# The Effects of Foreign Direct Investment on Local Communities\*

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Little evidence exists on the effects of foreign direct investment (FDI) on local communities in the United States, despite evidence that U.S. communities actively bid against each other for FDI. We use detailed county-level panel data from South Carolina across 5-year intervals from 1980 through 1995 to investigate the effect of foreign manufacturing plants on local labor markets and on the level and distribution of local government budgets. We find that foreign investment raises local real wages much more than does domestic investment, but lowers per capita county-government expenditures and redistributes monies away from public school expenditures. © 2000 Academic Press

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### 1. INTRODUCTION

The competition for new firm investment by state and local governments in the United States seems to be ever increasing. The amount and variety of state and local incentives to attract firms have progressed to include local property tax relief, free land, job tax credits, "enterprise zones" which give firms greater benefits for locating in economically depressed areas,

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and major infrastructure improvements. Beyond these now "standard" incentives, competing states also spend significant resources tailoring specialized incentive packages for potentially large investments.

This competition has led both policymakers and economists to question whether the competitive bidding for investment by local communities is actually harmful. The main concern is that various localities may end up in a bidding war that results in a "prisoner's dilemma" that benefits the firm at the expense of the winning community and the welfare of the entire country. In fact, to the extent that communities have a common valuation of the plant located in their area, even the local community that receives the investment may suffer a "winner's curse," because it bid too much.

The most notable recent incident may be the incentives offered by the State of Alabama to attract Mercedes-Benz AG in the early 1990s. As detailed by a November 24, 1993 article in the *Wall Street Journal*, Alabama ended up promising over \$300 million in incentives to Mercedes, including free land, employee salaries the first year of operation, property tax relief, payroll tax credits, state spending on Mercedes automobiles, etc. This led many to believe Alabama may have paid too high a price, as expressed by George Autry [28], head of an economic development group based in North Carolina: "They're [Alabama] losing money to invest in their people, their roads, their state in general. For a state like Alabama, which needs money for education, that's a problem." As this example shows, even some policymakers understand that these competitions involve significant tradeoffs.

The large wave of foreign direct investment (FDI) flows into the United States in the past two decades adds another dimension to the competition for investment.<sup>1</sup> Beyond the potential adverse welfare effects described above from state and local competition, foreign firms' gains from the incentives accrue to capital owners that likely reside primarily outside the United States. In addition, foreign plants may be less involved in the local community (e.g., through charitable giving) than domestic ones, which could lessen local benefits from the investment.<sup>2</sup> These issues, along with

<sup>1</sup> Research on FDI into the United States has mainly examined the possible reasons for the large inflow in the late 1980s and early 1990s and location decisions, including agglomeration issues addressed in Head, Ries, and Swenson [18]. Graham and Krugman [17] provides a survey of possible explanations for the wave of inward FDI in the U.S., and related literature. Much less has been done to examine the impacts of the foreign firms and plants on the United States, particularly at a local level. There are some exceptions, besides the papers we discuss below, that examine nationwide and industry wage effects of foreign investment. These include Graham and Krugman [17] and Blomström [3], which discuss economy-wide impacts of FDI for the United States, Caves [5] which examines productivity effects of FDI, and Blonigen and Figlio [4] which finds local FDI affects legislators' decisions on trade policy.

<sup>2</sup> In this paper, the terms "foreign" and "domestic" plants refers to *ownership* location, not geographic location of the plant.

the potential "prisoner's dilemma" problem with state incentives, have even led some to recommend a U.S. government ban on state incentives to foreign investors (Glickman and Woodward [15] and Graham and Krugman [17]).

Yet, states seem to be particularly competitive in trying to attract foreign plants to their area. The bidding for foreign automobile plants has been well documented in the popular press, but there is also indication that states may be more generally interested in investment by foreign plants. Woodward [27] points out that many U.S. states have overseas trade and development offices which are intended to both promote the state's exports and attract foreign investment, and data by the National Association of State Development Agencies shows that over 75% of these expenditures are on efforts to attract foreign investment. This is significant since there are no comparable expenditures to attract investment by domestic plants.

While the evidence above suggests that local communities may view foreign investment differently, it may not be clear at first glance why one would expect foreign plants to have different impacts on communities than do domestic plants. Studies examining the effect of new manufacturing jobs on local communities, and particularly their impact on local labor markets,<sup>3</sup> may be sufficient for gauging the local effect of manufacturing FDI. However, many recent studies have found evidence that there may be significant economic differences between foreign and domestic establishments. Howenstein and Zeile [19] use plant-level data from the Annual Survey of Manufactures for 1989 and 1990 and find that foreign affiliates in the United States are larger, more capital intensive, and pay higher wages than domestic plants. Globerman, Ries, and Vertinsky [16] find qualitatively identical results to those of Howenstein and Zeile [19] using data on foreign affiliates and domestic plants in Canada. Doms and Jensen [8] examine manufacturing plant-level data in the U.S. and find that higher wages and productivity are not just particular to foreign affiliates, but to any plants connected with a multinational firm, foreign- or U.S.-owned. Aitken, Harrison, and Lipsey [1] find that wage differentials between domestic and foreign enterprises are more substantial in data on Mexican and Venezuelan enterprises than for U.S. enterprise data, particularly

<sup>&</sup>lt;sup>3</sup> These include Marston [21], Topel [26], Crihfield [7], Bartik [2], Terkla and Doeringer [25], and Glaeser *et al.* [13]. Bartik [2] gives perhaps the most comprehensive overview of the effects of local job growth. Both his extensive review of the literature and his own analysis find that local job growth has a positive and significant long-run impact on real earnings in the community. He also finds evidence that long-run unemployment rates decrease and housing prices increase with local job growth.

when controlling for industry, size, and capital intensity differences.<sup>4</sup> Finally, Feliciano and Lipsey [10] find evidence that foreign ownership leads to higher wages in U.S. manufacturing establishments after controlling for industry and state characteristics. Thus, these studies provide some evidence that foreign plants pay higher wages, which can explain why states may be competing more intensely for foreign plants than comparable domestic ones. In addition, our analysis below, which employs county-level real wage data for the first time to address this issue, provides further support for substantial differences between foreign and domestic investment.

While higher real wages and employment seem to be the motivation for states' competition for investment, there is also the expectation that the tradeoff for these benefits is adverse impacts to government budgets. As with wages though, one might not expect any differential impact on budgets depending on whether the plant is foreign or domestic: state incentives and bidding wars occur with large investments by domestic plants as well. However, as described above, state and local competition appears stronger for foreign investments, and this would then presumably lead to larger impacts on the bidding communities. In addition, anecdotal evidence suggests that foreign plants may be interested in different types of incentives than are domestic ones, which may also affect the composition of local budgets accordingly. A number of Wall Street Journal articles on foreign investment in the United States have detailed the extensive funding for training and education programs that foreign plants (especially German plants in the Carolinas) have requested and received.<sup>5</sup> Foreign plants may also differ from domestic ones in terms of roads and other infrastructure they ask local governments to provide.

This paper explores these issues and provides new evidence that local communities face different trade-offs when trying to attract foreign plants rather than domestic ones. We examine the effects of FDI on local communities using detailed county-level panel data from South Carolina across 5-year intervals from 1980 through 1995. We focus on South Carolina for several reasons. First, South Carolina has a substantial level of foreign-plant manufacturing jobs relative to total manufacturing employment. As detailed below, FDI in South Carolina varies significantly

<sup>&</sup>lt;sup>4</sup> A related paper by Feenstra and Hanson [9] examines the impact of FDI on the relative wages of skilled and unskilled workers in Mexico. They find that FDI, and the likely more skilled-intensive production processes connected with it, accounts for over half the increase in skilled labor wage share that occurred in Mexico in the late 1980s.

<sup>&</sup>lt;sup>5</sup> For example, a *Wall Street Journal* article, May 4, 1993, reports a state-funded  $2\frac{1}{2}$  year training program for a Robert Bosch Gmbh plant in Charleston, SC.

across its 46 counties with the percentage of foreign-plant jobs in each county ranging from zero to over fifty percent, making South Carolina an excellent focus for our analysis. In addition, because of relatively high levels of FDI historically, South Carolina has exceptionally detailed information on foreign plant presence in their state over a long time period. Second, a substantial portion of incentives offered by South Carolina to plants comes from local property tax relief, as opposed to incentives funded at the state level. Rainey [24] reports that 54% of all revenue losses from business incentive programs in South Carolina during 1996–1997 (20.1 out of \$37.3 million) were from local property tax reductions. This means that the budget impacts from the investment should substantially affect the unit of our analysis—the local county.

We find substantial evidence that foreign investment raises local real wages much more than domestic investment, but this comes at a cost of lower per capita expenditures by the local county and budgetary redistribution away from public school expenditures. In particular, we find that the addition of an average-sized new foreign manufacturing plant (190 employees in our sample) is associated with more than a 2.3% increase in real wages for all workers, those of both foreign and domestic plants, in that industry in the county. In contrast, the estimated wage increase associated with an equal-sized new domestic plant is just 0.3%. This result is statistically significant and consistent with previous studies that found wage differences across all U.S. plants when not controlling for local labor market conditions. It also explains why local communities may be more interested in attracting foreign plants.

Unlike previous analysis, we provide formal evidence of the costs associated with attracting a foreign plant for a local community. Our estimates find that an average-sized new foreign plant is associated with a 1.2% reduction in real per capita revenues at the county level in South Carolina and a 1.8% reduction in real per capita expenditures, while the relevant comparison figures for domestic plants are 0.1 and 0.2% reductions, respectively. We also find that not only levels, but also the composition of county budgets change. Specifically, foreign plant presence is associated with lower per pupil expenditures by county governments (the main source of school district financing in South Carolina), but higher expenditures on transportation and public safety. None of these compositional effects on budgets occurs with domestic manufacturing employment. While our data and analysis focus specifically on South Carolina, there is reason to believe these issues affect many other states as well. First,

While our data and analysis focus specifically on South Carolina, there is reason to believe these issues affect many other states as well. First, while the percentage of foreign manufacturing was substantial for South Carolina during our database's time period, this percentage is not different from the U.S. national average. In 1980, 6.0% of South Carolina's manu-

facturing was foreign, while the national average was 6.4%. By 1994/1995, the South Carolina and national averages were 12.2 and 13.9%, respectively. Second, South Carolina is not unique in having many business incentives offered by the local level (cities and counties), as opposed to the state level. Fisher and Peters [12] contend that the most important U.S. economic development spending, such as abatements and specialized infrastructure, are financed out of local property taxes, while O'Connor [23] gives a detailed list of the many and varied incentives offered by cities and counties across the United States.<sup>6</sup>

# 2. TRENDS IN FDI, MANUFACTURING WAGES, AND COUNTY BUDGETS IN SOUTH CAROLINA

As just noted, South Carolina has had significant levels of employment by foreign plants as a percentage of total state employment, as well as a high level of growth in this percentage during the last two decades. This section provides more detail on this foreign plant presence in South Carolina. Throughout this section and most of the paper, we define foreign plants as only those that were established by the foreign parent as new (or greenfield) investments. In later years of our sample, there were significant numbers of foreign acquisitions of existing domestic plants in South Carolina. In our statistical analysis described below, we find that these acquired plants are much more similar to domestic operations than foreign ones in their impact on local communities and thus, we classify them as domestic plants. However, if one includes these foreign-acquired plants, employees in foreign plants grew to over 18% of total South Carolina manufacturing employment by 1995. Thus, regardless of how one defines FDI, employment due to foreign affiliates in South Carolina is substantial, both in terms of levels and growth.

These trends have not been uniform across South Carolina's 46 counties by any means. Table 1 gives a breakdown of levels in domestic-plant manufacturing employment and foreign-plant manufacturing employment from 1980 through 1995 in South Carolina's Metropolitan Statistical Areas (MSAs). Our data on total manufacturing employment comes from the County Business Patterns database, while foreign-plant employment numbers by county come from appropriate annual issues of the South Carolina

 $<sup>^6</sup>$  For example, O'Connor [23] finds that 83% of surveyed cities and counties offer revenue bond financing, 40% offered publicly owned industrial park cites, and 45% offered loans for building and construction costs.

		1980			1985			1990			1995	
Region	Domestic	Foreign	% Foreign	Domestic	Foreign	% Foreign	Domestic	Foreign	% Foreign	Domestic	Foreign	% Foreign
Charleston <sup>1</sup>	17,810	1,454	7.55	17,078	2,631	13.35	17,833	3,799	17.56	17,822	4,085	18.65
Columbia <sup>2</sup>	25,676	2,939	10.27	23,875	3,727	13.50	22,025	3,939	15.17	23,762	4,153	14.88
Florence	12,406	200	1.59	11,055	1,078	8.88	11,028	1,698	13.34	11,075	1,883	14.53
Greenville-	128,304	14,227	9.98	111,523	16,407	12.82	107,959	21,869	16.84	104,755	24,367	18.87
Spartanburg- Anderson <sup>3</sup>												
Other counties	193,737	5,377	2.70	171,459	5,662	3.20	176,488	8,432	4.56	175,470	11,586	6.19
State total	377,933	24,197	6.02	334,990	29,505	8.09	335,333	39,737	10.59	332,884	46,074	12.16
<sup>1</sup> Berkeley, C	harleston, an	nd Dorches	ter countie	S.								

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<sup>2</sup> Lexington and Richland counties. <sup>3</sup> Anderson, Cherokee, Greenville, Pickens, and Spartanburg counties.

Industrial Directory.<sup>7</sup> In terms of levels, the Greenville–Spartanburg–Anderson MSA has had a proportionally high share of South Carolina's total and foreign-plant manufacturing employment across all years. However, in terms of growth in the percentage of foreign-plant manufacturing employment, the Florence and Charleston MSAs have seen the greatest increase. It is clear from Table 1 that MSAs in South Carolina generally have a larger percentage of manufacturing jobs in foreign plants than the average "other county" in South Carolina.<sup>8</sup> Notable other counties with a high percentage of foreign-plant manufacturing jobs are Chesterfield and Georgetown counties with 22.3 and 26.9% of manufacturing jobs by foreign plants in 1995, respectively. Figure 1 gives a comprehensive look at



FIG. 1. Foreign direct investment in South Carolina, 1995.

<sup>7</sup> The South Carolina Industrial Directory, an annual publication, details information on manufacturing plants in South Carolina, including location, total employees, Standard Industrial Classification (SIC) codes, year of establishment, and parent company. The latter information allowed us to establish which plants were subsidiaries of foreign companies. These data were listed consistently in the annual publication back to 1980. One feature of the data was changes in plant ownership from foreign to domestic, or domestic to foreign. These changes were often observed in the industrial directories by observing changes in the listed parent company, but where questions arose we called plants directly to verify information. In about 8% of foreign plant-year observations, we had missing data on employee numbers. In all cases we had some information to help estimate the missing data, such as previous or subsequent period employee levels, but this of course, leads to some measurement error.

<sup>8</sup> Distribution of FDI by source country is quite varied across South Carolina as well. The top source countries in terms of employee numbers in South Carolina are Germany (27% of total foreign-plant employment in South Carolina), France (19%), Japan (17%), and the United Kingdom (10%).

foreign presence in all counties in South Carolina, presenting a map with counties shaded according to the foreign plant percentage of total manufacturing employment. In addition to variation across counties, there is also significant variation in the percentage of foreign-plant employment that exists across the 2-digit industries in each county. All the South Carolina MSAs see this percentage range from no foreign-plant employment in some industries to essentially all the industry employment due to foreign plants in others. Our wage regressions below exploit this variation across industries, as well as counties.

Table 1 also shows that growth in foreign-plant manufacturing employment during this period was not matched by similar growth in domesticplant manufacturing in South Carolina. In fact, except for the Charleston MSA, there was significant decline in domestic-plant manufacturing numbers from 1980 to 1985, with fairly constant numbers after 1985. This will ease our identification of the potentially different effects of foreign vs domestic investment on local counties in South Carolina.

As a first look at the relationship between FDI and local community effects, we examine changes in real wages and budgets across South Carolina counties from 1980 to 1994 (or 1995, depending on the variable), and then break these changes down by how much growth in FDI a county received over the same period. Columns 1-3 of Table 2 indicate how average real wages and per capita budgets changed in South Carolina from 1980 through 1994/5. Real wages grew 16.9% over this time period from an annual real wage of \$15,600 to over \$18,000, both expressed in 1982 dollars, while per capita real county revenues and expenditures both grew slightly during this period. Columns 4 and 5 examine whether these changes vary with the degree of FDI counties received during this same period. In fact, counties that experienced relatively high levels of FDI growth also experienced greater growth in real wages (25.9% compared to 12.4%), while these same counties had less growth in real per capita revenues and declines in real per capita expenditures. These results are only suggestive because we have not controlled for other factors and additionally, the differences between columns 4 and 5 in all instances are not statistically significant at conventional levels. However, Table 2 does indicate the possibility that FDI may have a positive impact on wages at the expense of county budgets, and therefore, we next turn to more formal estimation of these relationships.

# 3. TESTING FOR DIFFERENTIAL EFFECTS OF FOREIGN AND DOMESTIC INVESTMENT ON WAGES

Given fixed labor supply, new plant investment into a region will increase real wages, at least for a particular industry and/or labor-skill level, because it increases labor demand. Of course, labor supply is likely

TABLE 2 r-Time Changes in Wages and County Budgets in South Carolina: Broken Down by Changes in Foreign Direct Inve	
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Variable	Mean real value in 1980 (thousands of 1982 dollars)	Mean real value in 1994/5 (thousands of 1982 dollars)	Percentage change from 1980 to 1994/5	Percentage change from 1980 to 1994/5 (counties with below-median change in FDI)	Percentage change from 1980 to 1994/5 (counties with above-median change in FDI)
Real wage in industry in county	15.60	18.24	16.9	12.4	25.9
Real per capita	0.96	1.02	6.3	11.6	2.1
Real per capita	0.97	0.99	2.1	8.5	-3.0
expenditures					

not fixed, and migration of workers to the region will mitigate real wage increases, at least to some extent. If plants are identical in productivity, the effect of new plant investment on real wages will be identical regardless of which plant is responsible for the increase in labor demand. However, plants are not identical, and previous studies have found evidence of significant differences between foreign and domestic plants (in particular, domestic plants that are not multinational). For the United States, Doms and Jensen [8] find that foreign affiliates are more productive and pay higher wages than the average U.S.-owned plant. Simple averages from their data show that production workers in U.S. domestic plants averaged \$18,760 in 1987, while those in foreign plants averaged \$22,290; i.e., approximately 19% higher. Wage differences persist even after controlling for industry, plant size, plant age, and location, though they are reduced to about a quarter the effect without controls. Doms and Jensen [8] and Howenstein and Zeile [19] offer a variety of potential reasons why this may be true, including different labor skill mixes for foreign affiliates and/or wage premiums to deter unionization. Whatever the underlying factors for the differences, they seem to be specific to multinationality of the plant, since Doms and Jensen [8] find no wage differences between foreign affiliate plants and plants of U.S.-based multinationals.

Our analysis examines county- and industry-level real wage data to determine whether there are significant differences between the effects of foreign vs domestic investment on wages, as indicated by the U.S. plantlevel studies. Because we cannot identify whether U.S.-owned plants are multinational or not, our relevant comparison is between foreign and domestic investment. Thus, given the previous plant-level studies, the hypothesis we test is whether investment by foreign (multinational) plants increases real wages relative to all U.S. domestic plants. It is not clear that the results of plant-level studies will translate into similar effects in our database of local real wages, because analysis of local wages factor in varying percentages of foreign-plant jobs in the local community and indirect effects of FDI on local labor supply and domestic demand conditions. In addition, there is suggesting evidence that states

It is not clear that the results of plant-level studies will translate into similar effects in our database of local real wages, because analysis of local wages factor in varying percentages of foreign-plant jobs in the local community and indirect effects of FDI on local labor supply and domestic demand conditions. In addition, there is suggestive evidence that states like South Carolina are attractive to foreign plants because of low labor costs. A *Wall Street Journal* article on investment by German plants in the Carolinas reports that low labor costs in these states more than compensates for the increased transportation costs these plants face (*Wall Street Journal*, May 4, 1993, p. A1; 1). Finally, studies by Glickman and Woodward [14] and Coughlin, Terza, and Arromodee [6] find that high wages in a state discouraged investment by foreign plants. One might expect the wage premium given by a foreign plant to be mitigated or eliminated when that plant may be attracted to the area precisely because of its relatively

low wages. This makes the differential effect of foreign investment vs domestic investment on real wages an important empirical question.

## 3.1. Empirical Analysis of Real Wage Effects

To examine the relationship between foreign and domestic investment in a county and the wage levels in the county, we use data from County Business Patterns on industry-specific (2-digit SIC) county-specific real wages in 1980, 1985, 1990, and 1994 (the last year for which we have data) to estimate the model

$$w_{ikt} = \alpha e_{ikt} + \beta f_{ikt} + \gamma_{kt} + \delta_i$$

for county i in time t for each two-digit manufacturing industry k. Here, wreflects the average annual wage, deflated by the consumer price index to be expressed in 1984 dollars, in industry k in county i during time t.<sup>9</sup> The variable  $e_{ikt}$  is total manufacturing employment for county *i* in SIC industry k in time t, while  $f_{ikt}$  is the level of employees in foreign greenfield establishments for the specific county, industry, and time. These variables come from the sources noted in the section above. The coefficients on the variables e and f are our key parameters of interest. The parameter  $\alpha$  represents the marginal relationship between wages and manufacturing employment in the industry in the county. This is similar to what has been estimated by previous studies using comparable specifications (see Bartik [2]). Unlike previous studies, we estimate the differential marginal effect of foreign manufacturing employment in the industry in the county, represented by parameter  $\beta$ . To capture unobserved countyspecific differences in wages, we control for county-specific fixed effects  $\delta$ , while to control for time-varying industry-specific common effects we include industry-time-specific fixed effects  $\gamma$ .

While this specification is extremely parsimonious, we contend that it captures sufficiently the differential relationship between foreign and domestic investment and the wages in a community.<sup>10</sup> In particular, we note that while it is easy to think of time-varying, county and industry-

<sup>&</sup>lt;sup>9</sup>A shortcoming of these data is that we cannot distinguish full-time from part-time workers, and we must pool together all occupations within an industry. The ideal data set would have individual-level observations on specific occupation and hours worked to more fully control for these potential differences. However, we know of no datasets that would have sufficient individual-level observations in any given geographic area to address this issue. We note, however, that our approach is comparable to that used by previous studies.

<sup>&</sup>lt;sup>10</sup> We tried alternative regressor specifications to estimate the differential impact of foreign-plant employment on wages and budgets. These included substituting the regressors, f and e, with f/e by itself and with f/e and e. These generally gave qualitatively similar results with less precision, but also raised extra issues, such as collinearity problems in the case of the latter.

specific factors that are correlated with changes in *both* foreign and domestic investment in a county, it is difficult to conceive of a variable that should be associated with the *share* of total employment held by foreign plants and also with wages paid in the community. Therefore, while the estimated parameters  $\alpha$  may not reflect the true relationship between employment and wages as a whole, the parameters  $\beta$  should be accurate reflectors of the *differential* effect of new foreign vs domestic-plant employment.

We report the results of this estimation in the first row of Table 3. First, we observe that the relationship between domestic manufacturing employment and wages in a county is significantly positive. We find, for instance, that each additional domestic-plant manufacturing worker in an industry in a county is associated with about a 25-cent increase (in 1984 dollars) in annual wages for all workers in that industry. Contrast this finding with the estimated relationship between foreign-plant employment and county wages: each additional foreign-plant manufacturing worker in an industry in a county is associated with about a \$1.75 increase in annual wages for all workers in that industry. Hence, we find that the marginal new foreignplant manufacturing job has about seven times the effect on wages as does the marginal new domestic-plant manufacturing job. This difference is statistically significant at any reasonable threshold. All standard errors are adjusted to correct for heteroskedasticity and within-county-time correlations of errors. Specifically, we use the standard error correction suggested by Moulton [22], so that we construct our standard errors as if we have 184 effective observations (46 counties  $\times$  4 years of data) while still making use of the variation that exists across industries in a county. We employ the covariance matrix  $C = \sigma^2 (X'X)^{-1} [I + \rho(N - I)]$ , where N = $X'ZZ'X(X'X)^{-1}$ , X is the matrix of explanatory variables, Z is a matrix of county-time interactions, and  $\rho$  is the intra-county-time correlation of the disturbances.11

How large are these effects? At first glance, though strongly statistically significant, these numbers appear quite small. But consider the estimated effects on wages of adding a single average-sized plant. In our data, the average-sized new foreign manufacturing plant has about 190 employees; our results would suggest, therefore, that adding a single foreign plant to a county is associated with more than a 2.3% increase in real wages for *all* 

<sup>&</sup>lt;sup>11</sup> As an alternative, we also estimate our model with only one observation per county per time period, in which we aggregate our industries up to the county-time level. In this case, the estimated difference between another foreign-plant job and another domestic-plant job is 3.0 rather than 1.5, and is significant at the p = 0.047 level. Therefore, our results are clearly not being driven substantively by our choice of disaggregating the data by industry; in fact, if anything, disaggregating the data as we do appears to *reduce* the estimated differential effect of foreign investment.

Differential Effects of Domestic-	and Foreign-Plant Manu Real County-Level	facturing Employment per Capita Budgets an	on Industry-Specific, Cou d Budget Items	nty-Specific Real Wages and
Dependent variable	Effect of an	Effect of an	Difference between	Difference in the case in
	additional domestic	additional foreign	foreign and domestic	which dependent variable
	manufacturing job	manufacturing job	manufacturing jobs	measured in changes <sup>1</sup>
eal annual wage (1984 dollars) <sup>2</sup>	0.249	1.751	1.502	0.649
	( $p = 0.013$ )	( $p = 0.001$ )	( $p = 0.001$ )	( $p = 0.078$ )

TABLE 3

Dependent variable	additional domestic manufacturing job	additional foreign manufacturing job	foreign and domestic manufacturing jobs	which dependent variable measured in changes <sup>1</sup>
Real annual wage (1984 dollars) <sup>2</sup>	0.249 ( $p = 0.013$ )	1.751 ( $p = 0.001$ )	1.502 ( $p = 0.001$ )	0.649 ( $p = 0.078$ )
Real per capita revenues	-0.005	-0.061	-0.056	-0.056
(1904 uoliais) Real per capita expenditures	(p = 0.461) - 0.011	(cont.0 = d)	(660.0 - 0.079)	(p = 0.190) - 0.035
$(1984 \text{ dollars})^3$	(p = 0.233)	(p = 0.061)	(p = 0.054)	(p = 0.203)
Real per pupil school	0.013	-0.032	-0.045	-0.046
expenditures (1984 dollars) <sup>3</sup>	(p = 0.110)	(p = 0.045)	(p = 0.004)	(p = 0.016)
Fraction of K-12 students in	0.131	-0.585	-0.716	-0.677
public schools ( $\times 100$ ) <sup>3</sup>	(p = 0.308)	(p = 0.018)	(p = 0.002)	(p = 0.053)
Fraction of local expenditures	0.006	0.035	0.029	$n/a^4$
going to transportation $(\times 100)^3$	(p = 0.174)	(p = 0.052)	(p = 0.089)	
Fraction of local expenditures	0.000	0.058	0.058	$n/a^4$
going to public safety ( $\times 100$ ) <sup>3</sup>	(p = 0.959)	(p = 0.190)	(p = 0.164)	
		-	- - - -	

<sup>1</sup> Models control for county-specific time trends as well as dependent-variable-specific fixed effects, noted below.

<sup>2</sup> Model controls for county-specific fixed effects and industry-year-specific fixed effects. Standard errors are heteroskedasticity-robust and correct for within-county-time correlation in the errors. p values are in parentheses.

<sup>3</sup> Model controls for county-specific fixed effects and year effects. Standard errors are heteroskedasticity-robust (there is no within-county-time variation). p values are in parentheses.

<sup>4</sup> Cannot estimate model due to lack of observations.

workers, in foreign and domestic plants, in that industry in the county. The estimated wage increase associated with an equal-sized new domestic plant is just 0.3%.<sup>12, 13</sup> As a sensitivity check, we also estimate our model in differences, in which we can now control for county-specific *trends*, rather than just level fixed effects. While the estimated difference between the estimated effects of foreign- and domestic-plant manufacturing jobs is considerably smaller than before, it remains statistically significant at conventional levels. Since some of the difference between our levels and differences results are due to attenuation bias resulting from measurement error (which is exacerbated using first-differences), our suspicion is that the "true" differential effects of foreign plants lies somewhere between the two sets of results.

Of course, it is always possible that our results could suffer from endogeneity bias. If for some reason foreign plants are attracted to high-wage areas, then we might overstate the difference between foreign and domestic plants. While this explanation seems unlikely (as discussed above, the evidence suggests that, if anything, foreign plants are attracted to low wage areas) it is still plausible. We could not find an instrument that explains a significant portion of the variance in within-county, within-industry changes in foreign investment shares over time, while also passing Hausman-type instrument exogeneity tests.<sup>14</sup> However, we propose an

<sup>12</sup> One focus of Aitken, Harrison, and Lipsey [1] was measuring spillover effects in wages from foreign plants to domestic ones. Because our industry wage data is at the county level, rather than the country level as in Aitken, Harrison and Lipsey [1], we do not have separate wage data for foreign and domestic plants to identify direct vs spillover effects from foreign-plant employment. However, there may be some evidence for spillovers in our estimates. If we assume that domestic plants do not respond to higher foreign-plant employment in the sector (i.e., no spillovers), then a 14% pay differential between foreign and domestic plants is necessary in our data to explain the larger increase in *industry* real wages from an additional foreign plant vs an additional domestic one. Howenstein and Zeile [19] find a 16% pay differential (\$38,300 in foreign plants compared to \$33,000) using BEA plant-level data for all U.S. plants in 1990. However, they find that only 30% of this pay differential is due to within-industry differences rather than industry-mix effects. This suggests a within-industry differential of only 5%, which is significantly lower than the 14% differential necessary to preclude spillovers in our estimates.

<sup>13</sup> As a sensitivity check, we also estimate our model with the dependent variable expressed in logs, rather than levels. In this specification, as before, both the coefficients on manufacturing employment and foreign-plant employment are strongly statistically significant. The coefficients imply that a new domestic plant with 190 employees would increase wages by 0.3% while a new foreign plant of the same size would increase wages by 1.9%, roughly the same magnitudes as when the dependent variable is expressed in levels.

<sup>14</sup> Examples of instrument candidates that we tried include measuring the historical stock of foreign manufacturing in the county, and measures reflecting the quality of transportation infrastructure in the region.

alternative way of gauging the degree to which this possible simultaneity may be driving our results. As noted earlier, to this point we have treated foreign-acquired plants as if they were domestic. One rationale for this is that acquired domestic plants have existing capital and workers, which makes it much less likely that we would see these now foreign-owned plants "looking" substantially different from other domestic plants. In fact, most of the given reasons why foreign plants would pay higher wages concern a different plant-level technology (e.g., foreign plants use better technology and workers are more productive, or foreign plants use relatively more skilled labor) or different hiring practices or strategies (e.g., foreign plants pay higher wages to attract better workers in a labor market with which they are unfamiliar). These are features that are difficult to change with existing capital and labor. However, if there is something special and unobservable about a county that would attract a disproportionate amount of foreign investment (rather than domestic investment) and that is driving our results, we would expect that foreign, but acquired, plants would have the same effect as the one we find regarding new foreign investment. To explore whether this is the case, we estimate our model with three categories of plants: domestic plants, foreign acquisi-tions, and new foreign investment. We find that there is no discernible difference (either in magnitude or statistical significance) between domestic plants and foreign-acquired ones in the relationship between employment and wages, but both are substantially (and significantly) different from new foreign investment. This suggests that our results are not likely driven by endogeneity of foreign investment and wages.

Our identification strategy takes a linear form, in that we ask what is the effect of an additional foreign-plant job, conditional on the size of the industry in a given county. However, it is reasonable to suspect that this effect may vary systematically depending on the size of the industry in the county. For instance, it is possible that one additional job may have a larger impact when the market is smaller, although it is equally possible that the impact of an additional foreign-plant job increases with industry size. To gauge the degree to which these effects are nonlinear, we estimate several alternative models in which we interact foreign and total employment with some time-varying community characteristics (the number of employees in the industry in the county; the industry's employment share, as a fraction of total manufacturing employment in the county; or county population) as well as including the characteristic itself as a control variable. We report the results of these exercises in Table 4. We observe that the difference between the effect of a foreign-plant job and a domestic-plant job decreases somewhat (though not statistically signifi-cantly at conventional levels) with the size of the industry's employment in the county, as well as with the share of industry employment as a fraction

County-Specific Real Wages un		TON DOPUMENT A MINOR	, ,	
Situation	Effect of an additional domestic manufacturing job	Effect of an additional foreign manufacturing job	Difference between foreign and domestic manufacturing jobs	Difference in between rows
Fotal size of the industry's employment in the county is large (75 <sup>th</sup> percentile) Fotal size of the industry's employment in the county is empl (75 <sup>th</sup> percentile)	$\begin{array}{c} 1.113\\ 1 = 0.000 \end{array}$	$2.571 \\ (p = 0.003) \\ 2.861 \\ (n - 0.007) $	$\begin{array}{c} 1.458 \\ (p = 0.095) \\ 1.649 \\ (z = -0.116) \end{array}$	0.191
Fotal size of the industry's employment, as a share of total county manufacturing	0.314 ( $p = 0.009$ )	1.390 ( $p = 0.001$ )	1.076 ( $p = 0.017$ )	
employment, is large (75 <sup>th</sup> percentile) fotal size of the industry's employment, as a share of fotal county manufacturing	0.561 ( $n = 0.001$ )	2.057	1.496 ( $n = 0.021$ )	0.420 $(n = 0.456)$
employment, is small (25 <sup>th</sup> percentile)	(10000 - 0.000)	1.626	(P = 0.021)	(nction - d)
(75 <sup>th</sup> percentile)	(p = 0.002)	(p = 0.001)	(p = 0.008)	062.0
LOTAT COULTLY POPULATION IS SUITAIL (25 <sup>th</sup> percentile)	(p = 0.001)	(p = 0.230)	(p = 0.524)	(p = 0.194)

TABLE 4

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of total county manufacturing employment. In addition, we find that difference between the effect of a foreign-plant job and a domestic-plant job increases somewhat (though also not statistically significantly at conventional levels) with the population of the county. The lack of statistical significance or substantial magnitudes of these differences suggests that the results that we present in Table 3 are unlikely to be highly nonlinear, at least in terms of community or industry size.

# 4. TESTING FOR DIFFERENTIAL EFFECTS ON COUNTRY BUDGETS

While there has been some research on the effect of investment on real wages, there has been little formal analysis of investment on local government budgets, much less whether foreign investment has an impact different from that of domestic investment on these local budgets. New plant investment obviously brings in additional tax revenue, but also brings increased demand for other government services, such as infrastructure and public education, from an increase in population. As local governments offer tax relief as incentives for new plant investment, the potential cost to the local community is lower levels of government service per capita. As mentioned in the introduction, states and local communities arguably spend more to attract foreign investment, and there is anecdotal evidence that communities are especially interested in attracting foreign investment.<sup>15</sup> Provided everyone knows these preferences to some extent, one may expect local communities to offer greater tax relief to foreign plants, which leads to lower per capita government services with foreign investment. Below we proxy per capita local government services with measures of per capita revenues and per capita expenditures and test the hypothesis that foreign investment leads to decreases in these per capita measures that are statistically different from changes in domestic investment.

Additionally, foreign plants may be interested in incentive packages from local communities that are different from domestic ones. The possible incentives offered by states and local communities are numerous and often individually tailored to a particular new plant's needs. Obviously, different incentives can affect not only the level, but also the *composition* of local government budgets. Our data allow us to focus on local government spending for public education, transportation, and public safety, and we examine below whether foreign plant investment affects these components of the local budget differently than domestic investment.

<sup>&</sup>lt;sup>15</sup> For example, Alabama state literature on business incentives indicates the state is especially interested in attracting foreign plant investment.

#### 4.1. Empirical Analysis of Local Budget Level Effects

To test these hypotheses concerning FDI and local budgets, we estimate the differential relations between domestic and foreign investment and two measures of local government budgets: real per capita revenues and real per capita expenditures.<sup>16</sup> (As before, we express these variables in terms of 1982 dollars.) Our budget data come from the South Carolina Department of Revenue (for the years 1990 and 1995) and the City and County Data Books (for the years 1980 and 1985). We estimate variants of the equation:

$$b_{it} = \alpha e_{it} + \beta f_{it} + \gamma_t + \delta_i,$$

where b represents the real per capita budgets of all local governments in county i during time t, e and f are total manufacturing employment and foreign manufacturing employment taken from the same sources as before, and  $\gamma_t$  and  $\delta_i$  are year and county fixed effects, respectively. As before, the  $\beta$  coefficient will estimate the differential impact of foreign-plant employment relative to domestic-plant employment.

We report the results of this exercise in the second and third rows of Table 3. We observe that in the cases of both revenues and expenditures, new foreign-plant employment apparently leads to significantly lower levels of per capita budgets than does a comparable amount of new domestic-plant employment. Specifically, a new foreign plant is associated with 12 times the revenue reduction and 8 times the expenditure reduction of a new domestic plant of the same magnitude. For instance, while an average-sized new foreign plant is associated with a 1.2% reduction in real per capita revenues and a 1.8% reduction in real per capita expenditures, the relevant comparison figures for new domestic plants are 0.1 and 0.2%, respectively.<sup>17</sup>

We observe that foreign investment apparently leads to lower budget levels than before. Does it seem to systematically change the composition of local budgets as well? To explore this possibility, we investigate the differential relationships between foreign- and domestic-plant employment and several important local spending categories for which we have data.

<sup>&</sup>lt;sup>16</sup> Here we measure budgets as the sum of *all* local government (county or municipal) revenue or expenditures in a county.

<sup>&</sup>lt;sup>17</sup> Theoretical work by Janeba [20] suggests that even though state budgets may be adversely affected in the short-run from tax incentives, states may be able to extract greater revenue once the plant is relocated, particularly when plants are immobile. Unfortunately, the necessary data to test Janeba's proposition do not currently exist.

# 4.2. Empirical Analysis of Education Spending Effects

Two-thirds of all local government expenditures in South Carolina support public education. As with local budgets, it is impossible to sign ex ante the expected relationship between foreign plants and support for public education. On the one hand, the anecdotal evidence suggests that foreign manufacturers value a highly skilled and well-educated work force and so might be expected to push for higher educational spending-foreign plants often request education and training expenditures from local communities as part of location incentive packages. On the other hand, if employees of foreign plants tend to disproportionately enroll their children in private schools, one might expect support for public education to atrophy in communities with increasingly important foreign-plant employment shares.<sup>18</sup> Since school districts in South Carolina are dependent on county governments, county governments have considerably more latitude in shifting resources to or away from schools in South Carolina than in states (principally in the north and west) where school districts are independent.

To investigate the relationship between foreign investment and support for public education, we estimate an equation identical to those used for the budget specifications above, except that now the dependent variable is real per pupil expenditures on K-12 education. The results of this analysis are reported in the fourth row of Table 3. The results suggest that while communities with increasing levels of domestic-plant employment tend to increase their support for public education (though this relationship is insignificant), those with increasing shares of foreign-plant employment apparently tend to decrease their support for public schools. While the effects of any one plant are quite modest—for instance, an additional new foreign plant is associated with less than half a percent decrease in per pupil school expenditures—aggregating up to a number of new foreign plants in a county could lead to more substantial changes. For instance, a 1-SD increase in foreign-plant employment in a county is associated with almost a 2% reduction in real per pupil school expenditures.

What could lead to this change? In the fifth row of Table 3 we explore the differential effects of foreign vs domestic investment on the fraction of K-12 students in the county who attend public schools. We observe that foreign-plant employment is significantly related to the fraction of students attending public schools in a county. A new foreign plant of average size is associated with about 0.11 percentage points fewer students attending

<sup>&</sup>lt;sup>18</sup> German nationals located in the Carolinas apparently avoid sending their children to public schools in favor of private ones, according to a May 4, 1993 *Wall Street Journal* article. Also, training and education programs requested by foreign plants are often for apprentice-ship programs in area vocational schools that will directly lead to employment in their plant.

public schools. Since just over 6% of students attend private schools in South Carolina, on average, this suggests that adding a single new average-sized foreign plant is associated with a 1.8% larger private school sector in the county. A new domestic plant is (insignificantly) associated with a slightly larger public school sector (or smaller private sector). Hence, apparently employees of foreign plants are disproportionately likely to send their children to private schools.

What is the effect of the reductions in school spending on measured school services? To address this issue, we correlate changes in foreign- and domestic-plant employment in a county with changes in measured school services in the school districts in that county using private-access data from the Schools and Staffing Surveys administered by the U.S. Department of Education. While not a population sample, we have a panel of observations for 52 school districts, more than half of all school districts in the state of South Carolina, for the 1990-91 and 1993-94 academic years, the closest years that we could get to 1990 and 1995. Despite the lower average per pupil expenditures associated with foreign plants, there is no percepti-ble average reduction in real teacher salaries (found by Figlio [11] to be associated with higher teacher quality levels) or teacher-student ratio. However, there is considerable heterogeneity in the relationship between these variables and foreign investment. Specifically, it turns out that for below-median-income (in the state) school districts, the estimated effect of foreign-plant employment on measured school services is significantly more negative than the estimated effect of foreign-plant employment in above-median-income districts. Furthermore, it is only the lower-income areas that see differential movement to private schools and reductions in public school expenditures associated with foreign investment. Therefore, it appears that employees of foreign plants in lower-income areas tend disproportionately to enroll their children in private schools, but this tendency is not observed for higher-income areas. In the lower-income areas, increased foreign-plant employment is strongly associated with lower levels of school expenditure and measured services.

Not only does foreign investment appear to change spending on schools in affected communities, but it also appears to change affected schools' *priorities* as well. Using data from the Schools and Staffing Surveys, we find that school districts whose counties experience increases in the foreign share of manufacturing employment are significantly more likely to introduce policies of free teacher retraining in mathematics, science, and foreign languages over the same period. Therefore, we find suggestive evidence indicating that public schools in areas with foreign investment growth tend to shift their focus toward science, mathematics, and foreign language instruction.

# 4.3. Empirical Analysis of Transportation and Public Safety Effects

It appears that spending on public education is negatively related to foreign investment—at least in low-income communities. We next explore whether these expenditures are switched in part to other budget categories. For example, Coughlin, Terza, and Arromodee [6] find that foreign plants are attracted to states with more extensive transportation infrastructure, which suggests local communities may direct more monies into transportation expenditures. To examine this issue, we estimate models similar to the ones described above, except that now the dependent variables are the fractions of total local expenditures going to transportation or to public safety.<sup>19</sup> Here, we have observations only for three years —1980, 1990, and 1995—taken from the City and County Data Books (in the case of 1980) or data provided us by the South Carolina Department of Revenue for the other years. The results of these regressions are reported in the last two rows of Table 3.

We observe that while new domestic manufacturing plants do not seem to affect the fraction of local expenditures going to transportation or public safety, new foreign plants apparently significantly increase the fraction of expenditures going to transportation. While the relationship between foreign-plant employment and public safety expenditure is statistically insignificant at conventional levels, the point estimate on foreign plants is much larger than that estimated for domestic-plant employment. Hence, it appears that foreign investment leads local governments to redistribute funds from education spending to spending on transportation and possibly public safety.

# 5. DOES THE SIZE DISTRIBUTION OF FOREIGN PLANTS MATTER?

Our preceding evidence suggests that foreign investment has a substantially different effect on wages and budgets in local communities than does domestic investment. But the question remains: does the size distribution of foreign plants matter, or is the sheer fraction of foreign-plant employment all that matters? That is, if a county gets 500 new foreign-plant jobs, is the effect on local wages and budgets the same if the 500 new jobs come from one manufacturing concern, as opposed to 10 50-employee manufacturing plants? Many of the studies that have examined differences in foreign vs domestic plants, including Globerman, Ries, and Vertinsky [16]

<sup>&</sup>lt;sup>19</sup> Our dependent variable takes a different form here (fraction of total spending, as opposed to per pupil spending) than it does regarding education due to data limitations. We look at public safety and transportation because these are the two budget line items for which we have 3 years of data that correspond to the years for which we have information on foreign investment.

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#### TABLE 5

Differential Effects of Domestic- and Foreign-Plant Manufacturing Employment on Industry-Specific, County-Specific Real Wages and Real County-Level per Capita Budgets and Budget Items, Controlling for Concentration of Foreign Plants in the Industry in the County

Effect of an additional foreign manufacturing job when foreign concentration in manufacturing is at 25 <sup>th</sup> percentile	Effect of an additional foreign manufacturing job when foreign concentration in manufacturing is at 75 <sup>th</sup> percentile	Difference between columns
0.752	1.510	0.758
(p = 0.136)	(p = 0.000)	(p = 0.002)
-0.102	-0.077	0.025
(p = 0.006)	(p = 0.042)	(p = 0.001)
-0.100	- 0.094	0.006
(p = 0.028)	(p = 0.047)	(p = 0.348)
-0.031	-0.032	-0.001
(p = 0.090)	(p = 0.057)	(p = 0.803)
0.019	0.028	0.009
(p = 0.262)	(p = 0.082)	(p = 0.000)
0.066	0.062	-0.004
(p = 0.182)	(p = 0.185)	(p = 0.449)
	Effect of an additional foreign manufacturing job when foreign concentration in manufacturing is at $25^{\text{th}}$ percentile 0.752 ( $p = 0.136$ ) -0.102 ( $p = 0.006$ ) -0.100 ( $p = 0.028$ ) -0.031 ( $p = 0.090$ ) 0.019 ( $p = 0.262$ ) 0.066 ( $p = 0.182$ )	Effect of an additional foreign manufacturing job when foreign concentration in manufacturing is at 25 <sup>th</sup> percentileEffect of an additional foreign manufacturing job when foreign concentration in manufacturing is at 25 <sup>th</sup> percentileEffect of an additional foreign manufacturing job when foreign concentration in manufacturing is at 75 <sup>th</sup> percentile0.7521.510 ( $p = 0.136$ ) $-0.102$ ( $p = 0.000$ ) $-0.077$ ( $p = 0.006$ ) $-0.094$ ( $p = 0.028$ ) ( $p = 0.047$ ) $-0.031$ ( $p = 0.028$ ) $(p = 0.057)$ $0.019$ ( $p = 0.057$ ) $0.028$ ( $p = 0.082$ ) $0.066$ ( $p = 0.182$ )( $p = 0.185$ )

<sup>1</sup> Model controls for county-specific fixed effects and industry-year-specific fixed effects. Standard errors are heteroskedasticity-robust and correct for within-county-time correlation in the errors. p values are in parentheses.

 $^2$  Model controls for county-specific fixed effects and year effects. Standard errors are heteroskedasticity-robust (there is no within-county-time variation). p values are in parentheses.

and Doms and Jensen [8] find that controlling for size can significantly affect estimated differences. Thus, if foreign plants are systematically larger than the average domestic plant, our results may be explaining differences in large and small plants, not foreign and domestic ones. To explore the sensitivity of our results, we estimate models similar to those presented above, except this time we allow the marginal effects of foreignplant employment to vary depending on the market concentration of foreign plants in the industry (or county).

The first row of Table 5 presents the results of our estimation of the equation:

$$w_{ikt} = \alpha e_{ikt} + \beta f_{ikt} + \theta f_{ikt} h_{ikt} \gamma_{kt} + \delta_i,$$

where h represents a measure of the market concentration of foreign plants in the industry in the county. Specifically, we calculate h as the sum over all foreign plants in the industry in the county of their squared market shares (as a fraction of total employment in the industry). Therefore, a higher value of h reflects greater concentration of the foreign plants in the industry in the county, and presumably greater influence of any given foreign plant in the county.

We observe that the relationship between foreign-plant employment and wages is strongly related to the concentration of foreign plants in the industry. Specifically, we estimate that the marginal effect of an additional foreign-plant employee on wages is twice as large if the market concentration is at the 75<sup>th</sup> percentile in the state, relative to when the concentration is at the 25<sup>th</sup> percentile in the state. Therefore, it appears that wages in the county will increase more if one new large foreign plant enters, as opposed to when a number of smaller foreign plants with the same aggregate level of new employment enter the industry.

We also find limited evidence suggesting that the market concentration of foreign plants plays a role in determining local budgets as well. Specifically, the marginal effect of foreign investment on per capita revenues is three-quarters as high when the market concentration is at the 75<sup>th</sup> percentile in the state, relative to when the concentration is at the 25<sup>th</sup> percentile in the state. However, this difference is much smaller (and less significant) in the case of per capita expenditures. With regard to budget categories, the only case in which concentration of foreign plants seems to matter involves the fraction of local expenditures going to transportation. In that case, the marginal effect of foreign investment on the transportation spending share is 47% higher when the market concentration is at the 75<sup>th</sup> percentile in the state. In many ways, one might expect the last result more than any of the others, as transportation spending is more likely to have localized effects within a county than would other budget spending categories; hence, it is reasonable to expect that a plant with relatively high market power should be more likely to influence spending on transportation than would a collection of plants, each with low market power.

Given that the size concentration of foreign plants appears to affect the outcomes described in the paper, one might suspect that the results presented in Table 3 are really just large-plant effects, rather than foreign-plant effects. In order to gauge the degree to which this is the case, we estimate our models reported in Table 3 with an additional control for the average plant size (measured in terms of number of employees) in the industry in the county, regardless of ownership, calculated using data from County Business Patterns. The results of this exercise are highly similar to

those reported in Table 3; for instance, the difference between the effect of foreign and domestic manufacturing jobs in the wage equation is 1.497 (p = 0.000), rather than the 1.502 reported in Table 3. Other differences are comparable as well. This suggests that differential plant size is unlikely to be the major determinant of the difference between our estimated foreign and domestic plant effects.

#### 6. CONCLUSION

This paper presents evidence that foreign investment has considerably different effects on local communities than does domestic investment. Using detailed data on foreign and domestic investment in South Carolina, across industries and counties and over time, we find that foreign plants tend to significantly increase wages paid to workers in an industry in a local community, but also lead to substantially lower per capita government budgets. Moreover, foreign investment apparently induces changes in local government budget allocations; specifically, we find evidence suggesting that communities experiencing relative increases in foreign investment tend to substitute from education spending to spending on transportation and public safety.

We acknowledge that there are limitations to our analysis and results. For example, while our results show that the presence of foreign plants is associated with higher wages in the industry in a community, our results cannot identify whether this is due to foreign plants paying higher wages to a given worker, foreign plants using higher skilled workers who command higher pay, or some alternative explanation. Likewise, while foreign plant presence is associated with lower per capita budgets, we have not directly tested whether offered tax incentives are the source of this result. Nevertheless, our results point to substantial differences in how foreign manufacturing plants affect local communities vs domestic ones.

#### REFERENCES

- B. Aitken, A. Harrison, and R. E. Lipsey, Wages and foreign ownership: A comparative study of Mexico, Venezuela, and the United States, *Journal of International Economics*, 40, 345–371 (1996).
- T. J. Bartik, "Who Benefits from State and Local Economic Development Policies?" W. E. Upjohn Institute for Employment Research, Kalamazoo, MI (1991).
- M. Blomström, Host country benefits of foreign investments, in "Foreign Investment, Technology and Economic Growth" (D. G. McFetridge, Ed.), University of Calgary Press, Calgary (1991).
- B. A. Blonigen and D. N. Figlio, Voting for protection: Does direct foreign investment influence legislator behavior?, *American Economic Review*, 88, 1002–1014 (1998).

- R. E. Caves, Multinational firms, competition and productivity in host-country industries, *Economica*, 41, 176–193 (1979).
- C. Coughlin, J. V. Terza, and V. Arromodee, State characteristics and the location of foreign direct investment within the United States, *Review of Economics and Statistics*, **73**, 675–683 (1991).
- J. B. Crihfield, A structural empirical analysis of metropolitan labor demand, *Journal of Regional Science*, 29, 347–371 (1989).
- M. E. Doms and J. B. Jensen, Comparing wages, skills, and productivity between domestic and foreign owned manufacturing establishments in the United States, *in* "Geography and Ownership as Bases for Economic Accounting" (R. E. Baldwin, R. E. Lipsey, and J. D. Richardson, Eds.), University of Chicago Press, Chicago (1998).
- R. C. Feenstra and G. H. Hanson, Foreign direct investment and relative wages: Evidence from Mexico's maquiladoras, *Journal of International Economics*, 42, 371–393 (1997).
- Z. Feliciano and R. E. Lipsey, "Foreign Ownership and Wages in the United States, 1987–1992," National Bureau of Economic Research Working paper No. 6923 (1999).
- 11. D. N. Figlio, Teacher salaries and teacher quality, Economics Letters, 55, 267-271 (1997).
- P. S. Fisher and A. H. Peters, Tax and spending incentives and enterprise zones, *New England Economic Review*, 109–130 (March/April 1997).
- E. L. Glaeser, H. D. Kallal, J. A. Scheinkman, and A. Shleifer, Growth in cities, *Journal of Political Economy*, 100, 1126–1152 (1992).
- N. J. Glickman and D. P. Woodward, The location of foreign direct investment in the United States: Patterns and determinants, *International Regional Science Review*, 11, 137–154 (1988).
- N. J. Glickman and D. P. Woodward, "The New Competitors: How Foreign Investors Are Changing the U.S. Economy," Basic Books, New York (1989).
- S. Globerman, J. C. Ries, and I. Vertinsky, The economic performance of foreign affiliates in Canada, *Canadian Journal of Economics*, 27, 143–156 (1994).
- E. M. Graham and P. R. Krugman, "Foreign Direct Investment in the United States," Third Edition, Institute for International Economics, Washington, D.C. (1995).
- K. Head, J. Ries, and D. Swenson, Agglomeration benefits and location choice: Evidence from Japanese manufacturing investments in the United States, *Journal of International Economics*, 38, 223–247 (1995).
- N. G. Howenstein and W. J. Zeile, Characteristics of foreign-owned U.S. manufacturing establishments, *Survey of Current Business*, 74, 34–59 (January 1994).
- 20. E. Janeba, Tax competition when governments lack commitment: Excess capacity as a countervailing threat, *American Economic Review*, forthcoming.
- S. T. Marston, Two views of the geographic distribution of unemployment, *Quarterly Journal of Economics*, 50, 57–79 (1985).
- B. Moulton, An illustration of a pitfall in estimating the effects of aggregate variables on micro units, *Review of Economics and Statistics*, 72, 334–338 (May 1990).
- M. O'Connor, Cities, counties tackling economic infrastructure issues, *Industrial Development and Site Selection Handbook*, 1028–1052 (October 1987).
- 24. D. V. Rainey, "Business Incentives: Projected Fiscal Costs," Strom Thurmond Institute Working Paper Series (1997).
- D. G. Terkla and P. B. Doeringer, Explaining variations in employment growth: Structural and cyclical change among states and local areas, *Journal of Urban Economics*, 29, 329–348 (1991).
- 26. R. H. Topel, Local labor markets, Journal of Political Economy, 94, S111-S143 (1986).
- D. P. Woodward, Locational determinants of Japanese manufacturing start-ups in the United States, *Southern Journal of Economics*, 58, 690–708 (1992).