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Project Report

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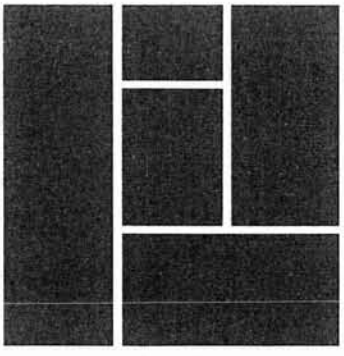

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Project Report

ECONOMIC ANALYSIS OF EFFECTS OF BUSINESS CYCLES ON THE ECONOMY OF CITIES

WHY ARE PLANT CLOSING RATES SO HIGH IN THE SUNBELT?

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Cooperative Agreement Number HA-5455
Cooperative Agreement Amount $134,976

Submitted To:

U.S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

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Original Submission: November 1984

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Why are Plant Closing Rates So High in the Sunbelt?

Until recently, a common explanation for lagging growth in the Frostbelt[1] was that a large proportion of Northern establishments were not competitive in national and international markets. According to this line of reasoning high wages, a unionized labor force, high energy costs, old capital equipment located at inefficient sites, and high taxes were undermining the competitive position of Northern firms. These high operating costs, combined with shrinking regional markets due to the North to South shift in employment and population, were assumed to result in higher rates of plant closures in the Frostbelt than Sunbelt[2] region (Bluestone and Harrison 1983; Storper and Walker 1984). High rates of plant relocations and failures were assumed to explain, in part, the economic stagnation and slow growth of the frostbelt.

Recent evidence on the regional pattern of plant closings does not support this view and it is now accepted that plant closing rates are higher in the Sunbelt than the Frostbelt (Birch 1979; Bluestone and Harrison 1982, 32). Using the Dun and Bradstreet Data, and a four region geographical breakdown, Birch (1979) found plant closing rates to be higher in the South for manufacturing, trade, and service activities. Our work with three 3-digit SIC manufacturing industries indicates that this finding holds when the data is disaggregated by industry and to finer geographical detail.

This paper explores the reason for surprisingly high closing rates among Sunbelt establishments. This topic is of importance not only because it sheds light on the growth and decline of specific regions, but because

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1 Frostbelt is defined here as the West North Central, East North Central, Mid-Atlantic and New England regions as defined by the U.S. Bureau of the Census.

2 Sunbelt region as used in this study includes the South Atlantic, West South Central, East South Central, Mountain, and Pacific regions as defined by the U.S. Bureau of the Census.

regional variations in plant closures can shed light on the causes of disinvestment at the national level.

Two hypotheses are tested. One explanation is that fast growth Sunbelt regions have a high proportion of establishments and employment in establishments that are new, and this type of establishment has a high probability of failure. A second hypothesis for high plant closure rates in the Sunbelt is that the growth of national enterprises combined with the maturation of our manufacturing technologies has resulted in a concentration of branch plant employment in the Sunbelt. It is hypothesized that branches have a higher than average probability of closing, explaining the relatively high plant closing rates found in the Sunbelt. These hypotheses are tested here. The findings, show that regional variations in plant closing rates are not eliminated when new firms are eliminated form the population of all establishments. Further evidence demonstrates that branch plant employment is less stable in the long run than employment in single plant firms and headquarters, but that Sunbelt dependency on branch plant employment does not explain high rates of shutdown among Sunbelt establishments.

The remainder of this paper is divided into four sections. The first section reviews the theory and previous literature that hypothesizes Sunbelt regions should have a higher proportion of employment in branches and that branches are more susceptible to shutdown. The second section discusses the methodology used to test the hypotheses and the third section discusses the results. The fourth and final section draws conclusions and policy implications.

Theory and Previous Literature

One explanation for high establishment closing rates in the Sunbelt regions is that, due to rapid economic growth, these regions have a high proportion of establishments and employment in establishments that are young. New firms experience high rates to failure because of managerial inexperience, lack of capital, inability to penetrate markets, and uncertain supplies of inputs. The U.S. Small Business Administration found that 53.6 percent of all business failures in 1980 were firms aged 0 to 5 years old. Only 18.3 percent of failures were firms aged 11 years and older (U.S. Small Business Administration 1983, 238). The same report shows that establishment formations are highest in the Mountain Pacific, West South Central, and South Atlantic regions and lowest in the East North Central, West North Central New England and Mid-Atlantic regions (U.S. Small Business Administration 1983, 142). Thus high closing rates in the Sunbelt may be explained by a concentration of new firms that in the fast growth regions.

A second explanation hypothesizes that there is a concentration of branch plants in the Sunbelt; and that branch plants close at high rates. One explanation for a concentration of branch plants in the Sunbelt is the product-cycle model. The product-cycle model links the diffusion of an innovation with the locational decisions of national and multinational firms. In the early stage of an innovation's development production is tied to the headquarters of the firm. Production methods are fluid at this stage of product development, and decisions about the manner of production and configuration of the innovation must be made quickly and on a regular basis. As a consequence, production must take place in proximity to decision makers. The manufacturing of a new product also requires a skilled labor force that can adapt to new product designs and changes in its production, and agglomeration economies to

keep track of innovations by competing firms and to be near producers of capital goods.

As the innovation becomes standardized and production methods routinized, ties to the decision makers, skilled labor force and agglomeration economies relax, and firms are freer to search for and branch out to take advantage of lower cost production sites and new markets (Vernon 1966). Within the United States boundaries, the low wage Sunbelt with its large supplies of unskilled workers and its growing population has offered a disproportionate share of such sites (For an example of this process using the textile industry see Hekman 1980b).

Aside from the standardization of many manufacturing products and the routinzation of their production, the hypothesized spin off of branches to the low wage Sunbelt has also been made possible by changes in the industrial organization of the United States' economy. In the process of industrial development, national corporations swallowed up small family firms in the merger movement of the early twentieth century. As part of this evolution, companies were reorganized into a vertical division of tasks with a head office overseeing production units. This organizational separation of tasks permitted the geographical separation of tasks (Hymer 1972). Headquarters could locate or remain in areas most suitable for innovating, planning and decision making activities, leaving production activities free to locate in areas of the country where production costs were lower and markets larger. The spatial separation of firms' managerial functions from production functions was therefore made possible by the growth of the national enterprise. In addition to the routinization of the manufacturing process which eliminated the need for daily managerial oversight of the production process and the development of the national corporation; improvements in communication and

transportation, which permitted contact between headquarters and branches, also played a part in the spin off of branch plants to the Sunbelt (Thompson 1968; Thorngren 1970).

According to the product-cycle and industrial development models, headquarters or managerial functions were located in or remained in urban areas of the Frostbelt to take advantage of proximity to capital markets, a skilled labor force, and agglomeration economies. Branch plants or the "production" functions requiring non-skilled workers were shifted to in the Sunbelt to take advantage of low cost, non-union labor (Thompson 1968; Hymer 1972; Westaway 1974).

For a number of reasons these branches are expected to have high closing rates. One hypothesis is that the Sunbelt is only a way station as corporations shut down domestic branches and shift their operations to even lower cost sites overseas. To meet the challenge of foreign competition, American firms began expanding into international markets in the decades after the 1950's. In order to cut production costs and maintain or expand markets, national firms began seeking out low cost sites abroad for their own branches or foreign producers who could produce inputs more cheaply than they could be produced by the firm. This latter phenomenon, known as "outsourcing", as well as the shift of American capital abroad is one explanation for plant shutdowns at home. The cheap labor force of the South cannot compete with the cost of labor in Taiwan, Korea, Brazil, Hong Kong and other Third World countries.

Not all branches are vulnerable to shutdown due to "outsourcing" and capital flight to third world countries. Vernon (1966, 203) identifies the characteristics of industries that are likely to have sought out low cost production sites first in the low wage areas of the Sunbelt in the 1950's and 60's, and to currently be vacating the Sunbelt in search of lower cost produc-

tion sites in less developed countries. In general these industries produce or assemble their products overseas and then reimport them for local markets or markets in other developed countries. Generally vulnerable industries are those that produce goods that have high value to weight ratios and a high elasticity of demand. A high value to weight ratio implies low transport costs as a proportion to product value. A high elasticity of demand implies that small differences in production costs will make large difference in the size of market for the product. Thus firms are motivated to search for production sites that can give them any cost advantages. In addition, production cannot rely on external economies, must be highly standardized, not tied to a natural resource, and require large inputs of low skilled labor. The same characteristics describe industries particularly hard hit by "outsourcing." It is worth noting that industries currently passing into the phase of maturation where production is routinized and can be separated from managerial oversight, skilled labor, and agglomeration economies may now be skipping the low labor cost South and instead moving directly overseas. The California based computer industry has been cited as an example.

Data from Dun and Bradstreet indicates that the phenomenon of Southern branches controlled by Frostbelt headquarters is significant. Birch (1979, 45-46) found that over the period 1969 to 1976, 70 percent of the South's net job growth in manufacturing was controlled by Frostbelt firms. Analyzing data on the computer industry Hekman (1980a, 12) found that New England and the Mid-Atlantic states were more likely to be home to headquarters than branches and that the South Atlantic and South Central regions had few headquarters relative to the number of branches they contained.

The product-cycle model implies that the Sunbelt will have relatively high concentrations of branch plants due to the relatively low costs of its

factors of production. We also expect that firms producing weight gaining or market oriented products have also situated branches in the Sunbelt to take advantage of expanding markets. Market oriented industries are not, however, threatened by cheap labor abroad.

The product-cycle model predicts that branch plants producing high value to weight ratio products, with a labor intensive routinized production process will be vulnerable to shutdown as firms' "outsource" or shift production to even lower labor cost areas overseas. There are two additional theories that hypothesize that any branch is more likely to shutdown than is a headquarters or single plant establishment. One theory is that managers of multiplant firms allocate capital more efficiently and rationally than managers of single plant firms and therefore are quick to close branch plants that do not yield sufficiently high rates of return. A second theory argues that large corporations are more likely to mismanage acquisitions and thus these acquisitions are more likely to show a loss and be closed.

Disinvestment and plant shutdowns may occur more readily in multiplant than single plant firms because managers of the former have a wider scan of investment possibilities than managers of single plant enterprises. First, the entrepreneur who manages several plants can easily shift cash flows among branches and subsidiaries. Williamson (1975, 147-148) argues that one of the greatest advantages of the multidivisional firm is that within the corporation capital is allocated more efficiently than in capital markets external to the firm. A multidivisional firm has good information about all of its branches and divisions and therefore can assign cash flows to high yield uses phasing out, divesting itself of, or closing less profitable activities. In addition managers of multiplant and multidivisional operations have the expertise and

staff to carry out a locational search for more profitable sites or new business ventures, again phasing out low return activities.

The single plant entrepreneur faces a more limited range of alternative investments because the cost of identifying and taking advantage of new investment opportunities is relatively high. Thus owners of single plant firms may not be aware of alternatives and therefore continue to invest in and operate ventures that a multiplant firm would shut down (Cyert and March 1963; Hymer 1972, 120; Storper and Walker 1984).

In addition, single plant entrepreneurs will be more likely to keep a plant operating when its profits fall below those of alternative ventures because the entrepreneur draws a salary from the business and lives in, derives status from, and has a commitment to the community where the business is located. Non-economic benefits, therefore, may compensate the single plant entrepreneur for lower rates of return (Westaway 1974, 151; Dicken 1976, 404-405; Erickson 1976; McGranahan 1982). Evidence on plant closures in Philadelphia support the view that branch plants of multiplant and multidivisional firms demand higher rates of return to operate than do single plant entrepreneurs. Hochner and Zibman (1982, 204-205) found that over a ten year period independent firms did not close until their sales revenues failed to keep pace with inflation. National corporations closed branches that had average sales increases that kept pace with inflation, and multinational corporations closed branches that experienced an average growth in sales that surpassed the inflation rate.

A second school of thought also argues that branch plants are more susceptible to shutdown than single establishment operations. As in the previous theory, plant disinvestment and shutdowns occur where rates of return are low relative to the alternative investment possibilities. However, according to

this theory, the low rates of return in many plants are due to the growing concentration and diversification of corporations. According to this theory the merger phenomenon of the 1970s led to a new surge of "paper entrepreneurialism" and diversion of resources from long-run production and investment in capital equipment into the acquisition of other enterprises. This failure to invest in research and development, new management techniques, and modern technology has led to falling rates of profits in many branches and subsidiaries, resulting ultimately in their closing (Reich 1983). Also corporations frequently acquire activities that they have little experience running. As a result a once highly profitable acquisition may be poorly managed, become unprofitable and ultimately be closed (Bluestone and Harrison 1982, 151-159).

The evidence on the unstability of branch plant employment is mixed. Evidence from Great Britain on closure rates for branch plants shows that branches are not particularly vulnerable to closure (Townroe 1975). Erickson's (1980) findings were similar. He conducted a study of branch plant closings in rural Wisconsin and found that the annual closure rate among branch plants between 1959 and 1977 was 3.3 percent. This figure compared favorably with an average annual closure rate for all firms in the U.S. economy of 8 percent.

Other authors have found, however, contradictory results. Barkley (1978) found that branch plants in rural Iowa were more likely to close than locally owned plants, over the period 1965-75 and Bluestone and Harrison found that corporations and conglomerates together were responsible for a disproportionate share of job loss through plant closings in New England (1983, 34). Barkley's and Bluestone and Harrison's findings for New England are consistent

with our findings for the three manufacturing industries studied and reported on here.

Data and Methodology

Dun and Bradstreet (D&B), a credit rating service, collects employment data and addresses, as well as other information, on individual establishments in their Duns Market Indicators (DMI) file. Data on all establishments in machinery manufacturing (SIC 354), electronic components (SIC 367), and motor vehicles (SIC 371) were taken from the 1975, 1979, and 1982 DMI files and then merged to create histories of each establishment. Any establishment that existed in the region a prior year but not in a later year was tagged as a closing. Thus the figures include establishments that relocated to sites outside of the region as well as establishments that ceased operation. The 1975 to 1982 time period was selected to include one full business cycle, the 1975-79 expansion and the 1979-82 recession. This avoids any bias in the results due to regional differences in responses to the national business cycle.

The merged data set, includes 27,014 machine tool, 14,067 electronic components, and 11,909 motor vehicle establishments, including branch plants, headquarters and single plant establishments. Because both total employment and number of establishments in each of these industries are equal to 100 percent of employment and establishments, respectively, as reported by the County Business Patterns (Howland 1983) the data reported below are treated as a population rather than a sample.

These three industries were selected because they represent market oriented and least-production-cost oriented industries. Machine tools and motor vehicles are both market oriented. Machine tool production generally requires

face to face contact with the client who is purchasing an individually tailored machine and Motor Vehicles is an high transport cost item that generally locates near markets. Electronic components production tends to be standardized, and labor intensive, requiring low skilled labor. In addition electronics products tend to be light in weight. Therefore this industry generally locates so as to minimize production costs, and we would expect this industry to have been particularly attracted to the Sunbelt in the last few decades in order to take advantage of the Sunbelt's labor force. At the 3-digit level of industrial detail there will be, however, exceptions within all three categories. This is expected to be particularly true for electronic components, where parts of the industry are highly innovative, requiring a skilled labor force and agglomeration economies.

The three-digit level of disaggregation was selected to avoid the problem of regional differences in plant closings occurring because of regional differences in the composition of industries. For example, high closing rates in the East North Central region could be due to this region's industrial composition; that is high closing rates in the troubled auto industry combined with the high concentration of the auto industry in this region. High closure rates could also be due to high closing rates among all industries in this region.

Results

Our findings demonstrate that machine tool, electronic component, and motor vehicle establishments in the Sunbelt are more likely to close than their Frostbelt counterparts. This finding is consistent with those of Birch (1979) for all industries and all manufacturing.

Cross regional comparisons of plant closing rates and rates of job loss due to plant closings are shown in Table 1. The results indicate that closing rates are greater in the Southern regions than the industrialized Northern economies. For example, for the period 1975 to 1982, closing rates of machine tool establishments ranged from 6.7 to 8.4 per annum in the Frostbelt and 8.1 to 11.6 per annum in the Sunbelt. The average closing rates were 10.0 in the Sunbelt and only 7.0 in the Frostbelt. Employment loss due to plant closings was also higher in the Sunbelt than in the Frostbelt. For the machine tool industry the rate of job loss due to closings was 5.9 percent in the frostbelt and 8.4 percent in the Sunbelt. For the three industries studied, employment losses due to closings were greater in the Sunbelt than the Frostbelt.

Are these differences explained by the concentration of new firms in fast growth regions of the country? The data in Table 2 show that they are not. Even when firms five years and younger are eliminated from the population of all establishments, regional variations in plant closing rates persist.

The second hypothesis explains the pattern by a concentration of branch plants in the Sunbelt and a tendency for branch plant employment to be unstable explain this pattern? While the evidence indicates that branch plants are more likely to close than headquarters, or single plant operations, there is no consistent pattern of Sunbelt economies being comprised of a higher proportion of branch plants than Frostbelt economics.

National figures on closings, shown in Table 3, indicate that branches have a higher probability of closing than do single plant operations and headquarters. Table 3 compares the probability of a closing plant being a headquarters, single plant operation, or a branch plant with the distribution of each type of establishment in the population of all establishments. The results are presented for two recessions, 1973-75 and 1979-82, and one expan-

Table 1

Annual Average Rates of
Establishment Closings by Region
1975-1982
(percentages)

	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Frostbelt[c]	Sunbelt[d]
Rate of Establishment Closings[a]											
Machine Tools	7.0	7.1	6.7	8.4	10.1	8.1	11.5	11.6	9.7	7.01	9.97
Electronic Components	9.7	8.8	10.3	10.5	12.4	13.3	12.9	13.1	11.6	9.61	12.06
Motor Vehicles	10.4	9.1	8.9	9.6	10.8	8.3	11.1	9.9	11.1	9.14	10.68
Rate of Job Loss Due to Establishment Closings[b]											
Machine Tools	5.9	5.6	5.9	7.0	5.8	7.2	9.7	12.0	10.0	5.85	8.39
Electronic Components	6.4	4.4	8.1	6.7	8.6	5.4	7.5	7.3	8.7	6.15	8.13
Motor Vehicles	3.0	4.4	5.2	4.8	4.2	4.1	9.0	4.6	7.9	5.04	6.17

Source: Urban Institute Analysis of the Dun and Bradstreet data file.

a. (Closings from December 1975 to July 1982/Total number of regional establishments in industry in 1975)/6.5.

b. (Job loss due to closing from December 1975 to July 1982/Total employment in industry in 1975)/6.5.

c. Includes New England, Mid Atlantic, East North Central, West North Central.

d. Includes South Atlantic, East South Central, West South Central, Mountain, Pacific.

Table 2

Annual Average Rates
Of Establishment Closings by Region
of establishments 5 years old and older

(percentages)

	New England	Mid Atlantic	North Central	East North Central	West South Atlantic	South Central	East South Central	West Mountain	Pacific	Frostbelt[c]	Sunbelt[d]
Rate of Establishment Closings[a]											
Machine Tools	6.5	6.6	6.2	7.9	9.3	7.4	10.8	10.8	8.8	6.44	9.12
Electronic Components	9.5	8.6	10.0	9.7	12.2	10.2	12.8	11.9	10.9	9.28	11.39
Motor Vehicles	10.1	8.3	8.4	8.6	8.6	6.5	10.2	9.2	9.9	8.52	9.27
Rate of Employment Loss[b]											
Machine Tools	6.5	5.3	5.8	6.8	5.0	6.5	8.7	9.1	9.4	5.96	7.47
Electronic Components	6.2	4.2	7.7	6.4	8.4	4.9	7.3	6.7	8.5	5.86	7.93
Motor Vehicles	2.9	4.4	5.2	4.5	3.9	3.8	8.7	4.4	7.5	4.98	5.78

Source:

a. (Closings from December 1975 to July 1982/Total number of regional establishments in industry in 1975)/6.5.

b. (Job loss due to closing from December 1975 to July 1982/Total employment in industry in 1975)/6.5.

c. Includes New England, Mid Atlantic, East North Central, West North Central.

d. Includes South Atlantic, East South Central, West South Central, Mountain, Pacific.

Table 3

Status of Establishments that Closed
as Compared to Total Population
of Establishments

	--1973-75--		--1975-79--		--1979-82--	
	% of Plants that Closed	% of All Establishments	% of Plants that Closed	% of All Establishments	% of Plants that Closed	% of All Establishments
Machine Tools						
Singleplant Est.	82	84	80	85	80	85
Headquarters	8	8	7	7	7	7
Branches	12	7	12	8	12	8
Electronic Components						
Singleplant Est.	65	67	65	69	66	70
Headquarters	13	15	13	14	12	13
Branches	22	18	22	17	21	17
Motor Vehicles						
Singleplant Est.	64	64	64	65	64	66
Headquarters	13	15	12	14	11	13
Branches	23	21	24	21	25	21

Source: Urban Institute Analysis of Dun and Bradstreet data file.

Table 4

Branch Plants and Employment in Branch Plants as a Proportion of All Plants and Employment 1975 (percentages)

	New England	Mid Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Frostbelt[a]	Sunbelt[b]
Establishment[a]											
Machine Tools	5.9	6.9	8.1	6.0	12.9	9.6	9.6	10.9	10.9	7.4	11.7
Electronic Components	17.1	14.8	18.7	19.0	23.6	30.0	18.8	18.2	15.6	16.8	17.9
Motor Vehicles	10.6	17.9	31.3	18.1	22.2	30.7	14.9	9.2	13.1	25.2	16.8
Employment[b]											
Machine Tools	20.6	29.8	29.0	12.3	59.5	34.1	35.4	26.3	23.4	27.0	38.0
Electronic Components	50.8	63.6	41.6	54.9	64.2	54.3	49.8	67.5	42.4	53.9	48.4
Motor Vehicles	50.9	56.8	70.9	62.9	73.4	74.3	45.2	14.7	63.9	68.3	65.0

Source: Urban Institute Analysis of the Dun and Bradstreet File.

a. Includes New England, Mid Atlantic, East North Central, West North Central.

b. Includes South Atlantic, East South Central, West South Central, Mountain, Pacific.

sion, 1975-79. The probabilities are calculated for the three industries, machine tools, electronic components, and motor vehicles.

During all phases of the cycle, single plant firms are less likely to close than headquarters or branches. For example, during the 1973 to 1975 recession, 84 percent of all establishments were single plant operations, and yet single plant operations were only 82 percent of all closings. During the 1975-79 period 80 percent of all closings occurred in single plant firms while these firms made up 85 percent of all establishments. Headquarters close in proportion to their population size. For example, during the 1973-75 recession 8 percent of all machine tool firms were headquarters and headquarters comprised 8 percent of all closings in the machine tool industry. Branch plants, on the other hand, close in greater proportions than their numbers in the population. For example, during the 1973-75 recession, 7 percent of all machine tool firms were branches and yet branches were 12 percent of all establishments that closed. These numbers are consistent with the above theories. Branches do appear to provide less stable employment than headquarters or single plant operations.

However, in contrast with the implication of the models described above a Sunbelt dependency on branch plants does not explain high shutdown rates in this region. The proportions of each region's employment in branch plants for the market oriented industries of machine tools and motor vehicle and the least production-cost oriented electronic components industry are shown in Table 4. While the Sunbelt has a higher proportion of machine tool employment in and machine tool establishments that are branches than the Frostbelt, this is not the case for electronic components and motor vehicles. Thirty-eight percent of Sunbelt machine tool employment is in branches, whereas only 27 percent of Frostbelt employment is in branches.

However, taking a closer look at the geographical breakdown of the data, the pattern in the machine tool industry does not support the hypothesis that the concentration branch plants explain high shutdown rates. According to Table 4, the South Atlantic region has 60 percent of all of its machine tool employment in branch plants, a greater dependence on branch plant employment than in any other region. Table 1, however, shows that the South Atlantic is not the region of the Sunbelt with higher than average closing rates for this industry. The highest plant closing rates are in the Pacific region (10.0 percent annual average closing rate) and the mountain region (12 percent annual average closing rate). These regions do not have larger than average proportions of their machine tool employment in branch plants.

For electronic components and motor vehicles the regional proportions of employment and establishments in branches are even. For electronic components 54 percent of all Frostbelt employment and 48 percent of Sunbelt employment is in branches. The comparable figures for motor vehicles are 68 percent for the Frostbelt and 65 percent for the Sunbelt. These findings do not support the hypothesis that relatively high concentrations of branch plants explain high plant closing rates in the Sunbelt. Sunbelt economies do not appear to be overly dependent on branch plant employment.

It is, however, possible that we have not fully tested the hypothesis. Regional differences in industry composition within the 3-digit level of disaggregation may mask a high shutdown rate among electronic components branches in the Sunbelt. More clearly, electronic components' branch plants in the low wage regions of the Sunbelt may be labor-intensive assembly requiring low skilled workers. Branch plants in this industry in the Frostbelt may be conducting state-of-the-art research and development, requiring skilled labor and agglomeration economies. In this case it is the Sunbelt branches

that would be threatened by low assembly-cost possibilities overseas, and capital flight, not Frostbelt branches. This argument does not apply to the major share of the machine tool or motor vehicle industries, whose location decisions tend to be market oriented rather than production cost oriented. Branches located in the Sunbelt to take advantage of markets are not threatened by cheap foreign labor.

To test this possibility, the annual average closing rates of branch plants, by region, are reported in Table 5. The data show that, as expected, Frostbelt branches are as likely to close as Sunbelt branches in the machine tool and motor vehicles industry. However, in the electronic components industry, Sunbelt branches are more likely to close than are Frostbelt branches. The annual average closing rate for branch plants in the electronic component industry in theFrostbelt is 10.7 and the comparable figure for the Sunbelt is 13.3. These regional differences are even greater when employment losses due to closings are considered. Employment losses due to branch plant closings in the Sunbelt are more than twice as high as those of the Frostbelt. Over the period 1975 to 1982, an average of 13.7 percent of all branch plant employees in the electronic components industry lost their jobs due to closings per year, while the comparable figure in the Frostbelt was 5.6 percent per annum.

Looking at rates of branch plants closing for electronic components, four regions stand out as having high rates of branch plant closures. They are the South Atlantic, East South Central, West South Central and Pacific regions. As expected three of these regions are low wage areas (see Browne 1984). This evidence is consistent with the product-cycle hypothesis. The one exception is the high wage Pacific region. High branch plant shutdown rates here lend support to the casual observation that California may be spinning off some of

Table 5

Annual Average Closing Rates of
Branch Plants 1975 to 1982
by Region

(percentages)

	New England	Mid Atlantic	West North Central	East North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific	Frostbelt[c]	Sunbelt[d]
Establishment											
Machine Tools	14.1	9.73	11.0	11.9	8.75	4.3	10.9	13.1	12.4	10.5	10.1
Electronic Components	10.6	11.3	10.5	9.8	10.1	6.5	15.2	8.1	15.4	10.7	13.3
Motor Vehicles	8.8	10.2	9.2	10.5	8.6	4.7	9.8	10.0	11.8	9.5	9.2
Employment											
Machine Tools	4.0	9.1	10.2	8.4	4.2	1.1	6.2	4.2	13.0	9.1	5.6
Electronic Components	6.1	4.3	7.9	6.3	9.0	10.4	18.6	3.3	16.0	5.6	13.7
Motor Vehicles	.9	3.6	6.1	4.0	3.0	1.5	5.0	4.3	9.5	5.7	5.1

Source: Urban Institute Analysis of Dun and Bradstreet File.

a. (Closings from December 1975 to July 1982/Total number of regional establishments in industry in 1975)/6.5.

b. (Job loss due to closing from December 1975 to July 1982/Total employment in industry in 1975)/6.5.

c. Includes New England, Mid Atlantic, East North Central, West North Central.

d. Includes South Atlantic, East South Central, West South Central, Mountain, Pacific.

its high-technology computer-assembly operations now that they have recently become routinized. Another explanation for the high shutdown rates in the Pacific region is that although California has a high average wage, they have a sizeable population of low wage workers that have immigrated, legally and unlegally from Mexico. These low wage industries may also be shifting overseas to countries with lower cost labor forces.

Conclusion and Policy Implications

Findings from the machine tool, electronic components and motor vehicles industries indicate that neither the concentration of new firms in the Sunbelt nor the Sunbelt region's dependency on branch plants explain the surprisingly high rates of plant shutdowns in this region. After eliminating firms less than five years of age from the population, closing rates still remain higher in the Sunbelt than the Frostbelt, and while the findings show that branch plants are more likely to shut down than are single plant operations or headquarters, the concentration of branch plants in the Sunbelt does not explain high plant closing in this region. For two of the industries, the proportion of industry employment and firms in branch plants are even in the Sunbelt and Frostbelt. For the exception, the machine tool industry, the regions with a disproportionate dependency on branches are not the ones with above average industry closing rates.

The data are consistent with the hypothesis that shutdowns are high in certain industries in the Sunbelt due to capital transfer to low wage countries. This phenomenon applies, however, only to a narrow category of goods. Those that are not tied to markets and produced with low skilled workers; goods that have a high elasticity of demand, and whose production does not require agglomeration economies; and goods with a high value to

weight ratio, that are standardized and produced with a routinized production process.

The 3-digit SIC-classification electronic components industry, in large part, subscribes to these characteristics. Evidence from this industry shows disproportionately high rates of shutdowns among the branches in low wage regions of the United States. However, the narrowness of these characteristics suggests that, while important for some industries, capital transfer to Third World Countries does not explain the aggregate pattern of high plant closing rates among Sunbelt establishments.

One clear implication of regional pattern of plant shutdowns is that relatively high tax rates, high labor costs, high energy costs, and a unionized labor force are not driving Northern establishments out of business. Once in place firms and branch plants do not readily close in response to regional differences in factor price levels and changes. This stability may be explained by firms' ability to substitute among inputs, replacing for example labor with capital, or it may be explained by the importance of community ties to entrepreneurs. In either case, the permanence of capital investments puts a break on regional economic decline. One policy implication is that state and local policy makers need not fear large scale disinvestment in response to changes in taxes, utility rates, negotiated wage increases by labor, and increased unionization of the labor force.[3]

The findings also suggest a number of other implications for policy makers. First, since branches appear to provide the least stable long run employment, whereas single plant operations provide the most stable long run

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[3] These changes in the cost of doing business may, however, deter new businesses from entering the region.

employment opportunities, economic development officials should adjust their development programs to favor local entrepreneurship. Incentives should be more generous for local entrepreneurs than for headquarters, and more generous for headquarters than branch plants.

Secondly localities offering low labor costs as their primary incentive should view the attraction of branches as a short run strategy. Localities producing products with the characteristics outlined above will be especially vulnerable to plant closings as their labor force fails to compete in the longer run with low wages abroad. Finally, the failure to adequately explain observed patterns of regional disinvestment suggests that further work is needed to explain plant closings, an important component of regional as well as national economic change.

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