In early 1994, IPSCO steel corporation, which had been negotiating with several states regarding the location of a new steel mill, was offered a $75.6 million package of incentives by the State of Iowa if the company located its plant along the Mississippi River in Muscatine County, Iowa. The package included several new incentives available only in the “Quality Jobs Enterprise Zone” created especially for IPSCO: a complete exemption from local property taxes on all manufacturing machinery and equipment in IPSCO’s plant, exemption from paying sales tax on construction materials and services, and a 10 percent investment tax credit. The package also included incentives from programs already in existence: a $1.5 million grant from a state program to build access roads, a $1 million forgivable loan from the Community Economic Betterment program, $0.5 million from the state’s Economic Development Set-Aside Program, a $1.2 million job training agreement (under the “260E” program) with the local community college, and creation of an economic development TIF (Tax Increment Financing) district that would divert almost all of the property taxes on the building over the next 10 to 12 years to retire bonds issued to pay for plant construction costs.

This is not the end of the story. The county government agreed to cover about $1.5 million in additional infrastructure costs, and IPSCO also benefited from the New Jobs Tax Credit program, providing corporate income tax credits based on the 300 new jobs promised. Furthermore, the company’s bottom line was undoubtedly enhanced by Iowa’s corporate income tax system which, despite a high 12 percent marginal tax rate, imposes very low taxes on corporations such as IPSCO that export most of their output. This occurs through the use of single-factor apportionment, whereby a firm’s total U.S. profits are apportioned to Iowa solely according to the percentage of total sales that are destined for Iowa.
This incentive package illustrates the whole range of economic development incentives offered to expanding and relocating firms in the United States. We divide these incentives into five classes, from the most specific to the most general:

(A) One-time deals negotiated with a specific firm, such as the property tax exemption granted exclusively for IPSCO or an agreement to finance road access to a site.

(B) Grants and loans provided under programs that receive annual state appropriations, where the firm must apply for funding.¹

(C) Programs with established parameters and limits but with some degree of local government discretion allowed. This would include property tax abatements in some places (where the abatement is discretionary or the abatement schedule can vary) and TIF districts. These programs require no explicit funding, and so have no annual limits statewide.

(D) Tax incentives that function as entitlements: investment tax credits or jobs tax credits under the state corporate income tax, and local property tax abatements in many places. Here the firm receives the benefit automatically, provided the investment is in an eligible sector and the size of the investment or number of new jobs exceeds some threshold. There may be geographic targeting: enterprise zones are the major example.

(E) Features of the tax code that apply to every corporation, but benefit some more than others and are often advertised by economic development agencies as reasons to locate in that state. Examples are single-factor apportionment, exemption of inventories from property taxation, and exemption of fuel and utilities from the sales tax.

Much of the popular debate over economic development incentives has focused on deals that states have negotiated to attract a major new industrial facility, while most research has been concerned with measuring the effects of the average level of business taxation or public services on economic growth. The average effective tax rates employed in such studies presumably reflect differences only of the type E variety, though some state-level type D incentives may be reflected as well. Only a modest amount of research has focused on entitlement incentives (type D), including studies of enterprise zones, and an even smaller body of research on nontax discretionary incentives. Little systematic research has been conducted on the one-time deals.

This raises several questions:

- Do incentives work? Does the research on incentives corroborate the findings on the effects of taxes and spending generally?
- How should tax and spending incentives be measured?
- What do we know about the relative size and importance of the various kinds of incentives, and of enterprise zone incentives versus other kinds? Does incentive competition narrow the differences across sites in terms of the after-tax return available?
- What are “firm-specific incentives” anyway, and could they be outlawed?

We have discussed the last question elsewhere (Fisher and Peters 1996a). Suffice it to say here that the practical difficulties in defining the firm-specific incentives that would be prohibited seem insurmountable, and that the efficiency arguments against such deals apply with nearly equal force to discretionary incentives and entitlements. Furthermore, banning firm-

¹ The agency typically will have some discretion in awarding funds and, in some instances, will apply eligibility criteria and clawback provisions. These grants and loans are usually applied to the cost of capital, but are also provided for infrastructure and job training.
specific deals may simply accelerate the process by which unique incentives are turned into established programs.  

In the remainder of this paper, we review the existing literature related to the first question above: What do we know about the effects of development incentives and enterprise zones on investment and job growth? We also draw on our own research to address the second and third questions.

The Impact of Development Incentives

It should be obvious that to claim any benefits from economic development policy we must be reasonably sure that it works—that incentives can reasonably be expected to influence the investment behavior of expanding and relocating firms. From a theoretical perspective, taxes and development incentives are a spatially variable business cost, and thus should influence location and investment decisions at the margin. However, the costs of locally supplied labor are about 14 times state and local business tax costs. Regional variations in construction, transportation, and energy costs are often larger than variations in state and local taxes and, presumably, development incentives. The result is that small differences in labor and other costs can outweigh quite large differences in tax costs and incentive awards. Cornia, Testa, and Stocker (1978, p. 2) find that “a mere 2 percent difference in wages could offset as much as 40 percent in taxes.” Thus some have claimed that where taxes and development incentives do influence location decisions, it is largely as tie-breakers between essentially similar locations (Schneider 1985). Unfortunately, our ability to measure the impact of incentives on location and investment decisions is circumscribed by often significant (and variable) time lags between the introduction of a policy instrument, spending allocations to that instrument, offers to individual firms, investment decisions on the part of a particular firm, the actual construction of a factory by the investing firm, and the achievement of a “normal” employment level at the factory site.

While a large literature exists on the investment and locational impacts of state and local taxes, much less work has been done on nontax or firm-specific development incentives. Part of the reason for this is the difficulty in measuring a locality’s commitment to or generosity with incentives. In the United States, four methods of evaluating the impact of state and local taxes on growth have been developed: (1) econometric models of the impact of taxes on growth; (2) surveys of people making location and investment decisions; (3) hypothetical firm models looking at the effect of spatial tax differentials on a firm’s income; and (4) general equilibrium models. The development incentive literature has generally followed the tax literature, except that considerable work has been done using one further method—(5) case studies of particular incentives—and there is no work using the general equilibrium approach. This section of our review focuses mainly on the econometric studies. Later sections—on enterprise zones—pay greater attention to the survey and case-study literatures. We also cover some recent results using the hypothetical firm method.

The Econometric Method

The econometric literature is very large indeed, but nearly all published models concern taxes. Moreover, of the tax models, very few have included data on local abatements or the various tax credits commonly in use at either the state and local levels. With a few notable exceptions, most models merely use effective tax rates (ETRs) as the exogenous tax variable within the location equation. Effective tax rates are calculated by dividing gross receipts (say, corporate income and franchise tax receipts) by some base (employment or population). Econometric models have been developed for various spatial scales and for a number of different state and local taxes. “Aggregate” or “macro” models have used state and local growth measures such as “levels of” or “changes in” employment, Gross State Product, per capita personal income, new plant openings, birth rates of small firms, and so on. “Micro” models, often using conditional logit techniques, focus on the decision to locate a new plant. The models also range widely in their technical sophistication—from simple regressions with poorly specified locality growth variables, no treatment of time lags in the growth variable, or fixed-effects con-

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trols or endogeneity in the explanatory variables, to considerably more complex models which address most, if not all, of these issues. Almost all develop equations that use local labor costs, transportation costs, energy costs, infrastructure provision, tax costs and so on—in other words, the traditional location factors—to explain local growth. A number of impressive reviews of this tax literature have been published in the recent past, and we will not repeat that work here. While no definite conclusions can be reached on the basis of the extant literature, there is a growing consensus that "The most recent studies, employing more detailed data sets and more refined econometric techniques, have generated results which cast some doubt on the received conclusion that tax effects are generally negligible" (Newman and Sullivan 1988, p. 232). Bartik (1991), in what is probably the most comprehensive assessment of recent research to date, generally supports Newman and Sullivan's conclusions. The reason for this change is that the more recent work is technically and empirically more sophisticated and thus better able to describe the relationship between taxes and growth. However, it is important to note that there have been dissenting voices. McGuire (1993), who has herself produced significant work indicating that taxes do influence growth, argues that Bartik claims too much. In particular, McGuire is concerned that some studies that found that state taxes significantly affect growth have not been replicable and are not robust to changes in specification or time period. She argues that the recent literature is as contradictory and inconclusive as the earlier literature.

The situation with regard to nontax development incentives is that much worse. The literature is tiny and focused over a wide range of incentive types. Moreover, with the possible exception of work on industrial development bonds (IDBs), measures of the state and local development incentive effort are crude and almost certainly misrepresent the true development incentive position of states and cities. Thus, results in the extant literature are preliminary, to say the very least.

Two early and important papers were written by Dennis Carlton (1979, 1983). Carlton (1979) looked at the impact of taxes and incentives on the generation of single-establishment firms and branch plants across standard metropolitan statistical areas (SMSAs, now MSAs). The study focused on three industries. The 1983 paper modeled both the location and employment choices of new branch plants, again across SMSAs. Both these studies have been very important in the tax and growth literature and have been widely discussed. Our interest is in the measurement of development incentives and Carlton's empirical estimates of their impact on growth.

A single "business climate" variable was constructed as an index reflecting the number of state incentives provided to business. The index counted positively revenue and obligation bond financing, state loans for construction and equipment, corporate tax exemptions, property tax exemptions, accelerated depreciation, state programs on research and development, state right-to-work laws, and so on; the index counted negatively state minimum wage laws, state fair employment practice codes, and so on. In both papers the various tax variables were statistically insignificant and often had the wrong sign. The business climate index—essentially a counting of development incentives offered—performed as poorly. Carlton (1983, p. 447) concludes: "We find no support for the view that a favorable 'business climate' alone can substantially stimulate new locational activity for branch plants."

A number of other studies conducted during the 1980s included a "business climate" variable. How-

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4. For instance, Plaut and Pluta (1983) analyzed the aggregate percentage change in employment in gh states during the 1967-72 and 1972-77 periods. They included two business climate variables. The first of these used a principal components index that explained 90 percent of the variance of the Fantus and COSMA (Alexander Grant) business climate rankings. Plaut and Pluta (1983) found that business climate, like taxes, was not significantly related to overall state industrial growth but was significantly related to state employment and capital stock growth. However, since the business climate variables used mostly reflect state variation in average factor and tax costs, it is entirely unclear what the direct relationship is between the provision of development incentives and employment and capital stock growth.
ever, in most cases the incorporation of such variables into econometric models of growth provided only a broad measure of a state's or city's pro-business investment attitudes. Seldom did such variables measure directly the development incentives available in a state or locality. Our focus is on studies, such as Carlton (1979), where the provision of development incentives is measured directly.

Wasylenko (1988), updating earlier work by Wasylenko and McGuire (1985), examined the percentage change in state employment between 1980 and 1985. Among the various fiscal variables entered into different equations was a counting of financial incentive programs. Wasylenko found that development incentives were significantly associated with lower total employment growth and with lower employment growth in manufacturing and retail trade. The association was statistically insignificant for the other industries tested. However, the number of employment training programs did appear to have the desired effect. They had a statistically significant and positive effect on total manufacturing employment growth. He writes that "one cannot reject that fiscal variables may influence firm location" (Wasylenko 1988, p. 20). He also points out that few studies have explicitly addressed the impact of nontax financial incentives; those few studies suggest little effect (p. 23).

In an important variation of this method, Walker and Greenstreet (1990) conducted an extensive survey of 540 new manufacturing plants in the Appalachian region. They then performed various analyses of the data. Incentives (such as site-specific infrastructure, low-interest loans, training subsidies, land and building and tax breaks) were treated as dummy variables. In one set of equations, the presence of an incentive resulted in the incentive dummy being coded "1," while in another set, if the incentive package dominated competing packages, the variable was coded "1." Two different sorts of analyses were undertaken. In the first, location decisions were modeled using discrete choice analysis. In these equations, incentives were consistently and significantly related to location decisions. In the second, on-site employment expansion was examined through a two-stage, generalized least-squares model. In these equations the various programs, though still treated dichotomously, were differentiated by type (for example, leasing, job training, interest subsidy, and so on). They found that such government programs have done "little to accelerate expansion of establishment employment once a plant is operating" (Walker and Greenstreet 1990, p. 24).

While incentive offerings can be effective in attracting industry at the local level, the authors nevertheless caution that their analysis leaves unanswered a number of important questions. In particular, since their work covered Appalachia only, they are unable to estimate the utility of incentives at higher scales in the search hierarchy. In particular, "if incentives work exclusively at the sub-regional level, regional policy based on them could lead to wasteful, intra-regional competition" (Walker and Greenstreet 1990, p. 25).

Of course, research that relies, in one form or another, on simple program counting measures, such as Carlton's (1979, 1983), Wasylenko's (1988), and Wasylenko and McGuire (1985), may seriously misrepresent a state's or city's commitment to economic development and the generosity of the incentives provided. Fisher and Peters (1996a, pp. 3-3 and 3-4) in a detailed survey of development officials in 24 states found the following examples: (1) programs on the books and in incentive directories that no longer are, or never were, funded; (2) states that consolidated several programs into one program or split a program into parts, without actually changing the actual incentives available; (3) states with several programs providing essentially the same thing, such as loans, but in slightly different circumstances; (4) similar sounding programs that are of very dissimilar magnitude because of differences in program constraints or ceilings; (5) multiple programs in one state that provide less of value to business, taken together, than a single large program in another state; and (6) multiple programs that are independent and additive in one state, but mutually exclusive in another. The number of programs offered by a state or city is clearly close to useless as a summary measure of the state or local economic development effort. Moreover, program counting may result in other problems. Fisher and Peters (1996a) claim that differences can be found in
the levels of coverage (and thus the programs listed) among the various directories of state-level programs (those published by Site Selection, Area Development, and The National Association of State Development Agencies (NASDA)). While an effort has been made to improve information on programs, most previous research has relied on flawed directories. Part of the reason for this problem is that almost no work has defined exactly what constitutes a development incentive.

A small amount of work over the past few years has tried to find better summary measures of the local development effort. Goss (1994), for instance, developed two-stage, least-squares models with state growth rates in enterprises and growth rates in establishments as alternative dependent variables. Exogenous variables covered the usual proxies for the standard set of factor and transaction costs included in such equations (wages, energy prices, personal and corporate taxes, and so on). Economic development—measured by state agency spending figures provided in the NASDA data base—and infrastructure spending were treated as endogenous. Goss finds that economic development spending had a positive impact on the formation of both new enterprises and new establishments. Moreover, the inclusion of economic development spending in the various equations he presents has an important impact on other variables. Notably, in equations that include economic development spending, both state spending on infrastructure and personal and corporate taxes are significantly (and with the appropriate signs) associated with business formation rates. Equations without economic development spending do not exhibit this result. In fact, Goss argues that a possible reason that so much of the extant literature on state and local taxes and growth has not found taxes significant is that they have failed to control for economic development spending.

In a variation on Goss's work, Goss and Phillips (1994) ran a series of similar models but with employment growth rates dependent. Their results are much the same as those of Goss (1994). They find the economic development spending coefficient statistically significant. However, unlike the result using the Goss (1994) models, the inclusion of the economic development variable did not improve the performance of the effective corporate tax rate variable, although Goss and Phillips do find that the incorporation of economic development spending increases the elasticity of personal taxes from $-1.65$ to $-1.88$. The elasticity associated with economic development spending is 0.20. At first glance this number appears small and thus unsuspicious—however, it implies that a mere 10 percent rise in economic development spending would increase state employment by 2 percent. Given the small size of state economic development budgets relative to state employment, the elasticity seems much too optimistic. Goss and Phillips admit that the economic development spending variable may be acting as a proxy for other variables (such as the state business climate) not included in the model, and that the model ignores most substate economic development spending. They conclude that "the impact of economic development spending on employment growth rates may be powerful enough to overcome the negative effect of raising taxes to fund economic development spending within a narrow range of changes" (Goss and Phillips 1994, p. 298).

State development agency spending data from NASDA (in this case, the 1990 data) have also been used by de Bartolome and Spiegel (1997) in models looking at employment growth in manufacturing. Although they find that the state corporate tax rate is a significant determinant of manufacturing employment growth in only one of their models, state spending on economic development is a robust and statistically significant determinant of growth. They claim that their results accord "with the general thrust of the literature that well-targeted development programs have a greater impact than lowering tax rates" (de Bartolome and Spiegel 1997). We do not believe the literature warrants such a conclusion. Overall, the various work using economic development agency spending as an explanatory variable does suggest that spending on development incentives causes employment growth.

However, a major problem with the last three studies reviewed is that economic development expenditure data are very poor indeed. The NASDA (1982, 1986, 1990) expenditure and salary survey data, used in all three, suffer from a number of important problems. Some crucial categories of economic development spending are not included in state development agency expenditure. Loan guarantees, loan subsidies, linked deposit programs, development credit programs, and even long-standing revolving loan funds all present few direct costs to state development agencies but may nevertheless provide the most generous state incentives available. Moreover, in many
states, training expenditures and special economic development infrastructure expenditures are not run out of state economic development agencies. Training programs are often run through, and thus funded by, state labor departments, while economic development infrastructure incentives are typically the responsibility of state departments of transportation. In many states training and infrastructure incentives, taken together, are worth more to a firm than all other economic development incentives (Fisher and Peters 1996a). Moreover, state economic development agency expenditures also include a number of noneconomic development activities, most importantly tourism. Admittedly, in places Goss talks of the economic development effort as recruitment, and he reports that in 1986 states spent a median of 63 percent of their industrial development funds on recruitment. Nevertheless, the NASDA expenditure data are a poor measure of the total economic development effort.

Furthermore, Goss's, Goss and Phillips', and de Bartolome and Spiegel's analyses are conducted at the state level. So too is all the work relying on program-counting measures. This parallels a problem in the tax literature. It may very well be that states with overall low state taxes have transferred more of the nonfederal tax burden to the local level. Similarly, generous state development incentives may make generous local incentives unnecessary, while scarce state resources may induce local governments to increase their spending on economic development. We believe this is indeed the case. Focusing on state taxes and incentives may severely distort actual spatial differentials across the American economy. Finally, some of the most important economic development spending occurs at the local level. Abatements, tax increment financing mechanisms, and the provision of customized infrastructure are often the most generous of all state and local incentives offered to a firm. All three are financed out of local property taxes. In some states, notably Iowa and Missouri, customized job training is also organized at the local level. Focusing merely on state expenditures severely distorts the true level of policy commitment to economic development.

Other work has been much more careful about development incentive measurement. Luger's 1987 study of economic development incentives is a case in point. Luger develops a summary measure of industrial development by measuring expenditures on eight categories of industrial development incentives. Many of these programs are either taxes or broad spending on education. Nevertheless, five—land and building subsidies, the provision of debt and equity capital, subsidized job training, business recruiting and outreach, and research and development support—fall within a more usefully restricted definition of development incentives. Luger then uses regression equations to measure the impact of development incentives on levels of, and changes in, wages and the unemployment rate. His two most important findings are that job training and debt and equity programs may result in lower average wages, but they may nevertheless help reduce unemployment rates. Land and building subsidies, state tax programs, business recruiting, and research and development have no effect on wages or the unemployment rate. However, Gerking and Morgan (1991, pp. 47-48) argue that Luger's somewhat perverse results, on training and debt and equity capital programs on the one hand and wages on the other, could "stem from a failure to eliminate simultaneous equation bias from the estimates or a poor choice of dependent variables."

The Luger index of development effort has been used in a few other studies of investment. Luger and Shetty (1985) used it to look at foreign firms' locational choices, and Woodward (1992) used it to analyze the locational determinants of Japanese manufacturing start-ups at the state level in the United States. The Woodward study is particularly important since it carefully distinguished between location factors at the state and county levels. However, in neither study did the Luger index prove to be statistically significant.

Loh's (1993) recent work tries to resolve some of the measurement issues associated with development incentives.
incentives. Although the paper focuses on only one state, Ohio, it presents what is probably the best use of incentive data thus far. The various equations include a grants variable—the scaled total dollars granted by the county between 1982 and 1990—and similar variables for loans, community development spending, business subsidy spending, and training outlays. Other reasonably standard local location variables, meant to capture labor force quality and amenities, were included in the equations. County employment growth was dependent. Moreover, concentrating on a single state means that these variables are measured consistently over space. The model allows comparisons between incentive types, and the data used provide a much better approximation of the incentive offers available, by county. Loh found that total outlays or total number of projects significantly increase employment growth. Models were run that disaggregated incentives by type. These showed that grants were better predictors of growth than loans, and business subsidies better predictors than training subsidies or community subsidies. Regressions were also run for specific 1-digit industries. Here Loh found that the significance of the coefficients was not uniform across industries.

Although Loh's measurement of development incentives is probably the best in the econometric literature, it is still vulnerable to some serious criticisms. Presumably, it is hoped that development incentives will encourage investment by reducing the costs associated with a particular site. Thus, location models should be able to catch the way in which development incentives reduce the costs experienced by the firm. The problem with all the measures discussed thus far, including Loh's, is that they do not do this. From the point of view of the firm, the benefits associated with a $1 million grant are not the same as those associated with a $1 million loan. Most obviously, the benefits of a loan are determined by the rate, term, and fees associated with that loan; the benefits are not a function of size alone. More worrying for those developing location models, the benefits of a grant, loan, or any other development incentive are mediated by the tax regime experienced by the firm; a $1 million grant does not raise firm income by $1 million. Measures of development incentives need a method of taking these problems into account. We return to this issue later.

The literature on industrial development bonds (IDBs) is better developed than that for any other single economic development instrument. One reason is that IDBs present fewer problems of measurement than most other economic development instruments. Unfortunately interest in IDBs has declined since federal restrictions, particularly the Tax Reform Act of 1986, reduced their importance to local economic development financing. Almost all studies look at bond issuance as the measure of economic development activity.

Hellman, Wassal, and Falk (1976) analyzed the relationship between IDB volume and total state investment in Kentucky. They found a small yet statistically significant relationship between the two. Steinnes (1984) ran a pooled cross-section, time series study of employment across 15 states. The issuance of IDBs was not statistically significant in any of his regressions. McHone (1984) looked at the relationship across 26 multi-state SMSAs. He found no relationship between IDB issuance and employment. A study by Carlino and Mills (1985), conducted at the county level, came to much the same conclusion. Stutzer (1985) found no effect of small industrial revenue bonds on employment growth in Minnesota. However, Marlin (1990), who used recent Treasury data to look at the relationship between IDBs and change in Gross State Product over the 1983-86 period, found that more intensive use of IDBs was positively associated with faster growth in GSP. This relationship was significant when IDBs were measured in per capita terms or measured in proportion to total tax-exempt debt issued by the state. Interestingly, Marlin finds, "a similar relationship could not be established between the volume of other private use tax-exempt bonds and GSP ... it may be that the IDB variable used here is serving as a proxy for the aggressive use of economic development subsidies in general. In this case it would be more accurate to conclude that those states that actively pursued economic development strategies were successful in meeting their objectives" (Marlin 1990, p. 21). As with the more general econometric literature on economic development, the work on IDBs does not support any firm conclusions about the impact of IDB issuance and growth, although the majority of the evidence suggests little impact.

The Survey Technique

In a number of studies, researchers have surveyed executives to determine what role taxes and development incentives play in the firm's relocation and expansion decisions. The surveys often distinguish...
between “must have” location factors and merely “desirable” factors. Since the evidence shows that large manufacturing firms tend to make their final location choice based on a sequential evaluation of factors at successively narrower spatial scales, deciding first on a broad geographic region, then a state, a metropolitan area (or county), a city, and finally, a plant site, some surveys have attempted to distinguish the impact of incentives (and other locational factors) at various spatial scales (Schmenner 1982).

Large manufacturing firms tend to make their final location choice based on a sequential evaluation of factors at successively narrower spatial scales, deciding first on a region, then a state, an area, and finally a plant site.

The Case Study Technique

Some researchers have used variations on the case study method to evaluate the impact of specific economic development programs. The advantage of this method is that the work has covered a variety of different incentive instruments, from enterprise zones, research parks, and property tax abatements to export promotion schemes. Unfortunately, this approach also has major problems. In the first place, incentive programs are often very small relative to the local economy in which they operate. Thus, even where subsidies are effective, measuring their impact on a local economy is rendered difficult by economic white noise—the other local factors that influence growth. Moreover, impact evaluations need to establish some sort of comparative control economy in order to measure the effect of incentives precisely. But choosing a control—in the best of all worlds, the control economy would be identical to the economy receiving the incentive, except that the control would not receive the incentive—is itself fraught with practical methodological and political difficulties.

Not surprisingly, given the range of programs covered, the published research using the single program approach is as contradictory—in terms of both detailed method and results—as the survey-based literature. Moreover, much of the research concerns

that some development incentives are important while others are not, and the confusion in the literature merely reflects this fact. Work by Glaser and Yeager (1990), who attempted a comprehensive survey assessment of the various classes of incentives, appears to support this conclusion. Their research covered everything from tax incentives, capital assistance, property development, and zoning flexibility to labor force development assistance. The study focused on Wichita-Sedgwick County, Kansas. They find that property tax abatements and regulatory flexibility are widely considered important by firms. Direct low-interest loans were the only capital-related incentive to enjoy broad-based support from most business types. More esoteric capital assistance, such as venture capital and incubator funds, was not valued highly by business.

The advantages and disadvantages of the survey technique are well known (Calzonetti and Walker 1991). At their best, surveys provide direct information about the actual siting decisions made by executives. Moreover, the more complex statistical assumptions that beset econometric analyses can be avoided. Unfortunately, survey researchers often have difficulty finding the cohort of individuals within a corporation who were responsible for a particular location decision. Moreover, executives may have a direct interest in saying that incentives are important even if they were not (admitting that an incentive had little effect on one’s location decision might cause later political problems), although, given the findings of the literature, this problem may have been exaggerated. Finally, while surveys may rank the importance of various locational factors, they do not provide a precise measure of the impact of each locational factor on local growth.

The results from the survey-based tax literature are unclear, with some research indicating that incentives are indeed important to location decisions (Premus 1982; Walker and Greenstreet 1989; Calzonetti and Walker 1991; M. Rubin 1991), and other studies indicating the opposite (Morgan 1964; Stafford 1974; Schmenner 1982). Part of the confusion may have to do with research methodology. But it is also possible

10 For recent reviews of the survey literature, see Calzonetti and Walker (1991), Eisinger (1988), and Bair and Premus (1987). For a review of the early literature, see Morgan (1967).

11 Barik (1991) has also provided a recent review of this literature. He finds that the literature is generally supportive of the notion that incentives influence the locational behavior of firms.
issues of fiscal impact or cost-benefit ratios of programs. Apart from the topic of enterprise zones, little work has considered the impact of incentives on location and investment decisions. However, even work focusing on broadly similar types of programs shows discrepant results. For instance, in a recent, widely quoted volume on enterprise zones, one paper found clear evidence of impact success (M. Rubin 1991), while two other papers found little or none (Elling and Sheldon 1991; Grass and Crosse 1991). We will return to these issues in our more detailed discussion of enterprise zones.

The Hypothetical Firm Technique

Given the difficulty of drawing any firm conclusions based on the existing literature, a few researchers have opted for an entirely different approach to the problem of taxes, incentives, and growth. This solution involves looking at the impact local taxes and incentives have on a firm's actual income. In order to accomplish this, researchers build models that replicate the operating ratios, balance sheets, and income and tax statements of real, or at least "potentially" real, firms. This allows researchers to calculate exactly what impact a state's or city's taxes have on a firm's income. Almost all the work in this tradition has looked at comparative tax burdens and has ignored incentives. In a few cases, the results of hypothetical firm studies have been included in econometric analyses of the relationship between taxes and growth (or, at least, taxes and investment). Industry-specific measures of the burden of taxes deriving from the hypothetical firm model replace effective tax rates (ETRs) as one of the independent variables in the econometric equation (Steinnes 1984; L. Papke 1987, 1991; Tannenwald and Kendrick 1995; Tannenwald 1996).

Very little work has used the hypothetical firm method within an explicitly economic development framework, although the benefits of doing so are large. Bartik et al. (1987) analyzed the location of GM's Saturn Plant. Using realistic simulations of transportation, labor, and tax costs they calculated that the best location for the new plant would be Nashville, Tennessee, about 30 miles from the actual site chosen by GM, Spring Hill. They then incorporated estimates of incentives offered to see how these would influence the location decision. For instance, Tennessee's training and property tax subsidies lowered Saturn's cost per car by $34, with $4 of this coming from the training subsidy and $30 from the property tax reduction (Bartik et al. 1987, p. 32). The implication of this finding is that where subsidies result in the lowering of a potential plant's cost structure, they may influence a firm's locational choice. Bachelor (1991) estimated the value of incentives received by Mazda from the state of Michigan. However, neither Bartik et al.'s (1987) nor Bachelor's (1991) work explicitly incorporates economic development incentives such as grants, loans, training awards, and the like into a hypothetical firm framework. We believe one way for research on incentives and growth to move forward is to rigorously implement a hypothetical firm model covering both taxes and nontax economic development incentives.

One way for research on incentives and growth to move forward is to rigorously implement a hypothetical firm model covering both taxes and nontax economic development incentives.

Over the past few years, we have attempted to develop a hypothetical firm model (the Tax and Incentive Model or TAIM) that fully incorporates nontax development incentives (Fisher and Peters 1996a, 1996b). TAIM measures competition among places, based on the dollar value of the locality's standing incentive offer to industrial firms expanding or locating there. The standing offer includes the whole range of competitive incentives over which state or local governments have some direct control. Since incentives may be embedded in tax codes, and since the value of incentives to a firm must be measured net of income tax effects, we also model the federal corporate income tax, each state's and city's corporate income and net worth taxes, the major state and local sales taxes paid by business, and property taxes.

12 Examples of this literature include Papke and Papke (1984), Hunt (1985), Brooks et al. (1986), and Laughlin (1993).
13 Using the Papkes' AFTAX hypothetical firm model.
14 This did not use a hypothetical firm model but a related cost-to-government/benefit-to-firm technique developed by Rasmussen, Bendick, and Ledehur (1984).
We constructed financial statements for 16 hypothetical firms, representing the characteristics of typical large and small firms in each of eight fast-growing manufacturing industries. The model then measures the net returns on a new plant investment, after state, local, and federal taxes, and after state and local competitive incentives. The new plant is located in one of the 24 states that account for most of the manufacturing employment in the United States, and in one of 112 cities, randomly selected from within these 24 states. TAIM allows simultaneous taxing over multiple states—thus, the effects of multi-state taxation across the 50 states are modeled. The firm is assumed to sell to a national market (apportionment formulas and throwback rules are included). The model incorporates federal income taxes and each state's and city's corporate income and net worth taxes; it also includes the major state and local sales and property taxes paid by business.

Tax incentives modeled include state corporate income tax credits for investment or job creation and local property tax abatements. Using a series of computerized expert systems, TAIM also models likely development incentive awards, based on the historical record of each incentive program under consideration. Incentives include all major state and city grants, sales, loan guarantees and subsidies, linked deposits, and tax increment financing instruments, including those restricted to training or infrastructure.

The difference between returns on investment with incentives and returns with only basic taxes modeled measures the value to the firm of the incentives offered. Calculations are done over a 20-year period in order to capture the full effects of incentives. Project returns are the incremental value of cash flow over the 20-year period.

Is there sufficient variation in returns on investment across states and cities that tax and incentive differences could plausibly affect location decisions? Table 1 provides summary information on project returns for each of the 16 firms at the 112 city locations. The coefficient of variation and the range both suggest substantial differences in returns among sites. For instance, the 20-year cash flow difference between a small furniture and fixtures firm investing a new plant in the least profitable city and the most profitable city is just under $1 million. (The small furniture and fixtures plant involves an original asset investment of $5 million.) For the large drugs firm, the difference is $58 million (for an investment of $470 million), for the large motor vehicles firm, also $58 million (for an investment of $600 million). Clearly, these differences are substantively significant—but are they significant enough to influence location decisions?

The last column of Table 1 translates the range between the best and worst cities into wage equivalent figures. Given the level of employment modeled for each plant, and assuming that all employees work a 40-hour week over a 50-week year, what is the present value wage equivalent of the range? For some firms, the results are startling. For the large drugs plant, the differences between the best and worst sites translate into an average hourly wage difference, for the full 20-year period, of $1.82 per employee. Moreover, the spreads between cities at the 80th and 20th percentiles or between the 75th and 25th percentiles, for instance, remain large. Thus, it seems reasonable to conclude that, at least at the extremes, taxes and incentives are potentially large enough to influence location decisions. The worst cities are substantially worse than the best cities. Nevertheless, for most states and cities, small changes to their tax and incentive systems are unlikely to make much of a competitive difference. In hourly wage terms, most cities are separated from the city just above them in rank by less than a penny. We doubt such separation is substantively significant. In fact, a rank position change of as many as 20 places often represents less than a 25-cent difference in hourly wages per employee.

For the handful of cities and states at the top, or the handful at the bottom, of the rankings for any particular firm type, we find very substantial differences in returns between one city or state and the next due to differences in taxes and tax incentives; and the inclusion of nontax incentives very often did little to change the identity of the majority of cities in the top 20 or bottom 20. Mostly, cities that were highly competitive after taxes and tax incentives were also highly competitive after the inclusion of nontax incentives. Overall, nontax incentives do not ameliorate, but actually accentuate, the tax differentials between the best and worst cities.

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15 Together, these 24 states account for about 87 percent of U.S. manufacturing employment.

16 For instance, the expert system would first apply the historical per employee, per investment dollar, per equity dollar average award to the new project to come up with a simulated initial award. Explicit and implicit program rules, and rules governing the award of multiple programs, would then be applied to (usually reduce) this simulated initial award. In the case of multiple competing non-additive programs (for example, two capital grants offered by a state), the final simulated award is the one that minimizes the cost of financing to the firm. Simulated awards are not risk-adjusted according to the probability of receiving an award; thus, the final simulated award represents the likely offer if the firm actually received an award.