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9 The Effect of U.S. State Tax and Investment Promotion Policy on the Distribution of Inward Direct Investment

Deborah L. Swenson

9.1 Introduction

Foreign investment plays an increasingly significant role in the U.S. labor market. By 1992, foreign investment provided more than 5 percent of all U.S. employment, although there was significant variation among the different states. For example, as table 9.1 indicates, while foreign employment represented almost 12 percent of all employment in Delaware and Hawaii, in Montana and South Dakota it accounted for little more than 2 percent of employees. Foreign investment is often seen as desirable for its employment benefits alone. However, it is widely believed that foreign investment may provide other advantages such as knowledge spillovers to host locations as well.¹ In this context, it is not surprising that state governments during the 1980s intensified their efforts to capture a larger fraction of these new investments. It is natural to ask how successful these states were in altering investment outcomes. It is also important to ask how this investment responded to differences in factor market conditions both across the nation and within regions.

The responsiveness of foreign investment to differences in tax and promotion policies intranationally as well as internationally, however, remains a matter of debate. Uncertainty arises in part from the number of ways to measure the volume of foreign investment. Measures include capital investment, the number of new plant investments, and the new employment generated. The more important reason for uncertainty is the difficulty of measuring and characterizing the significance of fiscal and promotion policies. While one may readily observe the existence of various investment inducements, it is difficult to provide an accurate view of the magnitude of the benefits conferred by these

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1. This argument applies particularly to "greenfield" investment.

Table 9.1 **Growth in Foreign Employment by State, 1980–92**

State	1992 Employment ^a		Foreign Percentage ^b		1980–92 Percentage Change ^c
	Foreign	U.S.	1980	1992	
Total	4,705.5	93,022	2.08	5.06	2.98
Connecticut	81.7	1,354	2.36	6.03	3.67
Maine	24.1	428	3.15	5.63	2.48
Massachusetts	113.6	2,508	1.79	4.53	2.74
New Hampshire	27.7	427	2.85	6.49	3.64
Rhode Island	12.3	376	1.62	3.27	1.65
Vermont	7.5	212	2.77	3.54	0.77
Delaware	35.8	302	3.29	11.9	8.56
Maryland	74.8	1,727	2.10	4.33	2.23
New Jersey	216.3	2,962	3.67	7.30	3.63
New York	340	6,552	2.41	5.19	2.78
Pennsylvania	215.3	4,496	2.31	4.79	2.48
Illinois	246.4	4,575	2.22	5.39	3.17
Indiana	126.2	2,226	2.00	5.67	3.67
Michigan	140.4	3,394	1.74	4.14	2.4
Ohio	212.6	4,228	1.85	5.03	3.18
Wisconsin	81.8	2,052	2.78	3.99	1.21
Iowa	32.6	1,062	1.5	3.07	1.57
Kansas	27.4	926	1.28	2.96	1.68
Minnesota	94.1	1,896	1.64	4.96	3.32
Missouri	77.2	2,025	1.44	3.81	2.37
Nebraska	16	626	0.72	2.56	1.84
North Dakota	5.3	217	0.88	2.44	1.56
South Dakota	5.8	248	0.37	2.34	1.97
Alabama	60.7	1,380	1.5	4.4	2.9
Arkansas	30.8	815	1.69	3.78	2.09
Florida	194.9	4,666	1.65	4.18	2.53
Georgia	154.3	2,518	2.89	6.13	3.24
Kentucky	69.4	1,260	1.67	5.51	3.84
Louisiana	62.1	1,325	2.41	4.69	2.28
Mississippi	23.8	771	1.02	3.09	2.07
North Carolina	191.3	2,698	2.59	7.09	4.5
South Carolina	111.1	1,267	4.11	8.77	4.66
Tennessee	121.7	1,933	2.3	6.30	4
Virginia	119.9	2,321	1.58	5.17	3.59
West Virginia	34.1	510	2.75	6.69	3.94
Arizona	52.6	1,298	1.29	4.05	2.76
New Mexico	13.6	462	1.4	2.94	1.54
Oklahoma	43.8	980	1.5	4.47	2.97
Texas	324.4	6,090	2.16	5.33	3.17
Colorado	61	1,355	1.46	4.50	3.04
Idaho	13.5	344	0.97	3.92	2.95
Montana	5.4	254	0.55	2.13	1.58
Utah	22.7	638	1.62	3.56	1.94
Wyoming	5.5	154	1.38	3.57	2.19

Table 9.1 (continued)

State	1992 Employment ^a		Foreign Percentage ^b		1980-92 Percentage Change ^c
	Foreign	U.S.	1980	1992	
California	521.8	10,614	2.06	4.92	2.86
Nevada	23	576	1.15	3.99	2.84
Oregon	43	1,063	0.90	4.05	3.15
Washington	78.7	1,870	1.18	4.21	3.03
Alaska	9.7	179	5.05	5.42	0.37
Hawaii	53	451	3.74	11.7	8.01

Source: Data are taken from the Bureau of Economic Analysis benchmark surveys.

^aNumber of employees in thousands.

^bForeign percentage of overall employment in each state.

^cPercentage change in state employment that is provided by foreign affiliates.

programs. Finally, the implementation of programs is not exogenous. Hence, in determining the value of a new program, further analysis of the governmental unit is important.

This study examines U.S. state employment data between the years 1980 and 1992 to determine the effect of state policies on the interstate distribution of employment by foreign firms. The focus on employment is motivated in part by the fact that little work to date has examined the role of fiscal policies in changing the distribution of foreign employment. In addition, since many state policies are justified by their positive employment effects, it is important to assess the significance of these claims.

Two tools are used to identify the effect of state policies on foreign employment. First, contrary to most treatments of investment, this paper does not assume that all states are equal competitors for foreign investment. Instead, states are assumed to compete most intensely with their neighbors. In other words, there should be a higher degree of substitutability among states within a region than between states located in different regions of the United States. Therefore, tax and factor market variables are measured relative to each state's region rather than to the nation as a whole. Second, foreign firms operating in the United States ultimately face one of two different tax treatments of their U.S.-based income when they repatriate their U.S. earnings to their home countries. The implication of this treatment dichotomy is that some countries will respond more vigorously to interstate tax differences than others. This dichotomy will be used as a further discriminant in testing for fiscal effects.²

The findings of this paper are as follows. Tax effects are not apparent in the

2. This method is introduced in the context of state data by Hines (1996), which studies cross-sectional data on foreign plant, property, and equipment in 1987. In contrast, this paper will study panel data concerning foreign employment.

employment of all nonbank foreign affiliates. However, tax effects are evident once the focus of attention is shifted to foreign manufacturing employment. Presumably, manufacturing employment is more responsive to interregional tax differences since proximity to final markets is less important than it is for nonmanufacturing activity. Further controls for tax system differences facing investors of different nationalities indicate that the intraregional distribution of investment is affected by state taxes. In contrast, state promotion efforts, such as the opening of state investment promotion offices overseas, provide no measurable stimulus to foreign investment. The failure to identify a significant effect for state promotion efforts may arise for any of a number of reasons. It is possible that the interstate subtleties of these state efforts are not easily captured by indicator variables that denote their presence. On the other hand, some states may implement such programs precisely because they are attempting to overcome intrinsic disadvantages in attracting investment. For example, a state whose industrial base has recently deteriorated may institute new policies that succeed in attracting new investment. The effects may not be readily apparent, however, since the policy brings the state back to the national average for states with similar observable characteristics. In addition, if a state adds a new policy tool but it is matched by neighboring states in its region, no net effect may be observed. Finally, it must be recognized that investment responds not only to tax and fiscal variables but also to nontax factors that enhance the attractiveness of one state over others. It is possible that the lack of a positive finding reflects that fact that foreign investors will not be attracted to a state on the basis of information programs unless the state has attractive characteristics.

The organization of this paper is as follows: Section 9.2 describes investment incentives and briefly reviews some previous work on the issue. Section 9.3 provides a model that relates investment decisions to the tax and promotion environment. Description of the data and discussion of relevant employment and fiscal trends are presented in section 9.4. Estimation proceeds in section 9.5, and section 9.6 concludes.

9.2 Background on Investment Incentives

It is natural to expect that, all else equal, increases in state taxes deter investment while state investment promotion efforts encourage investment. However, much research on state taxation finds that investment is only minimally responsive to tax policy.³ That corporate tax rates or average tax payments are not shown to consistently deter investment may mean in part that the revenues collected are used for the provision of infrastructure or services valued by busi-

3. Carlton (1983) is unable to find any significant evidence that state taxes exerted a negative effect on investment. In contrast, Helms (1985) and Wasylenko and McGuire (1985), when looking at employment changes, and Bartik (1985) and Papke (1987, 1991), when looking at industry-specific effective tax rates, discover significant tax effects. Extensive surveys of previous findings are provided by Bartik (1991) and Wasylenko (1994).

nesses. Nonetheless, numerous states during the 1980s made major changes to their tax systems, claiming that they would help to attract and retain investment and consequently raise state employment levels.

More recently, a number of papers have examined the responsiveness of foreign investment to state tax policies. Coughlin, Terza, and Arromdee (1991), Woodward (1992), Friedman, Gerlowski, and Silberman (1992), and Luger and Shetty (1985) study international investment in U.S. states as it relates to state promotion attempts, measured by promotion expenditures, promotion offices and unitary taxes, and an effort index. Dynamic aspects of interstate competition are explored in Head, Ries, and Swenson (1994). This paper creates investment-specific measures of the fiscal incentives to be gained by investors selecting the various states and finds that while state investment promotion measures increased the investment received by one state over the others, in the aggregate states neutralized each other's efforts through emulation. Ultimately, states received the same amount of investment that they would have received in the absence of all programs. In order to identify the tax sensitivity of foreign plant, property, and equipment expenditure, Hines (1996), Slemrod (1990), and Swenson (1994) utilize investor nationality to determine the strength of country response to host-country taxation. Hines's results, which consider the interstate distribution of investment, show that states with higher taxes attract smaller shares of foreign capital equipment and plant investments.

In the international context, there is additional work that has examined the responsiveness of investment to taxes and factor markets. Wheeler and Mody (1992) study the international location of manufacturing investment and investment in the electronics industry. They find that risk and factor conditions, such as wage differences across countries, are important determinants of investment location. Grubert and Mutti (1991) and Hines and Rice (1994) give greater attention to tax conditions. Both studies show that foreign investment is responsive to tax differences. The relationship they note is nonlinear, with particularly low rates of tax creating the greatest location incentives.

However, there are a number of advantages to studying the distribution of foreign investment within the United States, rather than examining the international distribution of investment. To begin with, since almost all states use the federal method for calculating corporate income, the computation of profits by state is less complicated than the calculation of profits across countries. After the computation of profit, each state assesses corporate income taxes on this profit according to apportionment formulas that seek to determine how activities in that state contributed to the firm's overall profits.⁴ In contrast, a firm's international tax payments are based on the profits it is deemed to have earned in various countries. In this context, differences in tax rates can create incentives to shift income between country jurisdictions for tax purposes as a means

4. The most common apportionment formula gives a one-third weight to payroll, sales, and capital. However, in recent years some states are increasing the relative weight placed on sales.

of reducing a foreign firm's tax liability for a given amount of real activity. For example, a multinational can, subject to some limitations, use the location of its financing to affect the amount of profit that is deemed earned and taxable in different locations. In marked contrast, a multinational operating in the United States cannot alter the amounts it pays to New Jersey versus Kansas, for example, by choosing different states for its debt or equity finance. A second advantage to the study of interstate tax differences is that interstate tax payments are not subject to the same timing issues that are present in the payment of international taxes. Foreign firms tend to become liable for home taxes when they repatriate income from host locations to the home country. As a result, it is financial movements, rather than income earning, that triggers tax payments. In the case of state taxes, taxes are based on current-year profits, rather than the timing of intrafirm financial flows that move across borders.

9.3 A Model of Investment

The objective of this paper is to determine the responsiveness of the interstate distribution of foreign employment to wage and fiscal differences between the states. In order to model this decision, we begin with the assumption that foreign firms distribute a fixed amount of new employment, L , across U.S. states.⁵ From the perspective of each individual firm i , labor is allocated to U.S. states in a fashion that maximizes the firm's overall U.S. profits after tax,

$$(1) \quad \Pi_i = f(v_s, \tau_s, p_s).$$

Profits earned by each firm depend on the vector of factor prices in each state, v_s , a vector of each state's tax and promotion efforts, τ_s , and finally a vector of final goods prices, p_s . This profit function governs how much labor, L_s , the firm deploys in each state. Changes in labor demand can now be written as

$$(2) \quad \Delta L_s = \sum_j \beta_j * \Delta v_{sj} + \gamma * \Delta p_s + \delta * \Delta \tau_s.$$

However, since we are examining the geographic distribution of investment, we will now rewrite equation (2) in a way that characterizes changes of employment in state s , relative to overall foreign employment in the United States. It is assumed that there is a single price for final output on national markets, allowing us to remove the price term, Δp_s :

$$(3) \quad \Delta(L_s / L) = \beta_w * \Delta(w_s / w) + \delta * \Delta(\tau_s / \tau).$$

Each of the terms in equation (3) represents the change in the variable in a particular state relative to the average change across all states. Another assump-

5. As is demonstrated by Wheeler and Mody (1992), the *amount* of investment located in the United States will depend, in part, on conditions in the United States relative to other countries. However, we assume that the *distribution* of investment within the United States is unaffected by the international location of non-U.S. investment.

tion that is implicit in equation (3) is that the only factor price that is relevant to the demand for labor is the wage by state. Because the capital market is assumed to operate at the national level, market integration implies that firms will not face interstate differences in the cost of capital. Since it is unlikely that labor markets are integrated to the same degree, the same is not assumed to be true of labor markets. Variants of equation (3) will be used as the basis for estimation.

However, further explanation of the tax coefficient is required. First, the notion that a state will receive less foreign employment if it raises its corporate taxes relative to other states is based on two factors. Naturally, a higher corporate tax rate will subject firms operating in state s to the direct effect of lower after-tax profits. In addition, almost all states use apportionment formulas to determine what fraction of a firm's U.S. earnings will be subject to corporate tax in that state. Each state collects taxes on accounting profits, Π_i^a , that are usually calculated in a similar manner for all states. Total state taxes owed by each firm, Tax_i , are then determined as follows:

$$(4) \quad \text{Tax}_i = \Pi_i^a \sum_s \tau_s [\theta_{sL} (L_{is} / L) + \theta_{sK} (K_{is} / K) + \theta_{sS} (S_{is} / S)].$$

The tax collected by each state is determined by the state's tax rate and by its apportionment formula. The apportionment formula determines the taxation of a firm's income according to a set of weights, θ , that are typically based on the firm's employment payroll, L , capital stock, K , and sales, S , within the state. The weights sum to one: $\theta_{sL} + \theta_{sK} + \theta_{sS} = 1$. As a result, if a firm increases its employment in a state, it increases the income that is subject to tax within that state. This factor creates an additional deterrent to placing employment in higher tax states.⁶

9.4 Data and Foreign Employment Trends

Between the Commerce Department benchmark surveys of foreign investment conducted in 1980 and 1992, employment by foreign nonbank affiliates in the United States more than doubled. Foreign nonbank affiliates provided slightly more than 2 million jobs in 1980. The number had risen to 4.7 million by 1992. Tables 9.2A and 9.2B provide further snapshots of foreign employment in the years 1980 and 1992, including a state and country breakdown of that employment. It is interesting to note that the rate of growth within a state is not uniform across investors. In part, these differences probably reflect the relative industry strengths of the investors of different nationalities.

This study uses employment data from these benchmark surveys for the

6. In recent years some states have worked to mitigate this disincentive to employment by changing the weights of their apportionment formulas to weight sales more heavily and the payroll and capital factors less heavily.

Table 9.2A**Distribution of Employment across States, by Country, 1980**

State	Country				
	Canada	France	Germany	Netherlands	Switzerland
Total	290	206.3	375.9	186.7	157.8
Connecticut	2.3	4.4	5.8		1.9
Maine	6.8			0.5	
Massachusetts	6	1.9	10.3	2.2	1.8
New Hampshire	2.6	1.6	2.5	0.7	
Rhode Island	0.5	0.5	1.3		0.984
Vermont	1.5			0.01	1.7
Delaware	0.5		0.9		0.02
Maryland	9	7.3	8.3	3.3	2.4
New Jersey	5.2	11.4	26.8	9.6	21.1
New York	21.4	18.7	23.3	10.9	19.7
Pennsylvania	13	12.9	31.8	2.9	8
Illinois	16.8	6.9	17	11	16.2
Indiana	5.7	5.5	12.4	9.2	2.7
Michigan	16	10.1	13.2	2.4	2.9
Ohio	9	13.2	15.6	4	12.3
Wisconsin	11.4	10.7	7.2	4.1	2.9
Iowa	6	0.7	2.6	1.3	1.6
Kansas	1.6	2.8	3.1	0.7	0.4
Minnesota	14.3	1.7	3.8	1.3	2.6
Missouri	6.6	1.1	6.6	2.3	2.6
Nebraska	0.8			0.3	1.3
North Dakota	1.3	0.03			0.02
South Dakota	0.5		0.04		0.03

Alabama	2.9	3.4	2.8	1.3	1.9
Arkansas	1.5	2	1.2		0.5
Florida	7.7	9.8	11.9	2.9	4.1
Georgia	10.4	7.1	8.1	6.2	2.1
Kentucky	5.2	1.1	5.1		0.5
Louisiana	4.9	2.2	8.8	8.5	2
Mississippi	2.1	0.9	1.8	0.8	0.9
North Carolina	11.1	4.5	12.6	8.7	3.1
South Carolina	3	8.9	11	10.3	2.5
Tennessee	3.9	3.5	4.6	12.5	5.8
Virginia	3	4.5	8.1	2.1	3
West Virginia	6	1	3.3		0.2
Arizona	3.1	0.7	4.4	0.3	0.6
New Mexico	1.8	0.1	2.3		0.07
Oklahoma	2.7	1.6	5.5		1.4
Texas	16.2	12.1	29.8	21.8	7.3
Colorado	4.6	2.8	3.3	1	1
Idaho	0.7		0.08		
Montana	0.6	0.3	0.3		
Utah	1.6	0.5	1.5		0.2
Wyoming	1.4		0.3		0.1
California	25.6	14.8	44.9	21.7	11.3
Nevada	0.9	0.5	0.9	0.02	0.1
Oregon	2.2	1.9	2.1	0.6	0.5
Washington	4.2	2.5	3.6	1.2	2.2
Alaska	0.8		0.005		0.006
Hawaii	0.8			0.08	0.09

Note: Table reports numbers of employees in thousands. The “total” column may contain a number higher than column includes foreign employment from countries not listed individually.

Table 9.2B

Distribution of Employment across States, by Country, 1992

State	Country					
	Canada	France	Germany	Netherlands	Switzerland	United Kingdom
Total	587.9	358.7	519.5	306.1	295.1	96.0
Connecticut	6.4	8.7	13.9	14.1	6.9	16.0
Maine	11	0.9	0.9	1.3	0.7	5.0
Massachusetts	14.9	11.3	11.1	3.4	5.3	34.0
New Hampshire	7.5	1.5	3	1.2	1.2	8.0
Rhode Island	1.8	0.4	1.9	0.6	1.4	4.0
Vermont	2.4	0.5	0.8	0.4	1.1	6.0
Delaware	17.5	0.5	1.3	0.6	0.5	5.0
Maryland	12	6.6	8.1	7.2	5.8	13.0
New Jersey	19.2	16	29	13.9	27.7	46.0
New York	41.1	28.6	39	31.4	21	81.0
Pennsylvania	25	21.3	30.8	20.8	8.8	58.0
Illinois	27	13.3	26.6	14.3	27.2	53.0
Indiana	13.7	15.6	12.8	9.5	4.9	17.0
Michigan	19.9	10	23.3	4.2	4.5	23.0
Ohio	16.6	15.9	15.7	15.5	16.7	53.0
Wisconsin	12.8	5.3	15	8.5	8.3	13.0
Iowa	5.8	3.4	3.4	2.6	1.7	6.0
Kansas	6.2	2.6	2.6	1.6	2.2	6.0
Minnesota	10.7	3.4	12.7	5.3	6.1	19.0
Missouri	16.1	6.7	6.8	4.6	6.6	13.0
Nebraska	1.5	1.8	3.1	1.2	1.3	3.0
North Dakota	1.8	0.8	0.2	0.3	0.1	0.0
South Dakota	1.5	0.1	0.7	0.9	0.1	0.0

Alabama	7.6	12.8	4	1.6	4.2	8.8	1.9	7.8	60.7
Arkansas	5.8	2.7	0.9	1.8	1.7	4.4	1.4	4.9	30.8
Florida	20.4	18	18.1	9.6	8.3	42.7	4.8	22.1	194.9
Georgia	21.2	12.7	13.1	10.4	10.1	34.5	5.3	21	154.3
Kentucky	10.7	4.7	7.9	2.4	1.8	12.8	1.2	19.1	69.4
Louisiana	10	3.6	7	7.3	2.6	11.6	1	2.3	62.1
Mississippi	4.3	2.2	2.3	0.7	2.7	3.8	1	2	23.8
North Carolina	29	14	29.5	6.7	12.6	43	1.6	13.3	191.3
South Carolina	8.4	15	17.4	18.3	5.1	14	0.6	11.7	111.1
Tennessee	16.9	9.6	7.3	6.2	6.9	30.7	4.7	20.3	121.7
Virginia	15.3	8.5	15.1	4.9	5.7	23.3	0.6	15	119.9
West Virginia	7.1	2.1	7.1	2.8	3.2	7		1.9	34.1
Arizona	10.2	3.9	3.3	1.7	2	7.8	17.5	7.5	52.6
New Mexico	1.3	1.2	2.4	1.5	0.3	1.9	1.8	1.8	13.6
Oklahoma	1.7	5.4	2.5	1.8	1.1	7.1	0.4	4	43.8
Texas	2.4	23.2	26.7	22.4	16.5	66.5	9.1	33.8	324.4
Colorado	0.6	3.6	5.5	2.9	4.3	11	1.5	7.9	61
Idaho	1.3	0.4	7.5	0.2	1	2.8	0.1	0.2	13.5
Montana	1.7	0.3	0.6	0.2	0.2	0.9	0.8	0.3	5.4
Utah	2.4	0.7	3.8	1.4	1.5	6	0.3	1.9	22.7
Wyoming	0.6	1.3	0.7	0.4		1.5			5.5
California	35.9	31.2	48.1	27.3	28.9	97.5	17.3	147.9	521.8
Nevada	4.9	0.7	2.8	2.9	0.3	2.9	1.9	4.4	23
Oregon	4.1	1.4	9.4	0.9	1.5	6.1	1.2	12.2	43
Washington	8.9	2.9	11.2	3.7	5.8	13.1	3.5	16.9	78.7
Alaska	1.8	0.1	0.1	0.5	0.2	2.5	0.4	2.6	9.7
Hawaii	0.5	0.6	0.5	0.8	1.6	1.1	3.3	35.7	53

Note: Table reports numbers of employees in thousands. The “total” column may contain a number higher than the sum of the country columns because the “total” column includes foreign employment from countries not listed individually.

analysis in section 9.5.⁷ Although employment data are available on an annual basis, the dependent variables used in the next section measure the change in employment between the 1980 and 1987 surveys and the change between the 1987 and 1992 surveys. There are a number of reasons for looking at the data at this lower frequency. First, we assume that foreign employment will adjust to changes in the fiscal and factor environments with a lag. Since it is not clear how long the lags should be, and it is not clear that the rate of adjustment to factor markets is the same as it is to fiscal changes, we examine the changes over longer time frames. Second, mergers and acquisitions were a large component of foreign investment expenditures, especially in the late 1980s. Many of these mergers were large, involving the acquisition of control over large labor forces, some of which might be reduced in subsequent selloffs. By looking at lower frequency data, we intend to capture a smoother picture of trends in foreign employment. The statistics that are of most importance to this study are those detailing investment at the state level, disaggregated by the country of investor origin.

The data on state fiscal characteristics and on policy changes are collected from a number of sources. Fiscal policies were first identified with the aid of the *Directory of Incentives for Business Investment and Development in the United States* (National Association of State Development Agencies [NASDA] 1991). Next, data on state characteristics and on state fiscal collections and expenditures were added from Census Bureau collections. Finally, the timing of changes in fiscal policies were identified through the periodical *Site Selection*.

At first glance, the fiscal environment is notable for its stability. Table 9.3A presents information on some variables of interest. For example, the range of corporate tax rates remained virtually unchanged over the 1982–90 period. The average state tax rate on corporate income did rise, but only from 6.36 to 6.71 percent. But these averages obscure some of the activity that was taking place during this interval. As table 9.3B demonstrates, though the average corporate tax rate changed only slightly, 18 states raised their rates while 7 states lowered theirs. The simultaneous changes in opposing directions mean that relative corporate taxes across states were changing and can be used to examine investment decisions.

A second tax of interest is the sales and use tax rate on manufacturing inputs. This tax applies to firm purchases of inputs, whether sourced from within or outside of the state of operation, and can lead to a significant increase in the cost of materials. Concern over this factor caused the state average sales and use tax on manufacturing inputs to be reduced by almost a third, from 1.89 to 1.27 percent (table 9.3A). State differences in the treatment of sales and use tax on manufacturing inputs are further captured in table 9.3B. Half of all states

7. U.S. Department of Commerce (1985, 1990, 1994). Data are studied from the reported samples of all nonbank affiliates and of manufacturing affiliates.

Table 9.3A National Summary Statistics on State Taxes and Promotion Variables

Variable	1982	1990
Corporate tax rates (%)		
Minimum	0.0	0.0
Maximum	12.0	12.0
Average	6.36	6.71
Standard deviation	2.84	2.80
Sales and use tax rates on manufacturing inputs (%)		
Minimum	0.0	0.0
Maximum	7.5	6.0
Average	1.89	1.27
Standard deviation	2.62	2.03
State corporate income tax provisions ^a (number of states)		
R&D tax credit	12	17
Investment tax credit	16	17

Source: NASDA (1991).

Note: Calculations are based on all 50 states.

^aNot all states that offered a provision in 1982 continued to offer it in 1990.

Table 9.3B National Summary Statistics on Changes in State Fiscal Offerings, 1982-90

Change ^a	Number of States
Corporate tax rates	
States raising their corporate tax rates	18
States lowering their corporate tax rates	7
States with no corporate tax	4
Sales and use tax rates on manufacturing inputs	
States raising their sales tax rates	25
States lowering their sales tax rates	0
States lowering their taxes on manufacturing inputs	7
States with no sales tax on manufacturing inputs	21
States raising their sales tax rates that exempted sales of manufacturing inputs	6

Source: NASDA (1991).

Note: Calculations are based on all 50 states.

^aChanges are based on comparison of 1990 and 1982 statistics.

raised their sales taxes on general sales. At the same time 21 states levied no sales and use tax on manufacturing inputs. Of those states that raised their sales taxes, almost one-fourth exempted manufacturing inputs from these increases. The pattern of changes in sales tax rates generally, and in sales and use tax rates on manufacturing inputs specifically, is consistent with a policy

that taxes less elastic sales activity at a higher rate than more elastic manufacturing activity, which can avoid the tax by moving to another location.

Another characteristic of the 1980s evidenced in *Site Selection* is that states changed the activities they targeted most directly. High technology was cited as a sector that states wished to foster, and this was reflected in the adoption of R&D credits, raising the number of states offering such credits from 12 to 17. The number of states offering investment tax credits rose overall from 16 to 17, but the identity of those states changed. Similarly, although 19 states had foreign investment promotion offices in both 1982 and 1990, the identity of some of those states changed. Since a number of states opened additional offices, the number of offices rose from 27 worldwide in 1982 to 45 in 1990.

A final cut on the data is provided in table 9.4. Here, fiscal variables are summarized on a regional basis, where the regional classifications conform to regional definitions presented in U.S. Department of Commerce, Bureau of Economic Analysis publications. The corporate tax rate on a regional basis ranges from a low of 4.1 percent to a high of 8.83 percent. Although states can make slight changes in their definitions of income that could potentially offset high tax rates, it appears that this was not the case in practice. The variation in corporate taxes collected as a fraction of value added in the region is highly correlated with the corporate tax rate.

Large dispersion is also seen in the rate of sales taxes across regions. However, the range of sales and use taxes on manufacturing inputs varies even more widely, as some regions, notably the Mideast and Great Lakes, have rates very close to zero, while other regions, such as the Far West and Southwest, offer no reductions for manufacturing inputs as compared with general sales. Two other policies that may be of interest to foreign investors are the availability of foreign trade zones and the existence of foreign investment promotion offices. Here too, we see great regional heterogeneity. Some regions, such as New England, have almost no foreign investment promotion offices, while other regions, such as the Southeast, average more than one per state.

Overall, the distribution of these variables across regions suggests that states may be competing not with the nation as a whole but with their neighbors. If states within a region are more similar, then tax policies that are implemented may actually result in the shifting of employment within a region. In contrast, tax effects may be much less pronounced among regions, since dissimilar regions will not be in competition with each other unless massive fiscal efforts are used to diffuse the general inclination to select one region over the others based on the suitability of factor conditions.

9.5 Estimation

In this section we examine the responsiveness of the interstate distribution of foreign employment to wage and fiscal differences between the states. The dimensions of the geographical responsiveness are tested by two cuts on the

Table 9.4 Regional Fiscal Variables, 1991

Variable	New England	Mideast	Great Lakes	Plains	Southeast	Southwest	Rocky Mountain	Far West
Corporate tax rate (%)	8.83 (1.34)	8.44 (0.83)	5.31 (2.90)	7.45 (3.93)	6.35 (1.35)	7.08 (2.55)	5.01 (3.04)	4.10 (4.58)
Sales tax rate (%)	4.58 (2.53)	5.08 (2.83)	5.40 (0.96)	5.10 (0.78)	5.19 (1.11)	2.32 (2.65)	3.66 (2.38)	4.87 (3.32)
Manufacturing sales tax rate (%)	1.25 (3.06)	0.08 (0.18)	0.03 (0.67)	1.57 (2.28)	2.19 (2.93)	2.32 (2.68)	1.80 (2.49)	4.87 (3.32)
Tax per capita (\$)	1,192 (354)	1,377 (231)	1,114 (139)	1,006 (248)	979 (97)	1,057 (178)	967 (157)	1,227 (225)
Corporate tax/Value added (%)	2.29 (0.91)	2.79 (0.77)	1.58 (0.91)	1.91 (1.10)	1.73 (0.70)	1.89 (1.98)	2.12 (1.84)	1.29 (1.79)
Foreign offices ^a	0.167 [0-1]	1.6 [0-4]	2.6 [0-5]	0.57 [0-2]	1.16 [0-3]	0.5 [0-2]	0.2 [0-1]	0.25 [0-1]
Foreign trade zones ^a	1.5 [0-3]	4.6 [1-12]	4.2 [2-7]	1.5 [0-2]	3.25 [0-10]	7.5 [1-22]	1.0 [0-2]	4.5 [2-8]

Note: Regional groupings are calculated according to the groupings used in U.S. Department of Commerce, Bureau of Economic Analysis publications: New England = CT, ME, MA, NH, RI, VT; Mideast = DE, MD, NJ, NY, PA; Great Lakes = IL, IN, MI, OH, WI; Plains = IA, KS, MN, MO, NE, ND, SD; Southeast = AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV; Southwest = AZ, NM, OK, TX; Rocky Mountain = CO, ID, MT, UT, WY; Far West = CA, NV, OR, WA; not included = AK, HI. Numbers in parentheses are standard deviations.

^aAverage number of facilities by region. Numbers in brackets provide numerical range for the states within each region.

data. First, the data are tested to see whether the *interregional* distribution of investment reflects wage and fiscal conditions. Second, the data are examined to see whether the *intraregional* distribution of investment responds to intraregional factor and wage conditions. Further tests are then performed to see whether different types of foreign investment respond more vigorously than others. In particular, it may be that manufacturing employment exhibits different responsiveness to wage and factor conditions than does other nonbank affiliate investment. This possibility is tested through applications of the tests to the subsample of foreign manufacturing employment data.

9.5.1 The Interregional Employment Distribution of All Nonbank Affiliates

In order to estimate the responsiveness of investment to differences across regions, comparison variables are created that normalize the change in the value of a particular variable in each region by the change in that variable nationally. These averages are weighted by population so that the effects of small states are not overrepresented in the regional variables. The estimating equation takes the following form:

$$(5) \quad \Delta(L_r/L) = \alpha + \beta_w * (w_r/w) + \delta * \Delta(\tau_r/\tau) + \gamma * (Z_r/Z) + \varepsilon_r.$$

The change in a country's employment in region r is related to changes in wages in that region relative to the nation and changes in taxes relative to the nation. The change in employment may also be affected by other characteristics of the region, which are contained in the vector Z . The comparison variables differ when interregional employment is being tested as opposed to intraregional investment. In order to avoid simultaneity bias, the wage variable presented is the relative level of wages across regions rather than the relative change in wages across regions.

It is possible that foreign firms choose the regions in which they will place their investments based on interregional differences. This idea is implicit in the estimation presented in table 9.5, which measures changes in employment by region as a function of the weighted average corporate tax and weighted average wage of the region. These changes are measured between the benchmark survey years 1980 and 1987 and between 1987 and 1992. Columns (1) and (2) test whether employment is proportional to regional activity as measured by either population or value added. In either specification these scale variables are shown to be highly significant. Column (3) tests whether either of these scale factors is more significant as a determinant of the interregional distribution of foreign employment. When both measures are included population remains highly significant while value added loses its significance. This suggests that value added entered significantly in specification (2) only because it proxied for population.

Specification (4) augments the regression with variables representing the weighted average wage in the region and the weighted average corporate tax

Table 9.5 **Employment Changes across Regions**

Variable	Dependent Variable: Change in Foreign Employment by Region							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Region population	0.76 (0.17)		1.17 (0.45)	0.69 (0.19)	0.73 (0.20)	0.66 (0.21)	0.75 (0.20)	0.69 (0.23)
Region value added		0.11 (0.03)	-0.08 (0.08)					
Region average wage				0.01 (0.01)	0.01 (0.01)	0.01 (0.01)	0.02 (0.02)	0.01 (0.01)
Region average corporate tax				0.19 (1.38)	0.31 (1.39)	0.57 (1.71)		
Region change in corporate tax							4.31 (9.20)	1.80 (10.15)
Region job credit programs					8.09 (9.57)		8.92 (9.77)	
Regional foreign investment offices						1.20 (3.12)		0.35 (2.86)
Adjusted R^2	0.12	0.08	0.12	0.11	0.11	0.11	0.11	0.11

Note: Numbers in parentheses are standard errors. Regression constant terms not reported. Regional variables are calculated as average of region. Each regression has 144 observations.

rate in the region. Contrary to expectation, both variables enter with a positive sign, though neither coefficient is significant. While a nonpositive coefficient is expected on wages, the positive coefficient on the corporate tax variable could be consistent with the "benefits" view of taxation. As long as the government is providing benefits that are valued by investors, higher corporate taxes can be consistent with rising levels of employment in a region. To examine the effect of including a specific benefit, regression (5) adds regional job creation credit programs as a variable, since it is a benefit that one would assume is directly related to employment decisions. While the expected positive coefficient is found, it is not significant. Moreover, the coefficient on the corporate tax rate remains positive.

Further specifications were tested that included benefit measures such as investment tax credits and R&D credits. The results are not displayed since they were as unpromising and insignificant as the result shown in column (5). If the benefits view of taxation is driving the insignificant positive coefficient found on the regional corporate tax rate, the successful combination of benefits is not discernable in this data set.

Regression (6) examines another variable that might enhance foreign employment in a region, the presence of foreign investment promotion offices. We find a weak positive correlation between foreign employment decisions and the presence of such offices.

Finally, regressions (7) and (8) try a different specification of the corporate tax rate by region. Here, the corporate tax rate variable is taken to be the weighted average *change* in the region's corporate tax rate. The coefficients again go against the common presumption that corporate tax increases decrease employment. However, no conclusions can be drawn, since these estimates are not statistically significant. As in the two previous specifications, these regressions are augmented alternatively by a job creation credit variable and a foreign investment promotion office variable. The coefficients on these variables remain equally insignificant.

It is too early to draw conclusions from the results in table 9.5. It is clearly possible that taxes and wages exert a significant effect on employment and that the regressions fail to capture these effects. However, one hypothesis is suggested. In particular, it appears that the interregional distribution of all affiliate investment is based purely on population, and by association ultimate product markets. The lack of any decisive effect of corporate taxes or wages on employment may reflect the fact that foreign affiliates locate their employment as a means of gaining proximity to final markets. If this proximity is sufficiently valuable, then they will distribute themselves evenly across U.S. regions in a fashion that is proportionate to population.⁸

8. The proximity arguments made here are similar in character to descriptions of international incentives for proximity in Brainard (1997).

9.5.2 The Interregional Employment Distribution of Manufacturing Affiliates

Unless transportation costs are extremely high or customers in final markets require frequent changes in product specifications, it is not necessary to locate production near final markets. Hence, we repeat the tests that were performed, this time on the narrower sample of foreign employment involved in manufacturing.⁹ Since the 1980 benchmark survey does not present foreign employment in manufacturing, the manufacturing data examined span the years 1987–92.

The first three columns of table 9.6 examine whether region size as measured by population or value added exerts a significant influence on the level of manufacturing employment placed in that region. The value-added variable has a positive coefficient but is not significant. The population variable is negative and insignificant, alone or in combination with the value-added variable. It appears that the location of foreign manufacturing employment within a region is not strongly influenced by population or manufacturing density as exhibited by value added. Regressions (4) and (5) now augment the specification with regional wages and taxes. Column (5) includes country dummies, while column (4) does not. The wage variables have a negative coefficient that is not significant. Regional variation in corporate tax rates now enters with a negative and significant sign. Column (6) measures the corporate tax with its change rather than its level, but the change does not enter significantly.

Finally, columns (7) and (8) include two indicators of state investment promotion effort. In contrast with the data on all nonbank affiliates, these variables enter with negative signs. In the case of the job creation credit program, the negative coefficient is significant. Interestingly, at the same time, the measured effect of wages in column (7) now approaches marginal significance. One interpretation would be that states with poor-quality labor forces are more likely to adopt job creation programs. The presence of the program provides an indicator variable for interregional variation in labor quality. Once one controls for this quality heterogeneity, it becomes more possible to identify the effects of wage variation.

In summing up, there are two primary differences in the interregional employment regressions performed on the manufacturing subsample relative to the full sample of nonbank affiliates. First, corporate taxes exert an identifiable negative effect on manufacturing, but not on overall affiliate activity. This is consistent with the previous conjecture that much foreign investment is located with proximity to final markets and customers in mind. To the extent that manufacturing can locate at greater distance from final markets, tax differences

9. In aggregate, foreign employment in manufacturing was less than half of total nonbank affiliate employment of foreign firms.

Table 9.6 **Manufacturing Employment Changes across Regions**

Variable	Dependent Variable: Change in Foreign Employment by Region							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Region population	-0.66 (0.11)		-0.49 (0.43)	-0.49 (0.43)	-0.49 (0.38)	-0.19 (0.39)	-0.63 (0.38)	-0.61 (0.39)
Region value added		0.02 (0.02)	0.07 (0.09)	0.07 (0.09)	0.07 (0.08)	0.04 (0.07)	0.10 (0.07)	0.13 (0.08)
Region average wage				-.002 (.006)	-.002 (.006)	.004 (.006)	-.009 (.006)	-.002 (.006)
Region average corporate tax				-2.94 (1.42)	-2.94 (1.25)		-3.21 (1.22)	-3.09 (1.24)
Region change in corporate tax						19.2 (6.05)		
Region job credit programs							-16.1 (7.55)	
Regional foreign investment offices								-3.75 (2.62)
Country dummies	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes
Adjusted R ²	0.20	0.12	0.24	0.12	0.24	0.29	0.29	0.26

Note: Numbers in parentheses are standard errors. Regression constant terms not reported. Regional variables are calculated as average of region. Each regression has 72 observations (8 countries, 9 regions).

will exert a greater influence. In addition, the effects of apportionment may also be evident here. Payroll is one component of most states' apportionment formulas. As such, this weight factor should discourage firms from locating manufacturing in states with high corporate tax rates. The difference in tax coefficients between the two samples are suggestive that these effects are operating.

The second interesting distinction in the manufacturing subsample reinforces the notion that the distribution of manufacturing employment is subject to different influences. Overall population was identified as the primary determinant of the changes in regional employment by all foreign nonbank affiliates. In the manufacturing subsample, population has a negative effect, if any. This is further evidence that manufacturing activities do not need to be located near customers while other operations do require proximity. At the same time, value added by state has a slight positive influence. This finding is potentially indicative of the presence of agglomeration economies in manufacturing.

9.5.3 The Intra-regional Employment Distribution of Manufacturing Affiliates

Our examination now moves to the more disaggregated analysis of the distribution of employment between states within regions, where each state's employment is compared with employment within its region, r . These results are presented in table 9.7. In portions of this table, identity of the foreign investor is used as a further discriminant to identify the effect of taxes on investment. The estimating equation takes the following form:

$$(6) (L_{cs} / L_{cr}) = \alpha + \beta_w * (w_s / w_r) + \delta * (\tau_s / \tau_r) + \gamma' (Z_s / Z_r) + \lambda_c + \varepsilon_{cs}.$$

Column (1) provides a benchmark. In considering the relative employment of different states within a region, value added in a state relative to other states in the region is a decisive factor. This factor is consistent with agglomeration stories of investment in which investment benefits from positive spillovers in either labor markets or in markets for intermediate inputs. This finding will not be discussed further since it is consistent throughout table 9.7.

The relative corporate tax rate in column (1) exhibits no discernable effect on the distribution of manufacturing employment. However, as is explained in Hines (1996), the nationality of the investor has important implications for the effect of U.S. taxes on investment. Investors who are headquartered in exemption countries pay no home-country taxes on their U.S. earnings. In comparison, investors who are headquartered in foreign tax credit countries may have a smaller reduction in their after-all-tax profits as a result of high taxes paid to a U.S. state. It is not purely true that all foreign tax credit investors will be unaffected by state tax differences. Firms that are in excess credit positions may not be able to use all their credits generated by state taxes. In this case higher taxes will deter investment by these firms, too. However, the result remains that exemption country investors should be more negatively influenced

Table 9.7 **Manufacturing Employment**

	Dependent Variable: Employment Relative to Region						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Relative value added	1.15 (0.18)	1.14 (0.16)	1.16 (0.18)	1.15 (0.17)	1.16 (0.16)	1.17 (0.16)	1.17 (0.16)
Relative population	-0.31 (0.19)	-0.30 (0.17)	-0.29 (0.19)	-0.30 (0.19)	-0.29 (0.17)	-0.33 (0.17)	-0.33 (0.17)
Relative corporate tax rate	0.03 (0.12)	0.07 (0.12)	0.04 (0.12)	0.032 (0.12)	0.71 (0.13)	0.70 (0.12)	0.73 (0.13)
Relative corporate tax rate*exemption		-0.93 (0.09)	-0.93 (0.09)		-0.93 (0.11)	-0.93 (0.09)	-0.96 (0.11)
Relative pay			-0.37 (0.43)		-0.46 (0.43)		
Relative job credit program offer				-0.03 (0.04)	-0.06 (0.06)		
Relative job credit program offer* exemption					0.03 (0.07)		
Relative use tax						0.04 (0.03)	0.01 (0.05)
Relative use tax* exemption							0.04 (0.06)
<i>N</i>	376	376	376	365	365	376	376
Adjusted <i>R</i> ²	0.36	0.50	0.50	0.38	0.51	0.50	0.50

Note: Numbers in parentheses are standard errors. Regression constant terms not reported.

by U.S. corporate taxes than the average investor who is governed by a foreign tax credit system. This hypothesis is tested in column (2) through an interaction variable that multiplies the relative corporate tax rate variable by a dummy variable that indicates exemption investors. As predicted, the results show that corporate tax variation within a region has a strong negative effect on exemption investors.

The effect of the job credit program is tested in a similar fashion in regressions (4) and (5). Job creation credits reduce state corporate taxes payable by firms. Therefore, foreign investors from exemption countries should derive equivalent, if not larger, benefits from job creation credits. Since these credits usually reduce a firm's state tax payments, it is expected that the job credit program variables will have the opposite sign of the corporate tax variables. The coefficient estimates on this interaction term are of the expected sign, but there are no significant effects, and the values of the credit to the two types of investors are not statistically distinguishable.

Finally, in manufacturing, sales and use tax is a component that may increase the cost of investment. To measure the effect of these sales and use taxes on the intraregional distribution of employment, regression (6) adds a variable that measures the sales and use tax on manufacturing inputs relative to the sales and use taxes applied to manufacturing inputs purchased by firms in other states of the region. No significant effect is found. However, the data present another opportunity to test whether the earlier exemption distinction was a spurious correlation that represented other characteristics of the exemption investors. Column (7) adds a regressor that multiplies the relative sales and use tax variable by the exemption dummy. There should be no effect here since, unlike taxes on corporate income, sales and use taxes are not deductible by firms from foreign tax credit countries. In other words, sales and use taxes do not have differential effects on the overall tax payments of firms from exemption as opposed to nonexemption countries. This spurious exemption variable has no measurable effect. This suggests that the earlier findings regarding the corporate tax reflect differential responsiveness to corporate tax rates rather than unmeasured differences that separate the exemption from the foreign tax credit investors.

As a second check on the robustness of the results, the regional groupings were changed to conform to the regional definitions presented by the Bureau of the Census. There were no discernable differences between the results presented in table 9.7 and the results generated with changes in the regional groupings.

In considering intraregional employment effects in manufacturing, three conclusions emerge. First, the strong coefficients on value added as opposed to population suggest that agglomeration economies are one of the important factors determining the distribution of employment in manufacturing. Second, when corporate tax effects are measured among the set of countries that are expected to respond most vigorously, intraregional differences in corporate

taxes appear to reduce employment in the states that have the highest taxes relative to their regions. Finally, the failure to find any correlation between the intraregional distribution of employment and sales and use taxes on manufacturing does not prove that these taxes have no effect. As table 9.4 showed, different regions center on different levels of sales and use tax on manufacturing equipment. Since this variable has a potentially strong effect on manufacturing investment, states within regions may bring their taxes into conformity with the rates that their neighbors have. If this occurs, no effect would be found, since state policymakers have set their tax rates in a way that minimizes loss of employment to other states in their region, leaving inadequate variation within regions to identify any effects econometrically.

9.6 Conclusions

Our results suggest that the geographical distribution of foreign employment across U.S. states is in fact sensitive to both fiscal and labor market conditions in some but not all situations. The distinction that is of most relevance here is whether the foreign employment is in manufacturing or in the broader category of all nonbank affiliates. Both the interregional and the intraregional distribution of foreign employment in manufacturing appear to respond to tax differences. Regions whose taxes are higher than average for the country, or states whose taxes are high relative to their region, appear to deter investment. By way of contrast, the distribution of all nonbank employment does not appear to be sensitive to tax differences. This may reflect the activity mix of the two sectors. If the activity of nonmanufacturing firms in the nonbank affiliate category is directed toward functions such as sales and services, then these activities need to be located in close proximity to final markets. This is consistent with the finding in this study that the broadly defined category of employment appears to be evenly distributed across regions in a fashion that corresponds to population. In contrast, the location of manufacturing is positively related to the current levels of business activities in states, as opposed to the populations themselves.

The differential tax sensitivity of these two types of employment suggests that fiscal policy oriented toward the more general investment levels is likely to be unsuccessful. The finding that foreign employment may in fact be more responsive to intraregional differences than to intranational differences has two implications for state policymakers. First, in crafting promotion policies, the most intense competition is found among one's neighbors. Therefore, it is not necessary for states to copy actions that are taken by states in other regions. Second, some observers claim that in the international context it will be difficult for nations to maintain high corporate tax rates when far lower tax rates are offered by tax havens. These results suggest that firms' real activities are not perfectly elastic in the face of fiscal differences.

While this study finds that foreign manufacturing employment is affected

by broad measures of corporate tax, the inclusion of other state promotion tools does not produce identifiable effects. One might suspect that we are unable to find measurable effects because these promotion policies are, for the most part, denoted by indicator variables that cannot capture the full degree of interstate heterogeneity that is present. A more serious problem is that the failure to measure results on this front may very well be due to the fact that states' use of investment promotion tools is endogenous. On the positive side, attractive states may open investment promotion offices since they expect large investments and these investment offices abroad help coordinate foreign firms' planning. On the negative side, states that have failed in the past may implement programs to augment employment. Here, the use of indicator variables for the programs will yield what appear to be negative effects. Yet another possibility is that no successful program will go without imitation. This possibility is explored in Head et al. (1994) in the case of foreign trade zones. If this is the case, imitation removes the differentials in the explanatory variables that are needed to identify the effects of these programs. In order to identify the impact of these promotion variables, future research is needed to model and measure states' use of promotion tools.

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Comment Michael Wasylenko

At a lively debate some years ago on the elasticity of demand for money, one person challenged the group to name one controversial issue in economics that was resolved through empirical work. Each empirical researcher has his or her favorite examples, but most would agree that resolving issues takes replication

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of results over several studies using a variety of data sets before one can speak confidently about the size and statistical significance of the coefficients.

Through replication, a strong consensus has recently emerged among researchers studying location decisions about the effect of state and local business taxes on plant locations. State and local taxes affect location decisions of manufacturers but have less or even no impact on the location decisions of nonmanufacturing industries. Another consistent finding is that in the United States the smaller a region over which the location decision is made, the more likely it is that taxes and other fiscal variables will influence location decisions. Those empirical results suggest that intraregional business location decisions are more susceptible to the influences of fiscal variables than are interregional business location choices.

The findings cited above seem to apply to domestic and foreign location decisions in the United States (Wasylenko 1995; Ondrich and Wasylenko 1993), although there are many more studies of location decisions of domestic plants (or employment) than of specifically foreign plants (or employment). For manufacturing firms, the elasticity of employment or location with respect to business taxes appears to be between -0.5 and -0.8 , depending on the time period of the study, on whether employment or plants are used as the left-hand-side variable, and on whether aggregate or micro data are used in the analysis.

Agglomeration economies, or plants locating in groups to take advantage of technological transfers, information, proximity to suppliers, or to a workforce, have consistently and strongly determined plant locations in empirical work. Put differently, regions with plants in a particular industry are likely to attract more plants in the same or a similar industry.

The results reported in Deborah Swenson's paper are roughly consistent with the results reported in other papers. Her paper makes a contribution to the literature on the location of foreign direct investors. However, several points should be made about the data and the modeling used in her paper.

Use of Aggregate versus Micro Data

Total employment in foreign-owned plants, which is an aggregate of new plants, plant expansions, mergers, acquisitions, equity increases, joint ventures, and other direct investments, is explained in her paper. Investors typically exercise more choice over where to locate new plants than they would over acquisitions of existing plants and other forms of investment. Therefore, findings on the variables that attract foreign investment to a state have typically been stronger when new plants or "greenfield" investments are analyzed than when other forms of investment are commingled with new plants in the analysis. Empirical results based on greenfield investments may describe what foreign investors actively seek, while the results based on aggregate data describe what investors do when financial and other considerations enter the location decision. Policymakers with an interest in shaping the state business climate

would want to know what investors actively seek in a location. Studies using aggregate data might then be less interesting to policymakers.

Tax Variables

While Swenson is careful to acknowledge and to account to the extent possible for several of the complications of the tax code as it applies to foreign investors, there are several points about the tax variables worth reemphasizing. Moreover, the measurement of the tax variables is not pushed as far as one would like in her paper.

Worldwide unitary taxation was used at one time or another in 13 states during the 1980–87 period. However, during that time period many of these states abandoned worldwide unitary taxation. These changes in the tax structure might be important in the analysis of the 1980–87 time period, and her study does not take into account the nature of the unitary tax system in the states. After 1987, however, only five states used worldwide unitary taxation, and the changes in this policy were few and not influential. Thus, in the latter period of the study, the variation in the unitary tax structure among states may be differenced away in her estimation and not important in her analysis of the 1987–92 period. But in the earlier period worldwide unitary taxation could have changed location decisions in the aggregate.

Formulas that are used to apportion corporate income among states vary among states. States do use the three-factor formula based on sales, payroll, and property; however, some states double weight the sales factor, while others allow firms to choose among several apportionment formulas. Again, these variations might difference out of the model if states do not alter their apportionment formulas over the time periods. If apportionment formulas change, however, they could influence the amount of manufacturing investment in the states.

Moreover, states do not typically use the three-factor formula to apportion income in some nonmanufacturing industries, such as finance. This is not taken into account in her model and reasoning.

Effective tax rates are preferred to nominal corporate tax rates as measures of tax burdens. In fact, one would like to have measures of marginal effective tax rates in states. Investment tax credits in New York State, for example, give New York a relatively low marginal effective tax rate, although the state's nominal corporate tax rate is higher than average. In her paper, Swenson uses nominal tax rates, which are likely to mismeasure the marginal tax rates of foreign investors.

However, her analysis accounts for the different state tax circumstances that investors from different home countries face. She distinguishes between home-country territorial and residential tax systems, where investors in territorial countries pay U.S. taxes and no taxes to their home country. An investor from a residence-based tax country might effectively pay no U.S. corporate taxes

(upon repatriation of the income), unless he were in an excess credit position in his home country.

Swenson accounts for some variation in the rate of manufacturing sales and use taxes. However, the administration of this tax complicates greatly the accurate measurement of the sales and use tax rate as it affects manufacturers. For example, Ohio exempts business machinery and equipment from sales taxes, but still 30 percent of all sales tax revenue in Ohio is derived from business purchases. The reason is that Ohio uses an administrative list approach, where a specific set of items is sales tax exempt, instead of granting a sales tax exemption to all material and equipment purchased by a firm (the integrated plant approach to levying the exemption). Thus, the findings in her papers that sales and use tax exemptions for business equipment do not influence locations may occur because investors are aware that the sales tax rate itself is a less important determinant of their sales tax burdens than is the administration of the tax. Put another way, there may be quite a bit of measurement error in the sales tax exemption variable used in the paper.

Fiscal Incentives

A generic problem that affects all attempts to analyze the effects of fiscal incentives is measuring accurately the size of fiscal incentive packages or programs. Swenson, for instance, attempts to account for whether a state has a foreign trade office in a country, but there are no easily available measures of the staffing and activity in the office. To emphasize this point, Japan has a Japanese External Trade Organization (JETRO) within the United States. There are eight regional offices, each with a large staff to promote Japanese exports as well as to help small to medium-size U.S. businesses export to Japan. Moreover, JETRO offices arrange exchange programs with universities in the United States for civil servants in Japanese ministries. This example highlights the range of activities that an office in another country could undertake. More important, the size of each state's foreign office in other countries is not measured in Swenson's analysis.

Similar arguments can be made for a host of fiscal incentive programs, which have typically limited participation to new firms or to small firm start-ups and made available everything from loan guarantees to direct loans. The wide variation in the formulation of fiscal incentives among states as well as the wide range of eligibility criteria for firms to qualify for the incentive packages complicates the measurement of these incentive programs and makes it difficult to estimate their effectiveness. As a result, what we can say with confidence about the effectiveness of these programs is limited. Moreover, as Swenson also notes, the presence of fiscal incentive programs in themselves may be an attempt to compensate for inherent weaknesses in the business climate of a state (and thus endogenous to employment growth) rather than an exogenous source of employment growth.

Comments on Specific Regressions

While she does not say so, I assume that a time effect was included as a variable when two different time periods are pooled in the analysis. Carroll and Wasylenko (1994) have shown that fiscal variables have different effects over time because different levels of state competition in different time periods can drive state fiscal systems to look more similar over time. As fiscal variables become more alike among states, fiscal variables become more neutral as determinants of location. (This latter point is also made by Swenson.)

It would be interesting to know the results of her model when it is run on all states without deflating the equations by their regional averages, as in table 9.7. By running all states (weighted appropriately by population to correct for the size of the state), one could learn about the sensitivity of the results when states are compared to averages within their respective regions relative to when states are simply pooled without comparisons to regional averages.

In summary, this is a good paper. Nonetheless, research in this area has moved beyond aggregate analysis and has employed microlevel plant location data. Better measures of the fiscal variables would also help identify their effectiveness with more accuracy.

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