. The Industrial Development Revenue Bonds Act of 1976 (Public Act 62)

permitted local government units to issue revenue bonds to finance the cost of certain manufacturing projects. Financing for projects was comprehensive and intended to cover the cost of the site, the buildings, and the machinery/equipment. These bonds had to be approved by the Michigan Municipal Finance Commission in the Department of Treasury, but there was no state or local guarantee of the bonds.

Second, Michigan's Economic Development Corporation Act of 1974 (Public Act 338) established the privilege that local government units can create public economic development corporations (EDCs) to help finance local commercial and manufacturing projects. The effect of this act was to expand the range of activity for which manufacturing revenue bonds could be used. It allowed EDC bonds to be issued without approval from Michigan's Municipal Finance Commission. Later, in 1980, Public Act 501 amended the EDC act and expanded the range of activities for which manufacturing revenue bonds could be issued. Agricultural and forestry projects were included.

Finally, the Michigan Job Development Authority was created in 1975 (Public Act 301) in order to make additional incentives available to small businesses. Small manufacturing projects were pooled in order to gain economies in issuing bonds, and Small Business Administration loan guarantees were used to reduce the rates. Because of legal difficulties, these issues were generally limited to projects involving pollution control equipment and have been a minor aspect of manufacturing revenue bond use in Michigan.

All three of these mechanisms include specific language in the enabling legislation indicating the objective of a "continuing need to alleviate and prevent conditions of unemployment." They also include language on the "need to strengthen and revitalize the economy of the state through manufacturing and commercial development."[6]

Table 3.8 reports the value in 1990 dollars of manufacturing revenue bonds issued prior to 1978 by municipalities in metropolitan Detroit. No issues of IDBs were recorded for 101 of the 112 municipalities. Five municipalities had issues of $10 million or less, another five had issues in the range of greater than $10 million to $80 million, and one municipality (Detroit) recorded an issue in excess of $100 million. Over 90 percent of the municipalities issued no IDBs prior to 1978.

Table 3.8 Total Real Face Value of New IDBs Issued by Municipalities in Metropolitan Detroit prior to 1978

Real face value (1990 $)	No. of communities	Cumulative %
0	101	90.18
500,000	0	90.18
1,000,000	0	90.18
5,000,000	3	92.86
10,000,000	2	94.64
20,000,000	0	94.64
40,000,000	2	96.43
60,000,000	0	96.43
80,000,000	3	99.11
100,000,000	0	99.11
120,000,000	1	100.00
140,000,000	0	100.00
160,000,000	0	100.00
180,000,000	0	100.00
200,000,000	0	100.00
>200,000,000	0	100.00

Over the period from 1978 to 1982, the distribution of new IDB issues across the Detroit area was focused on a few cities. Nearly 95 percent (106/112) of the municipalities in our sample issued no new IDBs over this time span (Table 3.9). To a large extent, this lack of local bond activity was attributable to increased federal restrictions on the statewide issue of IDBs. Three municipalities issued new IDB debt of greater than $5 million up to $10 million, and one municipality issued new debt in the range of greater than $20 million up to $40 million. Only two municipalities issued IDB debt in excess of $80 million.

Finally, from 1983 to 1987 the distribution of new IDB debt issued by Detroit area communities became even more concentrated as illustrated in Table 3.10. Only three municipalities issued new IDB debt over this time period. Two of the three municipalities that offered new

Table 3.9 Total Real Face Value of New IDBs Issued by Municipalities in Metropolitan Detroit, 1978–1982

Total real face value (1990 $)	No. of communities	Cumulative %
0	106	94.64
500,000	0	94.64
1,000,000	0	94.64
5,000,000	0	94.64
10,000,000	3	97.32
20,000,000	0	97.32
40,000,000	1	98.21
60,000,000	0	98.21
80,000,000	0	98.21
100,000,000	2	100.00
120,000,000	0	100.00
140,000,000	0	100.00
160,000,000	0	100.00
180,000,000	0	100.00
200,000,000	0	100.00
>200,000,000	0	100.00

IDBs for manufacturing firms had issues of less than $5 million. One municipality issued IDB debt in the range of greater than $10 million up to $20 million. The pattern over time is clear. Fewer Detroit area municipalities were able to issue new IDBs over the time period investigated, and the size distribution of IDB issues was shifting to the lower ranges.

The Tax Reform Act of 1986 severely limited the ability of state and local governments to use public bond issues for private purposes.[7] States were allocated maximums on the amount of public debt that could be issued for such activities. As a result, states now face a potentially difficult allocation decision. If the demand for IDBs exceeds the maximum amount permitted by federal law, how does the state allocate the tax-exempt issues among competing uses? Does it assign them to the largest manufacturing projects, to the projects with

Table 3.10 Total Real Face Value of New IDBs Issued by Municipalities in Metropolitan Detroit, 1983–1987

Total real face value (1990 $)	No. of communities	Cumulative %
0	109	97.32
500,000	0	97.32
1,000,000	0	97.32
5,000,000	2	99.11
10,000,000	0	99.11
20,000,000	1	100.00
40,000,000	0	100.00
60,000,000	0	100.00
80,000,000	0	100.00
100,000,000	0	100.00
120,000,000	0	100.00
140,000,000	0	100.00
160,000,000	0	100.00
180,000,000	0	100.00
200,000,000	0	100.00
>200,000,000	0	100.00

the greatest potential for reducing unemployment, to those with the greatest prospect of stimulating the economy of the state, or to the projects most likely to help incumbent politicians? As with any non-market allocation mechanism, more recent IDB apportionments are likely to be less efficient due to the political factors that now play a greater role.

LOCAL INCENTIVE USE IN METROPOLITAN DETROIT

> *These five economic development programs represent separate and distinct tools available to [Michigan] municipalities to promote and subsidize private sector*

> *growth in the state. Municipalities may use any or all of these programs simultaneously to fashion attractive packages that achieve the desired ends . . . The firm's tax liability, as well as the cost of construction of the new facility, is less than it would have been absent these incentive programs.*
>
> —Citizen's Research Council of Michigan (1986)

Municipalities in the Detroit area assembled packages of local incentives from those available under state law and offered them to manufacturing and commercial firms over the 1977–1992 period. As discussed in Chapter 1, it is difficult to know specifically how the Detroit area experience with local incentives compares with that of other large U.S. metropolitan areas. An educated guess is that the Detroit area is at the high end of the distribution regarding local incentive activity in U.S. metropolitan areas.

In Table 3.11, we report descriptive statistics that correspond to the number of different incentive packages that municipalities in metropolitan Detroit offered in each observed year. Although a count of the types of incentives offered in a city does not reflect intensity of use, it still provides information on the distribution of use across different varities of incentives. The table excludes IDBs since local authority to grant such bonds was effectively taken away during the period under observation.

In 1977, Michigan allowed the use of just two local economic development incentives: the granting of manufacturing property tax abatements and the establishment of a DDA. In 1977, the mean use of the two potential local economic development inducements across the 112 communities in our sample was 0.198; this represents just less than one-fifth of an incentive per municipality. To control for mean usage based upon what was legally available, we divided the mean of the chosen number of different incentives by the maximum allowed by the state, with the result shown in the last row of the table. For 1977, this is equivalent to 0.099.

Five years later, in 1982, the state allowed Detroit area municipalities to use four forms of local incentives: manufacturing property tax abatements, commercial property tax abatements, the establishment of

Table 3.11 Statistics on Combined Municipal Incentive Packages in the Detroit Metropolitan Area

	1977	1982	1987	1992
Maximum allowed by state[a]	2	4	4	3
Maximum chosen by any city	2	4	4	4
Minimum chosen by any city	0	0	0	0
Mean of chosen by all cities	0.198	0.874	1.505	1.072
Standard deviation of chosen by all cities	(0.456)	(1.089)	(1.244)	(0.948)
Mean of chosen maximum allowed by state	0.099	0.219	0.376	0.357

[a] In 1986, no new commercial property tax abatements could be offered, but ones offered previously would continue until they expired. This is why in 1992 the maximum chosen is greater than the maximum allowed.

a DDA, and the establishment of a TIFA. The mean incentive package in 1982 consisted of 0.874 incentives, a bit less than one incentive per municipality. Even accounting for the fact that Detroit area communities could now use four different types of incentives, the mean incentive package relative to the maximum between 1977 and 1982 increased from about 0.10 to 0.22. This is over a doubling of use relative to what could be used.

By 1987, the mean incentive package had risen to 1.505, or about one-and-a-half different types of incentives being used on average per municipality. At this time, there were still four different forms of local incentives available. Average municipal use relative to what could be offered had climbed to 0.38.

With the demise of commercial abatements in 1986, the potential new package that a metropolitan Detroit area community could offer to a business enterprise fell to three incentives. In 1992, the mean use of the different forms of incentives was about 1.07 per municipality, a reduction of about half an incentive per municipality from the 1987 mean package. Accounting for the fact that only three incentives could now be offered, the mean of chosen, divided by the mean of allowed, fell from 0.38 to 0.36 between 1987 and 1992.

SPATIAL MISMATCH IN METROPOLITAN DETROIT

> *For all the moaning about the plight of the cities, there is really only one major American downtown that has gone to hell in a handbasket, and that is Detroit.*
>
> —Joel Garreau (1991)

> *Detroit Downtown may be in trouble, but it is a much rosier picture when you look at the whole area.*
>
> —Joseph Spiedel, president of the Population Crisis Center, quoted in Garreau (1991)

The previous chapter contained a review of the literature relating to the possible occurrence of a spatial mismatch between potential employees and employers in a metropolitan labor market and included a discussion of the theory regarding how this could occur and a brief examination of empirical studies that have looked for supporting evidence. Empirical analysis usually points to the existence of some spatial mismatch in metropolitan area labor markets, although we found that such findings were not always consistent or fully conclusive. One goal of our analysis is to see whether spatial mismatch exists in Detroit, and whether local incentives do anything to alleviate that situation. We have already documented widespread use of local incentives in the Detroit area, so we now look for evidence on the existence of any spatial mismatch in that labor market.

Since the theory of spatial mismatch in a metropolitan area is based upon a separation between employment opportunities and potential employees, and this separation is hypothesized to traditionally occur between the central city/inner suburbs and the outer suburbs, we categorize Detroit area communities in a dichotomous manner.[8] Jurisdictions within 10 miles of the Detroit city central business district are defined as the *inner* group of cities. This classification results in the inclusion of 11 inner suburbs (Dearborn, Ecorse, Ferndale, Grosse Pointe, Grosse Pointe Farms, Grosse Pointe Park, Hazel Park, Harper Woods, Lincoln Park, Melvindale, and River Rouge), 2 enclaves within the city of Detroit (Hamtramck and Highland Park), and the city of Detroit. The remaining 98 communities in the Detroit metropolitan area are classified as the *outer* group of cities.

The group of 14 inner cities is by no means homogenous; in fact, the cities are quite heterogeneous. Consider median city income, for example. Highland Park had a median household income in 1992 of only $8,655 (in 1990 dollars) and the median household income in Detroit and in three other communities in the inner group was less than $20,000. In six of the remaining communities, median household income ranged from $25,240 to $35,203. In the remaining three Grosse Pointe cities, the 1992 median household income was between $56,548 and $68,569. Our core sample of 14 inner communities contains both the lowest median household income recorded for a city in the Detroit metropolitan area in 1992 and some of the highest city median household incomes as well.

The existence of a spatial mismatch in a metropolitan area's labor market usually begins when people and firms leave the central city and inner suburbs and migrate to the outer suburbs. To see this in metropolitan Detroit, compare what happened to population, residential employment,[9] and nonresidential property tax bases between cities classified as inner and outer.[10] The years chosen for comparison are 1977 and 1992. Table 3.12 illustrates that the average outer suburban community in 1992 realized an 18.3 percent increase in population from a base year of 1977. On the other hand, the average inner community experienced a 12.2 percent decrease in population. The percentage changes in residential employment exhibited similar contrary outcomes, a 19.0 percent increase for the outer cities compared to a 9.5 percent decrease for the inner. As for the real change in commercial property tax base over this 15-year period, the inner cities on average experienced nearly a 17 percent decrease in value, while the outer cities enjoyed an average boost in value of close to 100 percent. The effects of suburbanization on the inner cities' manufacturing property tax bases were even bleaker. On average, the real manufacturing property tax base declined in value for inner communities by almost 17 percent between 1977 and 1992. For the outer suburbs, the average increase in local manufacturing value was 288 percent. These figures definitely point to a migration of people and jobs from inner cities to outer cities in metropolitan Detroit. The appropriate *Z*-tests for no difference in two population means yield statistics that indicate that all of the changes observed in the inner cities are statistically different from the changes observed in the outer cities.[11]

Table 3.12 Spatial Mismatch in the Detroit Area Labor Market: Relevant Variables for Inner and Outer Cities

Variable	Inner cities	Outer cities	*Z*-statistic for equivalent means[a]
1977–1992 change in population (%)	–12.24[b] (11.06)	18.31 (94.77)	3.04
1977–1992 change in employment (%)	–9.53 (12.21)	18.97 (29.02)	6.50
1977–1992 change in real value of comm. prop. tax base (%)	–16.81 (32.02)	99.39 (369.85)	3.03
1977–1992 change in real value of manufact. prop. tax base (%)	–16.75 (26.42)	288.29 (1,193.73)	2.52
1992 African-American residents (%)	19.38 (30.18)	4.14 (11.44)	1.87
1992 Residents holding at least bachelor's degree (%)	20.84 (22.65)	22.98 (15.26)	0.34
1992 Commercial property tax base per resident (1990 $)	$3,639 ($3,055)	$5,787 ($5,528)	2.17
1992 Manufacturing property tax base per resident (1990 $)	$5,289 ($7,011)	$6,219 ($13,218)	0.40
1992 Residential employment rate (%)	41.35 (8.64)	52.13 (11.41)	4.57
1992 Families in poverty (%)	15.15 (13.50)	4.53 (4.47)	2.92
1992 Median household income (1990 $)	$32,081 ($18,806)	$45,138 ($18,805)	2.43

SOURCE: U.S. Bureau of the Census (1970, 1980, and 1990); Michigan Employment Security Commission, Detroit; Michigan Property Tax Commission, Dept. of Treasury, Lansing; and authors' calculations.

[a] $Z(0.05) = 1.96$.

[b] The mean is the first entry in each cell of the first two data columns; the standard deviation is in parentheses below the mean.

As Kain (1968) and others have stressed, the out-migration of people and jobs from the core of a metropolitan area to its periphery is more likely to result in spatial mismatch if racial minorities and lower-skilled labor are the ones left behind. So what did the 1992 distribution

of African Americans and people holding at least a bachelor's degree look like for the Detroit area? Table 3.12 provides the evidence.[12] The average proportion of the African-American population in the core cities was 19.4 percent. In the city of Detroit, it was an astounding 79.2 percent. This compares to an outer suburban average of only 4.1 percent African American.[13] There is evidence that racial minorities (likely through housing discrimination) have been less likely to migrate to the outer suburbs. This is another element necessary for spatial mismatch to occur in a metropolitan area.

There has been an out-migration of people and firms in the Detroit metropolitan area, and this movement has left African Americans behind. We must now ask whether there is evidence that core city residents face a more difficult time in finding employment at the core than outer city residents face at the periphery. One proxy measure for this is a comparison of the average dollar value of commercial and manufacturing property tax base per resident. As shown in Table 3.12, the 1992 commercial tax base per outer city resident was $5,787. This is greater than the corresponding figure of $3,639 calculated for inner residents. If the local nonresidential property tax base per resident is any measure of employment opportunities for inhabitants, then a citizen of an outer suburb clearly has greater opportunities for finding commercial sector employment in that vicinity.

If a spatial mismatch between low-skilled/minority workers and potential employment has occurred in Detroit, then the theoretical effects have been shown to be a lower average employment rate and standard of living in the core area. Table 3.12 indicates that the 1992 average percentage of residents employed per all residents (including children, adults, and seniors; i.e., the residential employment rate) was 41.4 for core cities and the larger ratio of 52.1 for periphery cities. In 1992, the average prevalence of family poverty for core cities was 15.2 percent. For outer cities, the poverty average was the much lower 4.5 percent. The average real (1990 $) median household income for all core cities was $32,081 in 1992. For all outer cities, it was the much higher $45,138. All of these measures of average differences in economic well-being between inner and outer cities were statistically different from each other.

Based upon this comparative statistical evidence, one cannot reject the hypothesis that a spatial mismatch between a greater prevalence of

employers in the outer suburbs (especially commercial) and employees at the core (especially minorities and the low-skilled) may have occurred in the Detroit metropolitan area labor market. With the trends observed since 1992, it is also likely that a comparison using updated data from the late 1990s would yield no different results, although the emphasis on the phrase "may have occurred" needs to be stressed. In this simple comparative analysis, we have not controlled for many of the other factors, besides spatial mismatch, that could yield the divergence in labor market results observed for inner and outer cities in the Detroit metropolitan area. In Chapter 5, we conduct a full analysis of the determinants of the residential employment rate and poverty rate in a Detroit area community.

Further support for our finding that spatial mismatch exists in the metropolitan Detroit area is provided in Holzer's (1996) book, *What Employers Want: Job Prospects for Less-Educated Workers*. Between 1992 and 1994, Holzer sent surveys to 800 representative firms in each of four large U.S. metropolitan areas: Atlanta, Boston, Detroit, and Los Angeles. The surveys were intended to solicit information relevant to the determination of the degree of spatial mismatch that exists in each area's intrametropolitan labor markets. In the city of Detroit, Holzer reports that the number of unemployed workers per vacant job was about two-and-a-half times as large as in the rest of the metropolitan area. If limited to low-income neighborhoods in the central city, this figure would be even larger. He also observed that, despite the high unemployment rates in the city of Detroit, employment vacancy rates in the central city were as high, or higher, than in the suburbs. This suggests a greater mismatch between the available labor force and the job openings in the central city than between the available labor force and the job openings in the suburbs. Specifically, Holzer found, for the city of Detroit, that employers required skill levels higher than what the city's residents possessed. African Americans who resided in the city of Detroit were also twice as likely to apply for a job in the central city than in the suburbs.

SUMMARY

This chapter has provided a review of the types of local incentives available for use by cities, townships, and villages in the metropolitan Detroit area. We have given a brief description of manufacturing and commercial property tax abatements, DDAs and TIFAs, and IDBs. In each case, we have described the incentive, what it is intended to accomplish, how and when the incentive came about in Michigan, and some of the institutional details on implementation.

We have also provided a statistical overview of the magnitude of use for each of these incentives at different points in time and of how this magnitude has changed over time. We showed that the overall levels of incentive usage have grown, while the variability in their use across the municipalities in metropolitan Detroit has decreased. Another pattern that emerges is that the availability of incentives and the intensity of their use by municipalities (compared with the available array of incentives) initially increased for communities in the Detroit area but has more recently declined. These findings are important and will be discussed again in Chapters 5 and 6, when we consider the regression results from our study.

The previous section of this chapter presented a simple comparison of variables drawn from a sample of 14 inner cities and 98 outer cities. Between 1977 and 1992, there was a definite out-migration of population and employment. This flow appears to have left a disproportionate percentage of minorities in the central city and inner suburbs. There is also evidence that employment opportunities may be fewer in the inner area than in the outer area. These are conditions that have been theorized to produce a spatial mismatch in a metropolitan labor market. The symptoms of spatial mismatch—lower employment ratios and a lower standard of living for the core—were also observed in metropolitan Detroit in 1992. At a minimum, it is safe to say that in the early 1990s a wide disparity existed between labor market outcomes generated by the average inner area resident and the average outer area resident. This occurred against a backdrop of nearly 20 years of local incentive use by Detroit area communities. The question we contemplate is whether this situation would have been any worse if these incentives had not existed and had not been used. Could the spatial

mismatch have been reduced if local incentives were used differently? We turn to these questions in the remainder of the book.

Notes

1. The astute reader may notice that the statistics recorded in Table 3.1 differ somewhat from similar statistics in Wassmer (1993) and Anderson and Wassmer (1995). The reason for the variation is that communities that had no manufacturing or commercial property were excluded from the calculation of the averages relating to an incentive given to the respective type of business activity. In previous calculations, these were considered to be zero and reduced the averages.
2. Villages have also had the ability to offer local economic development incentives in Michigan. They are not included in our data set due the difficulty in finding reliable socioeconomic data about them.
3. A *clawback* clause in an economic development incentive offer requires the firm to repay part or all of the benefits it receives if the number of jobs created or other external advantages do not meet the levels promised at the time of acceptance of the incentive offer.
4. In a few notable cases, a Michigan community has balked at approving another community's abatement to a firm that was leaving its boundaries. When this has occurred, it is not unusual for the governor and other prominent public office holders to step in and convince the hesitant community that it is in the state's best interest to grant the abatement. After all, the firm had assured the state that there were plenty of other states that would be glad to have its property tax base and employment. A prominent example is what went on between the Chrysler Corporation, the city of Highland Park (the residence of its world headquarters since its inception), the city of Auburn Hills (where Chrysler wanted, and got, its new world headquarters with a tax abatement), and Governor John Engler. A further discussion of this issue is in the Epilogue.
5. "Commercial firms" include the headquarters or regional offices of businesses such as insurance companies.
6. See Thomas (1982, p. 310).
7. See Fisher (1995, pp. 249–250) for a brief description of the increased federal restrictions on the state and local granting of IDBs.
8. As described earlier, many metropolitan areas in the United States developed in a traditional monocentric manner. The Detroit metropolitan area is almost a textbook example of this type of historic growth. Development in this way, and the suburbanization that followed, is more likely to have left the spatial mismatch of a greater percentage of low-skilled workers at the core of the area and a greater percentage of employment opportunities for low-skilled workers at the periphery.
9. "Residential employment" is the total number of residents in a community who hold a full-time job.
10. The averages reported in Table 3.12 are arithmetic averages for all cities in the stated group. If the averages were instead weighted by city population, the argu-

ments in favor of a spatial mismatch in the Detroit metropolitan area would only get stronger. This is because the city of Detroit itself contains more people than the remaining 13 communities placed in the inner group.

11. See Kanji (1995, p. 6) for a description of how to perform the *Z*-test for comparison of two population means when the variance is known and unequal.
12. Since the metropolitan Detroit area's dominant minority group is African American, that is the only racial identification considered here. For other metropolitan areas, it would be relevant, perhaps, to consider the distribution of Latinos.
13. It is only with around 90 percent confidence that we can be certain that the difference between the average percentage of African Americans in inner and outer cities is statistically significant.

4 A Model for Development Incentives in a Metropolitan Area

Everything should be made as simple as possible, but not simpler.

—Albert Einstein

However, there are situations where there is a two-way influence among economic variables; that is, one economic variable affects another economic variable(s) and is, in turn, affected by it (them).

—Damodar Gujarati (1995)

This chapter contains a discussion of the motivation for, and intuition behind, our model of local economic and incentive activity in a metropolitan area. We describe a model of a metropolitan area economy that explains differences in local employment rates, poverty rates, and manufacturing and commercial property tax bases, as well as differences in the use of local incentives, including property tax abatements, industrial development bonds (IDBs), downtown development authorities (DDAs), and tax increment finance authorities (TIFAs). Our modeling strategy takes into account the interrelationships between these variables and other causal factors.

For example, the percentage of residents living below the poverty line in a community depends upon a number of local factors, including the value of manufacturing property in the community. Other things equal, communities with a greater value of manufacturing property provide residents with more employment opportunities, and this may reduce the local rate of poverty. At the same time, the value of manufacturing property in a community itself depends upon a number of factors, including possibly the local poverty rate. Since manufacturers may not desire to locate in a high-poverty location, the value of manufacturing property in a community may be inversely related to an area's poverty rate. The poverty rate and the value of manufacturing property

in a community are jointly determined. Our model takes into account such joint relationships. Variables that are jointly determined in a statistical model are defined as *endogenous*. Of course, there are other factors that come from outside the model and also determine the value of endogenous variables; these variables are defined as *exogenous*.

Pushing this example further, the value of a city's manufacturing property tax base may additionally be influenced by the manufacturing property tax abatements offered by the city as well as by its geographic size. In this case, the area of the city is an exogenous variable, while the manufacturing tax base is an endogenous variable. The dollar amount of manufacturing property tax abatements offered by a city may also be affected by the dollar amount of the city's manufacturing tax base. These two variables are dependent on one another and endogenous. In a metropolitan area, we expect such simultaneous relationships to exist among the local employment rate, poverty rate, property tax bases, fiscal variables, and economic development incentives. The model described in this chapter and its subsequent statistical estimation reported in the next chapter account for these simultaneous relationships.[1] Our modeling contribution is to take account of the inherent endogeneity of the local variables necessary for determining the efficacy of local incentive offers.

In order to deal with the issue of simultaneity among the variables, we use the accepted econometric method of two-stage least squares. This method is a response to the fundamental difficulty faced by all social science researchers. Social scientists would like to run a controlled experiment, as done by their colleagues in the natural sciences. If we could separate the Detroit metropolitan communities into a control group with no treatment effects (economic development incentives) and a group that uses the treatment, and hold everything else constant, we could then compare the results and discern the effect of the treatment. Unfortunately, this is not an option. Not only is it impossible to run a controlled experiment in terms of treatment groups, it is not possible to hold everything else constant. Instead, we rely on statistical methods to separate the treatment groups and to hold everything else constant. By using variables referred to as instruments, which affect one economic relationship but not others, we identify the effects we seek to describe. A further discussion of our use of instrumental variables is in Appendix 1.

The first section of this chapter gives an explanation of the behavioral relationships that must be accounted for to accurately assess the efficacy of local incentives. This begins with models of what determines the residential employment rate and poverty rate in communities. Next, we describe separate models of what determines the value of local nonresidential property tax bases and the local use of five economic development incentives (manufacturing abatements, commercial abatements, IDBs, TIFAs, and DDAs). The models in this chapter are designed in broad enough terms to apply to any U.S. metropolitan area. Where specificity is required, the models are tailored to fit institutions peculiar to the Detroit metropolitan area.

The second section provides information on the source of each of the actual variables used in the study, on any modification of the original source data, and descriptive statistics for each variable. Since the variables are drawn from 112 communities across four different years (1977, 1982, 1987, and 1992), descriptive statistics are provided for all communities in each year and for all communities in all the pooled four years. The variables described by these statistics are used in the multiple regression analyses discussed in the next chapter.

RELATIONSHIPS TO ASSESS THE EFFICACY OF INCENTIVES

> *Given the common roots and interdependencies of many urban problems, a comprehensive approach to the problem may be more effective than a piecemeal one.*
>
> —Arthur O'Sullivan (1999)

Many of the behavioral and structural relationships presented next are associated with decisions made by a jurisdiction's policymakers. In modeling these decisions, we assume that they are based upon the behavior of a decisive voter maximizing utility subject to constraints. That is, the decisive voter makes a policy choice that is in the individual's best interest. The local policymaker accepts this decision as the community's own choice because it is the one most likely to insure the

policymaker's reelection or reappointment.[2] This is the motivation behind the standard median voter model of collective decision making. As a result, the decisive voter is called the *median voter*.[3] When it is obvious that other factors also enter into a local policymaker's choice, we include proxy measures for these. For example, there are proxies for the disparate strength of special interests and their lobbying activity and ability to make campaign contributions.

Key measures of the efficacy of local incentives in a metropolitan area are a positive influence on the residential employment rate and/or a negative influence on the poverty rate within a specific community. Such impact is necessary if local incentives are to be used to help alleviate spatial mismatch in a metropolitan area's labor market. A logical place to begin a model of intrametropolitan relationships related to the efficacy of local incentives is with an equation representing the determinants of the residential employment rate in a metropolitan community.

Residential Employment Rate

The residential employment rate in a community equals the total number of local residents that are employed divided by the total local population. Note that the numerator in this ratio is not the number of jobs that exist in the community; it is the number of people that live in the community and are employed. Residents of a community that are employed do not have to work in their community of domicile. However, as indicated by the spatial mismatch hypothesis, we expect that a greater business presence in a locality will result in a greater residential employment rate there.[4] The proportion of any given local population that is employed also depends upon the population's demographic characteristics.

As economists, we assume that a local labor market exists and that the outcomes observed in that market are determined by both supply and demand factors. At any given time, the behavior of economic actors on both the supply and demand sides of the local labor market determines the equilibrium level of employment and average wage observed in a community. The actors on the supply side are the residents themselves making decisions regarding participation in the labor market. The demand side is composed of firms within the community, firms in surrounding communities, and firms throughout the entire

metropolitan area, which are making decisions on hiring employees. When modeling the equilibrium level of employment observed in a community at a given point in time, there is no need to control for the number and type of firms in the entire metropolitan area because they are the same for all communities.[5]

The available labor force and the skill level of that labor force matter to the determination of a community's residential employment rate. The available labor force is measured by the percentage of the local population that is young or old. The skill level of the labor force is proxied by the percentage of the adult population with at least a bachelor's degree and the percentage of the population with less than a high school education. To control for possible differences in work choices made by African-American residents and others, and also to control for the effect of racial discrimination in the labor market, we include the percentage of a city's population that is African American.

On the demand side, the amount and type of business capital in the community are important elements. The real value of manufacturing and commercial property accounts for these factors in the model.[6] The greater the value of local business capital, holding other factors constant, the greater should be the city's level of residential employment. However, at the same time, the greater the value of the nonresidential property tax base, the more attractive the community may be to potential residents and the greater the local population. The influence of manufacturing or commercial property value on the residential employment rate is thus indeterminate. Finally, employment opportunities ought to be greater for residents in a place surrounded by communities with a high level of employment or intense concentrations of business activity. Hence, we include an average measure of employment activity, and the percentages of total property tax base involved in manufacturing and commercial activity, in surrounding communities.

The denominator of the residential employment rate is community population. As with employment, local population is determined by both supply and demand factors. These variables underlie the equilibrium population of the city and an equilibrium shadow price for the admittance of another resident. Supply-side factors affecting population include the available land area and zoning regulations allocating that land between residential and nonresidential use.[7] People and their desire to live in a specific community affect the demand side. This

interest is dependent on the geographic, economic, and demographic attractiveness of a community.

In order to control for city-specific influences such as area and land use zoning, we use a fixed-effects model where a separate dummy variable identifies each city in the sample. By including city fixed effects, we control for local characteristics that vary by community. Communities farther from downtown Detroit are quite different from the inner city and the inner ring of older suburbs. We also control for time effects by including year variables for each of the four years in the panel data set.

Using available variables to capture the influences just described yields the following:

Eq. 1 Residential employment rate = *f*(*manufacturing property value, commercial property value,* percentage population young, percentage population old, percentage population with bachelor's degree, percentage population with less than high school, percentage population African American, average surrounding property in manufacturing, average surrounding property in commercial, average surrounding residential employment, city dummies, time dummies).

Italic type designates the manufacturing and commercial property tax base variables as endogenously determined. The remaining explanatory variables are exogenous.

Poverty Rate

The percentage of the population that falls below the poverty line in each community is modeled to capture the link between economic development incentive use by a community, the value of nonresidential property bases in a community, and the potential impact of the nonresidential property base on community poverty. Since it is the lack of employment that is the fundamental cause of poverty in a community, we use the same set of explanatory variables as in the determination of the residential employment rate. The poverty rate in a community is specified as depending upon the following variables:

Eq. 2 Poverty rate = *f(manufacturing property value, commercial property value*, percentage population young, percentage population old, percentage population bachelor's degree, percentage population less than high school, percentage population African American, average surrounding property in manufacturing, average surrounding property in commercial, average surrounding residential employment, city dummies, time dummies).

Manufacturing Property Value

Because of countervailing effects, we cannot anticipate the influence of the real value of a community's manufacturing or commercial property tax base on the residential employment rate. We do expect property tax bases to have a negative influence on the poverty rate. A community's residential employment rate and poverty rate, in addition, affect the value of the community's nonresidential property tax base. When making an intrametropolitan site choice, firms are drawn to jurisdictions with a larger proportion of employable residents (as measured by the local rate of employment). Firms may stay away from a community with a high poverty rate. Local manufacturing property and commercial property values are thus simultaneously determined with local residential employment and poverty rates.

Local manufacturing property value is measured as the real market value of the manufacturing property tax base in a jurisdiction.[8] Earlier work on the determinants of local economic activity in a metropolitan area, reviewed in Chapter 2, provides the basis of our model of local manufacturing property value. Firms that reside in a metropolitan area, or are looking for a site within the area, drive the demand for business sites in a community in that area.[9] Fischel (1975) and White (1975) have established that the supply of local business sites is determined through pollution zoning. Demand factors that drive the value of business property within a community are fiscal attractiveness, geographic attractiveness, and local incentives for manufacturing. Supply factors that drive the value of local business property are city size and land use decisions.

Local characteristics that determine local manufacturing property value, and that do not vary over time, are accounted for with city-spe-

cific fixed effects. Local land use decisions are measured by the percentage of a city's property value composed of manufacturing property. In addition, characteristics of local residents (percentage of families in poverty, and the age and education distribution of city residents) are included as proxy measures of factors that influence a jurisdiction's pollution zoning decisions.

The fiscal attractiveness of a community is a positive function of its per-resident municipal expenditure and a negative function of local taxation. Local taxation is gauged by the combined property tax millage rate of all units of local government (city, county, schools, and other local units).[10] The fixed-effect city dummies capture the fact that some cities in the metropolitan area levy a local income tax.[11] The geographic attractiveness of a city site to manufacturing is also reflected in the preponderance of manufacturing firms in adjacent communities. Local economic development incentives that apply to manufacturing firms are IDBs and manufacturing property tax abatements. The offering of either of these incentives is designed to increase the demand for a community's given manufacturing sites and to raise the value of its manufacturing property base. As discussed earlier, IDBs and manufacturing property tax abatements may exert different effects on manufacturing property value in different years. By including interactive variables equivalent to IDBs or manufacturing property tax abatements offered locally in a given year, and zero for other years, we test this proposition in the regression analysis.

The value of manufacturing property in a community is as follows:

Eq. 3 Manufacturing property value = *f*(*residential employment rate, poverty rate, manufacturing property tax abatements with time-interactive variables, IDBs with time-interactive variables, municipal expenditure per capita, property tax rate*, percentage population young, percentage population old, percentage population with bachelor's degree, percentage population with less than high school, percentage property in manufacturing, average surrounding property in manufacturing, city dummies, time dummies).

The first six explanatory variables are endogenous. The remaining right-side variables are exogenous.

Commercial Property Tax Base

With only slight modification, the model developed for local manufacturing property value is applied to local commercial property value. The supply of local land available for commercial development is determined by the same factors that underlie the amount of local land available for manufacturing use. The influence of any of these factors, however, is not expected to be the same for the two different types of nonresidential activity.

Demographic and educational characteristics of the population affect the demand for commercial sites within a community's boundaries. The attractiveness of a local market to a commercial firm is positively related to the percentage of adults with a bachelor's degree and negatively related to the percentage with less than a high school education. Greater proportions of the population either young or old, or in poverty, should reduce commercial activity in the community. A community with a larger rate of residential employment and greater average employment in surrounding communities should also exhibit more commercial activity and larger commercial property bases.

The factors that account for the fiscal attractiveness of a community to a commercial firm are the same as those used in the manufacturing model. Local incentives intended to increase the demand for a community's commercial sites, and thus their value, are the establishment of a DDA, the presence of a TIFA, or the offering of commercial property tax abatements. Local commercial incentives can again exert different influences on local commercial property value in different years.

The geographic attractiveness of a community is measured by city fixed effects as well as through the inclusion of the average percentage of the surrounding property bases in commercial activity. A greater average percentage of surrounding property devoted to commercial enterprises may indicate positive agglomeration advantages. However, it could alternatively measure the negative effect of increased competition on local commercial property values, since commercial firms are more likely to serve local markets. The value of commercial property in a community is thus described by the following equation:

Eq. 4 Commercial property value = *f*(*residential employment rate, poverty rate, real commercial property tax abatements with time interactive variables, TIFA with time-interactive variables, DDA with time-interactive variables, municipal expenditure per capita, property tax rate*, percentage population young, percentage population old, percentage population with bachelor's degree, percentage population with less than high school, percentage population African American, percentage property in commercial, average surrounding property in commercial, average surrounding residential employment, city dummies, time dummies).

The first seven explanatory variables are endogenous. The remaining right-side variables are exogenous.

Municipal Expenditure per Capita

Since it is impossible with existing data sources to separate local expenditure on services primarily provided to residents from those mainly provided to business, the two are lumped together. The value of municipal expenditure per capita is determined by the demand for locally provided services by both the local business and residential sectors. Business sector demand is proxied by the value of manufacturing and commercial property in a community, and by the percentage of each of these nonresidential property tax bases in relation to the entire property tax base. The demand for locally provided goods and services intended for the residential sector is accounted for with explanatory variables representing local demographic characteristics. These include the percentage of the population living in poverty, the percentages of the population over age 65 and less than age 18, the percentages of adults over age 25 with a bachelor's degree and without a high school education, and the percentage of the population that is African American. A community whose primary school district (the district that serves the majority of the community's children) is "out of formula" receives no state aid for the public provision of kindergarten through high school education. By definition, a community in this situation has a high ratio of local property tax base to students, and this may also influence local municipal expenditure per capita.

The value of municipal expenditure per capita in a community is thus expected to be determined in the following manner:

Eq. 5 Municipal expenditure per capita = *f*(*poverty rate, manufacturing property value, commercial property value,* percentage population young, percentage population old, percentage population with bachelor's degree, percentage population with less than high school, percentage population African American, percentage property in manufacturing, percentage property in commercial, primary school district out of formula, city dummies, time dummies).

The first three explanatory variables are endogenous. The remaining right-side variables are exogenous.

Property Tax Rate

The rate of property taxation in a community, measured here as dollars paid per $2,000 of market property value, is a positive function of total municipal expenditure per capita in the community and a negative function of the value of the community's taxable property tax base. Municipal expenditure per capita is only a measure of one component of local spending in a community. We have no measure of school district, county, and special district outlays. Instead, we rely on local demographic characteristics and the set of community dummy variables to control for differences in these other local expenditure levels. A demographic characteristic that increases local expenditure levels, holding all else constant, would necessarily increase the local property tax rate.

The local taxable property base is made up of nonresidential and residential components. The value of property in manufacturing, less manufacturing abatements, plus the value of property in commercial use, less commercial abatements, make up the nonresidential taxable component. Among the variables included in this study, there is no measure of local residential property value. The explanatory demographic variables, plus the average surrounding residential employment, are used as proxy measures for the value of residential property in a community. The higher the taxable value of nonresidential or resi-

dential property in a community, the lower should be the local property tax rate. Finally, a community whose primary school district is out of formula has a high local property value per student. This means that local property tax rates are likely to be lower.

The following factors determine the property tax rate in a community:

Eq. 6 Property tax rate = *f*(*poverty rate*, *manufacturing property value*, *commercial property value*, *municipal expenditure per capita*, percentage population young, percentage population old, percentage population with bachelor's degree, percentage population with less than high school, percentage population African American, percentage property in manufacturing, percentage property in commercial, primary school district out of formula, average surrounding residential employment, city dummies, time dummies).

The first four explanatory variables are endogenous; the remaining right-side variables are exogenous.

Manufacturing Property Tax Abatements

It is difficult to model the cumulative market value of abatements granted to manufacturing property in a locality. As will be discussed in more detail in the next chapter, there are really two municipal decisions to consider. The first is whether to offer any property tax abatements to manufacturing firms. If the decision is affirmative, then the second issue regards the number of local manufacturing firms to receive an abatement (or the cumulative value of the manufacturing abatements offered).[12] These decisions could be modeled as being done by a rational economic actor (the median voter) who is fully informed of the short- and long-run costs and benefits of his or her choices. The reality is that these decisions are made with much less certainty and in a political environment where economic rationality does not necessarily dominate.[13] We take this into consideration by modeling the cumulative real value of abatements to manufacturing property as follows:

Eq. 7 Manufacturing property tax abatements = *f*(*residential employment rate, poverty rate, manufacturing property tax base, commercial property tax abatements, IDBs, TIFA, DDA, municipal expenditure per capita, property tax rate*, percentage population old, percentage population with bachelor's degree, percentage population with less than high school, percentage property in manufacturing, primary school district out of formula, average surrounding manufacturing property tax abatements, average surrounding industrial development bonds, time dummies, city dummies).

The first nine explanatory variables are endogenous. The property tax rate and per-capita municipal expenditure are two variables that account for local fiscal factors expected to exert an influence on local manufacturing property tax abatements. A higher property tax millage rate increases the cost of doing business, and a city with such a characteristic is expected to offer greater abatements. Alternatively, a higher level of municipal expenditure per resident may indicate a greater degree of local services provided to manufacturing firms and hence less of a need to offer property tax abatements.

A dummy equal to 1 if the city's primary school district is out of formula is expected to exert a negative influence on manufacturing property tax abatement offers. Out-of-formula districts face the full loss of local manufacturing property granted tax forgiveness. An in-formula district receives additional state revenue sharing after granting property tax forgiveness. This increase does not fully compensate the district for the abated property tax revenue, but it does soften the blow. If city officials consider the property tax revenue lost to school districts as a cost to granting abatements, they are less likely to offer such inducements if their primary school district is out of formula.

It is important to control for any "taste" factors that influence the local use of economic development incentives. Communities use more abatements if their citizens, and the policymakers that represent them, are entrepreneurial or risk preferring. We proxy for differences in the local taste for incentive use with dummies equal to 1 if the community is utilizing a TIFA or a DDA, and with two continuous variables that gauge the community's use of IDBs and commercial property tax abatements.

Finally, the value of local manufacturing property abatements is related to the scale of manufacturing activity in the community and to demographic characteristics of its residents. Since the abatement measure is the cumulative real value of all abatements granted to manufacturing property, holding other causal factors constant, a community with a greater value of manufacturing property likely offers a greater value of manufacturing abatements. The presence of older, and possibly more conservative, residents and the education profile of citizens in a community may contain information regarding taste for local incentive activity. In addition, a resident more likely to be employed, or less likely to be in poverty, may also offer local elected officials different opinions on the use of local manufacturing abatements.

Political pressure to offer manufacturing abatements should be greater, the greater the percentage of the community's total property base made up of manufacturing firms. Political pressure can further manifest itself in the usage of manufacturing property tax abatements and IDBs by surrounding communities.[14] Also, as other communities in the metropolitan area offer additional local economic development incentives, a noninnovative community is more likely to do the same. Thus, there is the need for time dummies to explain temporal variation in manufacturing abatement offers across Detroit area communities.

Commercial Property Tax Abatements

After minor substitution, the model developed for the determination of local manufacturing property abatements is applicable to the determination of local commercial property abatements. The substitutions are needed because political pressure to offer commercial abatements is determined by the percentage of the local property base in commercial enterprises and by commercial abatements granted by surrounding communities, and not by the analogous manufacturing values. Political considerations must also include the percentage of surrounding communities using alternative commercial incentives and not the alternative manufacturing incentive. In addition, the local taste for incentive use is proxied by manufacturing abatements instead of by commercial abatements, and the commercial property tax base is the relevant business scale. The cumulative real value of commercial

property abatements in a community at a specific time is thus determined in the following way:

Eq. 8 Commercial property tax abatements = *f*(*residential employment rate, poverty rate, commercial property tax value, manufacturing property tax abatements, IDBs, TIFA, DDA, municipal expenditure per capita, property tax rate*, percentage population old, percentage population with bachelor's degree, percentage population with less than high school, percentage property in commercial, primary school district out of formula, average surrounding commercial property tax abatements, average surrounding DDAs, average surrounding TIFAs, time dummies, city dummies).

The first nine variables that appear to the right of the equal sign are endogenously determined.

Industrial Development Bonds

The cumulative use of IDBs by a community in a metropolitan area is determined by most of the same factors that underlie the use of manufacturing property tax abatements:

Eq. 9 IDBs = *f*(*residential employment rate, poverty rate, manufacturing property tax base, manufacturing property tax value, commercial property tax abatements, TIFA, DDA, municipal expenditure per capita, property tax rate*, percentage population old, percentage population with bachelor's degree, percentage population with less than high school, percentage property in manufacturing, primary school district out of formula, average surrounding manufacturing property tax abatements, average surrounding IDBs, time dummies, city dummies).

The first nine explanatory variables are endogenous. The only difference between this model and the model for manufacturing property abatements is that local taste for offering incentives is measured by the amount of manufacturing abatements offered instead of IDB offers.

Tax Increment Finance Authority

The final two forms of local economic development incentives are different from property abatement and industrial development inducements because a TIFA and a DDA only involve a community's decision to institute and retain them. There is no secondary choice concerning the magnitude of their use. Michigan law allows a community to only institute one TIFA and one DDA within its boundaries.[15]

Since the purpose of a TIFA is to attract and retain commercial activity within a jurisdiction's boundaries, the decision to create one is based on the same factors important to the establishment and use of commercial property tax abatements. A model of the municipal adoption and continued use of a TIFA in a community at a specific time is as follows:

Eq. 10 TIFA = *f*(*residential employment rate, poverty rate, commercial property tax base, manufacturing property tax abatements, commercial property tax abatements, IDBs, DDA, municipal expenditure per capita, property tax rate,* percentage population old, percentage population with bachelor's degree, percentage population with less than high school, percentage property in commercial, primary school district out of formula, average surrounding commercial property tax abatements, average surrounding DDAs, average surrounding TIFAs, time dummies, city dummies).

The first nine explanatory variables are endogenous. The only difference from the earlier commercial abatement model is that commercial abatements replace the use of a TIFA as a proxy of local taste for incentive use.

Downtown Development Authority

A DDA's purpose is to attract and keep commercial activity within a jurisdiction's downtown area. A model of the municipal decision to establish and retain one is based on the same factors important to the establishment and retention of a TIFA. The following is a model of the municipal adoption and continued use of a DDA:

Eq. 11 DDA = *f*(*residential employment rate, poverty rate, commercial property tax base, manufacturing property tax abatements, commercial property tax abatements, IDBs, TIFA, municipal expenditure per capita, property tax rate,* percentage population old, percentage population with bachelor's degree, percentage population with less than high school, percentage property in commercial, primary school district out of formula, average surrounding commercial property tax abatements, average surrounding DDAs, average surrounding TIFAs, time dummies, city dummies).

The endogenous variables in this model are the first nine right-side variables. The sole difference from the earlier TIFA model is that the use of a TIFA replaces the DDA as a proxy of local taste for incentive use.

VARIABLES USED IN REGRESSION ANALYSIS

> *[T]he evaluation of local economic development initiatives needs to be extended to much longer term assessments of impacts and much more rigorous separation of the relative contributions of different elements of the 'policy package' at local levels.*
>
> —Tony G. Bovaird (1992)

The effort described in the first part of this chapter yielded an 11-equation model of the variables needed to assess the efficacy of local economic development incentives in a metropolitan area. The model demonstrates that such inducements could theoretically work to reduce spatial mismatch in a metropolitan area's labor market, increasing nonresidential property value in a community; the rise in nonresidential property value then lifts the local residential employment rate or reduces the local poverty rate. If this holds, and incentives are being offered with greater proclivity by inner cities, then local economic development incentives could reduce spatial mismatch in a metropoli-

tan area. However, the important question still remains as to whether the benefit of this mismatch reduction, if it occurs, outweighs the cost.

We comment on these issues through multiple regression coefficients in the appropriate simulations. The methods employed to derive the regression results, the regression coefficients themselves, a description of the simulations that use the regression coefficients, and an analysis of the simulation results are in the next chapter. Before this is done, we offer a recap of all the variables, both endogenous and exogenous, that came out of the previous modeling effort. Summaries are provided for all variable names and data sources, and any changes to the raw data are noted. Descriptive statistics in the form of means and standard deviations for all variables, for each of the four cross sections (1977, 1982, 1987, and 1992) and for the pooled sample used in the regression analyses, are also provided.

Names, Descriptions, and Sources

Table 4.1 presents the shorthand name used to identify a variable, a longer description of it, and the source from which it is derived. All nominal dollar values are transformed to 1990 real dollars through the Detroit area consumer price index (CPI). Nominal property-based values are doubled before being put in real terms. Doubling is necessary because the assessment ratio for all classes of property in Michigan is 50 percent of true market value. Because the state employs a rigorous two-level (county and state) equalizing program for aggregate values reported by class for each municipality, we are fairly confident that a doubling of reported values yields a reliable estimate of the market value of each municipality's property base. The average value of a variable for surrounding communities is found by noting all of the communities in the metropolitan area that border a specific community and finding the respective average value amongst them.

Since many of the 112 municipalities and townships in our sample are sparsely populated, there are no regularly collected data on local government expenditure.[16] However, we do have information on the property tax millage rate levied by the municipality or township. Therefore, an approximation of nominal municipal expenditure per resident equals the municipality or township's millage rate multiplied by its total property base in a given year, all divided by population. We

Table 4.1 Names, Descriptions, and Sources for Variables

Name	Description	Source
Endogenous		
Residential employment rate	(Number of residents employed in each community divided by community population) × 100	Employment: Michigan Employment Security Commission, Detroit Population: U.S. Bureau of the Census, *Characteristics of Population—Michigan*, 1970, 1980, 1990
Poverty rate	Percentage of residents living in poverty in each community	U.S. Bureau of the Census, *Characteristics of Population—Michigan*, 1970, 1980, 1990
Manufacturing property value	Real market value of manufacturing property in each community	Michigan Property Tax Commission, Department of Treasury, Lansing
Commercial property value	Real market value of commercial property in each community	Michigan Property Tax Commission, Department of Treasury, Lansing
Manufacturing property tax abatements	Cumulative real market value of manufacturing property abatements in each community	Michigan Property Tax Commission, Department of Treasury, Lansing
Commercial property tax abatements	Cumulative real market value of commercial property abatements in each community	Michigan Property Tax Commission, Department of Treasury, Lansing
Industrial development bonds (IDBs)	Cumulative real face value of IDBs in each community	Michigan Bond Commission, Department of Treasury, Lansing

(continued)

Table 4.1 (continued)

Name	Description	Source
Tax increment finance authority (TIFA)	Dummy variable equal to 1 if community has a TIFA	Citizens' Research Council of Michigan 1986; Southeast Michigan Council of Governments 1990
Downtown development authority (DDA)	Dummy variable equal to 1 if community has a DDA	Citizens' Research Council of Michigan 1986; Southeast Michigan Council of Governments 1990
Municipal expenditure per capita	Real value of municipal expenditure per resident in each community	Calculated
Property tax rate	Property tax millage rate in each community (local property taxes paid per $2,000 market value)	Michigan Property Tax Commission, Department of Treasury, Lansing
Exogenous		
Square miles	Area in square miles in each community	U.S. Bureau of the Census, *Characteristics of Population—Michigan*, 1970, 1980, 1990
Miles to Detroit's central business district	Miles from center of community to center of Detroit's central business district	Scaled from a map of southeast Michigan
Local income tax	Dummy equal to 1 if community has a local income tax	Fisher and Kohlhase 1986
Percentage population young	Percentage of population less than age 18 in each community	U.S. Bureau of the Census, *Characteristics of Population—Michigan*, 1970, 1980, 1990

Percentage population old	Percentage of population greater than age 65 in each community	U.S. Bureau of the Census, *Characteristics of Population—Michigan*, 1970, 1980, 1990
Percentage population with bachelor's degree	Percentage of population over age 24 with a bachelor's degree in each community	U.S. Bureau of the Census, *Characteristics of Population—Michigan*, 1970, 1980, 1990
Percentage population with less than high school	Percentage of population over age 24 that has not completed high school in each community	U.S. Bureau of the Census, *Characteristics of Population—Michigan*, 1970, 1980, 1990
Percentage population African American	Percentage of population that is African American in each community	U.S. Bureau of the Census, *Characteristics of Population—Michigan*, 1970, 1980, 1990
Percentage property in manufacturing	Percentage of property base that is manufacturing in each community	Calculated
Percentage property in commercial	Percentage of property base that is commercial in each community	Calculated
Average surrounding property in manufacturing	Average percentage for surrounding communities' property base in manufacturing	Calculated
Average surrounding property in commercial	Average percentage for surrounding communities' property base in commercial	Calculated
Primary school district out of formula	Dummy equal to 1 if primary school district is out of formula in each community	*Local Unit Computerized Information*, Department of Commerce, Lansing, Michigan

(continued)

Table 4.1 (continued)

Name	Description	Source
Average surrounding manufacturing property tax abatements	Average cumulative real value of manufacturing abatements in surrounding communities	Calculated
Average surrounding commercial property tax abatements	Average cumulative real value of commercial abatements in surrounding communities	Calculated
Average surrounding IDBs	Average cumulative real value IDBs in surrounding communities	Calculated
Average surrounding DDAs	Percentage of surrounding communities using a DDA	Calculated
Average surrounding TIFAs	Percentage of surrounding communities using a TIFA	Calculated
Average surrounding residential employment	Average total employment in surrounding communities	Calculated

realize that this is not entirely precise because communities collect other forms of local revenue.[17] In our regression analysis we try to control for this inaccuracy by including explanatory variables that serve as a proxy for the likelihood of a locality receiving revenue from other sources and thus having greater local expenditure.

Descriptive Statistics

Descriptive statistics for all of the variables used in our empirical analysis are given in Table 4.2. For each of the four yearly cross sections and for the pooled sample, the table lists the mean of a variable and below it, in parentheses, the standard deviation.

SUMMARY

This chapter provides models of the 11 different simultaneous relationships that jointly determine if locally offered fiscal incentives exert any influence on local employment markets in a metropolitan area. Behavioral and structural models of the determinants of the residential employment rate, poverty rate, nonresidential property bases, municipal expenditure per capita, property tax rate, and the offering of five different forms of local incentives were all given. Each of the 11 models began with the general factors expected to influence the value of the relevant endogenous variable. We then selected observable proxy measures for each of the general factors and wrote out 11 functional relationships that are the basis for the regression analysis and simulations described in the next chapter. This chapter also provides a full description of all of these variables and simple descriptive statistics. The next chapter presents the details of the regression analysis, a description of the regression results, and the simulations conducted using these results.

Table 4.2 Means and Standard Deviations of Variables[a]

Name	Year(s) 1977	1982	1987	1992	All pooled
Endogenous					
Residential employment rate	46.43	39.67	48.50	49.90	46.13
	(7.74)	(5.73)	(7.64)	(7.37)	(8.15)
Poverty rate (%)	4.84	5.20	5.56	5.86	5.36
	(4.01)	(4.99)	(6.15)	(7.16)	(5.70)
Manufacturing property value (1990 $)	174,829,904	161,351,546	172,348,787	189,470,687	174,500,231
	(479,378,573)	(410,952,732)	(388,042,747)	(412,267,207)	(424,154,786)
Commercial property value (1990 $)	121,136,896	134,423,901	160,744,673	177,353,637	148,414,777
	(274,857,835)	(270,572,215)	(317,915,453)	(322,389,799)	(298,199,130)
Manufacturing property tax abatements	10,908,247	63,968,194	98,322,462	133,968,277	76,791,795
(1990 $)	(51,258,762)	(212,294,326)	(269,175,895)	(353,229,956)	(251,575,131)
Commercial property tax abatements (1990 $)	$0	2,124,361	5,526,359	5,526,359	3,294,270
	(0)	(16,346,893)	(26,913,005)	(26,913,005)	(20,844,819)
Industrial development bonds (1990 $)	3,649,334	5,676,807	5,871,218	5,871,218	5,267,144
	(15,862,357)	(26,129,604)	(27,187,954)	(27,187,954)	(24,577,705)
Tax increment finance authority[b]	0.00	0.06	0.22	0.26	0.14
	(0.00)	(0.24)	(0.42)	(0.44)	(0.34)
Downtown development authority[b] (1990 $)	0.04	0.12	0.25	0.32	0.18
	(0.19)	(0.32)	(0.43)	(0.47)	(0.39)
Municipal expenditure per capita (1990 $)	472.70	421.42	413.45	523.32	457.72
	(207.14)	(169.75)	(185.89)	(251.45)	(209.88)

Property tax rate ($/2000 market value)	58.32	58.11	62.65	63.20	60.57
	(8.72)	(9.05)	(10.39)	(10.48)	(9.95)
Exogenous					
Square miles	17.52	17.52	17.52	17.52	17.52
	(18.43)	(18.43)	(18.43)	(18.43)	(18.43)
Miles to Detroit's central business district	20.84	20.84	20.84	20.84	20.84
	(9.65)	(9.65)	(9.65)	(9.65)	(9.65)
Local income tax[b]	0.04	0.04	0.04	0.04	0.04
	(0.19)	(0.19)	(0.19)	(0.19)	(0.19)
Percentage population young	30.34	28.34	26.34	24.34	27.34
	(5.53)	(4.54)	(3.82)	(3.55)	(4.95)
Percentage population old	8.39	9.57	10.76	11.95	10.13
	(4.82)	(4.52)	(4.57)	(4.97)	(4.88)
Percentage population with bachelor's degree	15.89	18.17	20.44	22.72	19.3
	(11.86)	(13.11)	(14.60)	(16.25)	(14.23)
Percentage population with less than high school	30.24	25.48	21.69	17.91	23.76
	(13.11)	(10.62)	(9.81)	(9.37)	(11.69)
Percentage population African American	4.33	4.86	5.43	6.04	5.17
	(13.17)	(13.87)	(14.83)	(16.10)	(14.50)
Percentage property in manufacturing	10.85	10.71	11.96	12.11	11.49
	(13.87)	(12.75)	(14.83)	(15.35)	(14.20)
Percentage property in commercial	12.83	13.01	14.06	13.79	13.42
	(8.63)	(8.62)	(9.64)	(9.82)	(9.17)

(continued)

Table 4.2 (continued)

Name	Year(s) 1977	1982	1987	1992	All pooled
Average surrounding property in manufacturing (%)	13.21 (22)	11.84 (10.14)	13.30 (10.40)	13.42 (10.51)	12.94 (14.39)
Average surrounding property in commercial (%)	12.38 (4.48)	12.60 (4.44)	13.67 (5.21)	13.48 (5.21)	13.03 (4.87)
Primary school district out of formula[b]	0.16 (0.37)	0.27 (0.50)	0.35 (0.48)	0.57 (0.50)	0.39 (0.49)
Average surrounding manufacturing property tax abatements (1990 $)	8,850,931 (16,133,609)	80,546,445 (121,937,385)	106,979,502 (141,304,250)	144,438,245 (187,669,400)	85,203,780 (141,434,601)
Average surrounding commercial property tax abatements (1990 $)	0 (0)	5,188,337 (14,247,765)	8,483,703 (20,313,464)	8,483,703 (20,313,464)	5,538,935 (16,390,592)
Average surrounding IDBs (1990 $)	7,415,642 (14,034,920)	11,323,235 (22,571,836)	11,450,829 (22,842,042)	11,450,829 (22,842,042)	10,442,033 (21,069,215)
Average surrounding DDAs (%)	0.06 (0.12)	0.14 (0.18)	0.24 (0.23)	0.24 (0.23)	0.17 (0.21)
Average surrounding TIFAs (%)	0.00 (0.00)	0.06 (0.02)	0.22 (0.42)	0.26 (0.44)	0.14 (0.34)
Average surrounding residential employment	26,832 (42,201)	25,086 (41,598)	28,201 (42,764)	25,741 (34,131)	26,465 (40,209)

[a] Standard deviations are shown in parentheses below the means.
[b] Dummy variable equal to 1 or 0.

Notes

1. A good introduction to simultaneous equation models and the statistical concerns that arise when using them is in Gujarati (1995, Part IV).
2. Chapter 3 in Fisher's (1995) textbook on state and local public finance provides an easy-to-follow review of how economists view local public choice through voting.
3. Bergstrom and Goodman (1973) provide a theoretical justification in support of the "median-voter theorem."
4. A simple explanation being the reduction in direct and indirect commuting cost if employment opportunities exist in one's community of residence.
5. In the pooled regression analysis done in Chapter 5, dummy variables representing each cross section of observations are called for if the number and type of firms in the metropolitan area have changed from one observed time period to the next.
6. Holding area, population, and commercial property value constant, a rise in manufacturing value should roughly designate an increase in manufacturing capital available to workers and greater employment opportunities. Alternatively, holding nonresidential property value constant, an increase in local population or area should approximately designate a decrease in available job opportunities per capita.
7. Recall Fischel's (1985, p. 23) observation and "it is possible with a little forethought (and sometimes just afterthought) to exclude most manufacturing and commercial activities" in U.S. municipalities through local zoning practices.
8. The real market value of manufacturing (commercial) property in a Michigan community is equal to the assessed value of manufacturing (commercial) property plus the assessed value of manufacturing (commercial) property granted abatement, all multiplied by two. It is necessary to add the abated property back in because it is taken off the official property tax rolls. Assessed property value is multiplied by two because Michigan's property tax system requires assessment of all classes of property at 50 percent of true market value.
9. See the earlier works of Webber (1986) and Schmenner (1982) for a clarification of the terms *market* and *site* stage in firm location decisions.
10. Local income taxes in Michigan are levied on corporations based upon the business earning income in a city.
11. A city's use of a local income tax did not change throughout the period observed.
12. We use the cumulative value of abatements and IDBs offered in a community for a few reasons. As discussed in Chapter 3, manufacturing abatements in Michigan are mainly granted for a period of 12 years and have usually been renewed at the end of the initial 12-year period. Commercial abatements began in 1978 in Michigan, and, again, most carried a 12-year initial offer. The first commercial abatements offered in Michigan would then expire in 1990. These first commercial abatements could still exert an influence on the value of commercial property observed in a locality in 1992. Finally, IDBs normally carry 20- to 30-year terms of payoff. The term is designed to approximate the economic life of the capital

being financed. The earliest IDB in metropolitan Detroit was given in 1967. Thus, even in 1992, the earliest IDB could exert an influence on local manufacturing property value in the city that issued it in 1967.

13. As discussed earlier in the literature review, Rubin (1988) and Wolman and Spitzley (1996) provide plenty of survey evidence to document this statement.
14. Throughout our work, surrounding communities are defined as those that are within the metropolitan area and share a boundary with a community.
15. In reality, there is some choice in regard to the magnitude of use as it pertains to the size of the TIFA and DDA, and expanding or contracting their size once they are established. Concerning a DDA, magnitude may also pertain to how much effort is put into running the authority for its stated purpose. Since we have no data on these magnitudes, we concentrate on the decision to use or not.
16. As collected by the *U.S. Census of Governments*.
17. In Michigan, these other forms of local revenue represent such sources as a local income tax, user fees, and intergovernmental grants.

5 Empirical Results

To count is a modern practice, the ancient method was to guess; and when numbers are guessed they are always magnified.

—Samuel Johnston (1775)

This chapter presents the results of our statistical analysis of the 11 functional relationships described in the previous chapter. Each relationship or equation is estimated using multiple regression methods and data from 112 municipalities in metropolitan Detroit from the years 1977, 1982, 1987, and 1992. The first part of the chapter provides a description of the regression procedure. The results for all 11 regressions are summarized in a table, and important findings are highlighted. A full description of the regression results is in Appendix 2. The second part of this chapter provides the thinking behind the use of regression results for simulations measuring the efficacy of local incentives in a metropolitan area. Simulation results are given, and a brief analysis is provided. The conclusions and policy prescriptions drawn from our statistical analysis and simulation are saved for the next and final chapter.

REGRESSION PROCEDURE AND RESULTS

Econometric analysis starts from a statement about a behavioral relation. This statement, which may come from sophisticated economic theory or from some plain reasoning, is then developed into an equation that specifies how the value of one variable is determined by the value of other variables.

—Thad W. Mirer (1995)

We use econometric or multiple regression techniques to estimate each of the 11 functional relationships described in the previous chapter. When multiple factors are expected to determine the value of a dependent variable, economists have widely used this statistical approach to estimate the relationship between one of the causal variables and the dependent variable. The advantage of multiple regression analysis is that it yields the relationship between an explanatory variable and a dependent variable given that the other explanatory variables are held constant.

For example, in terms of the manufacturing property value function described earlier, the regression coefficient for manufacturing property abatements describes the effect that a $1 increase in local manufacturing property tax abatements has on manufacturing property value in the average metropolitan Detroit community if all other causal factors remain the same. This *ceteris paribus* result is what we need to know in order to conduct the desired simulation. If the result of multiple regression analysis is to be trusted, preliminary tests and precautions need to be undertaken. We next turn to a discussion of these tests and precautions.

To properly interpret regression analysis, error terms (or the difference between the dependent variable's actual and predicted value) need to be *homoskedastic* (measurably unrelated to any variables). If the error terms are *heteroskedastic* (related to a specific variable), then the standard errors derived for the regression's coefficients are biased and the statistical significance of a coefficient cannot be trusted. In *cross-sectional* analysis, as done here, error terms are likely to be related to differences in size among the entities observed.[1]

A method used to correct for heteroskedastic error terms is a logarithmic transformation of the regression equation. Put simply, this involves calculating the natural logarithm of the dependent variable and the natural logarithms of all the nonnegative and nonzero explanatory variables before the regression is calculated.[2] The additional benefit of the logarithm transformation is that it allows for a nonlinear relationship between an explanatory and a dependent variable. This is an advantage because we do not know the specific functional form of the causal relationships between the 11 dependent variables and various explanatory variables in our model. If this is the case, it is usually best for the type of relationships that we are trying to model to allow it

to be nonlinear. Nonlinear means that a one-unit increase in the explanatory variable does not always lead to a fixed-unit increase in the dependent variable, but instead to a percentage increase. The regression coefficient calculated after a log transformation of the dependent variable and an explanatory variable is defined by economists as the *elasticity*, or the percentage change in the dependent variable that results from a 1 percent change in the explanatory variable. The regression coefficient calculated after a natural log transformation of only the dependent variable represents the percentage change in the dependent variable given a one-unit change in the explanatory variable. When multiplied by the average value of the explanatory variable, this regression coefficient measures elasticity.

Natural log transformations are performed for the regressions that use the residential employment rate, poverty rate, commercial property value, municipal expenditure per capita, and property tax rate as dependent variables. A natural log transformation cannot be taken for the remaining six regressions because the dependent variables contain zero value observations. Following the log transformations, we checked for the presence of heteroskedasticity in the residential employment rate, poverty rate, commercial property value, municipal expenditure per capita, and property tax rate regressions by regressing the square of the regressions' error terms against community square miles in various functional forms. After finding no statistically significant relationship between these three regressions' error terms and community area, we concluded that the log transformation handled any heteroskedasticity that existed without it.

A log transformation could not be performed on the manufacturing property value regression because there is no manufacturing activity in some communities in metropolitan Detroit. We ran this regression in a nontransformed linear form, retrieved and squared the error terms, and again could find no significant relationship between the squared error terms and community area. We are satisfied that this regression is free of heteroskedasticity and accept the linear results as appropriate. The linear regression coefficients are transformed into elasticities by multiplying them by the average value of the respective explanatory variable divided by the average value of manufacturing property in the Detroit area during the observed periods.

The remaining five regressions (manufacturing property tax abatements, commercial property tax abatements, IDBs, TIFAs, and DDAs) use measures of local incentive activity as dependent variables. Observations on the use of industrial development bonds and manufacturing and commercial property tax abatements by metropolitan Detroit communities over time indicate that, in any given year, many communities offered none of these incentives. Complete data on the nonzero use of one of these incentives and the appropriate causal variables are therefore available for only a subset of communities in a given year. The data exist in this form because the local process of issuing these three types of local incentives first involves the decision to offer one of them, and then the decision of how much to offer. It is not appropriate to estimate the regression with just the subset of communities offering incentives because the resulting regression coefficients will be biased as well as inconsistent.[3] Such a two-step decision process and the data generated necessitate the use of the tobit maximum likelihood regression technique.

The dichotomous decision to use a tax increment finance authority or a downtown development authority is represented by data that consist of ones (for yes) and zeros (for no). A regression whose dependent variable takes on a value of either one or zero can be estimated using ordinary least squares regression techniques, but is more appropriately estimated using a probit (or logit) maximum likelihood regression technique.[4]

Using community square miles, again, as the variable to which the error terms of the maximum likelihood regressions may be related, we attempted to correct for heteroskedasticity in the tobit and probit estimations. For all of these estimations, the maximum-likelihood process would not converge after the heteroskedastic correction was imposed, and consequently we accept the noncorrected results as appropriate.

The functional explanations given in Chapter 4 for the residential employment rate, poverty rate, manufacturing and commercial property value, municipal expenditure per capita, property tax rate, and all five forms of local economic development incentives involve a dependent variable determined by exogenous and endogenous variables. Since some of the explanatory variables are endogenous, or determined simultaneously with certain other variables, a two-stage technique of one form or another is employed for all 11 regressions. A two-stage

technique first involves running a first-state regression to derive a result that can be used to correct for the problem of endogenous explanatory variables in a second-stage regression. Before using these two-stage techniques, we checked all 11 regression specifications to insure that the order and rank conditions of identification are satisfied for each. In Appendix 1, we go through all of the regression equations and explain our reasoning for excluding certain variables, or identifying instruments, from each of them.

The instrumental variables used to predict the endogenous variables in the first-stage regressions were all the exogenous variables in the system.[5] For the residential employment rate, poverty rate, and manufacturing and commercial property value regressions, municipal expenditures per capita, and property tax rate, the predicted values derived in the first stage replace the actual values of the endogenous explanatory variables in a second-stage regression. For the five regressions that explain the use of the different forms of local incentives, we employ a second-stage technique suggested by Greene (1992, p. 585) and developed by Blundell and Smith (1986). This involves the substitution of error terms from each of the first-stage regressions into the second-stage maximum likelihood tobit or probit estimations as explanatory variables. Both of these two-stage techniques correct for the bias in the value of regression coefficients that arise if a dependent variable is regressed against an endogenously determined causal variable. Recent research by Bound, Jaeger, and Baker (1995) indicates that the two-stage regression techniques just described only work if the first-stage regressions produce significant *F*-tests for the excluded instruments. In Appendix 1, we discuss the results of the *F*-tests that support our two-stage techniques.

We also need to be concerned about unobservable jurisdiction effects that are constant across time and influence the value of each of the nine dependent variables. Without controls for those, the estimated impacts of each of the right-side variables are biased. For example, cities that have more vacant land zoned for manufacturing may also tend to hand out more manufacturing abatements. Controlling for this requires the inclusion of fixed effects, or a set of dummy variables representing each jurisdiction. A second problem with unobserved jurisdiction effects is that, even if they do not cause omitted variable bias, they may lead to an underestimation of the standard errors calculated

for the regression coefficients. The appropriate control is the use of jurisdiction random effects. The residential employment rate, poverty rate, manufacturing and commercial property value municipal expenditure per capita, and property tax rate regressions were each estimated without jurisdiction effects, with jurisdiction random fixed effects, and with jurisdiction random effects. As described in Greene (1992, Chapter 29), the appropriate statistical tests indicated that for all six of these dependent variables, estimating the regressions with jurisdiction fixed effects was the appropriate way to proceed. Based upon this finding, and the fact that the method of jurisdiction random effects cannot be used in a tobit or probit maximum likelihood regression procedure, we tried to include city fixed effects in the remaining five regressions that used manufacturing property tax abatements, commercial property tax abatements, IDBs, TIFAs, and DDAs as dependent variables. Unfortunately, the probit and tobit maximum likelihood estimation techniques would not converge after this inclusion, and all tobit and probit regressions were estimated without fixed effects. As an alternative to fixed effects, we include in the five incentive regressions three important variables that are fixed in cities over the period observed: square miles, miles to Detroit's central business district, and a dummy variable equal to 1 if the city has a local income tax.

An additional concern arises from the combining of data from four different years to generate the large pooled data set we use. To account for time-specific effects that may arise through pooling cross-sectional data over time, dummy variables for each of the four cross sections (1977, 1982, 1987, and 1992) are in all 11 regressions.[6]

Estimation results for each of the 11 regression equations are summarized in Tables 5.1 and 5.2. These tables include within each cell the respective regression coefficient, standard error of regression coefficient, and significance level of parameter hypothesis tests. The adjusted R^2 or hit ratio (and log likelihood) is given at the bottom of each table. For the probit results in Table 5.2, the marginal influence of a one-unit change in an explanatory variable on the probability of offering a TIFA or DDA in the average metropolitan Detroit area community is also included. For the tobit results of Table 5.2, the marginal influence of a one-unit change in an explanatory variable on the value of all manufacturing or commercial property abatement observations (zero and nonzero) is included. In Table 5.2, elasticities are also

Table 5.1 Least Squares Regression Results for Six Key Municipal Characteristics[a]

Dependent variable / Explanatory variable	Log residential employment rate	Log poverty rate	Manufacturing property value	Log commercial property value	Log municipal expenditure per capita	Log property tax rate
1977 Dummy	–0.0256	–0.0998	4.2402E+6	–4.4714E–3	–0.0266	–0.0394
1982 Dummy	–0.1042	–0.0142	2.4371E+6	0.0889	–0.0936	–0.0323
1987 Dummy	0.0383	0.0254	–666.263	–0.0434	–0.0546	0.0314
1992 Dummy	0.0915	0.0886	–6.0111E+6	–0.0410	0.1782	0.0402
Residential employment rate (log)	Note b		0.67 2,543,604 (5,072,275)	**–2.90** –2.8971***[c] (0.8915)		
Poverty rate (log)			0.86 27,900,018 (32,726,652)	**0.67** 0.6700* (0.3828)	**–0.55** –0.5501*** (0.2258)	0.04 0.0433 (0.0999)
Manufacturing property value	**–0.02** –0.1062E–9* (0.7500E–10)	**–0.07** –0.3788E–9* (0.2315E–9)			–0.04 –0.2020E–9 (0.7235E–9)	
Commercial property value (log)	**–0.04** –0.0377* (0.0251)	**–0.14** –0.1439* (0.0765)			–0.003 –0.0034 (0.1161)	
Nonresidential property value (mfg. value + comm. value – mfg. abatements – comm. abatements)						–0.23 –0.2372 (0.1918)

(continued)

Table 5.1 (continued)

Dependent variable / Explanatory variable	Log residential employment rate	Log poverty rate	Manufacturing property value	Log commercial property value	Log municipal expenditure per capita	Log property tax rate
Manufacturing (or commercial) property abatements × 1977 dummy			**0.05** 0.7554*** (0.2436)			
Manufacturing (or commercial) property abatements × 1982 dummy			–0.01 –0.0261 (0.0620)	**–0.003** –0.1479E–8* (0.0778E–8)		
Manufacturing (or commercial) property abatements × 1987 dummy			**–0.05** –0.0962* (0.0502)	**–0.01** –0.1826E–8** (0.0857E–8)		
Manufacturing (or commercial) property abatements × 1992 dummy			–0.01 –0.0069 (0.0383)	**–0.02** –0.2858E–8*** (0.0933E–8)		
Industrial development bonds (IDBs)			–0.30 –9.9939 (9.1582)			
Tax increment finance authority (TIFA)				0.1213** (0.0564)		
Downtown development authority (DDA)				0.2500*** (0.0702)		
Municipal expenditure per capita (log)			**2.62** 999,066** (487,544)	**1.24** 1.2442*** (0.4060)		0.26 0.2618 (0.2289)

Property tax rate (log)			1.23 3,545,801 (8,873,278)	**4.62** 4.6228*** (1.420)		
Percentage population young (log)	–0.10 –0.0950 (0.0769)	**0.51** 0.5055** (0.2363)	**–0.62** –3,932,598* (2,487,602)	**–1.33** –1.3289*** (0.3395)	0.11 0.1143 (0.2151)	–0.06 –0.0573 (0.1142)
Percentage population old (log)	–0.04 –0.0396 (0.3414)	**0.25** 0.2504** (0.1058)	**0.32** 5,443,276** (2,754,400)	–0.02 –0.0243 (0.1100)	–0.05 –0.0541 (0.1104)	–0.01 –0.0067 (0.0431)
Percentage population with bachelor's degree (log)	–0.01 –0.0106 (–0.0408)	–0.05 –0.0543 (0.1262)	–0.02 –155,348 (1,689,722)	**0.34** 0.3364*** (0.1126)	**–0.21** –0.2085** (0.0965)	0.04 0.0364 (0.0525)
Percentage population with less than high school (log)	**0.15** 0.1514*** (0.0388)	**0.44** 0.4394*** (0.1189)	–0.01 –62,504 (1,533,173)	0.05 0.0539 (0.1769)	**0.25** 0.2532** (0.1215)	–0.09 –0.0878 (0.0656)
Percentage population African American	0.01 0.8909E–3 (0.2312E–2)	**0.11** 0.0218*** (0.0071)		–0.08 –0.0159 (0.0117)	**–0.04** –0.0085 (0.0069)	0.004 0.7485E–3 (0.2946E–2)
Percentage property in manufacturing			**0.50** 7,687,310*** (2,178,078)		0.02 0.0018 (0.0084)	0.13 0.0110 (0.0087)
Percentage property in commercial (log)				**1.02** 1.0181*** (0.0812)	**–0.03** –0.0330 (0.1250)	0.11 0.1121 (0.1265)
Primary school district out of formula					0.0957** (0.0403)	–0.0283 (0.0214)

(continued)

Table 5.1 (continued)

Dependent variable / Explanatory variable	Log residential employment rate	Log poverty rate	Manufacturing property value	Log commercial property value	Log municipal expenditure per capita	Log property tax rate
Average surrounding property in manufacturing	0.03 0.0247 (0.0215)	**0.14** 0.0110*** (0.0040)	**0.21** 3,033,677** (1,398,636)			
Average surrounding property in commercial (log)	**0.06** 0.0557* (0.0355)	0.14 0.1377 (0.1117)		**0.72** 0.7196** (0.1429)		
Average surrounding residential employment (log)	**0.42** 0.4221*** (0.0434)	0.12 0.1204 (0.1344)		**1.31** 1.3081*** (0.3153)		0.09 0.0873* (0.0603)
R^2	0.853	0.925	0.981	0.988	0.857	0.861
F-Statistic for time dummies	51.64***	114.88***	335.67***	168.89***	209.37***	12.60*
F-Statistic for all manufacturing or commercial abatements			13.51***	3.06***		

[a] All columns report results from the two-stage, least-squares method with a sample size of 448. The first entry in each cell is the elasticity between the respective explanatory and dependent variable evaluated at the means. The elasticity is shown in bold type if it is statistically significant. The second entry is the regression coefficient. The third entry (in parentheses) is the regression coefficient's standard error. No standard errors are offered for the time dummies because they are not calculated in the Limdep regression package. Instead, the *F*-statistic at the bottom of the table indicates the statistical significance of all time dummies as a whole. As described in detail in Table 4.1, all dollar values for variables have been converted to 1990 real dollars. While not reported, all regressions were run with a set of 112 dummy variables that for each was set equal to 1 for a specific city and to zero for all other cities in the sample.

[b] The blank cells in this table occur either because the explanatory variable and dependent variable are the same or because (as detailed in Chapter 4) the given explanatory variable is not expected to influence the given dependent variable.

[c] *** Indicates two-tailed significance at the 99% confidence level or higher; ** indicates significance at the 95–99% confidence level; * indicates significance at the 85–95% confidence level.

Table 5.2 Maximum Likelihood Regression Results for Five Local Economic Development Incentives[a]

Dependent variable / Explanatory variable	Manufacturing property tax abatements[b]	Commercial property tax abatements[c]	Industrial development bonds (IDBs)[b]	Tax increment finance authority (TIFA)[d]	Downtown development authority (DDA)[e]
Constant[f]	–0.2133E+11	–17,582,210	–57,347,556	**0.4492**	**–503.39**
	–0.6306E+11	–74,106,089	–4,248,350,441	26.3608*[g]	–3,083.73**
	(0.1703E+12)	(10,814,980)	(57,266,580,000)	(15.5310)	(1,703.72)
1982 Dummy	0.2141E+11	Note h	67,316,400		**500.04**
	0.6332E+11		4,986,849,935		3,063.22**
	(0.1701E+12)		(57,275,641,000)		(1,698.02)
1987 Dummy	0.2144E+11	636,901	67,306,879	0.0143	**500.05**
	0.6339E+11	2,684,431	4,986,144,587	0.8379	3,063.25**
	(0.1700E+12)	(13,536,388)	(57,270,715,000)	(1.2129)	(1,697.92)
1992 Dummy	0.2147E+11	622,327	66,820,736	0.0179	**500.10**
	0.6348E+11	2,623,002	4,950,130,786	1.0504	3,063.54**
	(0.1700E+12)	(20,818,311)	(57,266,358,000)	(1.8221)	(1,697.89)
Residential employment rate	602,105	5,345	–16,701	–0.0027	0.0156
	1,780,421	22,527	–1,237,190	–0.1566	0.0952
	(4,197,891)	(2,007,336)	(2,079,984)	(0.2087)	(0.0736)
Poverty rate	–14,837,026	–1,349,277	87,348	–0.0138	0.0825
	–43,872,985	–5,686,977	6,470,782	–0.8081	0.5051
	(31,798,648)	(9,422,402)	(10,847,592)	(1.1077)	(0.4948)
Manufacturing property value	–0.2990		**0.0089**		
	–0.8841		0.6560**		
	(0.7332)		(0.2367)		

Commercial property value		–0.0168		**0.8193E–9**	0.5444E–9
		–0.0709		0.4808E–7***	0.3335E–8
		(0.1504)		(0.1467E–7)	(0.6162E–8)
Manufacturing property abatements		0.0163	0.0025	–0.1287E–9	–0.4691E–9
		0.0688	0.1882	–0.7552E–8	–0.2874E–8
		(0.0512)	(0.1496)	(0.5263E–8)	(0.3143E–8)
Commercial property abatements	–0.5384		0.0036	**0.1650E–8**	0.6365E–9
	–1.5921		0.2679	0.9683E–7***	0.3899E–8
	(2.4000)		(0.6496)	(0.2912)	(0.1921E–7)
Industrial development bonds (IDBs)	**16.0289**	0.0442		0.7537E–8	–0.1631E–7
	47.3973**	0.1862		0.4424E–6	–0.9992E–7
	(20.9929)	(3.6810)		(0.3942E–6)	(0.1104E–6)
Tax Increment finance authority (TIFA)	**101,236,749**	8,396,588	–199,226		**0.5015**
	299,356,378*	35,390,221	–14,758,806		3.0723*
	(172,973,310)	(27,944,453)	(53,334,277)		(1.7106)
Downtown development authority (DDA)	**–86,975,835**	734,285	414,036	–0.0109	
	–257,186,954**	3,094,891	30,672,091	–0.6392	
	(111,916,620)	(122,022,860)	(28,550,951)	(10.4587)	
Municipal expenditure per capita	**–150,125**	–10,791	–827.52	**0.0002**	0.1959E–3
	–443,919**	–45,483	–61,303	0.9896E–2**	0.1200E–2
	(190,169)	(40,359)	(82,083)	(0.4409E–2)	(0.2086E–2)
Property tax rate	–1,969,865	254,660	**–130,909**	**–0.0028**	**0.0256**
	–5,824,877	1,073,351	–9,697,868***	–0.1643*	0.1565***
	(5,433,787)	(924,231)	(2,398,636)	(0.0945)	(0.0550)

(continued)

Table 5.2 (continued)

Dependent variable Explanatory variable	Manufacturing property tax abatements[b]	Commercial property tax abatements[c]	Industrial development bonds (IDBs)[b]	Tax increment finance authority (TIFA)[d]	Downtown development authority (DDA)[e]
Square miles	**–1,137,626**	**234,613**	**19,436**	**–0.0010**	–0.6951E–3
	–3,363,952**	988,857***	1,439,868***	–0.0573**	–0.4258E–2
	(1,085,667)	(190,105)	(434,704)	(0.0247)	(0.1302E–1)
Miles to Detroit's central business district	155,061	–123,837	**–50,519**	–0.8273E–3	–0.0012
	458,514	–521,952*	–3,742,502***	–0.0486	–0.0072
	(2,262,104)	(354,033)	(1,390,088)	(0.0341)	(0.0220)
Local income tax	–24,753,333	1,707,620	**–772,123**	**0.0552**	**0.3985**
	–73,195,439	7,197,335	–57,199,457**	3.2397**	2.4414***
	(87,041,369)	(12,044,696)	(27,653,322)	(1.3605)	(0.7911)
Percentage population old	3,403,878	–210,867	**–105,278**	–0.0033	**0.0335**
	10,065,244	–888,767	–7,799,088**	–0.1940	0.2052*
	(9,483,662)	(3,273,900)	(4,195,212)	(0.3481)	(0.1286)
Percentage population with bachelor's degree	–224,508	74,398	–41,377	**–0.0074**	0.0161
	–663,868	313,578	–3,065,229	–0.4333**	0.0984
	(5,788,623)	(1,260,979)	(2,739,945)	(0.1814)	(0.1103)
Percentage population with less than high school	**3,325,040**	185,287	–36,780	–0.1033E–3	**–0.0090**
	9,832,119*	780,953	–2,724,686	–0.6065E–2	–0.0554*
	(5,165,116)	(1,364,677)	(1,193,440)	(0.1393)	(0.0359)
Percentage property in manufacturing	**8,938,526**		–88,875		
	26,431,160***		–6,583,942*		
	(9,238,496)		(3,494,384)		

Percentage property in commercial		371,917 1,567,568 (1,858,332)		**–0.0116** –0.6826*** (0.1993)	–0.0032 –0.0198 (0.0946)
Primary school district out of formula	**–22,663,865** –67,016,896* (44,216,612)	626,136 2,639,061 (7,593,142)	101,808 7,542,020 (15,206,289)	**–0.0487** –2.8601*** (0.8196)	0.0665 0.4077 (0.5237)
Average surrounding manufacturing property tax abatements	**0.0522** 0.1545* (0.0930)		**0.0008** 0.1022*** (0.040)		
Average surrounding commercial property tax abatements		–0.0444 –0.1871 (0.4829)		–0.1614E–9 –0.9472E–8 (0.4507E–7)	–0.2924E–8 –0.1791E–7 (0.1570E–7)
Average surrounding industrial development bonds (IDBs)	**–8.3834** –24.7898** (10.4559)		–0.8761E–3 –0.0649 (1.3748)		
Average surrounding downtown development authorities (DDAs)		–2,090,864 –8,812,643 (28,226,529)		–0.0056 –0.3267 (2.7452)	–0.0777 –0.4758 (0.5700)
Average surrounding tax increment finance authorities (TIFAs)		683,213 2,879,629 (23,467,658)		**0.0884** 5.1907** (2.2870)	**–0.2853** –1.7464** (0.8305)

(continued)

Table 5.2 (continued)

Dependent variable / Explanatory variable	Manufacturing property tax abatements[b]	Commercial property tax abatements[c]	Industrial development bonds (IDBs)[b]	Tax increment finance authority (TIFA)[d]	Downtown development authority (DDA)[e]
Probit hit ratio (total)				91.37	86.61
Probit hit ratio (ones)				70.49	46.91
χ^2 Wald statistic for time dummies	47.70***	4.10	27.67***	2.60	13.30***
Log–likelihood function	–4,390.85	–2,159.95	–953.53	–62.98	–136.10

[a] The first entry in each tobit regression cell is the marginal change in the dependent variable that occurs for all observation given a one-unit change in the explanatory variable evaluated at the means. The marginal change is in bold if it is statistically significant. The first entry in each probit regression cell is the marginal change in the probability that the dependent variable equals one given a one-unit change in the explanatory variable evaluated at the means. The second entry is the regression coefficient. The third entry (in parentheses) is the regression coefficient's standard error.

[b] Tobit maximum likelihood estimation, sample size 448.

[c] Tobit maximum likelihood estimation, sample size 336. There are only 336 observations instead of 448 because this incentive was not offered in 1977.

[d] Probit maximum likelihood estimation, sample size 336. There are only 336 observations instead of 448 because this incentive was not offered in 1997.

[e] Probit maximum likelihood estimation, sample size 448.

[f] A 1977 or 1982 dummy is excluded because of the inclusion of a constant term in the maximum likelihood regressions.

[g] *** Indicates two-tailed significance at the 99% confidence level or higher; ** indicates significance at the 95–99% confidence level; * indicates significance at the 85–95% confidence level.

[h] The blank cells in this table occur either because the explanatory variable and dependent variable are the same or because (as detailed in Chapter 4) the given explanatory variable is not expected to influence the given dependent variable.

reported for all nondummy explanatory variables in the residential employment rate, poverty rate, municipal expenditure per capita, property tax rate, and manufacturing and commercial property values regressions.[7] The implications of the statistical results presented in Tables 5.1 and 5.2 will be discussed later in this chapter.

SIMULATION

> *Simulation: A form of forecasting which generates a range of alternative projections based on differing assumptions about future situations, specifically to answer the question what would happen if, rather than what will happen?*
>
> —Pearce, Dictionary of Modern Economics (1983)

We next provide a description of the procedures used to simulate the result if an average community in the Detroit metropolitan area increased its use of a local incentive available to it over the period 1977 to 1992. One purpose of these simulations is to assess the efficacy of local incentive use at reducing spatial mismatch in the metropolitan labor market. With this in mind, the results of our simulations are discussed and a simple benefit/cost assessment is performed.

In regard to local incentives and spatial mismatch, policymakers are interested in finding out what happens to the residential employment rate and poverty rate in a community when it uses (or uses to a greater extent) a specific form of local economic development incentive. It also is instructive to know what happens to the local property tax rate and expenditure per capita after the increased use of a specific incentive. To predict all of these effects, we simulate an exogenous increase in the use of an incentive. An exogenous increase is one that has not been caused by a change in a variable thought to determine it.[8] To check the influence of a local incentive on the residential employment rate, poverty rate, municipal expenditure per capita, and property tax rate, we also derive the changes in these variables that occur through an endogenous variable change caused by the increased use of a local incentive.

An exogenous increase in a local incentive, or in a variable previously modeled as endogenously determined, could occur through at least two avenues. The first would be a local policymaker, who, despite the local factors that are discouraging the policymaker from offering an incentive, decides to do so anyway. Such a decision would be motivated by an element outside the system and could be considered exogenous.[9] In the earlier regression analysis, an offer of this type would have been picked up in the regression's error term. A second possible cause of an exogenous increase in the use of a local incentive would be the imposition of the incentive from a higher level of government. Suppose the state determines that a local incentive (normally not provided by a city displaying the characteristics that it does) is necessary for the revitalization of a city. The city itself has decided not to have the incentive. The state could intervene and strongly encourage, or even force, the city to offer the incentive. The coerced offer is exogenous to variables observed in the city.[10]

Simulation Procedure and Findings

Since the use of a DDA or a TIFA is a dichotomous choice, we simulate the effects of the average community going from not offering one of them to offering one of them. For property tax abatements and IDBs, we simulate an increase in use by $10 million in real 1990 dollars.[11] Since the average community had a real manufacturing property base of $174.5 million and a real commercial base of nearly $148.4 million over the period observed, these simulated offers are well within the realm of possibility.[12] A $10 million increase in manufacturing abatements is approximately 6.6 percent of the total real average use of manufacturing abatements (at $151.36 million in our sample) by Detroit area communities choosing to use them between 1977 and 1992.[13] A $10 million increase in commercial abatements use by a community represents slightly more than a 90 percent rise in these incentives (at $11.09 million) by the average community employing them over the period observed. A $10 million increase in the use of IDBs constitutes about 21 percent of such incentives (at $48.31 million) for the average Detroit area community using them.

From a real-world perspective, a $10 million property tax abatement applies to a new manufacturing or commercial enterprise whose

land and capital is valued at $20 million. A $10 million property tax abatement also applies to a rehabilitated manufacturing or commercial property whose assessed value was $5 million before the rehabilitation and $15 million after it. An industrial bond with a face value of $10 million would help finance the purchase of this dollar value of industrial machinery or buildings.

The simulation procedure first involves a look at Tables 5.1 and 5.2 to see where a specific incentive influences an endogenous variable. We assume that an incentive exerts an influence equivalent to the value of the appropriate regression coefficient. As is standard in this type of simulation, both statistically significant and insignificant regression coefficients are used.[14] For the continuous dependent variables that did not require the tobit procedure, the regression coefficients in Table 5.1 are used directly with the appropriate adjustment if the variable is in log form. For the tobit regressions, it is necessary to use the marginal effects recorded at the top of each cell in Table 5.2. The tobit marginal effects represent the increase in local tax abatement or IDB use, for both zero and nonzero values, following a one-unit increase in a causal variable. For the probit regressions, it also necessary to apply the calculated marginal effects in Table 5.2. These represent the percentage increase in the probability that a community will offer a TIFA or DDA after a one-unit increase in a causal variable.[15]

As an example, let us work through the simulated effects of an average community implementing a TIFA. Table 5.3 presents the simulation results. One effect this would have on an endogenous variable is that average commercial property value increases by 12.13 percent.[16] Since average commercial property value in the sample is about $148.4 million, this regression coefficient indicates that communities with a TIFA have a commercial property base whose value is on average just about $18 million ($0.1213 \times \$148.4$ million) greater. Remember that this increase is calculated after holding constant other local variables that determine commercial property value. The additional direct effects of the establishment of a TIFA are all felt in the offering of other local economic development incentives. The use of a TIFA represents an increase in the local taste for using property tax abatements and a DDA, and a decrease in the local taste for the use of IDBs. The appropriate regression coefficient in Table 5.2 indicates that local manufacturing abatements increase by about $101.2 million (from a mean

of around $77 million) after the local establishment of a TIFA. Local commercial abatements, in addition, increase by about $8.4 million (from a mean of about $3.3 million), and local IDBs decrease by about $200,000 (from a mean of about $5.3 million). Finally, the local probability of offering a DDA rises by about 50 percent after the local use of a TIFA.

The secondary effects of simulating the increase in a local incentive must be considered in order to understand its impact on residential employment, the local poverty rate, and local fiscal variables. The $18 million increase in commercial property value that occurs after the use of a TIFA lowers the residential employment rate by 0.22 from an average of 46.13 employed per 100 residents. The TIFA may generate more jobs within the community that could go to residents, but it is also likely to generate an increase in the number of residents in a community.[17] Here we find that the increase in residents is greater than the jobs created for them by the TIFA, and the residential employment rate falls. The $18 million rise in local commercial property value also reduces the local poverty rate. Given the commercial property value coefficient of –0.14 in the poverty rate regression, a 12.13 percent increase in commercial property value yields about a 1.7 percent decrease in the local poverty rate, or a fall to 5.27 from an average of 5.36 percent of residents living below the poverty line. The increase in commercial property value resulting from the offering of a TIFA yields nearly a $0.17 decrease in municipal expenditure per capita from an average value of about $458.[18]

The simulation procedure to check the effect on the local property tax rate deserves special attention. The TIFA first lifts commercial property value by about $18 million. However, the use of the authority is also correlated with about a $101.2 million rise in manufacturing abatements, and about a $8.4 million increase in commercial property abatements. In total, after the TIFA is put in place, taxable property value falls by about $91.6 million ($18 million – $101.2 million – $8.4 million) from an average over the entire period of $242.8 million.[19] This 38 percent drop in taxable property value in a community results in a 5.29 ($-0.38 \times -0.23 \times 60.57$) mill increase in the local property tax rate from the average of 60.57 mills.[20]

Intuitively, this all makes sense. Holding everything else constant, the offering of a TIFA serves its desired purpose and increases com-

mercial activity. The exogenous use of the TIFA also represents an increase in local taste for using more manufacturing and commercial abatements, and for using a DDA (see Table 5.2). The increase in commercial property value following the use of a TIFA offers local employment opportunities for individuals at the lower end of the income distribution. These opportunities work to reduce the local poverty rate. At the same time, a rise in commercial property value encourages an increase in the number of residents in a community. The end result is that more residents arrive after a TIFA than the number of jobs created by it, and the community's residential employment rate is lower (see Table 5.1). When the increase in commercial property value and abatements is allowed to influence the local property tax rate, the rate rises to a level higher than before the TIFA. Also, the increase in commercial property value lowers municipal expenditure per capita (see Table 5.1).[21]

As shown in Table 5.3, the simulated result of a community beginning a DDA is comparable to that for a community instituting a TIFA. As given earlier in Table 5.1, the local establishment of a DDA has a statistically significant positive influence on local commercial property value. If the average Detroit area community that is not using a DDA decides to use one, its commercial property value rises by 25 percent or about $37.1 million. In turn, this increase in commercial property value decreases the residential employment rate, poverty rate, and municipal expenditure per capita. The use of local commercial abatements and IDBs also rises after the establishment of a DDA, while the use of manufacturing abatements and the probability of offering a TIFA declines. In the end, the combination of the combined increase in commercial property value and decrease in manufacturing abatements is far greater than the increase in commercial abatements, and, therefore, local taxable property value rises. This lowers the average local property tax rate, quite substantially, from 60.57 mills to 53.50 mills.

A $10 million increase in the local use of manufacturing abatements by the average Detroit area community, at any time between 1974 and 1977, resulted in a $7.6 million increase in the value of manufacturing property in the community. This increase in manufacturing activity, in turn, decreased the average local residential employment rate by 0.04 from 46.13 local people employed per 100 residents, and,

Table 5.3 Simulated Increased Use of a Local Incentive

Endogenous variable [average value]	New use of a TIFA	New use of a DDA	$10 million increase in manufact. abatement, 1974–77	$10 million increase in manufact. abatement, 1983–87	$10 million increase in commercial abatement, 1978–82	$10 million increase in commercial abatement, 1983–87	$10 million increase in IDBs
Residential employment rate (%) [46.13]	**–0.22**[a]	**–0.46**	**–0.04**	**0.005**	**0.026**	**0.033**	**0.053**
(Poverty rate (%) [5.36]	**–0.09**	**–0.19**	**–0.02**	**0.002**	**0.011**	**0.014**	**0.043**
Manufacturing property value (1990 $) [$174,500,231]	0	0	**$7,600,000**	**–$962,000**	0	0	–$99,940,000
Commercial property value (1990 $) [$148,414,777]	**$18,002,712**	**$37,103,694**	0	0	**–$1,895,377**	**–$2,909,479**	0
Manufacturing property abatements (1990 $) [$76,791,795]	**$101,236,749**	**–$86,975,835**	**–**	**–**	–$5,384,000	–$5,384,000	**$160,030,000**
Commercial property abatements (1990 $) [$3,294,270]	$8,396,588	$734,285	$163,000	$163,000	–	–	$442,000

Industrial development bonds (1990 $) [$5,267,144]	–$199,226	$414,036	$25,000	$25,000	$36,000	$36,000	–
Tax increment finance authority (%) [0.14]	–	–1.1	–0.13	–0.13	**1.7**	**1.7**	7.5
Downtown develop. authority (%) [0.18]	**50.2**	–	–0.47	–0.47	0.6	0.6	–16.3
Municipal expenditure per capita (1990 $) [$457.72]	–0.17	–0.37	–0.78	0.10	0.018	0.025	10.53
Property tax rate ($/$2,000 mkt. value) [60.57]	5.29	–7.07	0.13	0.68	1.04	1.09	15.14

[a] The simulated effects in bold print are the result of regression relationships that are statistically significant with at least an 85% degree of confidence in a two-tailed test.

on average, decreased the local poverty rate from 5.36 percent to 5.34 percent. After a 1974–1977 increase in manufacturing abatements, municipal expenditure per capita fell $0.78 from an average of $457.72, and the property tax rate rose by 0.13 from 60.57 mills. In all years, a $10 million increase in manufacturing abatements was associated with an increase in commercial abatements and IDB usage, and a decrease in the probability of offering a TIFA and DDA.

Some of the simulated results of a typical Detroit area community granting a $10 million manufacturing property tax abatement between 1983 and 1987 (the other period when manufacturing abatements exerted a statistically significant influence on manufacturing property value) are quite different. During this time, a $10 million manufacturing abatement offer is correlated with about a $1 million decrease in manufacturing property value. This drop in manufacturing property value results in a slight increase in the average residential employment rate and poverty rate. The slight decrease in manufacturing property value, combined with the given $10 million increase in manufacturing abatements and a slight increase in commercial abatements, yields an $11.16 million decrease in taxable property value. This translates into a rise in the average local property tax rate from 60.57 mills to 61.25 mills.

The simulated effects of a $10 million increase in commercial property tax abatements or a $10 million increase in IDBs are by no means rosy; they are downright gloomy. In both the periods of 1978–1982 and 1983–1987, the increased use of local commercial abatements is correlated with a decrease in local commercial property value. The decline is greater in 1987 than in 1982. The simulated drop in commercial property value results in an increase in the local property tax rate and poverty rate. In addition, the use of more commercial abatements results in the increased likelihood that the community uses the two other forms of local incentives available to attract commercial activity, a DDA or a TIFA.

A $10 million increase in the local use of IDBs by the average Detroit area community is associated with a very large $99 million decrease in local manufacturing property value and a $160 million increase in manufacturing abatements. The decrease in manufacturing property value following the increased use of IDBs is not statistically significant. Such large increases translate into a rise of 15.14 mills in the local property tax rate from an average of 60.57 mills. The local

poverty rate also rises, from 5.36 percent to 5.40 percent. In addition, this increased use of IDBs represents a greater taste for the use of commercial abatements and a TIFA.

Benefit/Cost Assessment

A rough benefit/cost assessment of the simulation findings in Table 5.3 is needed. The simulated costs of a $10 million increase in manufacturing abatements after 1977, or a $10 million increase in commercial abatements or IDBs at any time, are far greater than the benefits. The offering of all of these incentives is correlated with a decrease in the respective nonresidential property value that they are designed to increase. There is only one simulated benefit that accrues to the average Detroit area community that extended these incentives, and it is rather perverse. The rise in the residential employment rate that is observed after the offering of these incentives is due to nonresidential property value exerting a negative influence on residential employment. A fall in nonresidential property value signals a decrease in employment opportunities for local residents, and it also provides a reason for local residents to leave the community. It appears that more leave the community than are influenced by the loss in local job opportunities, and the local residential employment rate rises. The costs that are correlated with an increase in local manufacturing abatements after 1977 and with an increase in local commercial abatements and IDBs at any time are increases in the local poverty rate and property tax rate.

Benefit/cost assessments of the simulated use of the other local incentives are not as easy. For the use of a $10 million manufacturing property abatement granted between 1974 and 1977, there is the benefit of about a $7.6 million increase in manufacturing property value. The average community over this period doling out $10 million in manufacturing property tax base forgiveness retained $7.6 million in manufacturing property value. The net cost of this transaction is a loss of $2.4 million in taxable manufacturing property value. This decline in taxable property value, along with the additional loss in taxable property value from the slight increase in commercial abatements that followed, results in a small increase in the local property tax rate from 60.57 mills to 60.70 mills. The decrease in municipal expenditure per capita that follows is not a cost since it is likely the result of communi-

ties with greater nonresidential property value exhibiting a lower municipal expenditure per capita, although the loss in residential employment rate after the manufacturing abatement must be considered. The 0.04 fall in the residential employment rate from an average of 46.13 residents employed per 100 translates into about 19 residents losing their jobs in the average Detroit area community in 1977.

The benefit of a $10 million increase in manufacturing property tax abatements between 1974 and 1997 is a slight decrease in the average local poverty rate from 5.36 percent to 5.34 percent. Since the average community in the Detroit area in 1977 had 35,745 residents, this drop in poverty is on average equivalent to about 7.2 (35,745 × –0.0002) residents moving out of poverty. If we assume that all residents live in a home and that there are four residents to a home, then the typical Detroit area jurisdiction we examined had around 8,936 (35,745 ÷ 4) homes. If these homes on average had a real market value of $100,000 (which is reasonable for the Detroit area over this period), then the value of taxable residential property in the average Detroit area community was around $894 million. Adding this market property value to the typical commercial and manufacturing market property values of $148 and $175 million, less the typical market values of commercial and manufacturing abatements of $3 and $77 million, yields a typical taxable property base of $1,297 million (or about $1.3 billion). Levying a millage increase of 0.13 mills on a $1.3 billion property tax base results in an increased property tax bill of $84,500 (i.e., [$1,300,000,000 ÷ $2,000] × 0.13) being paid yearly in the community that granted a manufacturing abatement before 1977.[22] The benefit associated with this cost of increased local property tax payments is that 7.2 local citizens have moved out of poverty. Thus, moving each local household out of poverty through the offering of manufacturing abatements carries an annual local price tag of about $11,736 for each individual ($84,500 ÷ 7.2). On the face of it, it does not appear that the calculated benefit of a $10 million manufacturing abatement during this period is greater than the costs. The residential employment rate falls, the local property tax rate rises, and there are more direct ways of moving a person out of poverty that cost less than $11,736 per year. However, there may be other benefits from this abatement offer that we have not considered.

In terms of a TIFA offer, the expected benefit is an $18 million increase in the offering municipality's commercial property value in

any of the observed years. This commercial property value increase then results in a decrease on average in local poverty of about 32 individuals (–0.0009 × 35,745), but also an increase on average of about 77 residents (–0.0002 × 35,745) who are no longer employed. In addition, the increase in manufacturing and commercial abatements following the use of a TIFA is larger than the increase in commercial property value, and the local millage rate rises by 5.29 mills. This translates into increased local property tax payments of about $3.4 million a year ([$1.3 million ÷ $2,000] × 5.29), or about $107,453 (= $3,438,500 ÷ 32) for each person moved out of poverty. Based upon these changes, the offering of a TIFA appears not to pass a simple benefit/cost assessment. The advantage of removing about 32 people from poverty is less than the disadvantage of having about 77 fewer residents employed and all residents and businesses paying greater local property tax rates.

The benefit/cost assessment of beginning to offer a DDA is the most difficult. A downtown development offer raises commercial property value and thus decreases the local residential employment rate (by about 164 residents [–0.0046 × 35,745] not having jobs) and the poverty rate (by about 68 people [–0.0019 × 35,745] not being in poverty). However, for a DDA, the $37.1 million increase in commercial property that contributes to an increased taxable property value in a community is furthered along by an $87 million decrease in manufacturing abatement and a less than $1 million increase in commercial abatements. Thus, this incentive is the only one that yields a simulated decline in local property tax rate through an increase in local taxable property value. For the average Detroit area community, the decrease in the local property tax rate is 7.07 mills. In the average community, this translates into lower yearly property tax payments of about $4.6 million ([$1.3 billion ÷ $2,000] × 7.07). The cost of this program for the average Detroit area community is thus the 164 additional residents that are not employed, while the benefits are the 68 people not in poverty and the $4.6 million in lower local property taxes. If the property tax payments not being paid are allocated to the 164 individuals who lose their jobs, each would receive about $28,021. Is this enough compensation, along with the fact that 68 residents are not in poverty, to justify the use of this incentive? This is not as easy a call as the ones made based upon the benefit/cost evaluations of other local incentive offers.

SUMMARY

Empirical estimation of the models of local residential employment, population, nonresidential property tax base, local development incentives, and fiscal variables in a metropolitan area has revealed important relationships that have clear policy implications. We save our broad discussion of these implications for the next and final chapter. Our focus in this chapter has been on the major relationships revealed by the regression and simulation analyses. In this last section, we summarize some of the important insights drawn from our regression and simulation work.

Regression Insights

The regression analysis just described represents one of the best attempts to establish the true influence that the offering of local economic development incentives in a metropolitan area has on local employment rates, poverty rates, and fiscal variables. This claim is made based upon our diligent effort to model the 11 different simultaneous relationships needed to properly ascertain the efficacy of local incentives in a metropolitan area. We went to great lengths to collect the data to statistically measure these relationships. The information was gathered for all 112 communities in the Detroit area over a period spanning nearly 20 years. We used the most appropriate and up-to-date regression methodology, not to complicate the analysis or to impress our audience, but to be certain that we could trust the regression coefficients derived from it.

Even standing alone, the results derived for each of the 11 separate regression analyses offer a wealth of information. For instance, the policymaker interested in knowing the contribution of different factors to the residential employment rate need only look at the coefficients derived in that regression or read the relevant summary of results provided in Appendix 2. The same holds for ascertaining the determinants of the local poverty rate, nonresidential tax bases, per-capita expenditure, property tax rate, and local incentive offers. A policymaker may also want to know whether an explanatory variable exerts a consistent influence in explaining other types or categories of dependent vari-

ables. We now turn to a brief review of some patterns observed among the regression coefficients.

As shown in Table 5.1, an increase in the local poverty rate is associated with an increase in local manufacturing value and commercial value, although the manufacturing result is not statistically significant. The commercial finding is likely a supply-side result in that poorer communities are more likely to welcome nonresidential development with open arms. Between 1982 and 1992, an increase in manufacturing or commercial property abatements is correlated with a decrease in manufacturing or commercial property value. It is not that an abatement offer drives out business property, but that communities losing business property were more likely to offer abatements. For communities losing business property value, it is possible that the loss could have been even greater if the abatements were not offered. Interestingly, an increase in municipal expenditure per capita and property tax rate is related to an increase in manufacturing and commercial property value. The positive association between local expenditure and nonresidential property value is as expected. The positive association between the property tax rate and nonresidential property value is not expected. In the case of manufacturing property value, it is statistically insignificant. For commercial property value, an increase in the local property tax rate is likely correlated with another local factor that is unaccounted for and drives up commercial property value.

There is also evidence of the zoned bedroom community in metropolitan Detroit. An increase in the percentage of residents under the age of 18 reduces both manufacturing and commercial property values. The negative effect of young people on commercial property value is over twice the negative effect on manufacturing property value. Agglomeration influences are also important. Communities that are surrounded by other communities with a greater average percentage of manufacturing (commercial) property have themselves greater manufacturing (commercial) property values. This positive effect, again, is greater on commercial property value than on manufacturing property value.

There is some correspondence in the factors that determine the local rate of residential employment and the rate of poverty. As emphasized previously, an increase in manufacturing or commercial property value decreases the residential rate of employment and the

local rate of poverty. As measured by the elasticities recorded in Table 5.1, the respective effect of commercial property value on both poverty rate and residential employment rate is two times the magnitude of the effect of manufacturing property value on these two rates. For all but some poor residents, the disadvantage of in-migration outweighs the advantage of job creation following an increase in business property value of either type. To poor residents, the benefit of a dollar increase in commercial property value is greater than a similar increase in manufacturing property value because poor residents, due to low skill levels, are more likely to attain employment in a commercial enterprise.

The greater the percentage of the adult population without a high school degree and the greater the percentage of population that is African American, the greater the rate of residential employment and poverty. However, the African-American proportion is not a statistically significant determinant of the residential employment rate. If potential wage earners in a household are lacking a high school degree, then more than one is likely to work, due to economic necessity, and the residential employment rate rises. Even so, such households are still more likely to be in poverty. Discrimination and spatial mismatch are the conceivable reasons that African Americans are more likely to be in poverty. Finally, the residential employment rate and poverty rate are both greater, the greater the average surrounding property in manufacturing and commercial activities, and the greater the average surrounding employment. However, only the surrounding manufacturing percentage exerts a significant influence on the poverty rate, and the surrounding commercial percentage and employment exert a significant influence on the employment rate. The positive relationship between the poverty rate and surrounding manufacturing is likely just a spatial occurrence in that these are both greater at the core of a metropolitan area. The positive influence of surrounding commercial property and surrounding employment on residential employment is more likely to be causal.

Concerning per-capita municipal expenditure and local property tax rate, the less the percentage of the population over age 65 and the greater the percentage property in manufacturing, the greater both of these local fiscal variables. Strong conclusions, nevertheless, should not be drawn from these findings because the regression coefficients they are based upon are not significantly different from zero.

The most interesting comparisons of the influences of explanatory variables across a category of dependent variables occur with regard to local incentive offers.[23] Over the period from 1977 to 1992, the likelihood of offering a DDA and the likelihood of offering any level of manufacturing property tax abatements rose with each of the four observed five-year time intervals.[24] As supported by our earlier research, metropolitan Detroit localities are increasingly offering these incentives because other communities are doing the same. In addition, there is a taste for incentive use that is measured by an observed complementarity between different incentives. An upturn in the local use of IDBs and in the use of the TIFA increases the local use of manufacturing abatements. Similarly, an increase in commercial abatement use raises the likelihood of adopting a TIFA. The same is true regarding the local adoption of a TIFA and the increased likelihood of adopting a DDA. Specialization in the use of local incentives to attract only one of the two types of business property is evident in the use of a DDA and commercial abatements decreasing the use of manufacturing abatements.

If municipal expenditure per resident (holding all else constant) acts as a positive proxy for local services desired by business, then a higher level of it should result in the need to offer fewer economic development incentives. This is the case for the two types of property tax abatements and for IDBs. However, the relationship is only significant in regard to manufacturing abatements. On the other hand, higher municipal expenditure per capita results in a greater probability of a municipality offering a TIFA or DDA. There is also a pattern regarding local incentive offers and distance from downtown Detroit. Manufacturing incentives are more likely to be offered by a community the farther it is from the central city, while commercial incentives are less likely to be offered the farther the community is from the core. This may reflect the greater need to offer a compensating differential to manufacturing in outer areas because of the agglomeration and transportation benefits at the core and the decreased need to offer a compensating differential to commercial enterprises in the outer areas because of the trend toward new retail and office development there.

Finally, there is evidence of copycat behavior in the form of local use of both manufacturing incentives (property tax abatements and IDBs) and surrounding communities' use of manufacturing property

tax abatements. Regarding surrounding communities' use of commercial property tax abatements, there is some evidence of the opposite of emulation, but it is not statistically significant. Greater use of commercial abatements by neighboring communities reduces local use of all three commercial incentives (abatement, TIFA, and DDA). There is mixed evidence regarding emulation and the surrounding-community use of IDBs. It is associated with a decline in local application of manufacturing abatement in a significant way, and in the decline in local IDBs in a statistically insignificant way. Also, the surrounding use of DDAs, holding all else constant, decreases the application of all local commercial incentives. However, this finding is not statistically significant.

Simulation Insights

In this chapter, we have described the method used to conduct simulations related to the primary issue of whether local incentive use in a metropolitan area could counteract spatial mismatch in the area's labor market. The simulations revealed that the offering of a TIFA or of a DDA anytime throughout the period was positively related to an increase in commercial property value, which, in turn, is associated with a subsequent decrease in the residential employment rate and local poverty rate. Also, a $10 million increase in manufacturing property tax abatements offered by the average metropolitan Detroit area community prior to 1977 was positively related to increases in manufacturing property value and to subsequent decreases in residential employment and local poverty rates. Equally important is the simulation insight that a $10 million increase in commercial property tax abatements or in IDBs exerts a negative influence on the corresponding (commercial and manufacturing, respectively) nonresidential property value. Simple benefit/cost analyses that use the results of these and other simulations indicate that a reasonable case can be made for the benefits of instituting a DDA outweighing the costs. A reasonable case cannot be made that the use of the other four local incentives generates local benefits that are greater than local costs. Chapter 6 discusses possible reasons for why this is so, as well as future policy courses concerning the offer of local incentives in a metropolitan area.

Notes

1. See Gujarati (1995, Chapter 11) for a further discussion of heteroskedasticity and regression analysis.
2. As discussed in Gujarati (1995, p. 386), a natural log transformation compresses the scales in which variables are measured, thereby reducing a 10-fold increase between two variables to a 2-fold increase. This reduces the likelihood that the regression's error terms are heteroskedastic.
3. See Greene (1990, p. 727) for a complete description of how the bias and inconsistency arise.
4. See Gujarati (1995, Chapter 16) for a description of why probit or logit is the preferred regression technique. For no particular reason, we choose to use probit.
5. The method to estimate appropriately a simultaneously determined system of structural regression equations is described in Gujarati (1995, Part IV).
6. This is measured through the use of the appropriate *F*-test.
7. Elasticity is a favorite measure of economists and shows the expected percentage change in a dependent variable given a 1 percent change in a causal variable. Economists like this measure because, unlike pure regression coefficients, all elasticities are directly comparable and tell the observer the relative percentage influence of quite different variables.
8. Recall that the use of an economic development incentive by a particular jurisdiction in a metropolitan area has been considered an activity that is simultaneously determined with the value of other exogenous variables.
9. Perhaps the policymaker was the first in the metropolitan area to read this book.
10. See Wassmer (1992) for an example of a different application of the same sort of simulation procedure.
11. The use of $10 million as the increase also makes it easy to shift decimal points to assess the impact of a $1 million or $100 million change in a local incentive.
12. See Table 4.2 for the descriptive statistics upon which these calculations are based.
13. The values given of $151.36 million, $11.09 million, and $48.31 million for the respective average use of manufacturing property tax abatements and IDBs are more than the pooled average reported in Table 4.2 because they are only calculated for the communities using them. All zero observations have been excluded in the calculation of these averages.
14. Statistically significant simulation results are distinguished from others by placing them in bold in Table 5.3.
15. The use of the marginal magnitudes derived for the influence of a causal variable on a dependent variable assumes that the calculated regression relationship between the two will be the same at the level of the simulated increase. If significant nonlinearity exists, this may not be the case, and the reported results for the simulation are not valid.
16. This is based upon the TIFA coefficient in the commercial property value regression given in Table 5.1.

17. In an earlier version of our system of simultaneous equations, the number of residents employed and local population were estimated in two separate regressions. When this was done, we found that both types of nonresidential property exerted a positive influence on population and a positive influence on employment.
18. The $0.17 decrease in municipal expenditure per capita is derived by multiplying 0.1213 (the effect of TIFA on commercial property value) by –0.003 (the effect of commercial property value on municipal expenditure per capita) by $457.72 (the average municipal expenditure per capita).
19. As described in Table 5.1, nonresidential property value equals manufacturing and commercial property value less manufacturing and commercial property tax abatements. The average of $242.8 million was derived from the appropriate pooled averages recorded in Table 4.2.
20. The value of –0.23 is the influence of a 1 percent increase in nonresidential property value on property tax rate that was previously recorded in Table 5.1.
21. This finding indicates that in two communities, identical in most respects except one has greater commercial property value than the other, the one with greater commercial property value spends less on municipal expenditures per resident. This is likely due to some unmeasured characteristic or test of a high-commercial community that is causing it to spend less.
22. The $1.3 billion property tax base must be divided by $2,000 to calculate the property taxes paid based upon the 0.13 increase in the property tax rate because the property tax rate measures the amount paid per $2,000 market value.
23. For incentive offers, the positive or negative influence of a variable on a particular incentive is considered significantly different from zero if the coefficient's *t*-statistic in the regression results recorded in Tables 5.1 and 5.2 indicates a two-tailed significance greater than an 85 percent confidence level.
24. This finding is based upon a comparison of the size of the regression coefficients for the dummy time variables and the fact that these dummies as a group are statistically significant. Because there is a constant term included in these regressions, the regression coefficient on a particular year dummy represents the change in that year, holding other factors constant, relative to 1977.

6 Summary and Policy Recommendations

[W]ith a better understanding of the consequences of public policy actions and a greater appreciation of the nature of economic change, perhaps Detroit's decline could have been cushioned if not arrested. Maybe things could have been different; maybe, just maybe, my present visits to my hometown could have been occasions of pride rather than occasions of despair.

—Frank J. Bonello (1993)

The economic and residential focus in most large U.S. metropolitan areas in the latter half of this century has shifted from the central city and inner suburbs to the periphery and outer suburbs. Earlier, we provided an overview of some of the reasons for this transition, such as rising affluence, technological advance, changes in consumer taste, government subsidies and regulation, and racism. This set of events has served to redistribute affluent residents away from the core of most large U.S. metropolitan areas and toward the outer reaches. Service sector jobs that exist to serve the affluent have followed. Even the builders of new U.S. manufacturing facilities are now more likely to choose the suburban greenfield over the urban brownfield.

The exodus of affluent residents, commercial activities, and new manufacturing activities to the outer suburbs of metropolitan America has produced a local fiscal climate at the periphery that is usually more attractive than the blighted fiscal climate left behind in many central cities and inner suburbs. We employ the term *fiscal blight* here in the same sense that Mieszkowski and Mills (1993) use it in their article, "The Causes of Metropolitan Suburbanization." A fiscally blighted area has high taxes, low-quality public schools and other local governmental services, and all or some of the following nonfiscal characteristics: racial tensions, crime, congestion, and/or low environmental quality. Property taxes and other local taxes or fees are generally levied at a lower rate in the periphery of a metropolitan area. Also, demo-

graphics and a larger property tax base per resident usually result in the provision of higher quality local government services at the periphery.[1] The process of central city exodus even builds upon itself: the more that leave, the greater the fiscal blight at the core, and the greater the incentive for more to follow. As a result, in the late 20th century there are very few large metropolitan areas in the United States that are best characterized as monocentric (focused toward a central business district). Polycentricity, or the existence of an older central business district and newer "edge cities," is more likely the rule.[2] The derogatory label of *suburban sprawl* captures the less-than-optimistic outlook that many have formed about this occurrence.

Much debate has ensued as to whether we should be concerned about the decentralization of large U.S. metropolitan areas and the movement of residential and business activity to the periphery.[3] From an economist's perspective, intrametropolitan location decisions have been presumably made by well-informed individuals and business firms acting in their own best interest. Based on the "invisible hand" of Adam Smith, such decisions should yield what is best for all of society. However, a closer inspection of this *laissez-faire* argument requires that decision makers—both individuals who choose where to live, and businesses that choose where to produce—bear the full costs of their decisions. If there are significant external costs that are not being considered, then private decisions fail to yield what is best for all, and there may be room for government intervention.

The external costs most often cited in intrametropolitan location decisions result from the failure of private decision makers, when they choose not to reside in the inner city, to consider the damage that they impose upon those remaining at the core of the metropolitan area. Damages come to core cities in the form of increased local fiscal stress through altered demographics (in the sense of population characteristics that result in more city spending per citizen to provide the same quality of local services to all citizens). Damages can further occur through a diminished tax base, lower population density, increased economic and ethnic segregation, and decreased employment opportunities through spatial mismatch.[4] As Voith (1992) and others have shown, damages additionally come to the entire metropolitan area in a diminished quality of life and public image for all residing in the region.[5] To be fair, it must be noted that there are also social costs to

those in the suburban periphery (especially residents with land holdings) when a resident or business chooses to remain, or chooses to locate, at the core of a metropolitan area. If a firm generates a *fiscal surplus*, or tax payments greater than the cost of services provided to it and the environmental consequences caused by it, then the satisfaction of actual and potential outer residents rises when the firm locates at the periphery.[6] This increased satisfaction is translated into higher land values. Nevertheless, even if social benefits exist for both residents at the core and at the periphery if a firm locates there, one could favor the core based on the equity argument that poor people are more likely to be concentrated in that area.[7] The efficiency-based argument in favor of the core is that unemployment is generated by the spatial mismatch that exists there and that enhancing a central city has been shown to offer benefits to all in the region.[8]

The existing resident or firm contemplating a move out of the core, or new resident or firm contemplating a location anywhere in the metropolitan area, only weighs the direct cost of choosing a location (difference in land price, moving expenses, and moving time) against the direct benefits (such as difference in local tax payments or in local government service quality). Consideration of this economic calculus is a necessary element to the public policy debate on local economic development incentives. Our discussion of this debate is centered around the three options that exist for future public policy regarding the use of local economic development incentives in a metropolitan area: 1) do nothing and leave such strategies to purely local choice, 2) eliminate the offering of all local incentives in a metropolitan area, or 3) regulate which communities in a metropolitan area are allowed to offer any local incentives.

Most would agree that the primary intent of local economic development incentives is to alter business location decisions. Implementing legislation regularly refers to its purpose as steering business where it is most desired. Based upon the literature review in Chapter 2, incentives offered by communities in a metropolitan area may actually be able to accomplish their stated goal. Both commercial and manufacturing firms choose a metropolitan area, or a portion of it, during the market stage of their location decision. Previous studies have shown that, in most situations, government taxation and service provision can do little to alter this stage of the location decision. When picking a site

within the metropolitan area to serve the desired market, local fiscal variables (or local incentives) can make a difference. It is argued that a community really needing existing and new businesses should have the right to offer incentives to try to attract and retain economic activity.

Consider a firm that is ready to leave a fiscally blighted core city and to go to a fiscally healthy outer city in the same metropolitan area. Assume that the private benefit of leaving, less the private cost of leaving, is greater than the private benefit of staying. Nevertheless, suppose that if the firm truly considers the social benefit of staying, then the sum of the private benefit of staying plus the social benefit of staying is greater than the private benefit of leaving less the private cost of leaving. How do you get the firm to consider the social benefits of staying? Could a local economic development incentive package be offered that does not exceed the social benefits of staying?[9] The benefits bestowed upon society by the firm choosing the core of the metropolitan area are internalized to the firm through the offering of the incentive.

If the nonconsideration of social benefits is the driving factor causing a firm to choose a suburban location, then the offering of a local incentive causes it to remain at the core. If the private benefit, less the private cost, of being out of the core is greater than the private and social benefits of remaining at the core, then the firm turns down the local incentive offered at the core and goes to the periphery.

However, what happens when the fiscally healthy outer city, which the mobile firm is considering as an alternative location, offers the same incentive package as the fiscally blighted inner city? The firm, getting the same incentive package at the periphery and knowing the benefits of lower taxes and greater services offered there, chooses the outer city. If the goal of a local incentive is to redirect economic activity to a location where it would not have otherwise gone, then the local incentive has failed. If the goal of the local incentive is just to reduce business costs and enhance profits throughout the metropolitan area, then the local incentive has succeeded.

This introduction begins to set the stage for the remainder of Chapter 6. We next review the material contained in the previous five chapters. The section after this summary contains a description of local incentive offers by core and periphery cities in the Detroit metropolitan area at specific times during the last 20 years. We use this, and other

information accumulated throughout the book, to evaluate the three policy options that exist for the future utilization of local economic development incentives: free choice, regulation, or elimination. To appraise the possible effects of a more targeted approach to local economic development incentives, we offer a brief review of previous research on enterprise zones (EZs), a form of geographically regulated incentive. The book concludes with an Afterword describing some new incentive programs in Michigan that, to a limited extent, capture the spirit of our policy prescription.

SUMMARY OF PRECEDING CHAPTERS

> *Suppose you have just caught a cab in New York City. While stalled in traffic, the cabby asks you about your work. You say you are a "policy analyst working for . . ." He says, "What's that?" You explain that you've been working on "the problem of . . ." He says, "So what's the answer?" You have one minute to offer a coherent, down-to-earth explanation . . .*
>
> —Eugene Bardach (1996)

In this section, we take Bardach's (1996) advice and offer the reader a concise summary of each of the five preceding chapters. In a nutshell, Chapter 1 offered a background on local economic development incentive programs throughout the United States. These incentives are of interest because some have offered them as a solution to our country's most pressing urban problems, with one of these being the spatial mismatch that occurs between where low-skilled workers live and where low-skilled jobs exist. If potential workers cannot get to the jobs, perhaps local incentives can get jobs to workers. A Foreword told the story of how these incentives began in Michigan with one corporation pushing one city for a tax break. A similar story can likely be told for every state. Information taken from the National Association of State Development Agencies (1983, 1986, and 1991) was then used to summarize the type of local economic development incentives

available throughout the United States. To justify our geographic concentration on one metropolitan area, a description of how the destructive offer/counteroffer scenario is more likely to play out in such a region was provided. Next, through a discussion of the competitive nature of cities in large U.S. metropolitan areas, and direct evidence on incentive activity in metropolitan areas, we documented the intrametropolitan use of these incentives throughout the country.

There are three questions that are the basis of any study of the efficacy of local incentives in a metropolitan area. In Chapter 2, each of these questions was answered through a brief review of the relevant literature. First, what determines the distribution of local economic activity in a metropolitan area? Being economists, we answered this question with a review of the theory of firm demand for local sites, and a review of the theory of community supply of local sites for firms. Second, can the offering of local incentives increase the equilibrium level of business activity observed in a community? An extensive review of regression studies on this topic led to the consensus that, yes, local fiscal variables could be used to alter the distribution of intrametropolitan economic activity. Finally, what theory supports the existence of job opportunities in one area of a metropolitan region and potential employees in another, and is there any empirical evidence that documents its existence? The theory of spatial mismatch and empirical research on the existence of this phenomenon in at least some large U.S metropolitan areas were described. Bringing the responses to these three essential questions together, we conclude that it is indeed reasonable to ask whether local incentive offers can help to alleviate a spatial mismatch between where low-skilled workers live and where low-skilled jobs exist in large U.S. metropolitan areas.

In Chapter 3, we described the five different types of local economic development incentives available in metropolitan Detroit between 1974 and 1992. The increased use of manufacturing and commercial property abatements and of downtown development authorities (DDAs) and tax increment finance authorities (TIFAs) over this period was documented in a table. Following this table, a summary was provided of when each local incentive began in Michigan, if it is still in existence, and background on how the local incentive operates. A frequency and cumulative distribution of the real value of all manufacturing abatements, commercial abatements, or industrial development

bonds (IDBs) offered between relevant five-year time periods was also provided. The data indicate that the mean number of incentives offered by the average Detroit area community, weighted by the number available, rose almost continually from 0.10 in 1977, to 0.22 in 1982, to 0.38 in 1987, to 0.36 in 1992. Finally, the 14 cities in the Detroit area within 10 miles of Detroit's downtown were defined as *inner* cities, and the remaining 98 as *outer* cities. Between 1977 and 1992, the growth in population, residential employment, and commercial and manufacturing property base was on average greater in the outer cities. Also, the percentage of non–African Americans, the percentage of the population with a bachelor's degree, commercial or manufacturing property base per resident, and employment per resident were on average greater in the outer cities. These statistics offered indirect evidence that a spatial mismatch existed in the Detroit area labor market during the period observed.

Chapter 4 advanced a multifaceted model of the determination of local economic activity in a metropolitan area. Eleven theoretical models, of the exogenous and endogenous variables expected to determine each of the necessary endogenous local relationships, were provided. Next, we described the real-world variables used to measure each of the exogenous and endogenous variables, the sources for all variables, and the mean and standard deviation of each variable for each of the four cross sections and the entire pooled sample.

We began Chapter 5 with a description of the logic behind the different regression procedures for each of the 11 endogenous variable regressions. The regression procedures may appear complex to a noneconometrician, but they are absolutely necessary to derive regression coefficients that properly show the cause-and-effect relationships between the appropriate variables in a metropolitan area. The results for each of the regressions were provided in a table and are further described in Appendix 2. Individual regression results are full of information that should be of interest to both academic researchers and policymakers. The remainder of Chapter 5 discussed a series of simulations showing what would happen if the average community in the Detroit metropolitan area increased its offering of manufacturing abatements, commercial abatements, or IDBs by $10 million, or if it went from not offering a TIFA or a DDA to offering one or the other. The results of these simulations are exactly what is needed to deter-

mine the efficacy of local incentive offers, in their unregulated form, at reducing spatial mismatch in a metropolitan area. The simulated offer, a $10 million manufacturing abatement during 1977, or the implementation of a TIFA or a DDA at any time, lowers the residential employment rate along with decreasing the local poverty rate. The offering of a DDA is the only simulated situation where we found that the residential employment benefits of a local incentive offer likely outweigh the local fiscal costs. A simulated increase in the remaining forms of local incentives (commercial abatements, IDBs, and manufacturing abatements after 1977) is correlated with decreases in local business property value.

There is a theoretical explanation for the positive influence of manufacturing abatement offers in the first period of their existence on manufacturing property value. Manufacturing is the more footloose of the two types of business property, and hence a property tax abatement for it would be expected to exert a greater impact than a similar abatement offer for commercial property. Also, in the first period, there is less copycat behavior among jurisdictions: needy or fiscally blighted jurisdictions offer the abatements because they have to, and other jurisdictions are less likely to be offering them just because needy ones are.

The positive influence of a TIFA or DDA on commercial property value is probably due to these two incentives being spatially tied to an area and the fruits of the incentive being specifically enjoyed by the area. The TIFA uses the incremental property tax revenue generated after establishment for capital improvements in the authority's area. The DDA does the same, but in an area that must be a community's central business district. The funds generated by a DDA can be used for capital enhancements in the authority's area, but they can also be used for broader purposes.

INCENTIVE OFFERS BY CORE AND PERIPHERY CITIES

> *[I]ndividual policies designed to stimulate economic development sometimes work at cross purposes.*
>
> —Bradbury, Kodrzycki, and Tannenwald (1997)

At the beginning of this chapter, we offered an explanation based on market failure and fiscal blight as to why core cities may be compelled to offer local incentives. We also mentioned how these offers, as a way of subsidizing the social surplus generated by a business locating in a core city, can actually enhance overall metropolitan-wide equity and efficiency. Moreover, outer suburban communities in the same metropolitan area may find that the fiscal surplus generated by a firm is large. If so, the outer community can offer a firm a local incentive and still enjoy a positive fiscal balance. Since the local fiscal climate of the outer community makes it the probable profit-maximizing choice for the firm, that locale is not obliged to offer an incentive unless it is in fear of losing the enterprise to a competing community. This concern arises if the inner community is in the regular habit of offering location incentives to companies.

Table 6.1 presents a statistical summary of the offering of the five different types of local incentives by the previously defined 14 inner cities and 98 outer cities in the Detroit metropolitan area. In order to track how incentive activity has changed over time in these two types of cities, descriptive statistics are given for each of the five years of the data. In the first part of Table 6.1, the mean and standard deviation of manufacturing property tax abatements per dollar of manufacturing property are given for both core and periphery cities. In 1977, core cities offered more manufacturing abatements than did periphery cities (0.04, compared with 0.02). In 1992, core cities still offered more (0.54, compared with 0.32). The same can be said for IDBs as a percentage of manufacturing property, the presence of a DDA, commercial abatement offers in 1982 and 1987, and the presence of a TIFA in 1982, 1987, and 1992.

Core cities exhibited a greater propensity to offer incentives than did periphery cities. Based upon their fiscally blighted environment and the greater potential and/or need for social surplus, it is not surprising that they did this. However, is there any evidence that over time periphery cities offered more incentives just because other cities were offering them?[10]

Table 6.1 also shows the ratio of the core average to periphery average for each of the measures of incentive use. Except for IDBs, a consistent pattern emerges.[11] In 1977, the ratio of core average use of manufacturing abatements to periphery average use was 2.00. By

Table 6.1 Local Incentive Use in Core and Periphery Cities[a]

Incentive type	1977	1982	1987	1992
Mfg. prop. tax abate./$ value mfg. prop				
Core cities	0.04 (0.10)	0.24 (0.21)	0.42 (0.29)	0.54 (0.32)
Periphery cities	0.02 (0.06)	0.13 (0.22)	0.25 (0.30)	0.32 (0.35)
Core aver./periph. aver. ratio	2.00	1.85	1.68	1.69
Coml. prop. tax abate./$ value coml. prop.				
Core cities	–	0.023 (0.041)	0.049 (0.066)	–
Periphery cities	–	0.004 (0.016)	0.021 (0.061)	–
Core aver./periph. aver. ratio	–	5.75	2.33	–
Face value IDBs/$ mfg. prop.				
Core cities	0.021 (0.051)	0.066 (0.174)	0.144 (0.415)	0.147 (0.425)
Periphery cities	0.010 (0.095)	0.016 (0.116)	0.004 (0.016)	0.004 (0.015)
Core aver./periph. aver. ratio	2.10	4.13	36.00	36.75
Presence of TIFA				
Core cities	–	0.21 (0.41)	0.36 (0.48)	0.43 (0.49)
Periphery cities	–	0.04 (0.20)	0.20 (0.40)	0.23 (0.42)
Core aver./periph. aver. ratio	–	5.25	1.80	1.87
Presence of DDA				
Core cities	0.07 (0.26)	0.21 (0.41)	0.29 (0.45)	0.43 (0.49)
Periphery cities	0.03 (0.17)	0.10 (0.30)	0.24 (0.43)	0.31 (0.46)
Core aver./periph. aver. ratio	2.33	2.10	1.21	1.39

[a] Values in rows labeled “Core cities” and “Periphery cities” are the mean (top value) and the standard deviation (in parentheses).

1987, this ratio fell 16 percent to 1.68 and basically remained there in 1992. From 1982 to 1987, the ratio of core-to-periphery average use of commercial abatements dropped from 5.75 to 2.33, or by nearly 60 percent. Between 1982 and 1992, a similar ratio calculated for the presence of a TIFA also decreased, by just slightly over 64 percent (5.25 to 1.87). For the presence of a DDA, the ratio fell from 2.33 to 1.39 between 1977 and 1992, or 40 percent.

Table 6.1 offers clear descriptive evidence that, with the exception of IDBs, a periphery community is more likely to use local economic development incentives (relative to a core community) the longer that the incentive program is in existence. Since we know that the fiscal blight experienced in core cities relative to periphery cities got no better over this period (a case can be made for it getting worse), *bidding for business* was the likely reason that periphery cities used a greater number of incentives over time. We use this finding and the results of our earlier simulations on local incentive offers to evaluate the three policy choices for the future of local incentive activity in a region.

POLICY CHOICES

> *The product of policy analysis is advice.*
> —David Weimer and Adrian Vining (1992)

We have now come to what is arguably the most important section in the book. As economists and policy analysts, we have taken great care to put together a thorough study of the efficacy of local incentives in a metropolitan area. One of our major criteria in this evaluation has been the ability to alleviate spatial mismatch in a metropolitan area's labor market. We have discussed the relevance of this issue, conducted the appropriate literature reviews, described the use of local incentive programs in the area under study, specified the suitable theory, run and interpreted the appropriate regressions and simulations, and now it is time to produce a socially useful output. As Weimer and Vining (1992) point out, this comes down to an assessment of what to do about the policy that we have spent so much time thinking about. Here we offer

our opinion on pursuing each of the three different policies concerning the future use of local economic development incentives in a metropolitan area: free choice, elimination, or regulation. This is obviously the most normative section of the entire book.

Free Choice

> *Indeed, such tax competition may actually enhance efficiency . . .*
>
> —Mattey and Spiegel (1997)

The free choice, or status quo, policy option is to continue to allow communities to offer local economic development incentives at their own volition. It is conceivable that a policymaker in each community weighs the costs of granting an incentive (such as lost revenue and negative change in local environmental quality from firm location) against the benefits (such as some revenue, employment, and positive change in local environmental quality) and offers it if the community's benefits outweigh the costs. This free market approach to local incentives provides the advantage of decision making at the level where community benefits and costs are best assessed. If a community offers an incentive of its own free will, then it can be argued that everyone gains—at least everyone in the community and the firm. A rational policymaker, representing the will of the citizens, only makes a local incentive offer if the community receives a net benefit from the firm residing there. What the firm saves in local costs is either translated into lower consumer prices (in the case of firms operating in a perfectly competitive market), higher wages paid to workers, larger firm profits, or different combinations of these effects.

Mattey and Spiegel (1997) have commented on the efficiency-enhancing aspects of state and local government competition for business. These include the power to attract and retain firms with a high level of external benefit, nurturing industry clusters, and the ability to use incentives to overcome information problems. Since the locality has better information about the quality of the location than does the firm, a properly used incentive signals this quality. In addition, many local government services are *tax priced* at the average cost of provid-

ing them. If the marginal cost of provision to the next firm is less than the average cost, then efficiency calls for the appropriate incentive. Also, any attempt to restrict the local offering of economic development incentives will place the entire state, and even nation, at a comparative disadvantage to the rest of the states in the country and world.

Mattey and Spiegel's argument regarding the efficiency-enhancing result of interjurisdictional competition for business is conceptually sound and grounded in economic theory. However, as Kenyon (1997) describes in her article, "Theories of Interjurisdictional Competition," it is only fully valid when the interjurisdictional market for business approaches perfect competition. She describes perfect competition as consisting of many jurisdictions with similar fiscal characteristics, the absence of spillovers between jurisdictions, fully informed voters and policymakers, and governments that seek to maximize the well-being of their constituents. If any of these characteristics is violated, competition can lead to negative-sum outcomes. Based upon the observations of political and institutional researchers such as Rubin (1988), Goetz and Kayser (1993), Wolman and Spitzley (1996), and our own observations of the real world, we come down on the side of a lack of perfect competition in most intrametropolitan markets for business location. As we have shown earlier, communities do not have equal fiscal resources, they do engage in strategic behavior over time, and a strong argument can be made for the existence of interjurisdictional spillovers.

If local economic development incentives exist to redistribute business activity to a place where it would not otherwise go, we believe that continued free choice in the offering of local incentives is the worst of the three possible policy options. We have shown that the efficacy of some of the local incentives that exert a positive influence on business property values declines over time. In the case of manufacturing property abatements, a positive influence on manufacturing property value occurs in only 1977. In addition, holding all else constant, communities emulate each other and offer more manufacturing abatements as time passes. If an abatement is the marginal factor that guides a firm to one community instead of another, then it becomes less effective when communities are giving such inducements just because of other community offers. A DDA exerts a positive influence on local commercial property value in any time period, but holding all else con-

stant, communities are again more inclined to offer these authorities just because time passes. Once again, these offers are made because DDAs are more prevalent in Detroit area communities as time passes.

If communities are offering local incentives just because others are offering them, and there is evidence that the incentive is only serving its purpose shortly after the program began, then these are reasons to reconsider the unrestricted use of local incentives in a metropolitan area. The property value benefit of manufacturing abatements shortly after they began may have lasted if the cities offering them prior to 1977 had continued to be the only ones doing so. The average distance to downtown Detroit for all communities in the sample is 20.8 miles (as given in Table 4.1). Prior to 1977, the communities that offered manufacturing abatements were on average 17.4 miles from the core. In 1992, the average distance to downtown Detroit for communities offering manufacturing abatements rose to 19.8 miles.[12] Relating this to spatial mismatch, manufacturing abatements exert their desired effect when used closer to the metropolitan area's core. This is likely due to the fact that communities exhibiting characteristics more likely to repel manufacturing enterprises, and thus be in greater need of a compensating differential (local incentive), are more likely to be closer to the metropolitan core. If only the most needy were allowed to use these incentives, they would be more likely to become the swing factor that could be used to retain or attract business development to a needy community.

Perhaps the benefits of greater local commercial property value from a TIFA or a DDA would also be larger if their use were restricted to communities most in need of them, or exhibiting local characteristics that repel commercial activity. Even commercial abatements or IDBs, which exhibit no positive influence on commercial or manufacturing property value in any year, may have exerted a positive influence on the appropriate nonresidential property value if their use had been limited to only the most needy communities.

Elimination

> *. . . [C]orporate welfare dispensed by the state house is not the best use of public revenues, even when the object is to encourage business firms to put more people to work.*
>
> —Robert G. Lynch (1996)

The value of manufacturing property in the Detroit metropolitan area not subject to any property taxes in 1992, due to abatement, was about $15 billion in 1990 real dollars. In that year, the average community in the Detroit area with any manufacturing property was granting property tax forgiveness to about 35 percent of the industrial property that it could have taxed. This level of manufacturing abatement activity was equivalent to about $474 million in potential local property tax revenue foregone each year.[13] Also in 1992, the total value of commercial property in the Detroit area enjoying property-tax-free status due to abatement was about $619 million. For the average metropolitan Detroit community with commercial activity, this meant that 2.1 percent of the commercial property that could have been taxed was not. Commercial abatements translated into about $20 million in potential local revenue foregone each year.[14] With the total population of the Detroit area in 1992 at approximately 3.8 million, manufacturing and commercial abatement usage was equivalent to $130 annually per every man, woman, and child in the area.

As shown through the simulation results in Chapter 5, it is questionable that these abatements offered benefits that clearly were greater than costs. With the exception of a slight increase in the residential employment rate, commercial property tax abatements never exerted a significant influence on local variables that help a community. Manufacturing abatement offers prior to 1977 resulted in a decrease in the local poverty rate, but also a decrease in the residential employment rate. Anecdotal stories and theoretical models, which support these simulation findings, are used by some to advance an outright ban on the offering of all state and local economic development incentives. Since state incentives are the more visible, most of the arguments given for such a ban are at this level. However, as is shown next, the framework of these arguments applies equally well to locally offered incentives.

McEntree (1997), the president of the American Federation of State, County, and Municipal Employees, argues that state bidding wars over business location have failed and need to be stopped, and that attention should be turned to something that does work (education and infrastructure). He believes that incentives do not create new jobs for a state or the nation, but only serve to allocate jobs between different states through “corporate blackmail.” Big winners are the mobile

businesses that are able to wrestle a tax break from a state or local government. Losers are the businesses that are unwilling or unable to threaten mobility. McEntree claims that this bidding process undermines public confidence in good government, reduces state and local government expenditure on other necessary services, and shifts the burden of subnational taxation away from business and onto individuals. He offers the withdrawal of federal revenue sharing as the necessary stick to enforce his proposed ban. McEntree's argument and conclusion could apply equally well to local competition for business through incentives, and a state could just eliminate their use. Lynch (1996), through a selective reading of the previous empirical literature on this topic, comes to a similar conclusion.

In their article, Burstein and Rolnick (1995), both of the Federal Reserve Bank of Minneapolis, are also of the opinion that Congress should end the bidding war among the states. In part, their argument is based upon a theoretical model developed by Holmes (1995). Burstein and Rolnick believe that there is a role for state and local government competition but only through overall tax and spending policy. As Tiebout (1956) was the first to point out, such rivalry can lead to a more efficient allocation of both public and private goods. However, as shown in Holmes' (1995) model, when state and local governments compete with each other for the increase in property tax base offered by a specific business, a national underproduction of public goods occurs due to less subnational tax revenue being collected throughout the country. Burstein and Rolnick point out that states, acting on their own interest, are not going to stop this behavior. These researchers call for federal legislation to end the bidding wars and provide a convincing argument as to why the U.S. Constitution's Commerce Clause would not prevent such legislation.

It is important to recognize that the Holmes' (1995) model, which is the basis of the Burstein and Rolnick argument to ban incentives, assumes that states (or local governments) compete with each other only to enlarge their own tax base. As Holmes acknowledges, a subnational government may also want a business to locate within its boundaries because of a positive social externality bestowed upon residents. In this case, the offering of subsidies and tax breaks by governments where the externality is largest increases the total amount of socially benefiting activity generated from the industry.[15] Holmes concludes,

"To the extent that this is true, banning tax discrimination by states might reduce aggregate welfare" (p. 39).

Among the three available options (free choice, banning, or regulation), the outright ban on all local economic development incentives in a metropolitan area is not our preferred policy choice. We agree with a prohibition of local incentive offers if the only other policy option is continued free rein. The targeted use of local incentives by communities that are fiscally blighted, and that would enjoy large social benefits when a firm resides within their boundary, is our preferred policy option.

Regulation

> *From a national perspective, we should applaud economic development policies to increase job growth when these policies are pursued by high-unemployment local areas, and deplore economic development policies to increase jobs when they are pursued by low-unemployment areas.*
>
> —Timothy J. Bartik (1991)

Bartik (1991b) offers and tests a theory of the hysteresis effects of local job growth. Simply summarized, the hysteresis argument holds that households are immobile in the short run (perhaps even in the long run in the case of minorities in U.S. central cities), and therefore local job growth in high unemployment areas has a permanent effect on the local labor market. Local job growth leads to long-run changes in the vicinity's human capital, and these changes reduce local unemployment levels even beyond the initial effect of the job growth. This failure of a property to return to initial state once the external agent of change is removed, or hysteresis, is exactly the desired outcome of most, if not all, urban renewal proposals.

Bartik tested and found support for his hypothesis by examining aggregate data from different metropolitan areas across the United States. We believe that, due to spatial mismatch within a metropolitan area, similar forms of labor market hysteresis can occur when local economic development incentives are used to effectively increase labor demand in high unemployment localities within a metropolitan area. It

is for this reason that our preferred policy prescription for the future use of local incentives in a metropolitan area is state-based encouragement (through intergovernmental revenue sharing) or regulation that targets the use of local incentives to only high unemployment and fiscally blighted areas.[16] To address the concern of a state that adopts this policy that it will be unable to compete with other states or nations that do not, we would allow for exceptions to this general rule only after convincing evidence is provided to an impartial arbitrator.[17] A low-unemployment or non-fiscally blighted community in a state with this policy could only offer an incentive if the arbitrator found compelling reasons that the entire state would lose the business to another state if the incentive was not allowed.

The information in this book clearly shows that, when communities are left to their own devices, local economic development incentives are increasingly offered by places that do not fit the "high unemployment and fiscally blighted" characterization.[18] Since a strong argument can be made for the social benefits of allowing only these types of communities to offer incentives, and because a state does possess the constitutional power to control the offering of all local incentives within its boundaries, regulation is the clear policy recommendation that follows. It is not surprising that Bartik (1994), through his extensive research on this topic, offers essentially the same advice.

An additional prescription would be that the communities allowed to offer local incentives under a targeted regime be more selective in the type of inducement they offer. Selectivity should come in the form of offering the available local incentive with the greatest poverty reduction benefits per dollar of foregone revenue. Our simulations clearly show that some incentives do little to nothing to reduce local poverty rates.[19] In their article, "A Methodology for Selecting Economic Development Incentives," Rasmussen, Bendick, and Ledebur (1984) address this important issue. More should be done on this. At the same time, policymakers need to remember our key finding that local incentives that increase nonresidential property values, and subsequently decrease local poverty rates, also lower rates of residential employment through a rise in local population that is greater than the jobs created.

Whether a state's legislators and/or governor have the political courage to initiate laws that would target local economic development

incentives to core cities in a metropolitan area is not so certain. We find some hope in the forms of local economic development incentives that have been adopted in Michigan since 1992. These are discussed in the Afterword of this book.

Nunn (1994) has also thought about the regulation of tax abatements and offers five different policy options: 1) free market, 2) volunteeristic or cartel behavior to maximize the good of all, 3) external incentives to shape behavior, 4) litigation, and 5) legislation. Like us, he considers the first two possibilities as not being preferable. Unlike us, he sees the remaining options as largely being applied at the federal level to the states. Nunn is not too optimistic about this likelihood and concludes his study by stating, "Reform at the grassroots level of individual cities may be the only truly effective way to envision the elimination of local tax abatements" (p. 586). This is exactly the reason that we like our policy prescription. A state is much more likely to be able to capture grass roots sentiment regarding the regulation of state and local incentives than is the federal government. We believe that fundamental support can come from metropolitan areas within a state if they are just made aware of the non-efficacy of the current system of free local choice and of the social benefits of incentives offered in only targeted communities.

ENTERPRISE ZONES

> *[Enterprise zones] can become valuable tools for evaluating the effectiveness of tax incentives as economic development policy, and can add to the longstanding debate on the effects of tax competition on the location of capital investment.*
>
> —Leslie E. Papke (1994)

Since urban enterprise zones (EZs) are currently the closest initiative to our suggested policy course, it is prudent to examine some of the empirical evidence regarding their effectiveness. Unfortunately,

there have only been a few good empirical studies on this topic. We review this research next.

Butler (1991) offers a conceptual description of the evolution of U.S. thinking on EZs. Beginning in Britain in the 1970s, EZs are designed to liberate market forces—through tax and regulation cuts, and employment and training subsidies—to revitalize a depressed urban area.[20] Considering these components, the establishment of EZs appeals to both ends of the political spectrum. Brought to the United States, and considering the politics of our legislative bodies, EZs have necessarily been extended to encompass rural and even suburban applications. As part of a subnational economic development policy, at least 37 states and the District of Columbia have some form of legislation that allows the creation of substate EZs (Papke 1991).

A volume edited by Green (1991) offers case studies on EZ programs in Florida, New Jersey, Maryland, Kentucky, Ohio, Illinois, and Indiana. With the exception of Rubin's (1991) analysis of the New Jersey program, these case studies are based on survey methodology and primarily report the number of jobs created or jobs retained. Rubin explains that New Jersey's original enterprise zone legislation in 1983 specified local characteristics that guaranteed that a zone would be placed in Camden and Newark. The remaining eight zones were selected on a competitive basis from 16 municipalities that met further criteria. On average, a New Jersey EZ encompasses about 30 percent of a municipality's area. Within the zones, businesses receive sales tax exemptions and credits, corporate tax credits, and unemployment insurance tax rebates. These are the costs of establishing an EZ in New Jersey. To assess the benefits, Rubin surveyed EZ firms to find the number of new jobs created, new payroll, new output in dollars, and new capital investment. Using this information, she applied the multipliers derived from a regional input/output model to calculate the full effects of new activity within EZs. She concludes that these benefits far exceeded the foregone tax costs. She cautions that she made no attempt to control for displacement of economic activity from areas outside New Jersey's EZs.

Boarnet and Bogart (1996) performed a more sophisticated empirical analysis of New Jersey's EZs. They accurately point out that Rubin's earlier method of data gathering created a selection bias. Firms that had chosen to leave the EZ before the survey was conducted

were not included. Boarnet and Bogart instead chose to tabulate employment data between 1985 and 1988 from the New Jersey Department of Labor for the municipalities that possessed an EZ. Using panel data regression techniques, they found no evidence that the presence of an EZ program in a municipality had any influence on total municipal employment, on employment in various industrial sectors, or on municipal property values. Due to the limited offering of EZs in the state, they express surprise at this finding. However, as they point out, the possibility exists that municipal business activity may have moved from outside the zone to within it. If this happened, and there is no way of telling through their analysis, the targeting of economic incentives to a specific geographic can still achieve the desired outcome of increasing labor demand in that place.

Papke (1994) offers one of the most thorough and empirically accurate assessments of U.S. urban enterprise zones. She looked at the effects of Indiana's EZ program on local employment and capital investment using data gathered by the state from local jurisdictions. Legislation allowing EZs in Indiana was enacted in 1983. Initially, depressed areas in six central cities were given EZ status. By 1991, this number had expanded to a total of 14. The Indiana program requires that an EZ have a continuous boundary, an unemployment rate that is one and one-half times the state figure, a residential poverty rate 25 percent greater than the national rate, a population between 2,000 and 8,000, and an area of between 3/4 and 3 square miles. The incentives provided to firms within the zone include no property tax on inventories, a reduction in the corporate gross receipts tax, a tax credit to lenders for loan activity within the zone, an employer income tax credit, and an income tax deduction for zone residents. Using a panel data regression methodology, Papke analyzed unemployment and capital investment data for a zone before and after EZ designation, finding that the establishment of an EZ program permanently increased the value of inventories by about 8 percent and that unemployment claims by zone residents fell by about 19 percent.

It is heartening to discover that there is some good empirical evidence that the targeting of local incentives in a metropolitan area may work. The Boarnet and Bogart (1996) study of New Jersey's EZ program does not preclude the possibility, while the Papke (1994) study of Indiana's EZ program shows that, if done appropriately, it can work.

Until our policy recommendation is fully adopted by a state, we will look to further research on urban EZ activity to assess the efficacy of incentive targeting being used on a much larger scale by a state. The 1995 federal establishment of major empowerment zones throughout the United States (of which one is in Detroit) offers a unique natural experiment to which future researchers should turn for data.

Notes

1. Some would argue that "flight from blight" is not a major cause of exodus from core areas in a metropolitan area because high local taxes and low local services are capitalized into lower land prices in the central city. These act as a compensating differential to the poor fiscal climate. As Mieszkowski and Mills (1993) and others have pointed out, this argument only applies if the metropolitan-wide land markets operate in a perfectly competitive manner. In most U.S. metropolitan land markets, significant land use controls exist that do not allow the neutralization of fiscal blight through capitalization.
2. See Garreau (1991) for the source of popularization of the term *edge city* and a very readable description of this occurrence in the United States.
3. An informed debate on the benefits and costs of suburban sprawl in the United States appeared in the Winter 1997 issue of the *Journal of American Planning*. Gordon and Richardson (1997), two economists, argue that the costs are exaggerated and make the case for nonintervention. Alternatively, Ewing (1997), an urban planner, states that the costs are large and that a valid case can be made for planning intervention.
4. Mills and Sendé Lubuele (1997) provide a recent review of studies and data relating to just how bad the conditions are in U.S. inner cities. A recent Bank of America (1997) publication provides a "laundry list" of the social and economic problems created by suburban sprawl in California.
5. Voith's (1992) study showing that city and suburban population growth in large U.S. metropolitan areas is complementary offers a way in which central city decline can affect the entire metropolitan area. In Chapter 4 of his book, New Visions for Metropolitan America, Downs (1994) also makes the point of strong links between a central city's health and the health of its suburbs.
6. An additional benefit exists if there are economies of scale in the municipal provision of local government services and a periphery community has less than the optimal number of residents or firms to take full advantage of them.
7. For proof of this in the Detroit metropolitan area, see the evidence presented earlier in Table 3.12.
8. As discussed in Chapter 1, Bartik (1991a) has also made the same equity- and efficiency-based arguments for directing economic activity back to a metropolitan area's core.

9. The value of a local incentive equal to the social benefit to residents in the city of the firm staying or locating there would under reasonable circumstances be less than or equal to the amount of the incentive offered through a local decision process. If there are significant social benefits bestowed upon the entire metropolitan area, then the level of the local incentive would have to be subsidized by the remainder of the area.
10. As discussed in Chapter 2, Anderson and Wassmer (1996) have used a duration regression model to show that the offering of a first manufacturing abatement by a community is positively influenced by the degree that such abatements are being used by other communities in the metropolitan area.
11. The rise in the ratio of core average use of IDBs to periphery average use of IDBs between 1977 and 1992 is likely attributable to the fact that this program moved from being under the discretion of local governments to becoming increasingly under the discretion of the state government. The reason is that the federal government placed more and more restrictions on the amount of IDBs that could be offered statewide. It appears that the states used their restricted ability to offer IDBs to steer their offering to a greater and greater extent to core cities and away from periphery cities.
12. These values are not found in any previous table; they were calculated from the data used to derive regression results recorded in Tables 5.1 and 5.2.
13. This is, of course, assuming that all of the manufacturing property would have remained in the Detroit area, or all of the rehabilitation projects would have been completed without the granting of a property tax abatement. The figure of about $474 million is derived by taking the market value of manufacturing property granted an abatement ($15 billion), dividing it by $2,000 to get the value of property responsible for one mill of property taxes ($7.5 million), and then multiplying this by the average millage rate in the Detroit area in 1993 ($63.20 per $2,000 market value).
14. The value of about $20 million is derived by taking the market value of commercial property granted an abatement ($619 million), dividing it by $2,000 to get the value of property responsible for one mill of property taxes ($309,500), and then multiplying this by the average mill rate in the Detroit area in 1992 ($63.20 per $2,000 market value).
15. This is precisely a variant of the occurrence described in the opening of this chapter.
16. In a metropolitan area that crosses state lines, an agreement would have to be reached among all states that have jurisdiction. This could be difficult, but not impossible.
17. This evidence would ideally show that the private cost of locating in a suburban location is lower (even after the core city put together its incentive package), and that a suburban location in another state (where the firm could realistically go) offers higher profits to the firm unless the suburban location in the state under consideration offers an incentive package.

18. Fisher and Peters (1997) have also found that, at the state level, economic development incentives serve to magnify and not reduce existing state tax differentials.
19. However, we must caution the reader that these findings are based upon the hands-off regime of free local choice. We suspect that some of the simulation results regarding local employment would be different if incentive offers were only restricted to the most needy communities.
20. In most cases, the designation of the urban area does not coincide with the entire city.

Afterword

Two new economic development programs, begun in Michigan since 1992, have been crafted in a manner that, in limited respects, follows our suggested policy course. The Michigan Employment Growth Authority (MEGA) started in 1995 and allows 20-year tax concessions for manufacturing, wholesale, and research businesses that create at least 75 new jobs from an expansion of an existing business or 150 new jobs from a business relocation from another state. Jobs must pay at least 1.5 times the current minimum wage, and the tax break is equivalent to the amount of personal income tax paid by new employees and the increased single-business tax liability of the firm from the expansion or relocation. In the spirit of our policy suggestion, this is not available to all firms, and every application for a MEGA tax concession is evaluated by an eight-member board chosen by the governor. The board's primary mission is to evaluate the claim that the employment expansion would not have taken place without this incentive. Since expansion is less likely to occur in fiscally blighted core cities in a metropolitan area, a proper evaluation should result in more tax inducements going to business in these areas. Our suggestion is that MEGA's evaluators explicitly adopt the additional criteria of fiscal blight and high poverty for a community to use the incentive.

In 1996, Michigan began a new Renaissance Zone program, which is designed to serve as a catalyst for the economic revival of depressed urban and rural areas in the state. The designation of nine zones was accomplished through a competitive evaluation based on the need of urban and rural areas throughout the state. In addition, military installations that closed after 1990 were eligible. The process resulted in the establishment of six zones established in depressed areas of the state's most blighted cities, three rural zones, and two military zones. The largest urban zone consists of 1,346 acres in the city of Detroit. State taxes within these zones are waived; these include the entire state business tax (Single Business Tax), personal income tax, and the six-mill property tax for education. Local taxes that are waived include the entire real and personal property tax, income tax if used in the city, and utility user tax. Again, the spirit of this new program is correct. It is

limited in scope and targeted in part to the state's most depressed urban areas. It also offers quite significant tax savings. While we question the policy of complete tax forgiveness as practiced in Michigan's Renaissance Zones, preferring some taxes to maintain the link with the benefits of public services provided to citizens and business, we are heartened by the focused application of economic development incentives in these two new programs. However, it must be remembered that the power of the Renaissance Zone and MEGA to influence business location decisions is still offset by the ability of all places in Michigan to continue to offer manufacturing property tax abatements, tax increment finance authorities, and downtown development authorities. (Commercial property tax abatements are not included in this list because the ability of local governments to offer them was eliminated in 1986.)

We can also report on a recent event in metropolitan Detroit that brought public discourse over local manufacturing property tax abatements to the front page of the *Detroit News* (Trowbridge 1999). The event involved whether a local government in Michigan should have the right to veto a manufacturing property tax abatement offer given by another Michigan community if the local government is losing jobs in the deal. This ability, though rarely used, was written in the original legislation (Public Act 198) that instituted these tax breaks. Controversy over the right to veto another community's abatement offer arose in the summer of 1999 when the city of Troy, an affluent outer suburb in metropolitan Detroit, refused to sign off on nearly $50 billion dollars in manufacturing property tax abatements that the city of Warren, a less affluent (though not fiscally blighted) inner suburb in metropolitan Detroit, wanted to give to the General Motors Corporation for a massive expansion of its world technical center in Warren. If the expansion takes place, the city of Troy is expected to lose about 700 jobs to the city of Warren through employment transers.

As of early August 1999, Troy's city council has refused to sign off on Warren's tax abatement deal with General Motors; thus, by Michigan law, Warren is unable to grant the massive tax break. What is interesting from a policy perspective is that Troy's city council claims that jobs are not the issue. The point that they make publicly is that Warren's tax break is bad because they believe that property tax breaks should only be used to redirect or retain economic activity in depressed

areas. The mayor of Troy has also refused to support the tax abatement offer to General Motors because it was not in "Warren's best interest."

It is of course debatable as to whether the public statements of the Troy city council and mayor represent their true motivation, or whether the retention of local jobs is the driving factor. The point to be made is that this dispute has brought the question of the efficacy of local tax abatements in a metropolitan area back into a statewide debate that will likely be settled in Michigan's legislature in the fall of 1999. A simple solution is the elimination of the ability of one local government to veto the abatement offer given by another if local jobs are being transferred to the other city. Based upon the evidence presented in this book, this would be an undesirable policy outcome. The veto ability that currently exists under Michigan's Public Act 198 is one tool that a fiscally blighted central city or inner suburb, with an existing manufacturing property tax base, can use to help insure that an abatement it offers cannot be matched by another competing suburb (usually a non-fiscally blighted outer suburb). Though, as described in the situation between Troy and Warren, an outer suburb can also use the veto to block the transfer of manufacturing property value and jobs to an inner suburb. If the choice were to keep the veto or to eliminate it, we would support its continued existence. If the choice instead were to restrict abatement use to communities with a high degree of fiscal blight or unemployment, we would support this alternative. Our hope is that this alternative is raised and supported if this issue is ever debated in Michigan's or any state's legislature.

Appendix 1
Regression Identification

As discussed in Gujarati (1995, Chapter 19), to estimate a system of simultaneous equations, a necessary (but not sufficient) condition is that of order. The order condition states that, for an equation to be identified, the number of exogenous variables excluded from the equation must not be less than the number of endogenous variables included in the equation less one. In this appendix, we check each of the 11 regression equations to make sure that they satisfy the order condition. For each of the 11 dependent variables that constitute a two-stage regression estimation, we first list the exogenous variables in the system that are excluded. The exogenous variables we draw upon for estimation are the 19 listed in both Tables 5.1 and 5.2, excluding square miles, distance to Detroit's central business district, and local income tax. These are excluded due to the use of city dummy variables in all first-stage regressions. We next offer plausible reasons as to the exclusion of these explanatory variables from the 11 equations. In the language of econometrics, the excluded variables are the identifying instruments that account for the simultaneous nature of the endogenous variables and allow for an unbiased account of the influence of one endogenous variable on another. Finally, we describe the results of a statistical test proposed by Bound, Jaeger, and Baker (1995) to evaluate the appropriateness of the two-stage correction for simultaneity.

RESIDENTIAL EMPLOYMENT RATE AND POVERTY RATE

> *Eight excluded variables*: percentage property in manufacturing, percentage property in commercial, primary school district out of formula, average surrounding manufacturing property tax abatements, average surrounding commercial property tax abatements, average surrounding IDBs, average surrounding DDAs, average surrounding TIFAs.

As provided earlier in Eqs. 1 and 2 in Chapter 4, the variables thought to influence differences in the residential employment rate and poverty rate between cities in metropolitan Detroit are the same. The eight exogenous variables excluded from the residential employment rate and poverty rate regressions are listed above. Since there are only two endogenous variables (manufacturing and commercial property value) thought to influence employment and poverty rate, both the residential employment rate and poverty rate regression equations more than satisfy the order condition and are considered *overidentified*.

If manufacturing and commercial property values are included as explanatory variables in these regressions, the percentage of local property in manufacturing or commercial activity should not influence local employment or poverty outcomes. It is the level of manufacturing or commercial activity in a community that affects economic results for residents and not the relative distribution of nonresidential activity between manufacturing and commercial pursuits. In addition, the dummy variable representing whether the community's school district is out of formula exerts no direct influence on employment or poverty rate in a community. Finally, after controlling for the average surrounding property in manufacturing and commercial activity, there is no reason to believe that what surrounding communities are doing in terms of local economic development incentives exerts an influence on a community's residential employment rate or poverty rate.

The percentage of property in manufacturing, average surrounding commercial property abatements, and average surrounding IDBs are the three variables excluded from the residential employment rate and poverty rate regressions that exert high statistically significant influences in the first-stage regression used to predict manufacturing property value. (We define "high" statistical significance as a 95 percent [or greater] level of confidence in a two-tailed test. The first-stage regression results are not reported in their entirety, but they are available from the authors upon request.) These three exogenous variables are what really identify the endogenous manufacturing property value variable in the residential employment rate and poverty rate regressions. The primary school district out of formula, percentage property in commercial, percentage property in manufacturing, and average surrounding manufacturing property tax abatements exert the same highly significant influences in the first-stage regression used to predict commercial property value.

As suggested by Bound, Jaeger, and Baker (1995), an *F*-test on the excluded instruments (the exogenous variables that are not in the second-stage regression) should be performed to check the adequacy of the two-stage correction used to account for simultaneity. If the group of excluded instruments as a whole is statistically significant from zero, then the two-stage correction is adequate. The calculation of the appropriate *F*-statistic for the exogenous variables in the first-stage manufacturing property value regression, which are excluded from the second-stage regression for the residential employment rate and poverty rate, results in an *F*-statistic of 25.98 ($F_{\alpha=0.01} = 2.66$). The analogous *F*-statistic for the first-stage commercial property value regression is 35.38. Thus, according to the test proposed by Bound, Jaeger, and Baker, the two-stage procedure for the residential employment rate and poverty rate regressions that accounts for the inclusion of the endogenous explanatory variables manufacturing and commercial property value worked as intended.

MANUFACTURING PROPERTY VALUE

> *Ten excluded variables*: percentage of population African American, percentage property in commercial, average surrounding property in commercial, primary school district out of formula, average surrounding manufacturing property tax abatements, average surrounding commercial property tax abatements, average surrounding IDBs, average surrounding DDAs, average surrounding TIFAs, average surrounding residential employment.

There are 10 exogenous variables excluded from the regression model designed to predict the local value of manufacturing property in Detroit area communities. As given in Eq. 3 in Chapter 4, there are six endogenous variables that influence manufacturing property value. Since the number of exogenous variables excluded from the regression is greater than the number of endogenous variables included in the regression, the order condition is more than satisfied, and this regression is overidentified.

It is the percentage property in manufacturing that may influence local zoning decisions on manufacturing property value and not the percentage property in commercial activity or the average surrounding property in commercial pursuits. We exclude these two exogenous variables from the manufacturing property value regression. The dummy variable representing whether the community's school district is out of formula and the percentage of population African American should not exert a direct influence on manufacturing property value. After controlling for the average surrounding property in manufacturing, there is no reason to believe that what surrounding communities do in terms of local economic development activity has an impact on a community's value of manufacturing property. Finally, there is no reasonable causal explanation as to why the average value of surrounding employment should influence a community's manufacturing property value.

Average surrounding property in commercial activity and average surrounding residential employment are the two exogenous variables excluded from the prediction of manufacturing property value that exhibit high statistically significant influences in the first-stage regression used to predict the residential employment rate. Recall that we have chosen to define high statistical significance as greater than a 95 percent confidence level. Surrounding commercial property tax abatements, surrounding IDBs, and average surrounding employment exhibit the same highly significant influences on the first-stage regression used to predict the poverty rate, while in the first-stage regression used to predict manufacturing property tax abatements, average surrounding manufacturing property tax abatements, and IDBs are highly significant. For the

prediction of IDBs, only the average value of surrounding IDBs is significant at greater than a 95 percent degree of confidence. Average surrounding property in commercial activity and average surrounding manufacturing property tax abatements both exert highly significant influences in the first-stage regression that predicts the property tax rate. Finally, average surrounding percentage property in commercial, primary school district out of formula, and average surrounding IDBs are highly significant influences in the regression that predicts municipal expenditure per capita. The first-stage identification of each of the six endogenous variables in the manufacturing property value regression is driven by the highly significant exogenous variables just described.

The tests suggested by Bound, Jaeger, and Baker (1995) all yield *F*-statistics that are greater than the critical *F*-value with at least a 99 percent degree of confidence. The calculated *F*-statistics in the first-stage residential employment rate, poverty rate, manufacturing property tax abatements, IDBs, municipal expenditure per capita, and property tax rate regressions are, respectively, 6.00, 13.65, 3.17, 4.71, 4.94, and 7.69 ($F_{\alpha=0.01} = 2.41$). The two-stage procedure for the prediction and substitution of endogenous variables in the manufacturing property value regression worked for six out of the six cases necessary for the manufacturing property value regression.

COMMERCIAL PROPERTY VALUE

> *Nine excluded variables:* percentage property in manufacturing, average surrounding property in manufacturing, primary school district out of formula, average surrounding manufacturing property tax abatements, average surrounding commercial property tax abatements, average surrounding IDBs, average surrounding DDAs, average surrounding TIFAs, average surrounding residential employment.

Of the 16 exogenous variables in our system of 11 regression equations, there are 9 excluded from the regression of the local value of commercial property. As given in Eq. 4 in Chapter 4, there are seven endogenous variables that influence commercial property value. Since the number of exogenous variables excluded from the regression is greater than the number of endogenous variables included in the regression, the regression is overidentified and is appropriately estimated using two-stage least squares.

It is the local percentage of property in commercial activity that may influence local zoning decisions on commercial property value and not the local percentage of property in manufacturing activity or the average value of surrounding property in manufacturing. It is thus reasonable to exclude these two

exogenous variables from the commercial property value regression. Whether a community's primary school district is out of formula should not exert a direct influence on commercial property value. After controlling for the average surrounding property in commercial, there is no reason to believe that what surrounding communities are doing in terms of manufacturing or commercial property tax abatements, IDBs, TIFA, or DDAs exerts an influence on a community's commercial property value. Finally, the average value of surrounding employment should not influence a community's commercial property value.

Average surrounding values of commercial property tax abatements, IDBs, and TIFAs are the three exogenous variables excluded from the second-stage commercial property value regression that exhibit highly significant influences in the first-stage regression predicting the residential employment rate. Surrounding IDBs, average surrounding property in manufacturing, and primary school district out of formula exhibit the same highly significant influences on the first-stage regression used to predict the poverty rate. In the first-stage regression used to predict commercial property tax abatements, average surrounding commercial property tax abatements and IDBs are highly significant. In the probit maximum likelihood prediction of TIFAs, the percentage property in manufacturing and average surrounding manufacturing property tax abatements are exogenous variables excluded from the second-stage prediction of commercial property value and are statistically significant at greater than a 95 percent degree of confidence. The first-stage probit estimation of DDAs revealed that only the percentage property in manufacturing exerts a highly significant influence. Average surrounding TIFAs have a highly significant influence in the first-stage regression predicting the property tax rate. Finally, average surrounding percentage property in manufacturing and primary school district out of formula are highly significant influences in the regression that predicts municipal expenditure per capita. The first-stage identification of each of the seven endogenous variables in the manufacturing property value regression is primarily driven by the highly significant exogenous variables just described.

The calculated *F*-statistics for the variables used in the first-stage prediction of residential employment rate, poverty rate, commercial property tax abatements, municipal expenditure per capita, and property tax rate regressions (but excluded from the second-stage estimation of commercial property value) are, respectively, 12.53, 3.39, 2.00, 4.29, and 12.00. The appropriate critical values are ($F_{\alpha=0.05} = 1.88$) and ($F_{\alpha=0.01} = 2.41$). All of these first-stage ordinary least squares regressions pass the Bound, Jaeger, and Baker (1995) test of the appropriateness of the two-stage procedure used to correct for endogeneity with at least a 95 percent degree of confidence.

The first-stage predicted values of the endogenous measures of a DDA and TIFA are derived using a probit maximum likelihood estimation technique. There are 8 exogenous variables excluded from the prediction of DDAs and TIFAs: percentage property in manufacturing, average surrounding property in manufacturing, primary school district out of formula, average surrounding manufacturing property tax abatements, average surrounding commercial property tax abatements, average surrounding IDBs, average surrounding DDAs, and average surrounding TIFAs. The Chi-squared tests of whether the probit regression coefficients on these variables are jointly equal to zero indicate that with 98 percent certainty, they are not in the TIFA regression and that, with more than 99 percent certainty, they are not in the DDA regression. These two first-stage regressions also satisfy the criteria that the two-stage correction is adequately performed.

MUNICIPAL EXPENDITURE PER CAPITA

> *Eight excluded variables*: average surrounding property in manufacturing, average surrounding property in commercial, average surrounding residential employment, average surrounding manufacturing property tax abatements, average surrounding commercial property tax abatements, average surrounding IDBs, average surrounding DDAs, average surrounding TIFAs.

There are eight exogenous variables excluded from the regression model designed to predict the municipal expenditure per capita in Detroit area communities. As given in Eq. 5 in Chapter 4, there are three endogenous variables that influence municipal expenditure: the poverty rate, manufacturing property value, and commercial property value. Since the number of exogenous variables excluded from the regression is far greater than the number of endogenous variables included in the regression, the order condition is more than satisfied, and this regression is overidentified.

It is quite easy to justify the exclusion of the eight exogenous variables from the second-stage estimation of municipal expenditure per capita. These variables measure what on average is going on in surrounding communities regarding the percentage of property in manufacturing and commercial enterprises, the offering of all five types of local incentives, and residential employment. Controlling for the demand for local expenditure by residents and business, what is going in surrounding communities should exert no theoretically justifiable influence on municipal expenditure.

The tests suggested by Bound, Jaeger, and Baker (1995) all yield *F*-statistics greater than the critical *F*-value with at least a 95 percent degree of confi-

dence. The calculated *F*-statistics for the first-stage poverty rate, manufacturing property value, and commercial property value regressions are, respectively, 8.94, 2.80, and 2.05 ($F_{\alpha=0.01} = 2.51$, and $F_{\alpha=0.05} = 1.94$). The two-stage procedure for the prediction and substitution of endogenous variables in the municipal expenditure per capita regression work for all cases.

PROPERTY TAX RATE

> *Seven excluded variables*: average surrounding property in manufacturing, average surrounding property in commercial, average surrounding manufacturing property tax abatements, average surrounding commercial property tax abatements, average surrounding IDBs, average surrounding DDAs, average surrounding TIFAs.

There are seven exogenous variables excluded from the regression model designed to predict the real value of municipal expenditure per capita in Detroit area communities. As given in Eq. 6 in Chapter 4, there are four endogenous variables that influence municipal expenditure: the poverty rate, manufacturing property value, commercial property value, and municipal expenditure per capita. Since the number of exogenous variables excluded from the regression is greater than the number of endogenous variables included in the regression, the order condition is more than satisfied, and this regression is overidentified.

It is not difficult to justify the exclusion of the seven exogenous variables from the second-stage estimation of the property tax rate. These variables measure what on average is going on in surrounding communities regarding the percentage of property in manufacturing and commercial enterprises and the offering of all five types of local incentives. Average residential employment is not excluded from the second-stage estimation of the property tax rate because it may exert an indirect influence on the value of residential property. Since the local value of residential property is not in our data set, and along with commercial and manufacturing property value exerts a negative influence on the property tax rate, we need to include proxy variables of what determines it. If we control for municipal expenditure and property values, the other measures of what is happening in surrounding communities should exert no theoretically justifiable influence on the local property tax rate.

The Bound, Jaeger, and Baker (1995) tests all yield *F*-statistics that are greater than the critical *F*-value with at least a 95 percent degree of confidence. The calculated *F*-statistics in the first-stage poverty rate, manufacturing property value, commercial property value, and municipal expenditure per capita regressions are, respectively, 8.83, 3.20, 2.09, and 8.10. The appropriate critical values are $F_{\alpha=0.01} = 2.64$ and $F_{\alpha=0.05} = 2.01$.

MANUFACTURING PROPERTY TAX ABATEMENTS AND INDUSTRIAL DEVELOPMENT BONDS

Nine excluded variables: percentage population young, percentage population African American, percentage property in commercial, average surrounding property in manufacturing, average surrounding property in commercial, average surrounding residential employment, average surrounding commercial property tax abatements, average surrounding DDAs, average surrounding TIFAs.

As provided in Eqs. 7 and 9 in Chapter 4, the variables thought to influence differences in the local use of manufacturing property tax abatements and IDBs in metropolitan Detroit are essentially the same. The one exception is that manufacturing abatement use is expected to influence IDB use, and IDB use is expected to influence manufacturing abatement use. There are nine exogenous variables excluded from these two regressions. Since there are nine endogenous variables thought to influence the local use of manufacturing abatements and IDBs, both regression equations satisfy the order condition (i.e., by exceeding nine endogenous variables minus one) and are overidentified.

The percentage of a community's population over age 65 may influence the offering of incentives to manufacturing firms if this block of voting residents feels differently than the rest of the population about their use. The percentage of the population less than age 18 is not expected to affect the use of local manufacturing incentives because this group cannot vote. In addition, holding other factors constant, we do not expect that different races will have different opinions on the use of local manufacturing incentives. After controlling for the percentage of local property in manufacturing, as a potential lobbying block the percentage of local property in commercial should not influence the local use of manufacturing incentives. Once the average use of manufacturing property tax abatements and IDBs by local communities is taken into account, the average surrounding percentage of property in manufacturing and commercial activities, the average surrounding use of local commercial incentives, and average residential employment should not affect the local use of manufacturing incentives.

As suggested by Bound, Jaeger, and Baker (1995), we again performed *F*-tests on the excluded instruments (the exogenous variables that are not in the second-stage regression) in the nine first-stage regressions used to predict the values of the endogenous variables in the manufacturing property abatement and IDB regressions. The *F*-test of the joint statistical significance of the nine excluded variables listed in the prediction of the residential employment rate

results in an *F*-statistic of 7.43 ($F_{\alpha=0.01} = 2.41$). Since this statistic is greater than the critical value of *F*, we can safely say that the nine excluded exogenous variables exerted a statistically significant influence in the necessary first-stage prediction of the residential employment rate. The analogous *F*-statistics for the first-stage regressions using poverty rate, manufacturing property value, manufacturing property abatements, commercial property abatements, IDBs, municipal expenditure per capita, and property tax rate as dependent variables are, respectively, 3.55, 1.90, 3.69, 7.93, 2.60, 6.67, and 9.08 ($F_{\alpha=0.05} = 1.88$). Since the endogenous TIFA and DDA variables are dichotomous, they are predicted with a first-stage Probit maximum likelihood procedure. In this approach, the appropriate Chi-square tests indicated that the nine excluded variables as a whole all exerted a nonzero influence in both regressions with greater than a 99 percent level of confidence in a two-tailed test. Thus, according to the evaluation proposed by Bound, Jaeger, and Baker, these two-stage procedures again worked as intended.

COMMERCIAL PROPERTY TAX ABATEMENTS, TAX INCREMENT FINANCE AUTHORITY, AND DOWNTOWN DEVELOPMENT AUTHORITY

> *Eight excluded variables*: percentage population young, percentage population African American, percentage property in manufacturing, average surrounding property in manufacturing, average surrounding property in commercial, average surrounding residential employment, average surrounding manufacturing property tax abatements, average surrounding IDBs.

As provided in Eqs. 8, 10, and 11 in Chapter 4, the variables thought to influence local differences in the use of commercial property tax abatements, TIFAs, and DDAs in metropolitan Detroit are essentially the same. There are eight exogenous variables excluded from these three regressions, as shown. Since there are nine endogenous variables thought to influence the local use of manufacturing abatements, a TIFA, and a DDA, all three second-stage regression equations just satisfy the order condition and are *just-identified*.

As with manufacturing abatements and IDBs, the percentage of the population less than age 18, the percentage of the population African American, and the percentage of local property in the nontargeted sector (manufacturing) should not influence the local use of commercial incentives. After accounting for the average use of commercial property tax abatements, TIFAs, and DDAs, the average surrounding percentage of property in manufacturing and commercial activities, the average surrounding use of local manufacturing incentives,

and average residential employment should not affect the local use of commercial incentives.

As suggested by Bound, Jaeger, and Baker (1995), we performed *F*-tests on the excluded instruments (the exogenous variables that are not in the second-stage regression) in the nine first-stage regressions used to predict the values of the endogenous variables in the three commercial incentive regressions. The *F*-test of the joint statistical significance of the nine excluded variables listed in the prediction of the residential employment rate results in an *F*-statistic of 9.66 ($F_{\alpha=0.01} = 2.41$). Since this statistic is greater than the critical value of *F* with a high degree of confidence, we can safely say that the nine excluded exogenous variables exerted a statistically significant influence in the prediction of residential employment rate. The analogous *F*-statistics for the first-stage poverty rate, commercial property value, manufacturing property abatements, commercial property abatements, IDBs, municipal expenditure per capita, and property tax rate are, respectively, 8.28, 3.72, 7.63, 8.92, 3.67, 7.09, and 7.43. Since the endogenous TIFA and DDA variables are dichotomous, they are predicted with a first-stage probit maximum likelihood procedure. With this method, the appropriate tests indicated that the nine excluded variables as a whole all exerted a nonzero influence in both regressions with greater than a 99 percent level of confidence in a two-tailed test. Thus, according to the test proposed by Bound, Jaeger, and Baker, the two-stage procedure for the commercial incentive regressions worked as intended.

Appendix 2
Regression Results

This appendix presents the findings from each of the 11 regression estimations. In each case, we highlight the variables that are statistically significant. A word of explanation is in order. Regression analysis involves the estimation of regression coefficients or parameters for equations such as those described in Chapter 4. While we have an interest in the size of the estimated parameter, we are even more interested in testing the general hypothesis that two variables are related to one another at all. It is one thing to find that two variables are related in a given data set, but quite another to determine that they are related in all possible data sets. We may care, for example, whether manufacturing property tax abatements have an effect on the likelihood of a community offering commercial property tax abatements. The regression coefficient for manufacturing property tax abatements in the commercial property tax abatement regression represents a point estimate of the parameter involved. To test the hypothesis that manufacturing property tax abatements affect commercial property abatements in general, we use the point estimate together with an estimate of the sampling error involved. This approach yields an interval estimate for a coefficient that has associated with it some level of confidence.

For example, we may construct an 85 percent confidence interval for a coefficient, which assures us that the true value of the coefficient lies in that interval. The probability of making an error in this judgment is 15 percent.[1] We can then test the hypothesis that manufacturing property tax abatements have no effect on city commercial property tax abatements by checking our confidence interval to see whether the parameter value of zero is in the interval. A parameter value of zero indicates that manufacturing property tax abatements have no impact on commercial property abatements. A confidence interval is essentially the set of acceptable hypotheses. If it contains zero, we cannot reject the hypothesis that there is no effect. The important distinction is the difference between information gathered from a sample of data and inferences drawn for a population. We use sample data to construct point estimates of parameters and then construct confidence intervals around those point estimates in order to test hypotheses concerning population parameters of interest.

Throughout the discussion that follows, we speak of only statistically significant or discernible effects. When we do so, we are referring to a test of the hypothesis that a causal variable has a nonzero population parameter, indicating that we can reject the hypothesis that it has no effect on the dependent variable. We draw this inference based on sample data. While we may speak of a coefficient being significant, we intend to convey that a test of the hypothesis

that the underlying population parameter is zero can be rejected with at least an 85 percent degree of confidence.

While not provided in Table 5.1, each of the six regressions recorded in that table also included a full group of city dummy variables to account for fixed effects. In addition, time dummies were also included in all of the regressions listed in Tables 5.1 and 5.2. Thus, the influence of time passage, holding all else constant, is recorded at the top of the results in both Tables 5.1 and 5.2 through regression coefficients on the time dummy variables. In Table 5.1, a constant term was not included and all of the four possible time dummies were. In Table 5.2, a constant was included and the time dummy representing the first year of observations was excluded. Each time dummy represents one of the four different years from which data are drawn: 1977, 1982, 1987, or 1992. The *F*-tests of the joint statistical significance of all time dummies are provided at the bottom of the regression results.

As given in Table 5.1, a dependent variable is used in natural log form if the word "log" appears in its description. An explanatory variable enters a regression in natural log form if "(log)" appears in its description and the dependent variable is in log form. If both the dependent and independent variables are in log form, the regression coefficient represents the percentage change in dependent variable that occurs with a 1 percent change in independent variable. If the dependent variable is in log form and the independent is not, the regression coefficient represents the percentage change in the dependent variable from a unit change in the independent. If both are in non-log form, the regression coefficient equals a unit change in the dependent variable from a unit change in the independent variable.

The discussions of regression results for the residential employment rate, poverty rate, manufacturing and commercial property value, municipal expenditure per capita, and the property tax rate are based on the data in Table 5.1. The discussions of the regression results for the five incentive options are based on the findings in Table 5.2.

RESIDENTIAL EMPLOYMENT RATE

As measured by the R^2 given in Table 5.1, the residential employment rate regression explains nearly 85 percent of the variation in the rate of residential employment, both over time and across municipalities. The percentage of the adult population with less than a high school education, average surrounding property in commercial activity, and average surrounding residential employment are the three variables that exert a statistically significant and positive influence on the residential employment rate. The percentage of a community's adult population without a high school degree acts as both a positive measure

of increased labor supply in the community and a negative measure of decreased labor demand. To earn an appropriate income, a household is more likely to have more than one member working if the other adult members never graduated from high school. Adults with less than a high school education, concurrently, qualify for fewer of the available jobs. We find that the increased labor supply aspect of residents with less than a high school education dominates and that a 10 percent increase in the percentage of the local population with this characteristic (holding all else constant) results on average in a 1.5 percent increase in the residential employment rate.[2]

Not surprisingly, locales that are surrounded by other communities with a large percentage of their property base in commercial activity, and with a larger number of employed residents, exhibit a greater rate of residential employment. Both act as positive measures of greater demand for a residential labor force from outside the community. A 10 percent increase in average surrounding residential employment is related to a 4.2 percent increase in the average local residential employment rate. A 10 percent increase in average surrounding property in commercial yields only a 0.6 percent increase in the residential employment rate.

Somewhat surprisingly, a 10 percent increase in manufacturing or commercial property value yields a 0.2 and 0.4 decrease, respectively, in the average residential employment rate in the Detroit metropolitan area.[3] While it is possible that greater nonresidential property value in a community measures greater potential employment opportunities for residents, it is also possible that it acts as lure for new residents to move into a community. The theoretical effect of an increase in nonresidential property value on the local residential employment rate is uncertain because it may increase the numerator used to calculate the rate (local residents employed), but it may also increase the denominator (number of residents).

POVERTY RATE

Our regression model of the local poverty rate explains nearly 93 percent of the variation in this dependent variable across metropolitan Detroit communities for 1977, 1982, 1987, and 1992. The explanatory power of this regression is derived in part by the significant influences that the percentage population young, old, with less than a high school education, and African American all exert on the poverty rate. A community displaying higher percentages in any of these categories had a greater percentage of families living in poverty. A 10 percent increase in the percentage population young, or the percentage of the population with less than high school, resulted in respective 5.1 percent and 4.4 percent increases in the poverty rate. Interestingly, a com-

munity that was surrounded by other communities with a greater average percentage of their property in manufacturing also exhibited greater poverty. This is unlikely to reflect a causal relationship, and more likely to be indicative of the inner cities in the Detroit area since manufacturing activity is still concentrated there.

A local increase in manufacturing or commercial property value results in a decrease in the local poverty rate. This is the result supported by the spatial mismatch theory discussed earlier. People in the Detroit metropolitan area are more likely to find themselves in poverty if their community is lacking in either manufacturing or commercial activity. For the average community over the period observed, a 10 percent increase in manufacturing property value results in a 0.7 percent decrease in the poverty rate. A 10 percent increase in commercial property value is associated with the twice as large 1.4 percent decrease in the poverty rate. Since the poor are more likely to find employment in commercial than manufacturing ventures, the differing results are as to be expected. This is due to a shift to a more service-oriented economy and to most manufacturing jobs during this period requiring greater skills than many of the poor possess.

MANUFACTURING PROPERTY VALUE

The local value of manufacturing property is determined by both demand and supply factors. On the demand side, average surrounding employment in manufacturing is included to account for the type of firm desiring to reside in a specific municipality, as measured by manufacturing property value. Municipalities that are surrounded by high manufacturing communities are themselves very involved in manufacturing; the likely reason for this finding is the benefit derived from agglomeration economies. On average, a 10 percent increase in average surrounding property in manufacturing resulted in a 2.1 percent increase in manufacturing property value.

Municipal expenditure per capita has a large positive effect on local manufacturing property value. A 10 percent rise in municipal expenditure per capita in the average Detroit area jurisdiction increased manufacturing property value by an elastic 26.2 percent. As for local economic development incentives, both industrial development bonds (IDBs) and manufacturing property tax abatements are included in the regression analysis. As described in Chapter 4, we allow for the possibility that these two forms of manufacturing incentives exert different influences during different years. However, we found that only manufacturing property tax abatements fit this possibility in a statistically significant manner. In 1974 and 1977, a 10 percent increase in the average use of local manufacturing property abatements is associated with about a 0.5 percent

increase in the local manufacturing property base. In 1982 and in 1992, any local offer of manufacturing abatements resulted in no significant increase in local manufacturing value. In 1987, alternatively, a 10 percent increase in manufacturing abatements is associated with about a 0.5 percent decrease in the local manufacturing property base. The greater influence of manufacturing property tax abatements in the initial period available is likely the result of these incentives being a new economic development tool used by fewer Detroit area municipalities. If competing communities are not offering them, it is not surprising that a community that does so earns a greater return per dollar. IDBs exert no statistically significant effect on the local manufacturing tax base in any of the observed years. This is the case whether or not they are interacted with the time dummies.

For the supply-side determination of manufacturing property value, we control for the degree that manufacturing firms are allowed to locate in the municipality by including several variables. The percentage population young has a negative and statistically significant influence on local manufacturing value. A 10 percent increase in percentage population young results in a 6.2 percent decrease in manufacturing property value. Communities with more children are more likely to be zoned as bedroom communities and therefore less likely to permit manufacturing firms. A 10 percent increase in the percentage population old (over age 65), alternatively, results in a 3.2 percent increase in manufacturing property value. Older people may be more tolerant of manufacturing activity within their community, or the association may just be picking up the fact that manufacturing in the Detroit area is concentrated in communities that have been around longer and hence have more older people within them.

Finally, on the supply side, if a community has a larger percentage of its property tax base in manufacturing, it also has a higher property value. The percentage of the property base in manufacturing acts as a positive measure as to the degree that manufacturing firms are allowed in the community. On the demand side, the percentage of property in manufacturing is also a proxy for local agglomeration economies that raise firm demand for local manufacturing sites. A 10 percent increase in this percentage is associated with about a 5 percent increase in manufacturing property value.

The regression coefficients on the time dummies indicate that local manufacturing property value for the average metropolitan community was greatest in 1977 and continually declined through 1992. The R^2 of 0.98 indicates that the explanatory variables do a nearly perfect job of accounting for variation in manufacturing property values across Detroit area communities and over time.

COMMERCIAL PROPERTY VALUE

With the exception of commercial variables used in place of manufacturing variables and a log transformation, the regression model of commercial property value is directly analogous to that for manufacturing property value. Quite respectably, the regression explains about 99 percent of the variation in commercial property values across communities and over time in the data set.

Several of the explanatory variables are demand-side factors intended to capture the type and number of commercial firms desiring to locate in a community. An agglomeration preference is reflected in the significant and positive coefficient on the average surrounding property in commercial activity. A 10 percent increase in this surrounding value yields on average a 7.2 percent increase in local commercial property value. The percentage of the total local tax base that is in commercial activity also exerts a statistically discernible positive influence on local commercial property value. As agglomeration economies indicate, commercial property value is larger in cities whose tax base is more commercial.

A city with a larger percentage of its population younger than age 18, and a larger percentage of its adult population not possessing a bachelor's degree, has lower commercial property value. This is likely due to the demand for commercial property being lower in a city with fewer potential adult customers and with fewer well-educated adult customers. The positive effect of potential customers on local commercial property value is also reflected in the finding that a 10 percent increase in average surrounding residential employment results in about a 13 percent increase in local commercial property value.

Two variables measure the fiscal condition of a community as it is expected to affect a business firm's demand for local commercial sites. Communities that spend more per resident have larger commercial tax bases. This is likely due to the additional provision of municipal services that commercial enterprises desire (such as sanitation, sewage, streets, sidewalks, lighting, and public safety). A 10 percent increase in real municipal expenditure per resident is linked with an elastic 12.4 percent increase in the average community's property value. Surprisingly, a one percent increase in the amount of local property taxes paid per $2,000 of market value of property is correlated with a 4.6 percent increase in local commercial property value. A higher local property tax rate, holding all else constant, should be capitalized into a lower commercial property value. The regression relationship between the local property tax rate and local commercial property value is thus unlikely to be causal. The property tax rate in a community must be positively correlated with an unmeasured community characteristic that serves to increase commercial property value.

Local economic development incentives are included in the commercial property value regression to capture their possible effect on local commercial tax bases. As discussed in Chapter 4, we tried to allow for the possibility that tax increment finance authorities (TIFAs), downtown development authorities (DDAs), and commercial property tax abatements exert a different effect in different years. Unfortunately, the interaction of year dummy variables with the dummies representing the presence of a TIFA or a DDA resulted in perfect collinearity in the regression estimation. Thus, we could only calculate the influence of these variables as being held constant across all years. Communities with a TIFA, holding other factors constant, have a commercial property tax base that on average is 12 percent larger than communities without one. Communities with a DDA, holding other factors constant, have a commercial property tax base that on average is 25 percent larger than communities without one. This does not necessarily mean that the adoption of a TIFA or DDA caused an increase in commercial property value, only that the adoption was correlated with it.[4]

Since the use of commercial property tax abatements is not represented through a dummy variable, we were able to interact these abatements with the year dummies and found that they do exert a significantly different influence in the three years they were available (1982, 1987, and 1992). A 10 percent increase in the amount of commercial property tax abatements offered by the average Detroit area community in 1982 resulted in a slight 0.03 percent decrease in commercial property value. This decrease reached 0.1 percent in 1987, and 0.2 percent in 1992. There is absolutely no evidence that local commercial abatements have been used to increase local commercial property value. The negative relationship between the two is likely due to the response of communities that are losing commercial property value with an attempt to control the loss through abatement offers. As with manufacturing abatements and manufacturing property value, the negative influence of the abatement rises over time. The trend is probably due to communities threatened with the loss of property value being more likely to offer this form of incentive as time passes.

Higher local poverty levels are associated with larger local commercial property values. Holding all else constant, a poorer community is more likely to zone local land for commercial use for the increased local tax revenue that follows. Along the same line, a city with a higher residential employment rate is less likely to zone local land for commercial use. A 10 percent increase in the residential employment rate is associated with a 29 percent decrease in commercial property value.

MUNICIPAL EXPENDITURE PER CAPITA

Municipal expenditures are modeled using an extension of the standard median voter model. In such a model, municipal expenditures reflect the level of services desired by the median voter/resident of the community. Through lobbying and political contributions, local business may also exert an influence on the real level of municipal expenditure per capita in a community.

Several of the residential/median voter characteristics that account for differences in residential demand for municipal services exert a significant impact. Since it is well established that expenditure on local government services is a normal good, it is not surprising that the local poverty rate exerts a negative influence on municipal expenditure per capita. A 10 percent increase in the poverty rate is associated with a 5.5 percent decrease in real per-capita expenditure. It appears that adult residents with a bachelor's degree desire (or require) less expenditure per capita from their community, while adult residents without a high school degree desire (or require) more. A 10 percent increase in the percentage of a community's population at the higher end of the education spectrum is associated with a 2.1 percent decrease in municipal expenditure per capita. In contrast, a 10 percent increase in the percentage of a community's population at the lower end of the education spectrum results in 2.5 percent increase in municipal expenditure per capita.

A community out of formula, in regard to its primary school district receiving no revenue sharing from the state, by definition has a higher relative property tax base per student than other communities in the area. The municipal expenditure regression shows that this type of community also has higher municipal expenditures per resident. Finally, the significant regression coefficients on the time dummies indicate that the average municipal expenditure per resident fell between 1977 and 1982, but rose between 1982 and 1992. This likely reflects the macroeconomic condition of the region.

The R^2 indicates that the regression analysis is explaining about 86 percent of the variation in municipal expenditure per capita across communities and time in the data set. While this value is lower than that for most of the previous regressions, it is still relatively high for a study based primarily on cross-sectional data.

PROPERTY TAX RATE

The regression specification for the property tax rate is based on the fundamental relationship that all tax revenue is the product of tax base and tax rate: $revenue = base \times rate$. Expressed alternatively, the tax rate equals tax revenue divided by the tax base: $rate = revenue / base$. Taking logarithms of both sides,

log (*rate*) = log(*revenue*) – log(*base*). Hence, the fundamental regression relationship is that the log of the tax rate is equal to the log of tax revenue minus the log of the tax base. Other variables are included in the property tax rate regression as intercept shifters to account for additional factors that influence the millage rate in a community.

The proxy for total tax revenue is municipal expenditure per capita. Local differences in expenditures by school district, county, and other special districts are controlled for with the inclusion of city fixed effects and the other explanatory variables. The estimated coefficient on municipal expenditure per capita is positive, but significant at only a 75 percent degree of confidence. The local nonresidential taxable property base is measured as total commercial and manufacturing property value minus the value of commercial and manufacturing tax abatements. The estimated regression coefficient on nonresidential taxable property value is negative, as expected, but significant at only a 78 percent degree of confidence. This negative relationship indicates that any reduction in the tax base due to abatements or other factors raises the local property tax rate.

Two variables expected to be proxies for grants given to the community have an impact on the property tax rate. If communities with a greater percentage of their population less than age 18 receive more intergovernmental grants, then it is not surprising that more children have the effect of reducing the property tax rate (at an 82 percent level of confidence). Communities whose principal school district is out of formula have lower overall property tax rates, other things being equal (at an 82 percent level of confidence). This result is quite consistent with what we would expect, as out-of-formula school districts receive no state education grants because they have a high property tax base per resident. The out-of-formula factor is accounting for communities with a high value of residential property.

The only statistically significant explanatory variable, as defined with at least an 85 percent degree of confidence, is average surrounding residential employment. A 10 percent increase in the value of this variable results in a 0.9 percent rise in the property tax rate. Since residential property value is not included as an explanatory variable in the property value regression, a city with greater residential employment around it may have a lower residential property value. This lower property value would then drive the higher local property tax rate. All of the time dummies together exerted a significant influence. The overall secular trend pointed to an increase in local property tax rates over the time period observed. The regression model explains about 86 percent of the variation in local property tax millage rates in the sample of data.

MANUFACTURING PROPERTY TAX ABATEMENTS

Recall from the earlier modeling of manufacturing property tax abatement offers in Chapter 4 that the value of this endogenous variable is determined by fiscal considerations, the taste for incentive use, business scale, median voter characteristics, political pressure, and innovator tendency. The decision process also involves two stages: the choice to offer any amount of abatements, and, if so, at what level.

Manufacturing property tax abatements (as well as commercial property tax abatements and IDBs) require additional attention in the estimation procedure due to censoring complexities. We cannot simply estimate the equation for manufacturing property tax abatements; doing so would ignore the fact that the data do not consist of a random sample of municipalities that offer manufacturing abatements. We have no data on what abatement use would be for communities that exhibit no use. Since we are concerned with estimating the expected value of abatements for all communities, our estimation method must account for this through the use of the tobit maximum likelihood procedure. However, when we tried to account for city fixed effects in this, and in all maximum likelihood regressions (tobit and probit), the statistical procedure detected a colinearity that was too great to allow the procedure to converge. We were forced to drop the set of community dummies from all of these regressions but could still include dummy variables for each year. As an alternative, square miles, miles to Detroit's central business district, and a dummy for the presence of a local income tax were instead placed in the five maximum likelihood regressions. These three exogenous variables control for some of the fixed effects that are constant in a city over time.

From the tobit regression estimation, we find that 10 of the explanatory variables exert significant effects. Three of the 10 significant effects occur in relation to the use of other local incentives. Greater local use of IDBs and the establishment of a TIFA result in the greater use of local manufacturing property tax abatements. As indicated by the calculated marginal effect given in bold in Table 5.1, a $1 increase in IDB usage in the average Detroit area community is associated with about a $16 increase in manufacturing abatements. The establishment of a TIFA results in about a $100 million increase in manufacturing abatements. Alternatively, the establishment of a DDA, holding all else constant, yields about an $87 million decrease in the use of manufacturing abatements. A feasible explanation is that DDAs are geared more specifically to communities with a distinct central business district. Such a community may be more likely to concentrate its local economic development activity on commercial enterprises and decide to offer less in the form of manufacturing abatements.

Municipal expenditure per capita is one of the two fiscal variables found to exert a significant influence on manufacturing abatements. Since municipal expenditure per capita likely acts as a positive proxy for local expenditures that also benefit business, communities that exhibit a lower expenditure level would have to offer greater incentives to attract manufacturing activity. For the average Detroit area jurisdiction, a $1 increase in municipal expenditure per capita resulted in about a $150,000 decrease in manufacturing abatements. If square miles acts as a variable related to innovator tendency, larger land area communities in metropolitan Detroit are less likely to offer manufacturing abatements. A square mile increase in the size of the average community resulted in just over a $1 million decrease in the use of abatements.

Also, communities with a higher percentage of their adult population lacking a high school degree are more likely to offer manufacturing abatements. This increased taste for incentive use could be due to the less educated being less mobile and in greater need of the manufacturing activity an abatement could bring, or, alternatively, the less educated being more likely to look for a quick fix to their declining manufacturing property base. The percentage of property in manufacturing is a political factor reflecting the share of the local property tax base that is in the manufacturing class. Cities with a greater percentage of property in manufacturing grant more tax abatements. Perhaps a jurisdiction with a larger percentage of its property in manufacturing has grown more reliant on this sector for revenue and is more likely to give into manufacturers who demand property tax reduction or threaten to leave. A 1 percentage-point increase in this explanatory variable for the average Detroit area community results in nearly a $9 million increase in manufacturing abatements granted.

A second fiscal factor important to the use of manufacturing abatements concerns whether the city's primary school district is out of formula. When a local property tax abatement is granted, an out-of-formula district loses the local revenue associated with the abatement, while an in-formula one receives some compensation for the loss through an increase in state revenue sharing based upon local property value per student. Understanding this, it is not surprising that a community whose primary school district is out of formula is on average likely to offer about $23 million less in manufacturing abatements.

Based upon the coefficients derived for the manufacturing abatement regression in Table 5.1, controlling for other causal factors, communities are more and more likely to adopt manufacturing tax abatements as time passes. This probably indicates the presence of an emulation effect that increasingly drives holdout communities to use manufacturing abatements. The result is consistent with our earlier conclusions in Anderson and Wassmer (1995). We also find that, if surrounding competitors are offering manufacturing abate-

ments, a community is also more likely to be offering them. A $1 increase in average surrounding manufacturing property tax abatements is associated with a $0.05 increase in a community's use of manufacturing abatements. However, a $1 increase in average surrounding IDBs is associated with over an $8 decrease in manufacturing abatements.

COMMERCIAL PROPERTY TAX ABATEMENTS

The use of commercial property tax abatements is also estimated in the manner of a tobit maximum likelihood regression. A smaller sample of 336 data points is employed because commercial property abatements were not available in Michigan before 1978. From the tobit regression estimation, designed to account for the nature of the data used, we find that only 2 of the 16 explanatory variables exert significant effects. This is quite different than the 10 significant effects previously found in the manufacturing abatement estimation. The process of offering commercial abatements in the Detroit area does not lend itself to simple cause-and-effect relationships. This is likely due to the nature of abatements being less suited to the task of altering commercial location decisions because commercial firms are less footloose than manufacturing firms in a metropolitan area. The lack of statistical significance may also be due to the fact that the commercial abatement program began later and was grandfathered out with an ending date of which both firms and communities were aware.

If the number of square miles again acts as a variable related to innovator tendency, larger land area communities in metropolitan Detroit are more likely to offer commercial abatements. A square mile increase in the size of the average community resulted in just under a quarter-million dollar increase in the use of commercial abatements. This finding is opposite to that for manufacturing abatements, where communities with greater land area offered less. The only other causal variable to exert a statistically significant influence on commercial abatement use is miles to Detroit's central business district. A one-mile increase in this distance is associated with about a $124,000 decrease in local commercial abatements. If commercial firms find locations at the core of the metropolitan area more profitable, it is not surprising that, as a compensating differential, commercial abatements increase in communities farther from the core.

There is some evidence that communities are more and more likely to adopt commercial tax abatements as time passes. This probably indicates the presence of an emulation effect that increasingly drives holdout communities to use commercial abatements. Holding all else constant, commercial abatement use in the average Detroit area community rose from 1982 to 1987, but

declined from 1987 to 1992.[5] The increase between 1982 and 1987 is consistent with an emulation effect. The decline between 1987 and 1992 is due to the fact that no new commercial abatements could be given after 1986.

INDUSTRIAL DEVELOPMENT BONDS

The regression methodology employed for the determination of local IDB offers in metropolitan Detroit is very similar to that used for manufacturing and commercial property tax abatements. In this tobit regression estimation, 8 of the 16 explanatory variables have regression coefficients that are significantly different from zero. Unlike the situation for manufacturing property abatements, an increase in business scale is positively associated with an increase in IDBs. A $1 increase in local manufacturing property value results in about a $0.01 increase in IDBs. Two of the fiscal variables are significant, although the direction of their influence is a surprise. A one-mill increase in the local property tax rate is associated with about a $130,000 decrease in IDBs. A city with a local income tax in place offers on average $772,000 less in commercial property abatements. These results cannot be causal in that a community with a higher local property tax rate or a local income tax (that applies to business income) would have to offer greater amounts of IDBs to attract manufacturing property. The finding of a negative relationship between the local property tax rate and local income tax and the local use of IDBs is likely the result of not being able to control for community fixed effects in the maximum likelihood estimations.

IDBs are more likely to be offered by a community that is larger in square miles and farther from Detroit's central business district. The tobit regression results in Table 5.2 also indicate that senior citizens exhibit less of a preference for their community to use IDBs. A 1 percentage-point increase in the percentage of residents over age 65 results in just over a $100,000 decrease in IDBs. Unlike the result for manufacturing abatements, a 1 percentage-point increase in local property in manufacturing results in just under a $90,000 decrease in IDBs. IDBs are used for the large-scale purchase of buildings and machines used in high visibility projects that are more likely to occur in greenfields than in brownfields. Also, greenfield cities are less likely to have existing manufacturing activity, so it is not surprising that IDBs and the percentage of property in manufacturing exhibit a negative relationship.

There is evidence of emulation and competitive behavior between surrounding communities and their use of IDBs and manufacturing property tax abatements. A $100 increase in the average use of surrounding manufacturing property tax abatements results in about a $1 increase in the use of IDBs for a community. The coefficients on the time dummies indicate that, holding other

factors constant, the use of IDBs in Detroit area communities declined continuously from 1977 to 1992. The copycat behavior observed over time in manufacturing and commercial abatements could not occur in IDBs because their offer is heavily regulated at the state level. Over this period, the state received an increasingly smaller federal allocation of statewide IDBs that could be used by communities.

TAX INCREMENT FINANCE AUTHORITY

Since the use of TIFAs was not permitted during the first period (1977), the estimation of the presence of a TIFA is based on the last three cross sections of data. The presence of a TIFA is modeled as a dichotomous variable depending on essentially the same explanatory variables used in the commercial abatement and DDA models. Since the dependent variable measures the presence or absence of a TIFA, the probit maximum likelihood regression technique is required.

Regarding fiscal considerations, the municipal expenditure per capita and local property tax rate variables exert statistically significant influences. The negative coefficient on the millage rate indicates that municipalities with high property tax rates are less likely to adopt a TIFA. The positive coefficient on municipal expenditure per capita indicates that high spending communities are more likely to adopt TIFAs. From the perspective of providing this incentive as a compensating differential for higher business costs in a community, these two fiscal relationships are the opposite of what is expected. The local income tax variable has an estimated coefficient that is positive. A community with a local income tax is 5.5 percent more likely to use a TIFA. This is the expectation based upon the compensation argument just given.

On the supply side, as measured by local median voter characteristics, only the percentage of adults with a bachelor's degree is a significant determinant of TIFA adoption. Communities with a more educated population are less likely to have this form of commercial incentive. In regard to taste for incentives, local TIFA use is a complement to the local magnitude of commercial property tax abatement use. A $10 million increase in commercial property abatement use by a community yields a 1.7 percent increase in the probability of using a TIFA.

Adoption of this commercial incentive by surrounding communities also has a strong positive impact on a community's adoption of a TIFA. An emulation effect again exists in the use of this local economic development tool. Just a 10 percentage-point increase in the proportion of surrounding communities using a TIFA results in about a 90 percent increase in the probability that a community itself uses such an authority. This is not the case for DDA and

commercial abatement use by surrounding communities. The tendency to be an innovator, as measured by land area, is the same as found for manufacturing property tax abatements. A bigger community in area, holding all else constant, is less likely to use a TIFA.

There is also evidence that political factors influence the use of TIFAs in metropolitan Detroit communities. Communities with greater commercial property value are more likely to create a TIFA. A $100 million increase in commercial property value yields about an 8.2 percent increase in the probability that a community will offer a TIFA. However, the greater the percentage of a community's property in commercial activity, the less likely that it uses such an authority. Finally, a community whose primary school district is out of formula is 4.9 percent less likely to employ a TIFA in its quest to attract commercial property. This could be due to such communities already having a high property base per resident.

The regression coefficients on the time dummies again indicate that the use of TIFAs has steadily increased over time.[6] Holding all else constant, this once again is evidence for the previously discussed emulation effect. The probit regression model predicts the use or nonuse of TIFAs very well with a hit ratio of 91.4 percent. The regression coefficients predict 43 of 61 actual adoptions, while 264 of 275 actual nonadoptions are correctly predicted. In this regression, as will be the case for DDAs, the regression results do a better job of predicting the non-adoption of a dichotomous local incentive rather than the decision to adopt. The decision to adopt is more likely to be influenced by community-specific characteristics that are difficult to categorize and measure without the use of fixed effects.

DOWNTOWN DEVELOPMENT AUTHORITY

The presence of a DDA in a municipality is modeled in Chapter 4 as depending on innovator tendency, political and fiscal considerations, local taste for incentive use, business scale, and characteristics of the local decisive voter. Two of the variables that are proxies for demand-side fiscal considerations, the property tax rate and local income tax, have positive and statistically significant coefficients. As expected, communities with higher property tax rates or an income tax are more likely to adopt DDAs. As these fiscal measures indicate a greater cost to do business in such communities, it is not surprising that a DDA is more likely to be offered as a compensating differential.

The percentage of a city's population over age 65 and the percentage of a city's adult population with less than a high school degree are meant to serve as proxies for taste differences for incentive use across city median voters. Older median voters are more likely to direct their community to use a DDA.

A 1 percentage-point increase in city seniors results in a 3.4 percent increase in the likelihood of adopting a DDA. Less-educated median voters are less likely to direct their city to offer a DDA.

A community with a TIFA is about 50 percent more likely to adopt a DDA. However, interestingly, we did not find that a community with a DDA is more likely to adopt a TIFA. The behavior of surrounding communities in adopting TIFAs has a negative and significant effect on DDA adoption. The more surrounding communities have TIFAs, the more unlikely a community is to adopt a DDA itself. The hit-ratio for the DDA probit regression model is 86.6 percent. For those municipalities with a DDA, our predictions are correct in about 47 percent of the cases.

Notes

1. An 85 percent level of confidence in a two-tailed test is the lowest that we deem acceptable to consider that a variable exerts a statistically significant influence on a dependent variable. We choose to use this slightly lower significance level because the Type II error of not considering a variable to be significant when it really is, is deemed worse than the opposite.
2. Because the dependent and independent variables are used in natural log form, the regression coefficient directly translates into an elasticity.
3. Since manufacturing property value enters the regression in non-log form, the 0.2 percent decrease in residential employment value is calculated by multiplying the regression coefficient by the pooled mean of manufacturing property.
4. Although we can feel better about this correlation representing a true causation because in the simultaneous regression analysis we have tried to control for other factors responsible for an increase in commercial property value.
5. Because a constant term is used, the 1987 and 1992 dummy represents commercial abatement activity, holding other factors constant, relative to the excluded year (1982).
6. Remember that the 1987 and 1992 dummies show that likelihood of a TIFA offer, *ceteris paribus*, relative to 1982.

References

Advisory Commission on Intergovernmental Relations (ACIR). 1967. *State-Local Taxation and Manufacturing Location*. Washington, D.C.

_____. 1991. *Interjurisdictional Tax and Policy Competition: Good or Bad for the Federal System?* Washington, D.C.

Anderson, John E. 1990. "Tax Increment Financing: Municipal Adoption and Growth." *National Tax Journal* 43(2): 155–164.

Anderson, John E., and Robert W. Wassmer. 1995. "The Decision to 'Bid for Business': Municipal Behavior in Granting Property Tax Abatements." *Regional Science and Urban Economics* 25(6): 739–757.

_____. 1996. "Offering Municipal Property Tax Abatements." Public Policy working paper no. 96-06. California State University, Sacramento, California.

Bahl, Roy. 1980. *The Impact of Local Tax Policy on Urban Economic Development.* Washington, D.C.: U.S. Department of Commerce (Urban Consortium Information Bulletin).

Bank of America. 1997. *Beyond Sprawl*. San Francisco, California. http://www.bankamerica.com/community/env_p8.html.

Bardach, Eugene. 1996. *The Eight Step Path of Policy Analysis*. Berkeley, California: Berkeley Academic Press.

Bartik, Timothy J. 1991a. "The Effects of Property Taxes and Other Local Public Policies on the Intra-Metropolitan Pattern of Business Location." In *Industry Location and Public Policy*, Henry W. Herzog, Jr., and Alan M. Stilton, eds. Knoxville, Tennessee: University of Tennessee Press, pp. 57–80.

_____. 1991b. *Who Benefits from State and Local Economic Development Policies?* Kalamazoo, Michigan: W.E. Upjohn Institute for Employment Research.

_____. 1994. "Jobs, Productivity, and Local Economic Development: What Implications Does Economic Research Have for the Role of Government?" *National Tax Journal* 47(4): 847–861.

Bartik, Timothy J., Charles Becker, Steve Lake, and John Bush. 1987. "Saturn and State Economic Development." *Forum for Applied Research and Public Policy* (Spring): 29–41.

Bergstrom, Theodore C., and Robert P. Goodman. 1973. "Private Demands for Public Goods." *American Economic Review* 63(3): 280–296.

Blair, John P. 1995. *Local Economic Development: Analysis and Practice*. Thousand Oaks, California: Sage.

Blundell, Richard, and Richard Smith. 1986. "An Exogeneity Test for a Simultaneous Equation Tobit Model with an Application to Labor Supply." *Econometrica* 54(3): 679–685.

Boarnet, Marlon G., and William T. Bogart. 1996. "Enterprise Zones and Employment: Evidence from New Jersey." *Journal of Urban Economics* 40(2): 198–215.

Bonello, Frank J. 1993. "The City of Detroit: A Personal Perspective." In *Urban Finance Under Siege*, Thomas R. Swartz and Frank J. Bonello, eds. Armonk, New York: M.E. Sharpe, pp. 175–181.

Bound, John, David A. Jaeger, and Regina M. Baker. 1995. "Problems with Instrumental Variable Estimation When the Correlation between the Instruments and the Endogenous Explanatory Variable Is Weak." *Journal of the American Statistical Association* 90(June): 443–450.

Bovaird, Tony G. 1992. "Local Economic Development and the City." *Urban Studies* 29(3-4): 343–368.

Bowman, Ann O'M. 1987. *The Visible Hand: Major Issues in City Economic Policy*. Washington, D.C.: National League of Cities.

_____. 1988. "Competition for Economic Development among Southeastern Cities." *Urban Affairs Quarterly* 23(4): 511–527.

Bradbury, Katharine L., Yolanda K. Kodrzycki, and Robert Tannenwald. 1997. "The Effect of State and Local Public Policies on Economic Development: An Overview." *New England Economic Review* (March/April): 1–12.

Brueckner, Jan K. and Richard W. Martin. 1995. *Spatial Mismatch: An Equilibrium Analysis*. Photocopy. Department of Economics, University of Illinois, Urbana-Champaign.

Burnier, DeLysa. 1992. "Becoming Competitive: How Policymakers View Incentive-Based Development Policy." *Economic Development Quarterly* 6(1): 14–24.

Burstein, Melvin L,. and Arthur J. Rolnick. 1995. "Congress Should End the Economic War among the States." Federal Reserve Bank of Minneapolis. *The Region* 9(1): 1–13.

Butler, Stuart M. 1991. "The Conceptual Evolution of Enterprise Zones." In *Enterprise Zones: New Directions in Economic Development*, Roy E. Green, ed. Newbury Park, California: Sage, pp. 27–40.

Cable, Gregory, Richard C. Feiock, and Jaehoon Kim. 1993. "The Consequences of Institutionalized Access for Economic Development Policy Making in U.S. Cities." *Economic Development Quarterly* 7(1): 91–97.

Cameron, Helen A. 1969. "Property Taxation as a Location Factor." *Bulletin of Business Research* 44(April): entire issue.

Chapman, Jeffrey I. 1996. *Tax Increment Financing as a Tool of Redevelopment*. Photocopy. Sacramento School of Public Administration, University of Southern California.

Charney, Alberta H. 1983. "Intra-metropolitan Manufacturing Location Decisions and Local Tax Differentials." *Journal of Urban Economics* 14(2): 184–205.

Citizen's Research Council of Michigan. 1986. *Municipal Government Economic Development Incentive Programs in Michigan*. Detroit.

Cornia, Gary C., William A. Testa, and Frederick D. Stocker. 1978. *State and Local Fiscal Incentives and Economic Development.* Columbus, Ohio: Academy for Contemporary Problems.

Courant, Paul N. 1994. "How Would You Know a Good Economic Development Policy If You Tripped over One? Hint: Don't Just Count Jobs." *National Tax Journal* 47(4): 863–881.

Dardia, Michael. 1998. *Subsidizing Redevelopment in California*. San Francisco: Public Policy Institute of California.

Downs, Anthony. 1994. *New Visions for Metropolitan America*. Washington, D.C.: Brookings Institution. Cambridge, Massachusetts: Lincoln Institute of Land Policy.

Eberts, Randall W., and Timothy J. Gronbert. 1988. "Can Competition among Local Governments Constrain Government Spending?" *Federal Reserve Bank of Cleveland Economic Review* 24: 2–9.

Ewing, Reid. 1997. "Is Los Angeles-Style Sprawl Desirable?" *Journal of the American Planning Association* 63(1): 107–126.

Fernandez, Roberto M. 1994. "Race, Space, and Job Accessibility: Evidence from a Plant Location." *Economic Geography* 70(4): 390–416.

Finney, Miles. 1994. "Property Tax Effects on Intra-Metropolitan Firm Location: Further Evidence." *Applied Economics Letters* 1(2): 29–31.

Fischel, William A. 1975. "Fiscal and Environmental Considerations in the Location of Firms in Suburban Communities." In *Fiscal Zoning and Land Use Controls*, E.S. Mills and W.E. Oates, eds. Lexington, Massachusetts: Lexington Books, pp. 119–174.

_____. 1981. "Is Local Government Structure in Large Urbanized Areas Monopolistic or Competitive?" *National Tax Journal* 34(1): 95–104.

_____. 1985. *The Economics of Zoning Laws*. Baltimore: Johns Hopkins University Press.

Fisher, Peter S., and Alan H. Peters. 1997. "Tax and Spending Incentives and Enterprise Zones." *New England Economic Review* (March/April): 109–130.

Fisher, Ronald C. 1995. *State and Local Public Finance*. Second ed. Chicago: Irwin.

Fisher, Ronald C., and Janet E. Kohlhase. 1986. "Fiscal Problems and Policies of the Cities." In *Michigan's Fiscal and Economic Structure*, Harvey E. Brazer and Deborah S. Laren, eds. Ann Arbor: University of Michigan Press, pp. 854–892.

Floyd, J. S., Jr. 1952. *Effects of Taxation on Manufacturing Location.* Chapel Hill: University of North Carolina Press.

Fosler, Scott R. 1988. *The New Economic Role of American States: Strategies in a Competitive World Economy.* Oxford and New York: Oxford University Press.

Fox, William F. 1981. "Fiscal Differentials and Manufacturing Location: Some Empirical Evidence." *Urban Studies* 18(1): 105–111.

Garreau, Joel. 1991. *Edge City: Life on the New Frontier.* New York: Anchor Books.

Glastris, Paul. 1989. "Holdup in the Windy City." *U.S. News and World Report* (July 17): 40–41.

Goetz, Edward G., and Terrence Kayser. 1993. "Competition and Cooperation in Economic Development: A Study of the Twin Cities Metropolitan Area." *Economic Development Quarterly* 7(1): 63–78.

Gordon, Peter, and Harry W. Richardson. 1997. "Are Compact Cities a Desirable Planning Goal?" *Journal of the American Planning Association* 63(1): 95–106.

Green, Roy E. 1991. *Enterprise Zones: New Directions in Economic Development*. Newbury Park, California: Sage.

Greene, William H. 1990. *Econometric Analysis*. New York: Macmillan.

_____. 1992. *Limdep Version 6.0: User's Manual and Reference Guide.* Bellport, New York: Econometric Software Incorporated.

Gujarati, Damodar. 1995. *Basic Econometrics*. Third ed. New York: McGraw-Hill.

Hahn, Paul. 1996. Quoted in "Campbell Soup Gets County Incentives," *Sacramento Bee*, p. B1, October 2.

Heckman, James J. 1979. "Sample Selection Bias as a Specification Error." *Econometrica* 47: 153–161.

Holmes, Thomas J. 1995. "Analyzing a Proposal to Ban State Tax Breaks to Business." *Federal Reserve Bank of Minneapolis Quarterly Review* 9(2): 29–39.

Holzer, Harry J. 1991. "The Spatial Mismatch Hypothesis: What Has the Evidence Shown?" *Urban Studies* 28(1): 105–122.

_____. 1996. *What Employers Want: Job Prospects for Less-Educated Workers*. New York: Russel Sage Foundation.

Holzer, Harry J., Keith R. Ihlanfeldt, and David L. Sjoquist. 1994. "Work, Search, and Travel among White and Black Youth." *Journal of Urban Economics* 35(3): 320–345.

Huddleston, Jack R. 1984. "Tax Increment Financing as a State Development Policy." *Growth and Change* 15(2): 11–17.

Ihlandfelt, Keith R. (1992a). "Intra-urban Wage Gradients: Evidence by Race, Gender, Occupational Class, and Sector." *Journal of Urban Economics* 32(1): 70–91.

_____. (1992b). *Job Accessibility and the Employment and School Enrollment of Teenagers*. Kalamazoo, Michigan: W.E. Upjohn Institute for Employment Research.

Johnston, Samuel. 1775. *A Journey to the Western Islands of Scotland*. Mary Lascelles, ed. New Haven: Yale University Press.

Kain, John F. 1968. "Housing Segregation, Negro Employment, and Metropolitan Decentralization." *Quarterly Journal of Economics* 82: 175–197.

Kanji, Gopal K. 1995. *100 Statistical Tests*. Thousand Oaks, California: Sage.

Kenyon, Daphne A. 1997. "Theories of Interjurisdictional Competition." *New England Economic Review* (March/April): 13–28.

Ladd, Helen F. 1994. "Spatially Targeted Economic Development Strategies: Do They Work?" *Cityscape* 1(1): 193–218.

Levy, John M. 1981. *Economic Development Programs for Cities, Counties, and Towns*. New York: Praeger.

Lowery, Kevin. 1996. Quoted in "Campbell Soup Gets County Incentives," S*acramento Bee*, p. B1, October 2.

Luce, Thomas F., Jr. 1994. "Local Taxes, Public Services, and the Intra-metropolitan Location of Firms and Households." *Public Finance Quarterly* 22(2): 139–167.

Lynch, Robert G. 1996. *Do State and Local Tax Incentives Work?* Washington, D.C.: Economic Policy Institute.

Masters, Stanley H. 1974. "A Note on John Kain's Housing Segregation, Negro Employment, and Metropolitan Decentralization." *Quarterly Journal of Economics* 88: 505–519.

Mattey, Joe, and Mark Spiegel. 1997. "On the Efficiency Effects of Tax Competition for Firms." *The Economic War among the States*. Minneapolis: Minnesota Public Radio.

McEntree, Gerald W. 1997. "The Problem with State Bidding Wars and Some Possible Remedies." *The Economic War among the States*. Minneapolis: Minnesota Public Radio.

McGuire, Therese J. 1983. "Firm Location in a Tiebout World." *Journal of Regional Science* 23(2): 211–222.

_____. 1992. Review of *Who Benefits from State and Local Economic Development Policies*? by Timothy J. Bartik. *National Tax Journal* 45(4): 457–459.

McHone, W. Warren. 1984. "State Industrial Development Incentives and Employment Growth in Multistate SMSAs." *Growth and Change* 15(4): 8–15.

_____. 1986. "Supply-Side Considerations in the Location of Industry in Suburban Communities: Empirical Evidence from the Philadelphia SMSA." *Land Economics* 62(1): 64–73.

McMillen, Daniel P. 1993. "Can Blacks Earn More in the Suburbs? Racial Differences in Intra-Metropolitan Earnings Variation." *Journal of Urban Economics* 33(2): 135–150.

Michigan Department of Commerce. 1985. *Property Tax Incentives.* Two-page handout. Lansing.

Michigan Department of Treasury. 1984. *Tax Expenditure Analysis of Public Act 255.* Taxation and Economic Policy Office, Lansing.

Mieszkowski, Peter, and Edwin S. Mills. 1993. "The Causes of Metropolitan Suburbanization." *Journal of Economic Perspectives* 7(3): 135–148.

Mills, Edwin S., and Luan Sendé Lubuele. 1997. "Inner Cities." *Journal of Economic Literature* 35(2): 727–756.

Mirer, Thad W. 1995. *Economic Statistics and Econometrics*. Third ed. New York: Prentice Hall.

National Association of State Development Agencies (NASDA). 1983, 1986, 1991. *Directory of Incentives for Business Investment and Development in the United States.* Washington, D.C.: Urban Institute Press.

Netzer, Dick. 1991. "An Evaluation of Interjurisdictional Competition through Economic Development Incentives." In *Competition Among State and Local Governments: Efficiency and Equity in American Federalism*, Daphne Kenyon and John Kincaid, eds. Washington, D.C.: Urban Institute Press, pp. 221–245.

Newman, Robert J., and Dennis H. Sullivan. 1988. "Econometric Analysis of Business Tax Impacts on Manufacturing Location: What Do We Know, and How Do We Know It?" *Journal of Urban Economics* 23(2): 215–234.

Nunn, Samuel. 1994. "Regulating Local Tax Abatement Policies: Arguments and Alternative Policies for Urban Planners and Administrators." *Policy Studies Journal* 22(4): 574–588.

Oakland, William H. 1978. "Local Taxes and Intra-urban Manufacturing Location: A Survey." In *Metropolitan Financing and Growth Management Policies*, George F. Break, ed. Madison: University of Wisconsin Press, pp. 13–30.

Offner, Paul, and Daniel H. Saks. 1971. "A Note on John Kain's Housing Segregation, Negro Employment, and Metropolitan Decentralization." *Quarterly Journal of Economics* 85: 147–160.

O'Sullivan, Arthur J. 1999. *Urban Economics.* Fourth ed. Chicago: Irwin McGraw Hill.

Papke, James A., and Leslie E. Papke. 1986. "Measuring Differential Tax Liabilities and Their Implications for Business Investment Decisions." *National Tax Journal* 39(3): 357–366.

Papke, Leslie E. 1987. "Subnational Taxation and Capital Mobility: Estimates of Tax Price Elasticities." *National Tax Journal* 40(2): 191–204.

_____. 1991. "What Do We Know about Enterprise Zones?" In *Tax Policy and the Economy*, James M. Poterba, ed. Cambridge, Massachusetts: National Bureau of Economic Research and MIT Press, pp. 37–72.

_____. 1994. "Tax Policy and Urban Development: Evidence from the Indiana Enterprise Zone Program." *Journal of Public Economics* 54(1): 37–49.

Parker, R.A. 1982. "Local Tax Subsidies as Stimulus for Investment: Are They Cost Effective?" *City Almanac* 16 (5-6): entire issue.

Pearce, David W. 1983. *The Dictionary of Modern Economics*. Cambridge: MIT Press.

Phillips, Joseph M., and Ernest P. Goss. 1995. "The Effects of State and Local Taxes on Economic Development: A Meta-Analysis." *Southern Economic Journal* 62(2): 297–316.

Raphael, Steven. 1998. "The Spatial Mismatch Hypothesis and Black Youth Joblessness: Evidence from the San Francisco Bay Area." *Journal of Urban Economics* 43(1): 79–111.

Rasmussen, David W., Marc Bendick, and Larry C. Ledebur. 1984. "A Methodology for Selecting Economic Development Incentives." *Growth and Change* 15(1): 18–25.

Reinhard, Richard T., and Brian D. Scott. 1993. "Downtown Management Districts: Leadership and Stability for North America's Downtowns." *Public Budgeting and Finance* 13(1): 107–111.

Rubin, H. J. 1988. "Shoot Anything That Flies; Claim Anything That Falls." *Economic Development Quarterly* 2(3): 236–251.

Rubin, Marilyn Marks. 1991. "Urban Enterprise Zones in New Jersey: Have They Made a Difference?" In *Enterprise Zones: New Directions in Economic Development*, Roy E. Green, ed. Newbury Park, California: Sage.

Schmenner, Roger W. 1982. *Making Business Location Decisions.* Englewood Cliffs, New Jersey: Prentice-Hall.

Schmitt, Neil, Philip Marcus, Sandra Gleason, and Bruce Pigozzi. 1985. "How Business Leaders View Plant Expansion and Relocation." *The Michigan Economy* 4(4). Detroit: Wayne State University.

Sjoquist, David L. 1995. "Black-White Wage and Employment Differentials: The Spatial Mismatch Hypothesis." In *Readings in Public Policy*, J. Michael Pogodzinski, ed. Cambridge, Massachusetts: Blackwell, pp. 111–142.

Southeast Michigan Council of Governments (SEMCOG). 1990. *Tax Incentives/Tax Abatements in Southeast Michigan*. Detroit.

Testa, Willliam A., and David R. Allardice. 1988. "Bidding for Business." *Chicago Fed Letter* no. 16, December.

Thomas, Ann R. 1982. "Manufacturing Revenue Bonds." In *Michigan's Fiscal and Economic Structure*, Harvey E. Brazer and Deborah S. Laren, eds. Ann Arbor: University of Michigan Press.

Tiebout, Charles M. 1956. "A Pure Theory of Local Expenditures." *Journal of Political Economy* 64(5): 416–424.

Trowbridge, Gordon. 1999. "Suburbs War over Tax Breaks." *Detroit News*, July 30.

U.S. Bureau of the Census. 1970, 1980, and 1990. *Characteristics of Population—Michigan*. Washington, D.C.

U.S. Department of Commerce. 1995. *Statistical Abstract of the United States*. Washington, D.C.

Voith, Richard. 1992. "City and Suburban Growth: Substitutes or Compliments?" *Federal Reserve Bank of Philadelphia Business Review* (September/October): 21–33.

Wassmer, Robert W. 1989. "Taxes, Property Tax Abatement, Expenditure, and the Composition of the Property Tax Base in Communities within a Metropolitan Area." Ph.D. dissertation, Michigan State University.

_____. 1990. "Local Fiscal Variables and Intra-Metropolitan Firm Location: Regression Evidence from the United States and Research Suggestions." *Environment and Planning C: Government and Policy* 8: pp. 283–296.

_____. 1992. "Property Tax Abatement and the Simultaneous Determination of Local Fiscal Variables in a Metropolitan Area." *Land Economics* 68 (3): 263–282.

_____. 1993. "The Use and Abuse of Economic Development Incentives in a Metropolitan Area." In *Proceedings of the Eighty-Sixth Annual Conference on Taxation.* Columbus, Ohio: National Tax Association, pp. 146–157.

_____. 1994. "Can Local Incentives Alter a Metropolitan City's Economic Development?" *Urban Studies* 31(8): 1251–1278.

Wassmer, Robert W., and Ronald C. Fisher. 1997. "Time, Tiebout, and Transition in the Structure of Local Government in U.S. Metropolitan Areas." Public Policy working paper 97-07. California State University, Sacramento.

Wasylenko, Michael J. 1980. "Evidence of Fiscal Differentials and Intra-Metropolitan Firm Relocation." *Land Economics* 56(3): 339–349.

Webber, Michael J. 1986. *Manufacturing Location. Scientific Geography Series*, vol. 3. Beverly Hills, California: Sage.

Weimer, David L., and Adrian R. Vining. 1992. *Policy Analysis: Concepts and Practice*. Second ed. Englewood Cliffs, New Jersey: Prentice Hall.

White, Michelle J. 1975. "Firm Location in a Zoned Metropolitan Area." In *Fiscal Zoning and Land Use Controls*, E.S. Mills and W.E. Oates, eds. Lexington, Massachusetts: Lexington Books, pp. 119–174.

Wilson, William Julius. 1987. *The Truly Disadvantaged*. Chicago: University of Chicago Press.

Wolkoff, Michael J. 1982. "Tax Abatement as an Incentive to Manufacturing Location." In *Michigan's Fiscal and Economic Structure*, Harvey E. Brazer and Deborah S. Laren, eds. Ann Arbor: University of Michigan Press, pp. 281–305.

_____. 1985. "Chasing a Dream: The Use of Tax Abatements to Spur Urban Economic Development." *Urban Studies* 22(4): 305–315.

Wolman, Harold, and David Spitzley. 1996. "The Politics of Local Economic Development." *Economic Development Quarterly* 10(2): 115–150.

Yinger, John, Axel Borsch-Supan, Howard Bloom, and Helen F. Ladd. 1988. *Property Taxes and House Values*. San Diego: Academic Press.

Zax, Jeffrey S. 1989. "Quits and Race." *Journal of Human Resources* 24(3): 469–493.

_____. 1990. "Race and Commutes." *Journal of Urban Economics* 28: 336–348.

Zax, Jeffrey S., and John F. Kain. 1991. "Commutes, Quits, and Moves." *Journal of Urban Economics* 29(2): 1–13.

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The W.E. Upjohn Institute for Employment Research is a nonprofit research organization devoted to finding and promoting solutions to employment-related problems at the national, state, and local levels. It is an activity of the W.E. Upjohn Unemployment Trustee Corporation, which was established in 1932 to administer a fund set aside by the late Dr. W.E. Upjohn, founder of The Upjohn Company, to seek ways to counteract the loss of employment income during economic downturns.

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