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THE EFFECT OF BUSINESS CYCLES ON
METROPOLITAN SUBURBANIZATION°

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This paper presents evidence that the process of metropolitan decentralization depends upon rates of national economic growth. The rate of suburbanization accelerates during expansions in the national economy and then declines when the national economy is sluggish. This uneven process of suburbanization occurs because during periods of strong national economic growth net investment rises. Investors, those considering both expansion at on-site locations or new business formations, favor suburban locations. When national economic growth contracts, aggregate investment stagnates and the process of suburbanization slows.

For approximately five decades metropolitan areas in the United States have been undergoing a process of decentralization that is commonly referred to as suburbanization. Initially, uneven rates of growth in metropolitan areas were the cause—central cities were growing less rapidly than their suburbs, so that their share of total metropolitan area population declined. More recently, suburbanization has occurred as some central cities have actually lost population while their suburban areas have continued to expand at a rapid pace.

Suburbanization of both population and employment has occurred in this period, for both growing and declining metropolitan areas [6]. As a result, many

central cities in recent years have experienced declines in both the number of residents and number of jobs they can claim, and this has forced them to struggle with declining tax bases while trying to maintain levels of service provision. Various remedies to shelter cities from these changes have been attempted, such as direct financial aid and economic development programs. Whatever degree of success or failure these measures have achieved, the process of suburbanization continues. We believe that a better understanding of the suburbanization process can better inform decision makers and help them to formulate better public policy for distressed urban areas.

This paper will show that suburbanization does not occur uniformly over time. In the typically long-time periods used in previous studies, suburbanization has been manifest as a secular decline in the proportion of metropolitan population

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and employment located in the central city. When viewed over shorter time periods, however, we find that suburbanization rates rise and fall with fluctuations in national economic growth. Expansions accelerate suburbanizations as real incomes rise and business investments increase, while recessions, conversely, retard the process. In fact, our findings indicate that employment suburbanization may effectively cease in periods of sharp economic contraction.

PREVIOUS WORK

Although there is a substantial body of literature on the general process of suburbanization, there is very little work which relates this to aggregate economic growth, and in most cases this topic is only of tangential consideration. Kain [7] speculates that "central cities and suburban employment levels appear to be affected differentially by fluctuations in aggregate economic activity," but he does not link this to the process of employment redistribution. Noll [12] contends that "central city employment is likely to be more sensitive to changes in the business cycle" because of the greater attractiveness of suburbs for firms seeking to maintain or expand professional and managerial staff during recessions. Unfortunately, he provides no supporting analytical or empirical evidence for his proposition that employment tends to suburbanize during recessions.

Perhaps the most extensive study has been done by Nelson and Patrick who used County Business Patterns data to examine changes in the pattern of metropolitan employment during the 1969-1972 business cycle. They observed an acceleration in decentralization during the recovery and concluded that their "results suggest that employment decreases at all locations during a downturn, but it increases differentially in noncentral locations when economic growth resumes" [11]. While this conclusion may contradict the expectations of Noll and Kain, it is consistent with the findings

from other studies of employment relocation which do not consider business cycle effects.

Major research contributions that explain the secular trend of suburbanization generally cite changes in production technology, improvements in transportation, and rising real income as the underlying causes. In particular, Muth's [10] theoretical model and empirical study demonstrate the importance of the income elasticity of housing demand and rising real incomes to the suburbanization of population. Studies of employment spatial diffusion focus on the importance of improvements in transportation, especially trucking, and the adoption of new production technologies in single-story plants as factors driving the suburbanization of manufacturing employment [3; 5; 8; 9]. While the manufacturing sector has generally been the focus of analysis, these factors influence location in other sectors as well, as has been clearly demonstrated by suburbanization in the retail trade sector.

MODEL

In our model we define suburbanization as an increase in the suburban share of metropolitan area employment (or population) over a period of time. This occurs as suburban areas grow more rapidly than their central cities and increase their share of metropolitan employment. Differences between central and suburban area growth rates can occur when suburbs experience higher rates of new firm births (or expansions), by a net migration of firms from central to suburban areas, by differences between area in firm death rates (or contractions), or a combination of these factors.

Other research has demonstrated that the rate at which plant closings occur is not dependent on central or suburban locations and that intrametropolitan migration explains only a negligible share of central city decline and suburban growth [2; 9; 14]. Differences in net new employment in these areas are therefore expected to depend on gross new locations

and net expansions in stationary establishments. Consequently, we hypothesize that national economic growth will affect the rate of suburbanization through its influence on the rate at which new investment decisions are made.

Investment decisions by business vary during the cycle. During expansions levels of new investment increase as businesses grow and technological advances are incorporated into the production process. This can mean constructing a new facility or expanding capacity in one or more branch plants at existing sites, as well as stimulating the entry of new firms into the industry. The factors which favor investment in suburban locations are easy to see. In the case of manufacturing activities, modern one-story production facilities are more easily built on large, relatively cheap sites in suburban locations. In the service sector, offices may incorporate new communications technologies that reduce their dependence on central areas and allow them to choose suburban locations that improve access for their suburban workers. In retail trade, the success of suburban shopping malls may be due as much to incorporating new retailing technology in expansive suburban locations as it is to moving closer to the market.

Expansions in the national economy increase the rate at which new location decisions are made. To the extent that suburban locations are preferred, upswings in the economy hasten the suburbanization process. Correspondingly, business cycle intensity will be a factor in differences between rates of suburbanization during recessions and recoveries. The greater the amplitude of the cycle, the greater the differences between these rates.

In the same way that the secular rise in real per capita income has stimulated the suburbanization of population, income fluctuations during the business cycle will induce different rates of suburbanization. When income levels rise during an expansion, the pace of suburbanization will increase as more families feel they can afford to consume greater amounts of housing in suburban locations. Conversely, lower real income levels during recessions will reduce the rate at which households seek suburban locations to increase their housing consumption.

METHODS AND DATA

Our analysis of the effect of national economic growth on suburbanization is based on aggregate data from the Local Area Personal Income file produced by the Bureau of Economic Analysis (BEA), and Dun and Bradstreet's Duns Market Indicators (DMI) file. These sources provide data on the level of economic activity by geographic location and industrial classification. The BEA macro data report all labor income by industry source at the county level and have been converted to a quarterly series (in constant dollars) using a procedure developed for this study. Counties have been classified as central or suburban so that the series contains quarterly estimates of income by industry source in the central county and suburban county portions of 137 multicounty metropolitan areas. Using these data, the suburban share of metropolitan industries (as indicated by place of work income) can be computed for every quarter from 1969 through 1980. By comparing these shares in consecutive quarters, we calculate average rates of suburbanization during recessions and expansions.

To study the dynamics of the suburbanization process over the business cycle, the DMI file was combined with the Bureau of the Census's 1977 city reference file to create a separate geographic data base with approximately 50,000 manufacturing establishments. For two 3-digit Standard Industrial Classification (SIC) code industries the file contains establishment-level employment by city/suburban status for 1973, 1975, 1979, and 1982, using constant 1977 central city and SMSA boundaries throughout.

Total employment in these establishments contains approximately 100 percent of the employment reported by the

Bureau of the Census in *County Business Patterns* for 1973, 1975, and 1979. Therefore, in the analysis that follows, the data set described here is treated as a census rather than a sample. This data set allows establishment births, closings, expansions, contractions, and migration to be tracked over the three periods between 1973 and 1982. The importance to suburbanization of each of these components of change can be determined by computing its contribution to industry decentralization in each of the three periods.

FINDINGS

Our hypothesis asserts that the rate of suburbanization is affected by the fluctuations in business investment and per capita income which occur during the business cycle. As these decline during recessions fewer new location decisions are made, and the rate of suburbanization declines. Conversely, their rise during expansions leads to higher rates of movement away from central locations. In Table 1 annual rates of change in nonresidential fixed investment and per capita personal income are shown for the recession and expansion in the two cycles between 1969 and 1980. The depressing influence of the recession on business investment and personal income is evident from these figures.

salary earnings as a proxy measure for employment levels. The results in Table 2 show clearly that income, and therefore employment, suburbanizes more rapidly during expansions than during recessions. About three-fourths of private sector income is earned in central county locations. In the first cycle this share dropped at an annual rate of -0.26% during the rather mild 1969:III-1970:IV recession. As economic activity and investment increased in the expansion, the rate of decentralization picked up, increasing to an annual rate of -0.39%. The second recession (1973:IV-1975:I) was considerably more severe and especially so in suburban areas. In this period employment decentralization nearly came to a halt (-0.03%) as the decline in the central area share of SMSA income virtually stopped. In the recovery the rate of decentralization increased to -0.42%, almost identically equal to the rate in the previous expansion.

These findings are consistent with our hypothesis. When non-residential fixed investment declined sharply in the second recession from $51.7 billion in 1973:IV to $27.6 billion in 1975:I, suburbanization nearly stopped as a result of comparatively fewer new location and expansion decisions. When the level of investment activity recovered again in the expansion—to $52.6 billion in 1980:I—subur-

TABLE 1

INDICATORS OF BUSINESS CYCLE INTENSITY

Annual Rate of Change*

(constant dollars)

Income Components	1969:III – 1973:IV		1973:IV – 1980:I	
	Recession	Expansion	Recession	Expansion
Net Non-Residential Fixed Investment	-25.3%	15.4%	-47.2%	13.1%
Personal Income Per Capita	1.6%	3.8%	- 3.5%	2.8%

*Quarterly changes are peak to trough for recessions, trough to peak for expansions, and are expressed as annual rates.

Source: Computations from Bureau of Economic Analysis, *National Income and Product Accounts.*

It was not possible to construct a quarterly series of employment by location from the BEA macro data. As a substitute, this analysis uses income from wage and

banization resumed its earlier pace. By comparison, in the preceding mild recession there was a much smaller drop in investment—from $45.6 billion in 1969:III

TABLE 2

ANNUAL CHANGE IN CENTRAL
COUNTY SHARE OF SMSA
INCOME AND POPULATION*

| Components | 1969:III – 1973:IV | | 1973:IV – 1980:I | |
	Recession	Expansion	Recession	Expansion
Private Sector Income	-0.26% (77.5%)	-0.39% (76.8%)	-0.03% (76.1%)	-0.42% (74.9%)
Population	-0.37 (67.5)	-0.38 (66.8)	-0.23 (66.0)	-0.33 (65.0)

*Figures in parentheses are central county shares of SMSA.

to $32.9 billion in 1970:IV—and less slowing in the rate of employment suburbanization.

A geographic breakdown shows that suburbanization rates are affected by business cycles in all regions of the country. While there are slight differences among SMSAs by region, Table 3 shows that greater rates of suburbanization during expansions are broadly based among the nine census regions in each cycle. The only exception to the general pattern is in the West North Central region where suburbanization was especially rapid during the first cycle expansion. This regional breakdown also provides further evidence that cycle strength affects the rate of suburbanization. For six of the nine regions the differences in suburbanization rates between recession and expansion were greater in the second cycle than in the first. Among the exceptions, the only large difference was in the Mountain region; differences between the cycles were minor for both the Mid Atlantic and South Atlantic regions.

The BEA data also provide annual estimates of population by area, and these were converted to quarterly population estimates with a smoothed interpolation. Analysis of this series shows that the hypothesized pattern of suburbanization is also evident in the distribution of population. During expansions the share of population in the central county portion of metropolitan areas declines more rapidly than during recessions, and the difference between these rates is affected by the strength of the cycle. In the 1969:III to 1973:IV cycle the fluctuation in real per capita personal income levels

was comparatively minor. Real income rose at an annual rate of 1.6% during the recession and then increased to 3.8% in the expansion. This mild fluctuation in a continuous growth of personal income produced little change in the rate of population suburbanization. In the recession, the annual change in the central county share of metropolitan area population declined by -0.37%, nearly the same as the rate of -0.38% during the expansion. The second cycle (1973:IV to 1980:I) was more severe, and the greater intensity is apparent by the changes in personal income. During the recession real personal income per capita declined at an annual rate of -3.5% compared to a 2.8% annual rate of growth in the expansion. This difference in cyclical severity is again reflected in the rate of population suburbanization. In the recession the rate of change in the share of metropolitan population in central counties dropped to an annual rate of -0.23%. During the following recovery this pace accelerated to -0.33%, nearly equal to the rate in the previous recovery.

Within the private sector economy there is considerable variability among industry groups in their rates of suburbanization. Table 4 shows the annual change in the central county share of SMSA income by industry division within the private economy. The results are mixed, and not all industries follow the pattern of suburbanization set by the private sector as a whole.

In the first cycle, differences in the rates of suburbanization between the recession and expansion were generally minor, and many industries actually experienced greater rates of suburbanization during

TABLE 3

ANNUAL CHANGE IN CENTRAL COUNTY
SHARE OF SMSA PRIVATE SECTOR INCOME

Region	1969:III – 1973:IV		1973:IV – 1980:I	
	Recession	Expansion	Recession	Expansion
New England	–0.39%	–0.50%	+0.40%	–0.51%
Mid Atlantic	–0.34	–0.62	–0.37	–0.60
South Atlantic	–0.02	–0.31	–0.38	–0.62
East North Central	–0.19	–0.52	+0.04	–0.50
East South Central	+0.24	–0.23	+0.30	–0.26
West North Central	–0.53	–0.34	–0.30	–0.49
West South Central	–0.04	–0.14	+0.04	–0.18
Mountain	–0.35	–1.37	–0.25	–0.52
Pacific	–0.35	–0.45	0.00	–0.48
All Regions	–0.26	–0.39	–0.03	–0.42

the recession. This is not surprising, however, since the cycle was mild by historical standards. By comparison, behavior was much more uniform among industries in the substantially more severe second cycle. Among industry groups, wholesale trade is the only exception to the pattern of a greater rate of suburbanization during the expansion.

Analysis of the DMI micro data also shows that downturns in the national economy dampen employment shifts between central cities and suburbs in machine tool and motor vehicle manufacturers—a result that is consistent with the findings above, based on the aggregate BEA income data. In Table 5 we report the annual average change in the central city share of metropolitan employment during the 1973–1975 recession, the 1975–1979 expansion, and the 1979–1982 contraction, in each of the two decentralizing industries.

In general, the annual average central city loss was lower during the 1973–1975 and 1979–1982 recessions than it was during the expansions. For example, the central city share of employment in motor vehicles manufacturing in metropolitan areas decreased by an average of 3.8% per annum during the 1975–1979 expansion. During the 1973–1975 recession the central city share of this industry's employment increased by 2.7% per annum and during the 1979–1982 downturn the central city share increased by 0.1% per annum. The pattern for machine tools is similar, with an exception in the second recession. In the 1979–1982 recession, the central city share of machine tool employ-

ment declined at an annual rate of 1.44%, a greater decrease than the 1.25% annual change during the 1975–1979 expansion.

To determine the causes of the uneven rate of suburbanization over the business cycle, central city and suburban growth rates were divided into cause of employment change: births, closings, in-place expansions, and migration. The results are shown in Table 6. Column V of this table displays the annual average growth rates for central cities and suburbs over the business cycle. As shown in column VI, the difference between suburban and central city growth rates widen during the expansions and narrow during the recessions. The widening in growth rates is due to the acceleration of suburban growth relative to central city growth during the economic expansion. This acceleration of suburbanization during the economic recovery could be due to an increase in net firm migration to suburban areas during periods of expansion as well as to higher rates of "natural increase" or net in-place expansions in suburbs than in central cities.

The values displayed in column IV of Table 6 show annual net migration rates for central cities and suburbs over three cycle phases—the 1973–1975 recession, the 1975–1979 expansion, and the 1979–1982 recession. The central city migration rates include migration of employment to central cities from any suburb and all non-metropolitan areas and from central cities to any suburb or non-metropolitan area. Similarly, the suburban rates include all establishment moves to suburbs from any central city or non-metropolitan

TABLE 4

ANNUAL CHANGE IN CENTRAL COUNTY SHARE
OF SMSA INCOME IN THE PRIVATE SECTOR, BY INDUSTRY[**]

| Industry | 1969:III – 1973:IV | | 1973:IV – 1980:I | |
	Recession	Expansion	Recession	Expansion
Private	-0.26% (77.5%)	-0.39% (76.8%)	-0.03% (76.1%)	-0.42% (74.9%)
Ag. vcs., F&F	• •	• •	• •	• •
Mining	• •	• •	• •	• •
Construction	-0.47 (73.7)	-0.46 (72.4)	-0.24 (72.1)	-0.46 (70.6)
Manufacturing	-0.32	-0.30	-0.24	-0.41
non-durables	-0.30 (76.6)	-0.43 (75.9)	-0.34 (74.8)	-0.37 (73.7)
durables	-0.45 (72.5)	-0.17 (72.1)	-0.21 (71.6)	-0.42 (70.5)
Trans., Comm., and Util.	-0.52 (83.7)	-0.36 (82.7)	-0.25 (82.2)	-0.43 (80.7)
Wholesale	-0.74 (84.1)	-0.70 (82.4)	-0.82 (81.2)	-0.74 (78.4)
Retail	-0.64 (74.9)	-0.48 (73.6)	-0.26 (72.9)	-0.39 (71.5)
F.I.R.E.	-0.18 (87.0)	-0.44 (86.0)	0.44 (85.8)	-0.72 (83.7)
Services	-0.24 (77.5)	-0.32 (76.9)	0.07 (76.5)	-0.36 (75.5)

[*] These industries were subject to extremely high levels of data suppression and have been deleted since their importance in total metropolitan area income is minor.

[**] Figures in parentheses are central county shares of SMSA income.

TABLE 5

ANNUAL AVERAGE CHANGES IN
CENTRAL CITY SHARE OF TOTAL METROPOLITAN EMPLOYMENT
OVER THE BUSINESS CYCLE, BY INDUSTRY[*]
(PERCENTAGES)

	Machine Tools	Motor Vehicles
1973–1975 Recession	– .50	2.71
1975–1979 Expansion	-1.23	-3.80
1979–1982 Recession	-1.44	.08
Central City Share in 1973	54.4	61.3
Central City Share in 1982	44.9	51.7

[*] Estimates are based on all metropolitan area establishments in the DMI file.

area and from suburbs to any central city or non-metropolitan area.

These rates demonstrate that migration plays a minor role in the suburbanization process. For example, during the 1973–1975 recession, net migration of establishments reduced central city machine tool employment by only 0.3% while the net migration of establishments to suburban areas increased their employment by only 0.4%.

Employment changes due to establishment births, closings, and inplace expansions play a far greater role in explaining suburbanization throughout the cycle than does firm migration. For example, during the 1975–1979 expansion, machine tool employment in suburbs experienced an annual growth rate of 5.7%. Establishment births net of closings ("natural increase") account for 67% of this growth, whereas net in-migration from central cit-

ies accounts for only 7% of the growth, with the balance due to expansions in-place. Moreover, the pattern of central city to suburban migration does not appear to be sensitive to the business cycle, since the results show that the rate of central city-suburban net migration is as likely to increase during expansions as it is to fall.

The results on the role of plant closings are less clear. In three of the four recessionary cases, suburban rates of employment loss due to plant closings exceed that of central cities. In both expansionary periods the suburban rates drop below those of central cities. This relative cyclical sensitivity of suburban establishment closings may explain, in small part, the tendency for suburbanization to slow during recessions and accelerate during recoveries. While it is impossible to draw firm conclusions from two industries, the observed pattern of establishment closing rates is consistent with evidence reported earlier [14] and the hypothesis that central city and suburban plant closing rates are similar during all phases of the business cycle.

The results of Table 6 do indicate that the major cause of the cyclical nature of suburbanization is that suburban economies increase their share of metropolitan employment during periods of national economic growth primarily because they capture a high proportion of metropolitan establishment births and on-site expansions. In the case of machine tools, the increase in the rate of suburbanization during the expansion, 1975–1979, appears to be due primarily to the relatively high suburban establishment birth rate during this period. The central city birth rate was 4.7%, whereas the suburb rate was 8.2%. While the suburban establishment birth rate is consistently higher than that of central cities, the results of column II indicate the central city/suburban birth rate differential widens during the expansion and narrows during recessions.

As in the case of machine tools, the rate of suburbanization of motor vehicles manufacturing employment was more rapid during the 1975–1979 recovery than during the two recessions. However, contrary to the case of machine tools, the suburbanization of motor vehicles employment during the expansion is due to an increase in suburban relative to central city on-site expansions. This is shown by comparing central city net expansion rates in column I of Table 6. While an analysis of cross industry differences in cyclical behavior is beyond the scope of this paper, we might speculate that existing firms in industries with limited firm entry and low establishment birth rates are forced to absorb employment fluctuations over the cycle. In contrast, in industries such as machine tools where birth rates are higher, it is the births and deaths of new establishments that explain employment fluctuations over the cycle.

The results of the microdata analysis for these two industries indicate, therefore, that rates of employment suburbanization vary with the business cycle. During recessions, suburbanization slows or is reversed as suburbs experience more severe trend-adjusted cyclical fluctuations than central cities. During recoveries, new investment—either through on-site expansions or births of new establishments—takes place at a greater rate in suburban areas, thereby increasing the rate of suburbanization.

CONCLUSION

Evidence from aggregate income data show that suburbanization is sensitive to national economic growth. Suburbanization accelerates when the national economic growth is high and nearly halts when the national economy is in sharp decline. The underlying causes of this cyclical pattern were explored using microdata for two decentralizing industries. The evidence indicates that as aggregate investment rises with economic expansion, suburban areas capture a disproportionate share of metropolitan investment of both new establishments and net expansions. When national economic growth slackens, investment rates fall and

TABLE 6

ANNUAL PERCENT EMPLOYMENT CHANGE DURING THE BUSINESS CYCLE,
FOR CENTRAL CITIES AND SUBURBS

	Net Expansion (I)	Births (II)	Closings (III)	Net Migration (IV)	Net Employment Change (V)	Suburb-Central City Growth Rates (VI)
			MACHINE TOOLS 1973–1975 Recession			
Central City	.35	2.15	7.25	–.29	–5.04	–5.30
Suburbs	2.99	4.64	7.80	.40	.23	
			1975–1979 Expansion			
Central City	.54	4.69	5.71	–.17	–.65	6.34
Suburbs	1.46	8.20	4.37	.40	5.69	
			1979–1982 Recession			
Central City	1.59	4.90	9.42	–.43	–3.30	3.51
Suburbs	1.19	5.34	7.04	.53	.21	
			MOTOR VEHICLES 1973–1975 Recession			
Central City	3.62	.11	3.67	–.20	–.14	–12.26
Suburbs	–8.04	.31	5.17	.50	–12.40	
			1975–1979 Expansion			
Central City	–3.51	.38	6.46	–.16	–9.75	9.90
Suburbs	4.71	.65	5.46	.25	.15	
			1979–1982 Recession			
Central City	–5.26	.32	6.27	.07	–11.14	1.85
Suburbs	–.41	.85	9.98	.25	–9.29	

Of necessity our estimates of birth rates are based on several assumptions that adjust for the under-reporting of total new births in the DMI file. Our work with the data suggests that the DMI file in a given year only captures about 13.7% of all new employment due to births in the machine tool industry. By comparison, the DMI file appears to capture a much higher proportion of all new activity in the motor vehicles industry. Estimates of employment gains due to establishment openings are further complicated because the file fails to distinguish between the birth of a branch plant and the addition to the file of an existing (but previously unreported) branch. To correct for this and for the underreporting of new establishments, only employment gains due to births are extracted from the file, and the employment gains in machine tools are scaled upward by $1/.137$. Birth rates in motor vehicles were left unchanged.

the gap between central city and suburban investment narrows.

These results suggest that the predictions of a slow rate of real GNP rates of growth for the remainder of the decade, if accurate, will lead to slower rates of suburbanization than have recently been experienced. This will not strengthen central city economies, however, since investment in both central cities and suburbs will be relatively low. To the extent that personal income growth will be dampened by a sluggish economy the outmigration of households from central cities will be lower than would be the case with more rapid growth. This will allow central cities to capture indirectly a larger share of metropolitan employment than they would under conditions of more robust national growth.

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