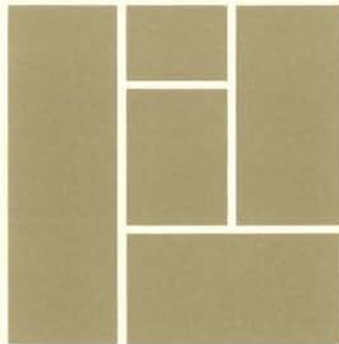HUD-0004039

**THE URBAN
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Project Report

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

THE SENSITIVITY OF
LOCAL ECONOMIC ACTIVITY TO
NATIONAL ECONOMIC CYCLES:
LITERATURE REVIEW

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Submitted To:

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INTRODUCTION

With the national economy in recession, concern about the sensitivity of local economic activity to national economic cycles has intensified. Jurisdictions facing high unemployment rates have searched for ways to insulate their labor markets and public sector budgets from the impact of national fluctuations in economic activity. The long-run consequences for local economies of steeper and more frequent cyclical troughs remains uncertain.

The purpose of this paper is to review the economic literature regarding local, private-market impacts of national economic cycles. A companion paper will review the impact of economic cycles on the local public sector. Both papers are being prepared as the first stage of a cooperative agreement between the Department of Housing and Urban Development and The Urban Institute to study the effects of business cycles on the economy of cities.

The first section of the paper reviews what is known about differences in cyclical exposure across sectors of the economy, segments of the labor force, and vintages of capital facilities. The second section summarizes the findings of several empirical studies of regional, state, and metropolitan cyclical behavior, and considers how much of the geographical variation in cyclical intensity can be accounted for by differences in the characteristics discussed in Part I. In the third section of the review we turn to longer-term trends of population and job decentralization from

central cities, and ask how these trends are affected by national economic cycles.

The purpose of this literature review is to help shape original empirical analysis to be carried out over the next two years. Consequently, Part IV briefly examines the data sources that have been, or can be, used for analysis of local economic fluctuations, and their shortcomings. This final section identifies the principal analytical issues that remain unresolved in the economic literature, and considers which of these could be addressed with the data and resources available to the project.

I. VARIATIONS IN CYCLICAL SENSITIVITY
WITHIN THE NATIONAL ECONOMY

It is well known that national economic cycles do not affect all parts of the economy uniformly. An understanding of the reasons for local differences in cyclical impact properly begins with an understanding of the types of variations in cyclical sensitivity that exist throughout the economy, since in the first instance, local variations in cyclical exposure derive from differences in the composition of local economies.

Central to all studies of cyclical sensitivity is the selection of an index of economic activity and a method of dating and measuring the severity of business cycles. These issues are reviewed in our project proposal. It is necessary here only to mention that employment, unemployment, and income have all been used to measure changes in economic activity, and that a variety of methods has been used to identify cyclical turning points. Further discussion and references can be found in Boschan (6), Zarnowitz and Boschan (59), Mintz (35), and Friedenberg and Bretzfelder (18).

SECTORAL SENSITIVITY

Research has firmly established differences across sectors in sensitivity to national economic cycles. An excellent review of the pre-1976 literature can be found in Roger J. Vaughan, Public Works as a Counter-cyclical Device: A Review of the Issues (55).

Durable goods manufacturing, construction, and basic industrial activities necessary to durable goods production have been found to have the steepest cyclical fluctuations in the U.S. economy. Durable goods and construction both involve items that are expected to be in service for many years; the serviceable lives of existing durables and plant can be stretched, if necessary. Therefore, both items are logical candidates for postponement of purchase during cyclical fluctuations. The fact that both are associated with major expenditures makes them more affected by economic uncertainty and expectations about the future level of demand than are other expenditures. This heightens their cyclical swings. In economic cycles where restrictive monetary policy plays a role, as in the three most recent cycles, recessions are accompanied by high interest rates, raising the costs of durable goods and plant and housing purchases, further exacerbating the cyclical downturn for these sectors.

Almost all studies of sectoral sensitivity have identified durable manufacturing as the sector most sensitive to fluctuations in the business cycle. This appears to hold true among all of the indicators and methods used to identify cycles. Durable manufacturing showed the greatest fluctuations in employment in studies by Moore (36), Okun (43), Zarnowitz and Moore (60), Borts (5) and Vernez et al. (56). Using nonfarm payrolls as a measure, studies by Bretzfelder (7), Friedenberg and Bretzfelder (18) and Bretzfelder and Friedenberg (8), and recent tabular data publications by the Bureau of Economic Analysis in Business Statistics (11) show the same results.

The extreme sensitivity of the durables manufacturing sector is shown by some illustrative measures of the amplitude of its cyclical fluctuations. For the period 1948 to 1979 Friedenberg and Bretzfelder observed

an average swing in durable manufacturing payrolls of 17.6 percent, but only 6.8 percent for total nonfarm payrolls. Similarly, Okun found big differences among industries in the cyclical sensitivity of employment. He used the elasticity of the ratio of actual to potential employment by industry to the ratio of actual to potential total (non-federal) employment as a measure of industry sensitivity. By a wide margin, durables manufacturing was the most sensitive with an elasticity of 2.65. By comparison, industries in the service sector had less than unit elasticities. For example, the elasticities for wholesale trade, retail trade, and finance, insurance, and real estate were 0.68, 0.99, and 0.27, respectively, indicating that employment levels fluctuated less widely for these industries than for the non-federal economy as a whole.

Within durables manufacturing there has been shown to be considerable variation in the cyclical fluctuations of individual industries. Borts computed average annual amplitudes of employment change in 19 two digit SIC industries between 1914 and 1953. Although there were differences among the industries from one cycle to the next, machinery and transportation equipment showed the greatest sensitivity during the study period. These were followed closely by electrical machinery and primary metals. Using his measure of average annual amplitude, Borts estimated these four industries had fluctuations on the order of 10. By comparison, the less sensitive durable manufacturing industries of lumber, furniture, and stone, clay, and glass had fluctuations around 5.

The construction industry is also cyclically sensitive, second only to durable manufacturing. For cycles during the period 1948 to 1979 and the cycle of 1980-1981, Friedenberg and Bretzfelder found cyclical swings in durable manufacturing payrolls of 17.6 percent and 21.5 percent, re-

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spectively, and swings for construction payrolls of 8.0 percent and 16.5 percent for the same periods. Although highly cyclical, construction is much less important to the total economy than durables manufacturing. In 1979 durables manufacturing accounted for 18 percent of total nonfarm payrolls, whereas construction accounted for only 6 percent.

Past studies show broad agreement on the relative ranking of cyclical exposure by sector. Although other studies using different methods and time periods may show some variation, for the period 1948-1979 Friedenberg and Bretzfelder found the order of increasing cyclical stability to be: durable manufacturing, construction, nondurable manufacturing; mining; transportation, communication, and public utilities; federal government direct employment; wholesale and retail trade; services; finance, insurance and real estate; and state and local government, which a series of studies has shown to have behaved counter-cyclically, at least since the Depression [Rafuse (46), ACIR (1, 2), Friedenberg and Bretzfelder (18)].[1]

Federal employment and payrolls, as opposed to total federal spending including transfers, tend to follow the business cycle. Moore (36) noted that employment in this sector was procyclical in every one of the five recessions between 1948 and 1970, with percentage changes in employment that rivaled those in the private sector. Friedenberg and Bretzfelder (18), on the other hand, argue that between 1948 and 1979 the cyclical swings in federal payrolls have followed the business cycle, but these have been generally stabilizing since their swing has been less than that for total nonfarm payrolls.

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1. A companion literature review examines the cyclical behavior of the state and local sector in detail. Friedenberg and Bretzfelder (8) demonstrate that in 1974-75 and 1980-81, the state and local sector behaved pro-cyclically in the Northeast and North Central states. They attribute this to the

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Unemployment compensation is the most important counter-cyclical tool of the federal government. Its inclusion in non-agricultural earnings significantly reduces the total cyclical sensitivity of nonfarm payrolls. Friedenberg and Bretzfelder found that nonfarm payrolls had a swing of 7.8 percent in the period 1948 to 1973 and 4.2 percent in 1973 to 1979 without unemployment compensation. When unemployment compensation was included, cyclical fluctuations were reduced to 7.0 and 3.2 percent, respectively. On a regional basis, the greatest reductions occurred in the more cyclically sensitive North, as compared to the South and West.

An anomalous response has been observed in the behavior of the mining sector. Generally, this sector has been characterized by instability during the business cycle [Moore (36)]. Bretzfelder (7) found coal mining (directly related to durables production) to be especially sensitive between 1948 and 1970. However, Friedenberg and Bretzfelder (18) found that mining payrolls stabilized during the 1973-79 cycle. This is attributed to an increase in the exploration for energy sources.

There is also a concensus that cyclical fluctuations in the economy have generally declined over time, at least until very recently. At the national level this has been attributed to a shift in employment towards the cyclically stable service industries and away from the cyclically sensitive manufacturing sector. Moore (36), writing about business cycles between 1948 and 1970, noted that recessions had become less frequent, shorter, and milder due to this shift, and that the impact of recession on total employment had been reduced by roughly one-third. He shows that the industries that contributed least to cyclical fluctuations have had the greatest secular growth. Employment in cyclically sensitive industries

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financial difficulties of many city governments.

accounted for more than half of total employment in 1952, but by 1972 this share had declined to about two-fifths. Borts (5) observed a movement towards milder cycles in the four decades preceding 1960.

The two most recent business cycles do not fit the pattern of lessening cyclical intensity, however. Between 1948 and 1979 cyclical swings in nonfarm payrolls averaged 6.8 percent, on the BEA amplitude measure, but the swing in the 1980-81 cycle was 8.5 percent (18, 8), and the 1982 cycle appears to be still stronger.

LABOR FORCE AND DEMOGRAPHIC CHARACTERISTICS

National economic cycles have been shown to have differential impacts not only on differect sectors of the economy, but on different segments of the labor force.

Low-wage workers, young workers, and minorities have the greatest exposure to cyclical fluctuations. The basic explanation offered for this vulnerability [Okun (42), Thurow (52)] is the investment that firms make in training skilled workers. Because of this investment in specialized training, firms tend to hoard skilled workers during downturns in order to avoid the training costs that would be necessary to replenish their skilled labor force during recovery. This practice tends to smoothe the employment cycle for higher-wage, skilled workers. Lower skilled workers are thought to be more readily available, and firms tend not to hoard unskilled workers during slowdowns. During cyclical expansion they dip into the unemployed pool of low skill workers for temporary additional labor, creating a strong cyclical fluctuation in employment for these groups. In unionized sectors of the economy, the cyclical vulnerability of young, newly hired workers is reinforced by seniority rules governing layoffs.

The greater cyclical swings in employment for young workers, low-wage workers, and minorities, can be seen in the basic unemployment figures. But the labor market adjustments that take place during the cycle are more complicated than these figures might imply. The most cyclical industries, such as durable manufacturing, pay high wages and employ a core labor force of males over 25, the group with the most stable work history. As Okun (43) and Vroman (57) have demonstrated, during cyclical expansions, these industries draw workers away from low-pay sectors, like retailing. Moreover, they draw their increased employment disproportionately from demographic groups, like the young and minorities, which have generally lower earnings records. Thus, cyclical fluctuations in the unemployment rate are reinforced by cyclical upgrading and downgrading in jobs and pay levels.

An illustration of the differences in real wage growth over the cycle is shown in Table 1, taken from Vroman (57). The table compares real wage growth during the recession period 1969-71 with growth during the expansion period, 1964-66, for different demographic groups. The figures compare total earnings for fixed panels of potential workers, and thus combine the effects of changes in employment rates and changes in average earnings. The fact that all table entries are less than 1.0 indicates that all demographic groups experienced a slowdown in real wage growth during the recession. However, the recession impact was concentrated on young workers and blacks, as shown by the especially low ratios of recession-period real wage growth for workers in these categories.

Cities that have high concentrations of minorities, low-skilled labor, and young workers can be expected to reflect the wide cyclical swings in earnings of these groups. There is evidence that the degree of

·Table 1

GROWTH IN TOTAL REAL WAGES FOR DIFFERENT DEMOGRAPHIC COHORTS:
RATIO OF 1969-71 GROWTH TO 1964-66 GROWTH

Initial Year Age	Race-Sex Group				
	White Men	Black Men	White Women	Black Women	All Groups
16-19	.720	.494	.718	.434	.696
20-24	.875	.751	.936	.712	.873
25-34	.895	.825	.898	.796	.889
35-44	.920	.876	.925	.858	.917
45-54	.913	.878	.931	.928	.915
55-59	.915	.897	.937	.887	.918
60-64	.860	.849	.907	.869	.869
16-64	.901	.835	.905	.820	.898

Source: Vroman (57).

unionization of the labor force also influences cyclical labor market behavior. Feldstein (15) and Medoff (33) show that workers in unionized firms have significantly higher probabilities of being laid off during periods of slack demand than workers in non-unionized firms. The reason is that nonunion firms have other options for reducing labor costs. Voluntary quit rates are lower in unionized firms [Freeman (17)], largely because of the higher wages paid under union contracts. This makes it difficult for unionized firms to adjust to slack demand by leaving unfilled positions vacated by quits. Nonunion firms also appear to have greater wage flexibility, so that they can meet reduced product demand by real wage reductions. This hypothesis is supported by the empirical findings of Hamermesh (22) and Lewis (31) that real wages in the union sector are less sensitive to changes in the unemployment rate than are wages in the nonunion sector.

The fact that union labor is more likely to absorb adjustments to reduced demand through unemployment, while nonunion labor is more likely to accept real wage reductions, has important consequences for measuring cyclical effects. Unemployment measures alone are likely to miss a good part of the labor market adjustment and distort comparisons between unionized and non-union parts of the country.

AGE OF CAPITAL PLANT

Just as cyclical declines in demand have uneven impacts on different segments of the labor market, so they can be expected to have uneven impacts on capital of different vintages.

The first plants to be removed from production during recession are likely to be the oldest plants. These facilities are generally least

well adjusted to current relative prices of labor, energy and other inputs, to current geographic patterns of demand, and to current technology. That is, they are economically obsolescent. They will be kept in production as long as firms can cover their variable costs. When demand falls during a recession, prices fall (or costs rise and cannot be offset by higher product prices), making it likely that some old plants with high average costs will be knocked out of production.

The diagrams below, taken from Howland (25), illustrate the vulnerability of high average-cost plants. At price level P_1, quantities q_a and q_b are produced by the two plants. If the price now falls to P_2, plant B will be unable to stay in operation. Plant A will continue to produce, although at the lower volume, q_a: thus the unemployment impact of the recession will be concentrated on the location of plant B.

The above effect will generally be even more pronounced if A and B are two plant locations of the same firm. Some costs that would be fixed costs over the intermediate term for a single plant (e.g., existing wage or raw material contracts) are variable costs for each plant of the multi-plant firm, because production can be shifted between locations. Thus, the average variable cost curves will be at a higher level, making it more probable that the multi-plant firm will shut down its more expensive plants during a recession and consolidate production at the more efficient location (see Figure 1).

More generally, for industries that sell their products on national markets a recession-induced decline in demand can be expected to cause disproportionate plant shutdowns and layoffs in locations that have the highest average cost plants. Economic obsolescence from shifting relative
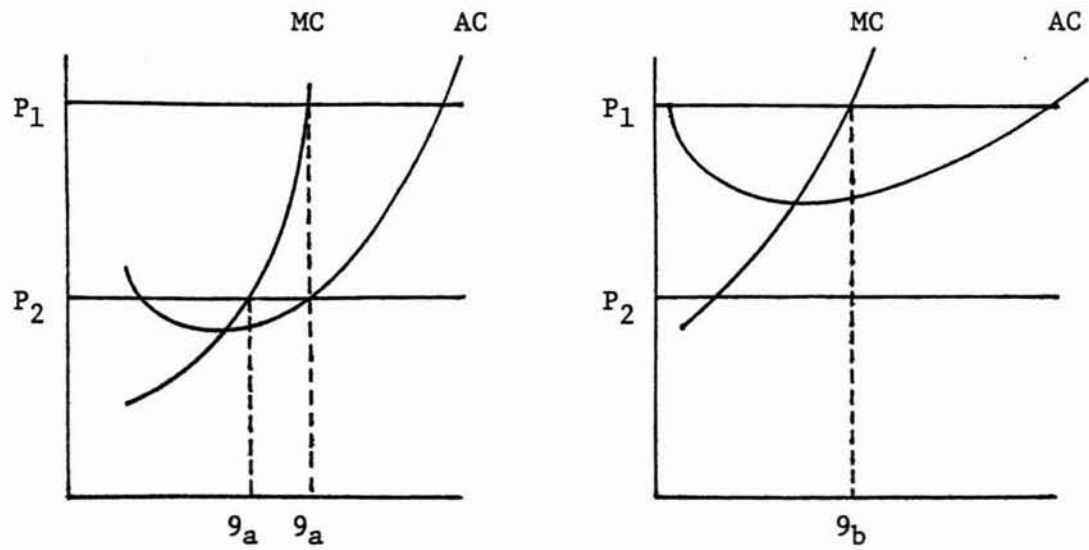
Figure 1

IMPACT OF DECLINE IN DEMAND ON PLANT PRODUCTION

prices, advancing technology, and capital depreciation make it probable that these high-cost plants will be older vintage capital.[1]

In industries that produce for a local or regional market, the relevant cost comparisons will be with other producers for the same geographic market. In this case, however, the disequilibrium of current plants locations can be exacerbated by shifting patterns of regional demand. Plants built to serve regional markets in existence 20 years ago will be candidates for shutdown if regional demand has shifted away from the location.

The geographic distribution of capital, by vintage, then creates a profile of candidate locations for shutdown in recession. The brunt of recession impacts can be expected to be felt in regions and locations that have concentrations of old capital. This argument has been advanced by Peterson (44) and Varaiya and Wiseman (54), though it has yet to receive an adequate empirical testing. The argument in principle applies to all types of capital, but Hulten (27) has shown that there is very little variation between regions in the age distribution of machinery, but large variations in the age distribution of plant.

Ironically, some types of business expansion can have the same geographic impacts on capital as recession. If business expansion is stimulated by large tax subsidies for new capital investment, such as the Investment Tax Credit, the resultant surge in partially subsidized industry output will generally depress market prices, placing exactly the same type of cost pressure on old plants as a price drop by a recessionary decline

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1. Note, however, that relative prices do not always shift in the same direction over time. Relative energy costs fell steadily between 1945 and 1973, then rose precipitously. The economic obsolescence of capital then would not be a smooth function of age; under some circumstances, capital of vintage t-2 could better fit today's relative prices than capital of vintage t-1.

in demand.[1] Peterson (44) has argued that for this reason an investment

tax credit for new plant stimulates regional re-location of capital.[2]

The above arguments imply that the most rapid regional relocation of

capital and employment will occur in a highly cyclical economy, where

steep recessionary troughs are followed by a recovery that is stimulated

by tax or other subsidies to new capital investment.

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1. It is not necessary that product prices actually fall, but that the
relative price of product to inputs fall.
2. Although an investment tax credit always will stimulate the replace-
ment of old capital by new capital, it will have geographic implications only
to the extent that old plant is inefficiently located relative to today's
prices and regional demand. Otherwise, the discarded old plant will be re-
placed in situ by the new plant. It is possible, too, that though the invest-
ment tax credit stimulates a relative regional re-distribution of capital, it
will boost capital formation in all locations.

II. GEOGRAPHICAL VARIATIONS IN CYCLICAL IMPACT

The business cycle fluctuations that occur in the national economy
are also observed in geographic subdivisions such as regions, states,
metropolitan areas, and cities. Previous studies have established that
there are substantial differences among locations in their sensitivities
to fluctuations in the national economy and that there is some variation
in the timing of cycle response. [Friedenberg and Bretzfelder (18),
Gellner (20), Sum and Rush (50)].

Using unemployment data for labor market areas centered on 33 Mid-
western cities from April 1960 to September 1964 to measure cyclical fluc-
tuations, King, Casetti, and Jeffrey (29) examined the transmission of
economic impulses through a system of <u>cities</u>. By examining a regression
of local unemployment rates on national rates, and by computing lagged
correlations on the regression residuals for pairs of cities, they identi-
fied relationships for the timing of local cycles and the level of inter-
action among the 33 cities in the sample. Based on this analysis,
clusters of cities were identified for which there were strong and simul-
taneous effects on unemployment. They found that local cycles in their
sample were strongly influenced by national cycles. Further, their re-
sults showed that the timing of the response of cities in the Pittsburgh-
Youngstown cluster led the cyclical response of other cities; for example,
this cluster led the Detroit-Indianapolis cluster by three to five months
over the cycle.

Another attempt to explain local unemployment rate fluctuations as a
function of national unemployment changes was carried out by Tideman

(53). He observed a skewed distribution for local responses to changes in the national unemployment rate. Most areas experience rises in unemployment that are smaller than the national increase, but a few have rises that are much larger. He also found that large areas tend to lead others in the timing of their response, as do areas with rapid rates of growth and high concentrations of durable good manufacturing.

The finding of major differences in cyclical amplitude among regions has been generally observed in the literature, and there is considerable concensus about the behavior of many regions. For example, the Great Lakes/Midwest region, where durables manufacturing is concentrated, is very sensitive to national cycles; the New England/Mideast region has a response similar to the nation as a whole; and the Plains and Rocky Mountains areas are quite stable by comparison.

Borts (5) found that there were "long-lasting differences among states in the severity of the cyclical fluctuations experienced" (p. 152) when he examined the cyclical behavior of manufacturing employment in 33 states over the period 1914-1953. At the extremes of response were Michigan and Ohio with high degrees of sensitivity, and South Carolina and Massachusetts with cyclically stable economies. The average annual cyclical amplitude in Michigan was highest at 10.64, which compares with the low value of 4.65 for South Carolina.

Three studies by the Bureau of Economic Analysis (BEA) (7, 8, 18) provide considerable detail and commentary on the variations in regional cyclical behavior for the business cycles since World War II. These studies find that all regions follow the national pattern of change, but the greatest cyclical swing occurs in the Great Lakes region and has a magnitude that is one and a half times the national swing. This high level of

sensitivity is attributed to the concentration of durables manufacturing in the region. Accompanying this finding is the interesting secondary finding that other industries in this region also experienced larger than expected cyclical swings, presumably because they are more likely to be suppliers to regional durables manufacturers, which themselves are subject to wide cyclical swings.

Over the period covered by the BEA studies there have been some significant changes in the patterns of response of certain regions. In the 1973-79 cycle the responses of nonfarm payrolls in several states were substantially different than in the five preceding cycles (18). Sensitivity increased in Tennessee, Mississippi and Arkansas due to increased levels of cyclically sensitive types of manufacturing, and also increased in New Hampshire, Florida, Nevada, Arizona, and Colorado, due to adverse effects on construction and related private service-type payrolls. Reductions in sensitivity were found for West Virginia, Kentucky, and Wyoming, where activities to increase energy supplies reduced the sensitivity of mining payrolls.

In the 1980-81 cycle, BEA (8) found that two regions departed from their earlier patterns of cyclical response. The response in the Plains region went from a normally below average response to one that exceeded the national average. The cause for this is assigned to the sensitivity of durables manufacturing linked to agriculture. The Southeast region, on the other hand, went from an above average response to a smaller than average swing. This change is attributed to relatively smaller swings in the region for construction, trade, non-durables, the transportation group, and services as compared to earlier periods.

Vernez, Vaughan, et al. (56) investigated the consistency of local cyclical behavior for business cycles between 1960 and 1975, and found no single dependable guideline for anticipating the characteristics (timing and amplitude) of local labor market cycles. After dating local cycles by visual observation, they found that using the past performance of local areas during cyclical fluctuations to determine turning points in the following national cycle resulted in incorrect predictions for over half of the cases. They were also unable to identify a consistent pattern among regions in terms of relative cycle severity, although the Northeast and West North Central regions generally experienced the largest absolute cyclical amplitudes.

The source of variation in the response of regions to national business cycles is often attributed to differences in the industrial composition of the region. In particular, Borts (5) and Browne (9) note this factor, but Borts also adds that its importance has been diminishing over time while the importance of intra-industry regional differences has been increasing. Phillips (45) found that areas with heavy concentrations of employment in occupations classified as operatives and semi-skilled laborers, and often a heavy concentration of employment in durable goods industries, had above-average sensitivity to national cycles.

The traditional view that industrial composition is the source of regional variations in cyclical response has been criticized by Engerman (14) and Richardson (47) as being incomplete. They caution that other important factors such as the differences between national and local industries, transportation costs, age of industrial facilities, type of markets served, and so forth, must be considered.

Industrial diversification has also been advanced as an explanation
for regional differences in response to national business cycles. Borts
(5) concluded that increased industrial diversification among states has,
in part, reduced the differences in regional business cycles. Engerman
(14), however, disagrees, claiming that highly diversified regions might
be more sensitive to national fluctuations. This would occur when regions
found it difficult to pass on declines in demand to other areas because of
a low marginal propensity to import.

Another factor cited as an influence on the degree of response is the
rate of growth in a region, although Vaughan (55) found no well developed
theory concerning this factor. Borts (5), Engerman (14), and Tideman (53)
all found, to one degree or another, that regions experiencing slow growth
generally had large cyclical fluctuations, while those that enjoyed rapid
growth usually had smaller swings. A number of factors have been cited as
possible mechanisms to explain this relationship, but three appear most
often: (1) In growing areas with tight labor markets labor hoarding oc-
curs during downturns, and this reduces apparent sensitivity. (2) Rapidly
growing areas have high concentrations in local industries, especially
construction, and these are less affected by national cycles. (3) Indus-
tries in rapidly growing regions tend to have more modern facilities.
During downturns, firms in these industries continue at high levels of
utilization longer than their counterparts in older areas and then return
to high utilization more quickly during recovery.

Recent empirical testing of these hypotheses has provided mixed re-
sults. In a study that builds on the work of Borts and Engerman but uses
a longer time series of observations, Howland (26) was unable to find any
significant relationship between factor (1), long run regional growth, and

recession severity or length. Thirwall (51), in a study of Great Britain, did find that the regions with the greatest cyclical sensitivity were those where secular unemployment rates were highest, which he interpreted as evidence that large pools of unemployed labor remove the incentive for cyclical hoarding of labor. Moore (36) and Zarnowitz and Moore (60) have pointed out that the post-World War II decline in cyclical amplitude in the U.S. has been accompanied by an increase in the secular rate of unemployment, contrary to the hypothesized relationship between slack labor markets and cyclical intensity.

The analysis of the 1973-79 cycle by BEA (18), found evidence that conflicts with factor (2), the hypothesized cyclical stability of areas dependent upon production for local markets. It was found that construction and private service-type payrolls experienced larger cyclical swings in the South and West than in the North, and thereby actually intensified cycles in the former regions. They relate this finding to a slowdown in the rate of migration from the North during recessions and to "building ahead" during expansions.

In one of the most comprehensive tests of the reasons for state-level variations in cyclical behavior, Howland (25) found that the national cycles working through the different industry mixes of states could account for about 36 percent of the observed variation in state cycles, the largest single share. The degree of unionization of the labor force was positively and significantly related to cyclical intensity, as measured by unemployment rates. This is consistent with the oboservation that unionized firms have larger cyclical variations in layoffs.

Contrary to hypothesis, cyclical variations in state unemployment rates were found to be inversely related to peak levels of unemployment

during the preceding recession. Peak unemployment rates were meant to
measure slack in the labor market. It is difficult, however, to distin-
guish the impact on states of purely cyclical factors from the impact of
intermediate-term secular shifts affecting adjacent business cycles. For
example, decreased auto demand and tight construction markets have been
major elements in both the 1980-81 and 1982 cycles, without significant
cyclical recovery between the troughs. The existence of slack labor mar-
kets in 1980 in states like Michigan, Indiana, and Ohio, was not associ-
ated with a strong subsequent rebound, because demand continued to be
depressed by "secular" shifts. This suggests that some other measure of
the underlying tightness pf labor markets and the incentives to hoarding
is needed.

. Howland also used a crude measure of age of capital in her study--the
proportion of net capital stock put in place during the last two years.
This measure suffers from two severe drawbacks. First, it measures the
share of "very new" capital, rather than the share of "very old" capital,
which is the relevant consideration for the vintage hypothesis. Second,
Howland uses the age of all capital rather than the age of plant. Theory
suggests that plant is the location-tied component of capital and which
empirical evidence shows that only plant has significant age variation
between sites.

Using this age-of-capital variable at the all-industry level, Howland
found that states with concentrations of new capital were more prone to
cyclical variations. She speculated that this may be the effect of indus-
try age. New firms are likely to be the most susceptible to bankruptcy or
failure during recession, and high rates of recent capital investment are
likely to be associated with greater importance of new industries and new

firm formation. When cyclical behavior was estimated for textiles, an industry with relatively little recent growth, the age of capital variable became a significant factor, indicating greater cyclical fluctuations in employment in states with old capital facilities.

One important issue that surprisingly has been neglected in past studies is the role of federal transfer payments and state-local payrolls in stabilizing cycles at the metropolitan or city scale. This issue takes on special importance in view of current federal budget reductions and state-local budget retrenchment, which threaten to remove these traditionally stabilizing forces in many places. The potential importance of these factors for cities is suggested by the fact that federal transfer projects in 1975 ranged from one and a quarter to almost three times as much as manufacturing earnings in Boston, Baltimore, New York City, and Philadelphia [Muller (38)].

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III. SUBURBANIZATION OF POPULATION AND EMPLOYMENT

Decentralization of population and employment in U.S. metropolitan areas has been observed for some time and has stimulated a substantial amount of study. The literature which has developed provides theoretical explanations of this process and substantial empirical evidence in support of them. Generally speaking, improvements in transportation and rising real income are considered to be the underlying cause of this change. Major contributions to this literature have been provided by Kain (28), Mills (34), and Muth (39). In particular, Muth's theoretical model and empirical results indicate that a major role is played by the high income elasticity of demand for housing and rising real incomes.

Until the 1970s, metropolitan areas were generally growing faster than the U.S. population, although the percentage of population living in central cities has been declining since the 1970s. Berry (3) provides a good overview of these changes through the 1970s. In 1970, central cities accounted for 66 percent of U.S. metropolitan population, but the process of suburbanization had reduced this to 43 percent by 1975. After 1970 a new phenomenon occurred—for the first time total central city population in metropolitan areas declined. While selected central cities were losing population prior to this date, those losses were largely confined to the industrial cities of the Northeast and North Central regions. Non-metropolitan counties are now experiencing the fastest growth. Fugitt and Beale (19) have concluded that a "centralization of residence is no longer taking place except in the sparsely settled center of the country where

towns would most likely continue to serve predominantly as agricultural service centers." (p. 168)

A pattern of spatial diffusion in employment, particularly in manufacturing, has also been occurring for some time. The rapid growth of employment around the peripheries of cities and in suburbs has been noticed for some time, although analyses of this pattern of change have mostly been based on the study of individual areas.

In this area the work of Creamer (13), Kitagawa and Bogue (30), Hoover and Vernon (24), and Moses and Williamson (37) have made major contributions. These studies generally all cite the importance of improvements in transportation, especially trucking, and the need for large tracts of inexpensive land to house single-story plants as factors driving the suburbanization of manufacturing employment.

Some attention has been devoted to investigating causal interactions in the relationship between the suburbanization of population and the suburbanization of employment. Efforts in this area have usually, in one way or another, addressed the question of whether "jobs follow people, or people follow jobs." No satisfactory resolution has yet been achieved in this debate, but significant progress has been made. In their early study, Kitagawa and Bogue (30) concluded that the manufacturing labor force shifts towards the suburbs as jobs suburbanize, but they found no evidence of the reverse process where manufacturing shifts outward towards a dispersed labor force Kain (28) used aggregate data and found that population moved towards manufacturing jobs. Mills (34), however, used a density gradient model as the basis of his analysis and found "that the movement of people to the suburbs has attracted manufacturing employment to the suburbs rather than vice versa." (p. 17)

More recently econometric modeling techniques have been used to study the simultaneous relationship between the shifts in population and employment. Using this method Steinnes (48) determined that the movement of population to the suburbs attracts manufacturing jobs, with less conclusive evidence for service jobs. He also found more tentative evidence that employment in retail trade may attract population.

Greenwood (21) constructed a more elaborate econometric model of the suburbanization process. He concluded that there is strong support for Muth's position that the movement of population to the suburbs has been stimulated more by housing considerations than by the movement of jobs. Although this agrees with Steinnes' finding for the movement of manufacturing jobs, Greenwood also found strong evidence that the suburbanization of population has attracted employment in retail trade.

The location of residences and workplaces in urban areas has been examined by Loewenstein (32) for a small set of U.S. metropolitan areas. He observed that there is a strong spatial differentiation in employment by industry and in residential locations by industry of employment. These findings are based on detailed data obtained from matrices developed from transportation survey studies conducted during the 1960s. The static analyses performed on these data indicate a strong urban core orientation of employment in finance, insurance, real estate, education, medicine, and public administration. Manufacturing employment, in both durables and non-durables, was shown to be oriented towards the periphery, while wholesale and retail trade each had employment concentrations in both central and peripheral locations.

The birth and death process of business establishments has frequently been identified as a key mechanism in the suburbanization of employment.

In broad terms, this process leads to employment suburbanization through a spatially uniform distribution of establishments going out of business in combination with a spatial concentration of new enterprises locating in places away from the central urban area. While other factors such as those described by the incubator hypothesis or benefits from economies of urbanization may be centralizing forces, the dominant tendency is for aggregate employment to decentralize as a result of the birth and death process operating on business establishments.

In a study of manufacturing relocation in Chicago, Moses and William-son (37) found that the propensity of firms to relocate was constant over the metropolitan space, but the direction of this relocation was towards the periphery. Cameron (12) investigated changes in the distribution of manufacturing firms in the Clydeside region of Scotland. He concluded that there was no significant spatial variation in the location of firms going out of business, but that central areas experienced much lower rates of new establishment location than did peripheral locations. Thus, differentially there was a tendency towards a suburbanization of manufacturing employment. Struyk and James (49) concluded from a micro-level study of manufacturing firms in four metropolitan areas that there was no evidence of systematic spatial variation in the rate of business failures. They reasoned, therefore, that the suburbanization of manufacturing employment was the result of selective addition to employment at the periphery.

Cyclical fluctuations clearly must play an important role in the birth and death process for business enterprises. In spite of the importance that is suggested by this connection, it appears that there has been only limited research on the relationship between business cycle fluctuations and the relocation of employment.

Kain (28) speculates that "central cities and suburban employment levels appear to be affected differentially by fluctuations in aggregate economic activity." (p. 107) However, he does not attempt to link this with the process of employment redistribution. Noll (41) asserts that "central city employment is likely to be more sensitive to changes in the business cycle" (p. 501) and relates this to the greater attractiveness of suburbs for firms seeking to maintain or expand professional and managerial staff during recessions. While this is a provocative hypothesis, he does not offer any analytical or empirical evidence in support of it.

Nelson and Patrick (40) examined changes in the pattern of employment during the 1969-1972 business cycle. Using a shift-share framework to control for industrial mix and regional distribution, they analyzed the shift of employment by industry among central (city), suburban, and non-metropolitan counties based on data from the County Business Patterns. Although employment decentralization occurred throughout the period, they observed that the rate was relatively more rapid during a period of economic recovery than during recession. This pattern of change occurred in all industries and all census regions except for the Mountain. They feel that their "results suggest that employment decreases at all locations during a downturn, but it increases differentially in non-central locations when economic growth resumes." (p. 11) These results appear to contradict the expectations of Noll and Kain, but they are consistent with the findings of those studies of employment relocation which do not consider business cycle effects.

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IV. UNRESOLVED RESEARCH ISSUES

This section identifies some of the principal research issues that
remain unresolved from past studies. It considers their appropriateness
for analysis under The Urban Institute-HUD cooperative agreement, taking
into account available data sources.

SENSITIVITY OF CITY ECONOMIES TO NATIONAL ECONOMIC CYCLES

None of the studies examined in this review treats the cyclical be-
havior of cities, as distinct from metropolitan regions or labor market
areas. The only study that disaggregates to the level of counties is that
by Nelson and Patrick (40). One clear gap in the literature is an under-
standing of the special cyclical sensitivity of central cities.

Unfortunately, there are severe data limitations on city-scale
analysis. The only standard measure of economic activity for which city
data are available is the unemployment rate, and then only for the period
after 1975. Moreover, the reported monthly estimates of city unemployment
are smoothed over a six month period; the Bureau of Labor Statistics (10)
expressly warns against using the data for time series analysis.

County-scale income data, with some sectoral breakdowns, are avail-
able from the Bureau of Economic Analysis. These have the important limi-
tation that they are available only on an annual basis. In view of the
fact that the average business cycle since World War II has lasted ten
months (60a), the annual nature of income data makes it impossible to
examine leads and lags over the cycle, and hampers measurement of cyclical
swings, as well. Central counties moreover are an acceptable geographic
approximation to central cities for only some metropolitan areas.

Nonetheless, county income data possess several advantages. First, income by place of residence can be distinguished from income by place of work, permitting tests of how central counties fare as job locations relative to residential locations over the business cycle. Second, aggregations of rest-of-SMSA data can be computed, facilitating tests of metropolitan job or population decentralization over the cycle, and permitting contrasts of central-area and rest-of-SMSA behavior. Third, the sectoral breakdown of data permits some analysis of sectoral behavior at the local level, particularly of federal transfer payments and state-local employment. Finally, county income data can be matched with other county data on the sectoral distribution of business activity, labor force characteristics, and vintage of capital, making it possible to test most of the behavioral hypotheses developed in the literature. Information for most of these other variables is not available on a city scale.

In summary, it would seem that most of the project's analysis should concentrate on the county income series. It may prove optimal to use different-sized samples for analysis of different hypotheses, depending upon the importance of having the central county closely approximate the boundaries of the central city.

For specialized purposes, other measures of economic activity can be used. Dun and Bradstreet (60b) maintain monthly files on business failures by firm location, size, and industry classification. These are a good index of economic strength or fragility in the business sector. A newly established file allows separation of minority-owned firms and their behavior over the cycle.

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STABILITY OF CITY CYCLICAL BEHAVIOR

Past research—especially that by Vernez, Vaughan, et al. (56)—
clearly indicates that there is little stability over different cycles in
the timing of cyclical turns of particular metropolitan labor market
areas, and only limited stability in the relative amplitude of cyclical
swings of labor market areas in different cycles.

These results suggest that there is little policy insight to be
gained from simple time series analysis of city cycles in relation to
national economic cycles. An extrapolation of past cyclical behavior into
the future presumes a stability of city response that is unlikely to be
observed.

More valuable is the testing of hypotheses regarding the effect of
industry mix, labor market characteristics, and age of capital on differ-
ences across cities in cyclical sensitivity and on changes over time in
individual cities' cyclical exposure. Understanding the reasons for re-
cent changes in local cyclical sensitivity make for one of the most
policy-relevant avenues of research.

INDUSTRY MIX

The impact of industry mix on state and regional cycles has been well
established. Confirmation of its importance for cities is one feasible
item on the research agenda.

Of greater interest, perhaps, is analysis of the role that shifts in
industry mix have had in modifying city cyclical behavior.

LABOR FORCE CHARACTERISTICS

The concentration of minorities, youths, and low-wage workers in the labor forces of some cities should contribute to more severe cyclical fluctuations in these localities. This hypothesis can be tested.

The reverse analytical question is also of interest. Do minority or low-wage workers suffer greater cyclical fluctuations in earnings or employment when they live in central cities? That is, does residence in a central city or in a certain type of central city heighten the cyclical exposure of marginal members of the labor force? Unfortunately, the best data source for answering this question--the Social Security longitudinal employment data on individual workers--no longer is made available to external researchers because of confidentiality limitations. We will determine whether alternative data sources can be used for this purpose.

AGE OF CAPITAL

Central cities are distinguished both by their labor forces and by their capital plant, which tends to be of older vintage. The impact of national economic cycles on plant shutdowns and layoffs in central cities has received little attention. The impact of national cycles on decentralization of jobs and plant locations within metropolitan areas has received almost no attention.

The basic data set for analyzing firm creation and dissolution is the Dun and Bradstreet series, examined by Birch (4) and Struyk and James (49), among others. We will investigate the possibility of using this data set to examine the cyclical response of job and firm creation, job disappearance, and job movement within cities and metropolitan areas.

BIBLIOGRAPHY

1. Advisory Commission on Intergovernmental Relations, <u>Countercyclical Aid and Economic Stabilization</u>. Washington, D.C.: ACIR, December 1978.

2. Advisory Commission on Intergovernmental Relations, <u>State-Local Finances in Recession and Inflation</u>. Washington, D.C.: ACIR, May 1979.

3. Berry, Brian J. L., and Donald C. Dahmann, "Population Redistribution in the United States in the 1970s," in Brian J. L. Berry and Lester P. Silverman (eds.), <u>Population Redistribution and Public Policy</u>. Washington, D.C.: National Academy of Sciences, 1980: 8-49.

4. Birch, David, <u>The Job Generation Process</u> (Report submitted to the Economic Development Administration, MIT) 1979.

5. Borts, George H., "Regional Cycles of Manufacturing Employment in the United States, 1914-1953," <u>American Statistical Association Journal</u>, March 1960: 151-211.

6. Boschan, Charlotte and Walter W. Ebanks, "The Phase-Average Trend: A New Way of Measuring Economic Growth," <u>American Statistical Association Proceedings of the Business and Economics Statistics Section</u>, 1978: 332-335.

7. Bretzfelder, Robert B., "Sensitivity of State and Regional Income to National Business Cycles," <u>Survey of Current Business</u>, April 1973: 22-33.

8. Bretzfelder, Robert B. and Howard Friedenberg, "Sensitivity of Regional and State Nonfarm Wages and Salaries to the National Business Cycle, 1980:I - 1981:III," <u>Survey of Current Business</u>, January 1982: 26-29.

9. Browne, Lynne, "Regional Industry Mix and the Business Cycle," <u>New England Economic Review</u>, November/December 1978: 35-53.

10. Bureau of Labor Statistics, "Labor Force, Employment, and Unemployment Estimates for States, Labor Market Areas, Counties, Selected Cities, and Other Areas Used in the Administration of Federal Economic Assistance Programs," January 1982.

11. Bureau of Economic Analysis, U.S. Department of Commerce, <u>Business Statistics 1979</u>, October 1980.

12. Cameron, Gordon C., "Intraurban Location and the New Plant," <u>Papers of the Regional Science Association</u>, 31, 1973: 125-143.

13. Creamer, Daniel B., _Is Industry Decentralizing?_ Philadelphia, Pa.: University of Pennsylvania Press, 1935.

14. Engerman, Stanley, "Regional Aspects of Stabilization Policy," in Richard A. Musgrave (ed.), _Essays in Fiscal Federalism._ Washington, D.C.: The Brookings Institution, 1965.

15. Feldstein, Martin S., "Temporary Layoffs in the Theory of Unemployment," _Journal of Political Economy_, 84, 1976: 937-957.

16. Feldstein, Martin S., "The Effect of Unemployment Insurance on Temporary Layoff Employment, _American Economic Review_, 68, 1978: 380-395.

17. Freeman, Richard, "Individual Mobility and Union Voice," in Reynolds, Masters, and Moser (eds.), _Readings in Labor Economics and Labor Relations._ Englewood Cliffs, N.J.: Prentice-Hall, 1978.

18. Friedenberg, Howard and Robert Bretzfelder, "Sensitivity of Regional and State Nonfarm Wages and Salaries to National Business Cycles, 1948-79," _Survey of Current Business_, May 1980: 15-27.

19. Fugitt, Glenn V. and Calvin L. Beale, "Population Trends of Nonmetropolitan Cities and Villages in Subregions of the United States," _Demography_, 15 (4), November 1978: 605-620.

20. Gellner, Christopher, "Regional Differences in Employment and Unemployment, 1957-72," _Monthly Labor Review_, 97, March 1974: 15-23.

21. Greenwood, Michael J., "Metropolitan Growth and the Intrametropolitan Location of Employment, Housing, and Labor Force," _The Review of Economics and Statistics_, LXII (4), November 1980: 491-501.

22. Hamermesh, Daniel, "Market Power and Wage Inflation," _Southern Economic Journal_, 39, 1972: 204-212.

23. Hansen, Alvin H. and Harvey S. Perloff, _State and Local Finance in the National Economy._ New York, N.Y.: Norton, 1944.

24. Hoover, Edgar M. and Raymond Vernon, _Anatomy of a Metropolis._ Cambridge, Mass.: Harvard University Press, 1959.

25. Howland, Marie, "Regional Variations in Cyclical Employment" (unpublished paper). College Park, Md.: Institute for Urban Studies, University of Maryland, 1982.

26. Howland, Marie, "The Business Cycle and Long-Run Regional Growth," in William C. Wheaton, _Interregional Movements and Regional Growth._ URI 26600. Washington, D.C.: The Urban Institute, 1979.

27. Hulten, Charles, _The Age Structure of Regional Plant and Equipment_, Research Paper 1485-04. Washington, D.C.: The Urban Institute, November 1981.

28. Kain, John F., "The Distribution and Movement of Jobs and Industry," in John F. Kain, Essays on Urban Spatial Structure. Cambridge, Mass.: Ballinger, 1975.

29. King, L., E. Casetti, and D. Jeffrey, "Economic Impulses in a Regional System of Cities: A Study of Spatial Interaction," Regional Studies, 3, 1969: 213-218.

30. Kitagawa, Evelyn M. and Donald J. Bogue, Suburbanization of Manufacturing Activity within Standard Metropolitan Areas. Oxford, Ohio: The Scripps Foundation, Miami University, 1955.

31. Lewis, Gregg, "Unionism and Relative Wages in the United States," in Reynolds, Masters, and Moser (eds.), Labor Economics and Labor Relations. Englewood Cliffs, N.J.: Prentice-Hall, 1978.

32. Loewenstein, Louis K., The Location of Residences and Work Places in Urban Areas. New York, N.Y.: The Scarecrow Press, 1965.

33. Medoff, James L., "Layoffs and Alternatives under Trade Unions in U.S. Manufacturing," American Economic Review, 69, 1979: 380-395.

34. Mills, Edwin S., Studies in the Structure of the Urban Economy. Baltimore, Md.: Johns Hopkins Press, 1972.

35. Mintz, Ilse, "Dating United States Growth Cycles," Explorations in Economic Research, Summer 1974.

36. Moore, Geoffrey H., "Some Secular Changes in Business Cycles," The American Economic Review Papers and Proceedings, May 1974: 133-137.

37. Moses, Leon and Harold F. Williamson, Jr., "The Location of Economic Activity in Cities," American Economic Review Papers and Proceedings, May 1967: 211-222.

38. Muller, Thomas, "Venture Capital and Central City Job Decline," Department of Commerce, Urban Round Table, October 1977: 29-44.

39. Muth, Richard F., Cities and Housing. Chicago, Ill.: University of Chicago Press, 1969.

40. Nelson, Kathryn P. and Clifford H. Patrick, Decentralization of Employment During the 1969-1972 Business Cycle: The National and Regional Record. Oak Ridge, Tenn.: Oak Ridge National Laboratory, June 1975, ORNL-UR 123.

41. Noll, Roger, "Metropolitan Employment and Population Distribution and the Conditions of the Urban Poor," in John P. Crecine (ed.), Financing the Metropolis, Vol. 4. Beverly Hills, Calif.: Sage, 1970.

42. Okun, Arthur M., Prices and Quantities: A Microeconomic Analysis. Washington, D.C.: The Brookings Institution, 1981.

43. Okun, Arthur M., "Upward Mobility in a High Pressure Economy," *Brookings Paper on Economic Activity*, 1973: 207-261.

44. Peterson, George E., "Effect of an Investment Tax Credit for New Plant on the Utilization of Older Capital Facilities," testimony before the House Ways and Means Committee, October 1977.

45. Phillips, Bruce D., "A Note on the Spatial Distribution of Unemployment by Occupation in 1968," *Journal of Regional Science*, 12 (2), 1972: 295-298.

46. Rafuse, Robert W., Jr., "Cyclical Behavior of State-Local Finances," in Richard A. Musgrave (ed.), *Essays in Fiscal Federalism*. Washington, D.C.: The Brookings Institution, 1965: 63-121.

47. Richardson, Harry W., *Regional Economics*. New York, N.Y.: Praeger, 1969, Chapter 11.

48. Steinnes, Donald N., "Causality and Intraurban Location," *Journal of Urban Economics*, 4, 1977: 69-79.

49. Struyk, Raymond J. and Franklin J. James, *Intrametropolitan Industrial Location*. Lexington, Mass.: Lexington Books, 1975.

50. Sum, Andrew and Thomas Rush, "The Geographic Structure of Unemployment Rates," *Monthly Labor Review*, 98, March 1975: 3-9.

51. Thirwall, A. P., "Regional Unemployment as Cyclical Phenomenon," *Scottish Journal of Political Economy*, 13, 1966: 205-219.

52. Thurow, Lester, *Poverty and Discrimination*. Washington, D.C.: The Brookings Institution, 1969.

53. Tideman, T. Nicolaus, "Defining Area Distress in Unemployment," *Public Policy*, 24 (4), Fall 1973: 441-492.

54. Varaiya, Pravin and Michael Wiseman, "The Age of Cities and the Movement of Manufacturing Employment, 1947-72," Working Paper 77-1. Berkeley, Calif.: Institute of Business and Economic Research, 1977.

55. Vaughan, Roger J., *Public Works as a Countercyclical Device: A Review of the Issues*. Santa Monica, Calif.: Rand Corp., July 1976, R-1990-EDA.

56. Vernez, Georges, Roger Vaughan, Burke Burright, and Sinclair Coleman, *Regional Cycles and Employment Effects of Public Works Investments*. Santa Monica, Calif.: Rand Corp., January 1977, R-2052-EDA.

57. Vroman, Wayne, "Cyclical Earnings Changes of Low-Wage Workers," in Ronald Ehrenberg (ed.), *Research in Labor Economics*, Vol. 2. Greenwich, Conn.: JAI Press, 1978.

37

58. <u>Wall Street Journal</u>, "Business'Failures Spurt for Wholesalers, Manufacturers and in the West and South," March 22, 1982, p. 8.

59. Zarnowitz, Victor and Charlotte Boschan, "Cyclical Indicators," National Bureau of Economic Research, <u>57th Annual Report</u>, September 1977: 34-38.

60. Zarnowitz, Victor and Geoffrey H. Moore, "The Recession and Recovery of 1973-1976," National Bureau of Economic Research, <u>57th Annual Report</u>, September 1977: 38-39.