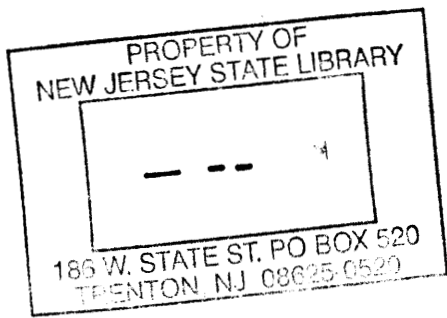


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# 19<sup>th</sup> Annual Report

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Economic Policy Council  
and Office of Economic Policy

STATE OF NEW JERSEY  
1987

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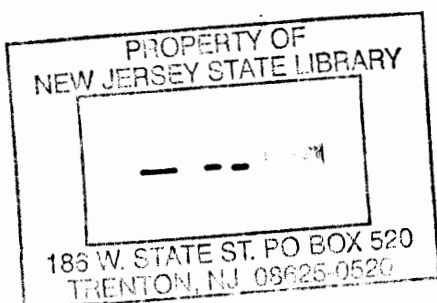
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# 19<sup>th</sup> Annual Report

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Economic Policy Council  
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STATE OF NEW JERSEY

1987





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September 14, 1987

The Honorable Thomas H. Kean  
Governor of New Jersey  
The State House  
Trenton, New Jersey

Dear Governor Kean:

In compliance with Chapter 129 of New Jersey Public Law 1966, the Economic Policy Council is pleased to submit its 19th Annual Report.

Four topics of current interest are examined in this Annual Report. Chapter I studies regional economic growth and explores the existence of a regional cycle. The economic decline in the 1970's of the North Atlantic region resulting from manufacturing losses has given way to the robust economy of the 1980's led by large gains in the region's service sector. This Chapter traces these changes in regional economic performance and notes the potential for further significant growth in the service industries.

Chapter II examines the difficult task of financing the estimated \$2.2-2.9 billion in subsidies necessary to produce the 146,000 housing units called for under the Fair Housing Act. This approach analyzes the imposition of a developer fee on new construction to finance this low- and moderate-income housing requirement. The efficiency and equity aspects of such a tax are discussed.

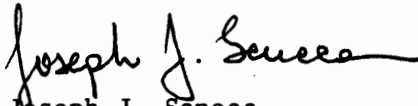
Chapter III notes that the property tax burden in New Jersey has declined considerably since the early 1970's. However, this tax remains an important component of the State's fiscal system. Trends in various measures of the tax burden are compared. While the burden in New Jersey has lessened, it remains high compared to that of the nation. High income earners pay less property tax as a percentage of gross income than low-income recipients. Moreover, an examination of assessment to sales price ratios reveals that those of relatively inexpensive homes are systematically higher. This is further evidence of the regressivity of the property tax. We present a proposal to reduce the tax's regressivity that does not involve a major restructuring of the entire tax system.

Finally, Chapter IV calculates the benefits to firms under the State Industrial Development Bond (IDB) program that are now being phased-out as a result of the 1986 federal tax law. The investment and employment gains of this program for New Jersey have been significant. We propose an expanded use of Employees Stock Option Plans as a possible replacement for the IDB program.

We wish to thank the Department of Labor, Division of Planning and Research for the statistical tables at the end of this Report; the Department of the Treasury, Division of Taxation for property tax data; the Economic Development Authority for IDB data, and to Carol Maslowski for her careful preparation of the manuscript.

We appreciate your continued interest in our activities and we look forward to assisting you in your attempts to improve further the performance of the State's economy and to extend its prosperity to all of its residents.

Respectfully submitted,

  
Joseph J. Seneca

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# PREFACE

This Annual Report examines four problems of special concern to New Jersey policymakers. Each of the chapters in this publication has been prompted by recent developments in the State.

Chapter I attempts to determine whether New Jersey's economy is experiencing a regional business cycle. This Chapter is motivated by observations that the regional decline in manufacturing in the 1970's is now being more than matched by growth in services. The strength of the State's economy in this decade has been in sharp contrast with its poor performance in the 1970's. Directives of the New Jersey Council on Affordable Housing provided the impetus for examining, in Chapter II, aspects of compliance with the new housing law and consideration of the necessary revenues to finance the required low- and moderate-income housing subsidies. The deliberations of the State and Local Expenditure and Revenue Policy Commission and changes in the burden of the property tax since the early 1970's prompted the analysis of Chapter III. Finally, Chapter IV examines the new provisions in the 1986 federal tax law affecting industrial development bonds and the increasing use of Employee Stock Option Plans as investment financing tools.

## Chapter I -- Understanding Uneven Regional Growth

In the 1970's it was widely believed that New Jersey and other industrial states of the North would continue to experience prolonged decline because of their relatively old and less efficient capital stock. But the rapid growth of the construction and service industries in the

1970's, even in the face of continued manufacturing decline, has brought about a return to health for the regional economy. Signs of the region's return to prosperity include declining unemployment rates and wage rates rising faster than those of the national economy.

More generally, the growth and decline of the manufacturing and service sectors, at various times by regions, suggest the existence of regional cycles. This prompts the question: What are the causes of the regional cycle and how has it affected the State's economy? The economic rebound in the North Atlantic region has lasted for nearly ten years and shows no sign of faltering. This Chapter sheds some light on the causes and effects of the regional cycle; its approach reviews regional economic shifts over the past several decades and examines several hypotheses pertaining to regional economic change. A tentative hypothesis is offered explaining the causes of economic resurgence in the North Atlantic region. It concludes that growth rates of manufacturing industries are undergoing equalization, but there is no evidence that service industries are displaying a similar trend. In addition, the relative decline of manufacturing has meant that services have become continually more important.

High technology manufacturing has been thought of as the great hope of the regional as well as of the national economy. But the United States advantage has eroded as foreign competition has made inroads in this sector. As a result, it now seems apparent that most long-term gains to be made in the regional

economy will be in the service sector. In particular, computer-related services display comparative advantage and significant potential for growth in the region.

## Chapter II -- Financing Housing Through Developer Fees: An Economic Assessment

A difficult task is being faced by the State's municipalities. The courts and the State Legislature have decided that the public and private sectors have failed to produce a sufficient quantity of affordable housing for families of low- and moderate-income. As a result of court rulings and legislative actions, directives of the New Jersey Council on Affordable Housing under provisions of the Fair Housing Act, require the construction or rehabilitation of 146,000 housing units. A total of \$2.2-2.9 billion, or a \$15,000-20,000 subsidy per unit, will be needed to meet the needs for low- and moderate-income families. This Chapter examines financing this cost through fees on new development. Specifically, it estimates the economic effects of a statewide tax imposed on new construction on the supply of housing, as well as its broader efficiency and distributional effects.

The distributional effect of a developer fee will mean that faster growing areas will be the primary sources of funds, which would then be distributed on a need basis among the various municipalities. In essence, growing municipalities in some parts of the State will be subsidizing low and moderate housing in others. Other State activities may complicate this redistributive effect. Redistribution among individuals is less clear than the intrastate effect. While the results among individuals may not be unsatisfactory, disputes may nevertheless occur.

Suggestions for policymakers

include:

- 1) the tax rate should be kept low, preferably below two percent, so as not to act as a drag on growth;
- 2) the tax should be applied statewide to avoid adverse inter-municipality effects;
- 3) the tax should be defined as broadly as possible; all new construction should be included -- residential and nonresidential, and
- 4) the State should collect and administer any tax on new construction.

## Chapter III -- New Jersey Property Tax Reform: A Proposal

New Jersey has made considerable progress in lowering its property tax burden since the early 1970's. Yet, because it remains an important element in the State's overall tax system, this Chapter examines aspects of the present burden and distribution of the tax and makes suggestions for improvement.

In the first part, trends of several versions of burden are examined and compared. In constant dollars, the property tax has declined steadily from 1972 to 1984, with the 1984 per capita tax over 16 percent below the 1972 level. As a percent of total personal income, some cyclical variation is noted, but the 1984 ratio in property taxes as a percent of "Gross Income", and property tax as a percentage of property value fell from 3.66 percent in 1972 to 2.45 percent in 1984.

Despite these significant reductions, the New Jersey burden vis-a-vis the nation as a whole remains high. As a percent of personal income, New Jerseyans paid 4.67 percent in property tax vs. 3.44 percent for the United States, a 1.23 percentage points difference.

The above figures are averages. Not all the tax burdens of municipalities showed improvements in

recent years. There are 23 municipalities with populations over 15,000 whose property taxes as a percent of gross income exceeded 5.5 percent, or one point above the 4.5 percent State average in 1984. However, most of the 23 municipalities showed declines in burden from 1977 to 1984. The variations in the changes of burdens indicate a changing distribution of the tax among municipalities. High property tax/income ratios tend to be found in the larger cities.

Property tax/income ratios are found to be inversely related to average gross income in the State. For example, homeowners with incomes between \$10,000 and \$15,000 paid 20.6 percent of income in property taxes in 1984, while homeowners with incomes exceeding \$50,000 paid only 2.8 percent. While incomes exclude some items, e.g., pensions, there is one element affecting regressivity that does not depend directly on income: the assessment vs. sales price ratio. Higher priced homes tend to be undervalued more than lower priced ones. For example, houses in the \$100,000-150,000 class were undervalued by 85.9 percent in 1984; houses in the \$15,000-30,000 class were undervalued by only 59.6 percent.

In principle, the maldistribution of the property tax could be improved by either a general or a selective tax reduction. A general reduction might lead to a serious and complicated redistribution of the State's overall tax burden. It is therefore suggested that a selective reduction be used. This could be accomplished by redesigning the current rebate system, directing higher rebates toward lower-income property owners.

#### Chapter IV -- Saving Investment Costs: IDB's vs. ESOP's

New Jersey's Industrial Development (IDB) Program has been a very powerful tool, and since its inception it has played an important part in the State's economic resurgence. In 1975, \$47 million in bonds were issued under the program. By 1984, the total had risen to \$1.113 billion and remained approximately at that level in 1985. Because of the anticipated federal tax law, total issues fell to \$486 million in 1986. Cumulative financings from 1975 through 1986 totaled almost \$7 billion.

The first part of this Chapter estimates the savings realized by firms who financed investment prior to the new tax law. Pre-tax, the IDB program would have saved investment costs of about \$56.6 million in 1984 and an equal amount in 1985 when bond issues in each year totaled about \$1.1 billion. This \$56.6 million saving may be thought of as the annual loss resulting from the tax changes.

Regression analysis yields estimates of investment and employment gains produced by the IDB program over the period from 1975 to 1986. It is estimated that \$1.455 billion investment that would not have been undertaken otherwise, was generated by the \$7 billion total bond issues. This induced investment produced an additional 135,000 jobs in the State.

The second part of the Chapter considers Employee Stock Option Plans (ESOP's) as a possible replacement for IDB's. Consideration is confined mainly to financing investments through leveraged ESOP's. Estimates for firms utilizing ESOP financing reveal that the approach would produce savings per \$1000 investment that would far exceed the loss per \$1000 IDB's. Accordingly, it is urged that a vigorous program of ESOP promotion, and assistance to firms utilizing them, be considered to offset the IDB loss.

# I.

## UNDERSTANDING UNEVEN REGIONAL GROWTH\*

### INTRODUCTION

During the 1970's, serious questions were raised concerning New Jersey's long-term economic outlook. The State's manufacturing industries were rapidly declining, and other sectors also fell significantly below their national trends. Moreover, New Jersey was not alone in experiencing such a precipitous decline; other states in the industrial North Atlantic and North Central regions shared similar economic conditions. Uneven regional economic growth led to a widespread belief that New Jersey and other industrial states of the North would experience a prolonged relative decline due to their inefficient and obsolete capital stock.

Such pessimism, however, has recently been replaced by new optimism in the North Atlantic region. Rapid growth in construction and service industries in the 1980's has created an economic resurgence in this region despite the continuing decline of its manufacturing sector. The recent economic revival of the North Atlantic region has led to a steadily declining unemployment rate below the national average, and a wage level rising more rapidly than the national trend.\*\*

This reversal of regional economic fortune leads to an interesting question: is there a systematic regional economic cycle with long waves? The resurgence of the North Atlantic region has been sustained for nearly ten years and does not appear to be an ephemeral phenomenon caused by an accidental event. In a recent paper, Booth (1986) suggests an existence of long waves in regional economic growth. On the other hand, Olson (1982) argues that older (regional or national) economies tend to suffer from institutional sclerosis which leads to slower economic growth than younger economies. Thus, Olson would deny the existence of an endogenous long cycle and would argue that a long-lasting revival of a declining old industrial state, such as New Jersey, requires a major upheaval and shake-out of its institutions.

This paper attempts to shed some light on the causes of a regional cycle. To do so, regional economic shifts over the past several decades are reviewed and analyzed and various hypotheses are examined. The paper concludes by synthesizing these hypotheses to provide a tentative explanation of recent developments in regional economies of the United States.

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\*Prepared by Jong Keun You, Office of Economic Policy.

\*\*The average pay level in the private sector in New England rose 6.3 percent above the national trend during the period 1979-1985 and 2.5 percent above the national trend in the Mideast states (see Browne, 1987).

**I. POSTWAR TRENDS IN REGIONAL ECONOMIC GROWTH**

Until recently, the post-World War II U.S. economy has been characterized by a steady shift in employment and population away from the northern regions and toward the southern and western states. Such a phenomenon has been dubbed by the media and economists as a movement away from the "frost belt" or the "rust belt" to the "sun belt", or from the "manufacturing belt" to the "peripheral states" (Rees). This trend is depicted in Table 1.1.

In 1950, North Atlantic and North Central regions, or the manufacturing belt, accounted for 62.7 percent of the nation's total non-agricultural employment and 72.0 percent of U.S. manufacturing employ-

ment, in sharp contrast to a 55.5 percent population share. By 1985, these figures had fallen to 47.0 percent for the nonagricultural employment share, 52.3 percent for the manufacturing employment share, and 45.7 percent for the population share.

Of course, such dramatic changes in employment distributions resulted from uneven regional growth rates. For example, nonagricultural employment in the manufacturing belt grew by 64 percent during the 35-year period since 1950, compared to 211 percent in the South and West. The divergence is even more dramatic in manufacturing employment growth rates; -6 percent in the North Atlantic and the North Central regions versus 119 percent in the South and the West.

Table 1.1  
Population and Nonagricultural Employment Trends by Region  
(Population and Employment in Millions; Figures  
in parentheses are shares in national totals)

Year		North Atlantic	North Central	South	West
1950	Population	39.5 (26.1%)	44.5 (29.4%)	47.2 (31.2%)	20.2 (13.3%)
	Total Emp.	14.2 (31.7%)	13.9 (31.0%)	11.1 (24.8%)	5.6 (12.5%)
	Mfg. Emp.	5.5 (36.7%)	5.3 (35.3%)	2.9 (19.3%)	1.3 (8.7%)
1960	Population	44.7 (24.9%)	51.6 (28.8%)	54.9 (30.6%)	28.1 (15.7%)
	Total Emp.	15.6 (29.1%)	15.8 (29.4%)	14.2 (26.4%)	8.1 (15.1%)
	Mfg. Emp.	5.5 (33.1%)	5.4 (32.5%)	3.7 (22.3%)	2.0 (12.1%)
1970	Population	49.1 (24.1%)	56.7 (27.8%)	63.1 (30.9%)	35.0 (17.2%)
	Total Emp.	18.6 (26.3%)	20.0 (28.3%)	20.3 (28.7%)	11.8 (16.7%)
	Mfg. Emp.	5.6 (28.8%)	6.3 (32.5%)	5.1 (26.3%)	2.4 (12.4%)
1980	Population	49.1 (21.7%)	58.9 (26.0%)	75.4 (33.3%)	43.2 (19.0%)
	Total Emp.	20.5 (22.6%)	23.6 (26.0%)	29.1 (32.0%)	17.6 (19.4%)
	Mfg. Emp.	5.1 (25.0%)	6.1 (29.9%)	6.1 (29.9%)	3.1 (15.2%)
1985	Population	49.8 (20.9%)	59.2 (24.8%)	81.9 (34.3%)	47.8 (20.0%)
	Total Emp.	22.0 (22.5%)	24.0 (24.5%)	32.4 (33.1%)	19.5 (19.9%)
	Mfg. Emp.	4.6 (23.8%)	5.5 (28.5%)	6.0 (31.1%)	3.2 (16.6%)

Source: Wheaton (1979) and Wharton Econometrics Data Base (Original Source: U.S. Department of Labor and U.S. Department of Commerce.)

Table 1.1 also shows that regional employment shares in 1985 were more in line with population shares than they were in 1950. This trend toward a more balanced employment/population ratio has been accomplished by an adjustment on the employment side which was the result of significant structural changes.

Population growth between 1950 and 1985 in the South and the West (92.4%) greatly exceeded that in the North Atlantic and the North Central regions (29.8%). But, nonagricultural employment growth has been far more in favor of the Sunbelt states. This dramatic increase in nonagricultural employment, in excess of population growth, was possible due to a rising labor force participation ratio in the nation as a whole and, in particular, of the South and the West catching up with the national norm. As shown in Table 1.2, in 1950 the nonagricultural employment/population ratio in the South and the West was significantly lower than that in the northern industrial regions. In fact, there was a clear ranking with the North Atlantic region showing the highest ratio and the South the lowest. By 1985, however, this ratio has become essentially identical in three of the

four regions. (The North Atlantic region continued to show a higher level.)

As noted above, manufacturing employment showed the most uneven growth rates among regions. The result is that regional shares of manufacturing employment have increasingly become closer to the population shares (see Table 1.1). This phenomenon also suggests that an interesting structural change has taken place over the past three and a half decades. Table 1.3 shows that this structural change consists of a twofold adjustment process. First, the percentage of manufacturing employment in total nonagricultural employment has steadily decreased throughout the nation and, second, this percentage has plummeted in the manufacturing belt from close to 40 percent in 1950 to a little over 20 percent in 1985, while it declined much more moderately in the other regions -- from about 25 percent in 1950 to about 18 percent in 1985. The result is that the United States economy in 1985 exhibited a much more even distribution of industrial employment among the constituent regions. Implications of this phenomenon will be further investigated later.

Table 1.2  
Trends in Nonagricultural Employment/Population Ratio

Year	North Atlantic	North Central	South	West
1950	0.360	0.314	0.236	0.278
1960	0.351	0.307	0.260	0.288
1970	0.379	0.352	0.321	0.337
1980	0.417	0.401	0.387	0.407
1985	0.441	0.405	0.396	0.407

Source: Table 1.1

Table 1.3  
Manufacturing Employment as Percent of Total  
Nonagricultural Employment

Year	North Atlantic	North Central	South	West
1950	39.6	38.1	26.1	23.2
1960	35.3	34.2	26.1	24.7
1970	30.1	31.5	25.1	20.3
1980	24.9	25.8	21.0	17.6
1985	20.9	22.9	18.5	16.4

Source: Table 1.2.

## II. RECENT DEVELOPMENTS IN REGIONAL ECONOMIES

Table 1.2 above shows that, during the 1950's, the employment/population ratio showed little change except for a small increase in the South. In the 1960's, the North Atlantic region showed a moderate increase in the employment/population ratio, while the other regions experienced a much faster rise, and in the 1970's, all four regions exhibited a rapidly rising employment/population ratio. However, this ratio changed very little during the first half of the 1980's except in the North Atlantic region where it has continued to increase, apparently in response to tight labor markets.\* It is not clear whether the recent increase in the employment/population ratio in the North Atlantic region represents a new nationwide trend or is a temporary phenomenon caused by tight labor markets.

The sign of revival of the North Atlantic region can also be observed from the growth rates of population and employment (Table 1.4). The directions of changes in these growth rates (as indicated by the arrows in parentheses) show a reversal from the previous pattern in the North Atlantic region. In the 1960's, all four regions show basically the same trend in these growth rates. The downward trend in the nationwide population growth rate was shared by all four regions, and employment growth rates increased from those of the previous decade, as a result of the prolonged economic expansion in the 1960's following the slow-growing 1950's. This was true for all regions except for manufacturing employment growth in the West where the extraordinary growth rate of the 1950's (4.40% per annum) could not be sustained.

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\*As of the first quarter of 1987, the unemployment rates in New England and the Mid-Atlantic Region were 3.7% and 5.1%, respectively, in comparison to 6.6% in the U.S. In 1977, this rate was 7.7% in New England, 8.7% in the Mid-Atlantic region, and 7.0% in the U.S.

Table 1.4  
Population and Employment Growth Rates  
(Annual Average Percents)

Period		North Atlantic	North Central	South	West
1950-60	Population	1.24	1.49	1.52	3.36
	Total Emp.	0.94	1.29	2.49	3.76
	Mfg. Emp.	0.00	0.19	2.47	4.40
1960-70	Population	0.94 (↓)	0.95 (↓)	1.40 (↓)	2.22 (↓)
	Total Emp.	1.77 (↑)	2.39 (↑)	3.64 (↑)	3.83 (↑)
	Mfg. Emp.	0.18 (↑)	1.55 (↑)	3.26 (↑)	1.84 (↓)
1970-80	Population	0.00 (↓)	0.38 (↓)	1.80 (↑)	2.13 (↓)
	Total Emp.	0.98 (↓)	1.67 (↓)	3.67 (↑)	4.08 (↑)
	Mfg. Emp.	-0.93 (↓)	-0.32 (↓)	1.81 (↓)	2.59 (↑)
1980-85	Population	0.28 (↑)	0.10 (↓)	1.67 (↓)	2.04 (↓)
	Total Emp.	1.42 (↑)	0.34 (↓)	2.17 (↓)	2.07 (↓)
	Mfg. Emp.	-2.04 (↓)	-2.05 (↓)	-0.33 (↓)	0.64 (↓)

NOTE: Arrows indicate the direction of changes in the growth rate from that of the previous decade.

Following the nationwide expansion of the 1960's, growth in the U.S. economy became dichotomized in the 1970's. During this period, the growth rates in the industrial North and those in the rest of the continental U.S. moved in opposite directions. In the North Atlantic and the North Central regions the growth rates uniformly decreased, while in the South and the West two of the three growth rates increased in each region.

In the 1980's, the dichotomization has been replicated in a sub-national scale in the manufacturing belt, as the North Atlantic and the North Central regions have become two distinct economies. In fact, the North Atlantic region is the only place where the 1980-85 growth rates have increased over those of 1970-80, while the other three regions have all experienced decreases. While the South and the West exhibited the same downward trend in growth rates in the 1980's as did the North Central

region, the latter region in the 1980 is nevertheless distinct from the other two regions, since its growth rates are significantly lower than those of the South and the West. Thus, it can be said that the U.S. economy in the 1980's consists of three distinct regions (North Atlantic, North Central, and the rest of the U.S.).

Another interesting phenomenon revealed by Table 1.4 is that in the 1970's the North Atlantic region experienced a decade of stationary population, very slow growth in total employment, and a significant decline in manufacturing employment before the rebound in its growth rates. The North Central region is now experiencing a similar situation. Will this region follow the pattern established by the North Atlantic region? An affirmative answer to this question implies an existence of a regional cycle, a question we now attempt to address.

### III. SHIFT-SHARE ANALYSIS

#### 1. The Model

In this section, a simple but useful method of analyzing regional economic shifts is discussed. Although this technique has been criticized for being a truism and thus lacking theoretical underpinnings, it has, nevertheless, been found to be a useful tool for identifying sources of economic shifts among regions.\* This technique decomposes economic changes of a given region into three components:

(1) The national component ( $N_{ij}$ ), which would have resulted if each industry in the region had grown at the same rate as the national total of all industries did.

(2) The industrial-mix effect ( $M_{ij}$ ) which arises from the region's uneven share of fast and slow growing industries.

(3) The competition effect ( $C_{ij}$ ), resulting from regional industries growing at rates different from those of their national counterparts.

Mathematically, the three components are derived from the following identity:

$$(1) E_{ij}^1 = E_{ij}^0 (1 + r_{ij})$$

where:

$E_{ij}$  = employment in the i-th industry of the j-th region,

$r_{ij}$  = employment growth rate of the i-th industry of the j-th region,

and superscript 0 and 1 denote, respectively, the base year and the end year. Equation (1) can be written as:

$$(2) E_{ij}^1 = E_{ij}^0 [(1 + r_i) + (r_{ij} - r_i) + (r_{ij} - r_i)],$$

where:

$r_i$  = employment growth rate of the i-th industry in the U.S.,

$r$  = employment growth rate of all industries in the U.S.

Thus, employment change in the i-th industry of the j-th region can be represented by:

$$(3) E_{ij}^1 - E_{ij}^0 = r E_{ij}^0 + (r_i - r) E_{ij}^0 + (r_{ij} - r_i) E_{ij}^0 = N_{ij} + M_{ij} + C_{ij}$$

The national component ( $N_{ij}$ ) is that part of the industry's regional employment growth which would have resulted if the region's industry kept pace with the nation's **aggregate** employment growth. The mix effect ( $M_{ij}$ ) is the additional employment which results from the region keeping pace with the **industry's** national trend. This component would be positive (negative), if the industry's national trend exceeded (lagged

\*See, for example, Perloff and Wingo (1961), Rees (1979), and You (1980).

behind) that of the national aggregate employment. The competition effect ( $C_{ij}$ ) represents extra employ-

ment (positive or negative) arising from the difference between the rate of growth in employment of the region's industry and that of the industry's national counterpart. Thus, a positive competition effect can be considered the region's comparative advantage for that industry and vice versa. This model yields two propositions and corollaries:

- **Proposition 1:** The summation of the mix effects over all industries and all regions must necessarily be zero.\*

Corollary: If a region's industrial composition is identical to that of the nation, the sum of its mix effects ( $M_{ij}$ ) over all industries would be zero.

- **Proposition 2:** Summation of the competition effects over all industries and all regions must necessarily be zero.

Corollary: If the growth rate of each industry of a region is identical to its national counterpart, the competition effect is, by definition, zero for each industry.

Corollaries to both propositions are intuitively obvious, but it is unrealistic for any region to have an

identical industrial mix as the U.S., or identical industrial growth rates to those of the nation. Moreover, the converses of these corollaries are not necessarily true. More important, however, are the implications of these corollaries; if a region's industrial mix closely resembles the national composition or if its industrial growth rates are similar to those of their national counterparts, that region's total mix effect or total competition effect would be small. (Propositions 1 and 2 are useful for detecting computational errors.)

## 2. Application of Shift-Share Analysis

The technique described above is applied to regional and national employment data and the results are analyzed and compared with those from previous studies. The most recent census data are for 1982 and not up-to-date enough for analyzing the recent developments. Therefore, this study uses the BEA employment data and also adopts the BEA classification of eight regions instead of the nine census regions.\*\* Unlike previous studies which dealt exclusively with manufacturing industries, this study applies the same technique to both manufacturing (SIC 20-39) and services (SIC 70-89). Since complete regional employment data for services are not available for the years before 1975, this study covers the periods 1975-80 and 1980-85.

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\*Mathematical proofs of Propositions 1 and 2 and their corollaries are given in the Appendix.

\*\*In the BEA classification, Mideast includes the Middle Atlantic states (NY, NJ, and PA) plus DE, MD, and DC; Great Lakes and Plains are the same as East North Central and West North Central, respectively; Southeast consists of South Atlantic states (less DE, MD, and DC), East South Central states plus AR and LA; Southwest is composed of AZ, NM, OK, and TX; Rocky Mountain region contains CO, ID, MT, UT, and WY; and Far West covers CA, NV, OR, and WA.

Table 1.5  
Shift-Share Analysis of Manufacturing Industries  
(Thousand persons)

Region	1975-80				1980-85			
	Mix	Effect	Comp.	Effect	Mix	Effect	Comp.	Effect
North Atlantic (New England plus Mideast)		29.0		-294.0		-17.0		-244.3
North Central (Great Lakes plus Plains)		32.5		-489.1		28.9		-253.4
South (Southeast & Southwest)		-109.9		477.2		-62.4		316.6
West (Rocky Mount. & Far West)		50.0		302.9		50.1		182.8

Note: Figures do not sum to zero because Alaska and Hawaii are not included.

(1) Manufacturing Industries

Table 1.5 presents the results of a shift-share analysis of 21 manufacturing industries.\* Calculations were done initially for the eight BEA regions and then consolidated into four wider regions. The results reveal several interesting points. First, the absolute values of the mix effect are much smaller than those of the competition effect and, moreover, have decreased from the 1975-80 period to the 1980-85 period. This implies that industrial compositions of the regions have become more balanced than before and, therefore, are not a major source of variations in regional employment growth. This observation is consistent with findings in earlier studies. For example, Borts (1969) finds that

industrial composition was a major explanatory variable for the amplitudes of regional economic fluctuations during the 1929-37 period, but its explanatory power had become much weaker for the period 1948-53. Similarly, Rees finds a relative decline in importance of the mix effects in his study of 1963-72 census data, compared to the results of a previous study for the period 1939-54 by Perloff and Wingo.

Second, positive mix effects during the 1975-80 period in the North Atlantic and the North Central regions have become smaller or negative in the 1980-85 period. This confirms the trend found in previous studies that the manufacturing belt enjoyed positive mix effects but these diminished over time.

\*Two-digit industries except for SIC 37, which was disaggregated into Motor Vehicles and Equipment (SIC 371) and Other Transportation Equipment (rest of SIC 37).

Third, the North Atlantic and the North Central regions continue to suffer from negative competition effects, implying that industries in these regions have performed worse than their counterparts in the rest of the nation. As shown in Table 1.4, manufacturing in these regions sharply decreased during the 1980-85 period due mainly to negative competition effects. Such a steep decline in **manufacturing** took place in the North Atlantic region, even though the region was experiencing a moderate revival in **overall** economic growth. Negative competition effects in the manufacturing belt have also been detected for the period 1939-54 by Perloff and Wingo, and for the periods 1963-72 and 1972-76 by Rees (1979).

Fourth, competition effects in the 1980-85 period have become smaller in absolute values than those in 1975-80 in all four regions, even though total manufacturing employment increased between 1975 and 1980 in all regions. This phenomenon implies that competitive advantages/disadvantages among regions have diminished over time and there is a trend toward equalization of industrial growth rates among regions.\* Such has not always been the case. According to Rees, the competition effect in the manufacturing belt had become more negative in the 1960s than in the previous decades. Moreover, the competition effect in the North Central region changed from -76 thousand in 1972-76 (Rees) to -489 thousand in 1975-80. On the other hand, the competition effect in the Northeast (North Atlantic less DE, MD, and DC)

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\*Howland (1979) tested the hypothesis that relative inefficiency of older capital stock in the northern states makes their industries first to close and last to reopen over the business cycle. However, she found no evidence for this. Therefore, the fact that the 1980-85 period contains the recession years should only affect the national component. Moreover, if recessions do affect the mix and the competition effects, it would be in the direction of magnifying their absolute values, and the observed decrease in these values may therefore understate the actual extent of equalization.

was -396 thousand in 1972-76 (Rees), compared to -294 thousand in 1975-80 for the North Atlantic region -- an obvious improvement.

Therefore, the second half of the 1970s may have been a turning point for the manufacturing sector of the North Atlantic region and, perhaps, the 1980s for the North Central region. Also for the national economy as a whole, the 1980s seem to be the beginning of a convergent trend in regional manufacturing industries. The significance of this point is that regional variances in the growth rates would diminish over time, if this convergent trend continues. To test this hypothesis, variances of the state manufacturing employment growth rates are estimated. The estimates are 6.31 for 1977-82 and 3.80 for 1982-86, and the decrease in variance during these two periods is statistically significant at the five percent level.

## (2) Service Industries

It has been proclaimed that the U.S. economy is transforming from a manufacturing-based economy into one that is based on service industries. In particular, high-technology services are said to be responsible for the resurgence of the North Atlantic region from the decline of smokestack industries. As has been observed above, the decline in the relative importance of manufacturing employment and the trend towards smaller variance in regional manufacturing growth rates make nonmanufacturing industries increasingly more important. To what extent have regional economies been affected by services?

Figure 1.1 and Figure 1.2 show that, during the 1972-77 period, the Midwestern and the East North Central states experienced the lowest growth rates in both the manufacturing employment and the services employment. As a result, the growth in total nonagricultural employment (not shown here) reveals basically the same pattern. The observed correspondence between the states' relative performances in manufacturing and that in services may be due to the strong multiplier effects of changes in manufacturing on services at the state level. Studies using an Input/Output model of the New Jersey economy show that the statewide multiplier effect is heavily concentrated on services regardless of the sources of initial changes, and there is no reason why other states would behave differently. This implies that sec-

ondary job creation resulting from industries' purchases of inputs and employees' purchases of consumer goods and services are largely in favor of service industries, because manufactured goods are more often imported from other regions than services are. In a recent study, Falk (1980) also finds that regional growth in services employment is positively affected by manufacturing employment growth.

For the next five-year period (1977-82), however, the manufacturing growth rate and the services growth rate show weaker correspondence (not shown here). And during the 1982-86 period, the North Atlantic and the East North Central states have exhibited relatively better growth in services than in manufacturing (see Figures 1.3 and 1.4). As a result,

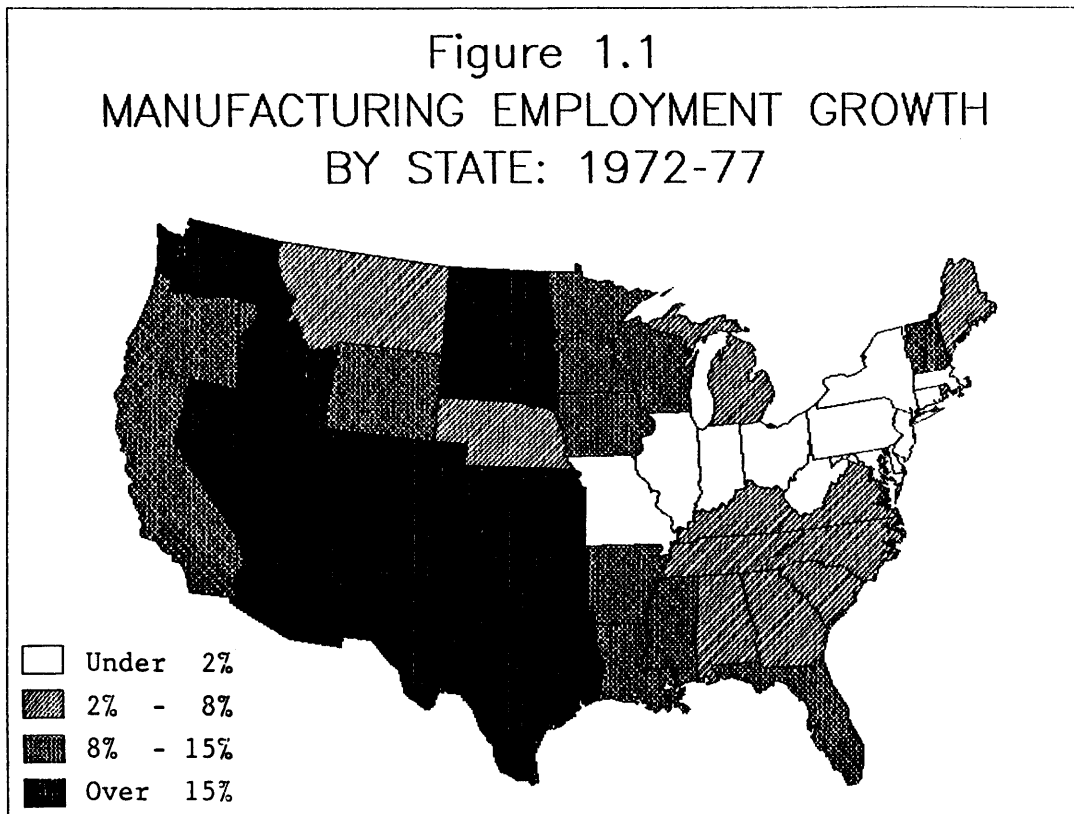
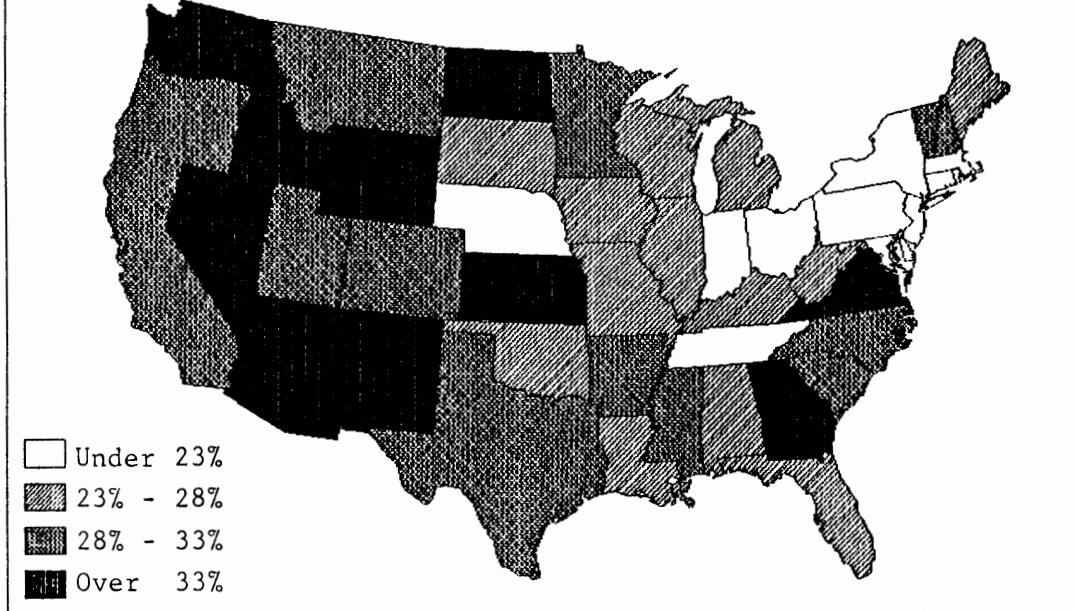


Figure 1.2  
 SERVICES EMPLOYMENT GROWTH  
 BY STATE: 1972-77



the ranking of states by the total nonagricultural employment growth is no longer dominated by the states' relative performances in manufacturing (Figure 1.5). This is demonstrated by the changes in the Spearman rank correlation coefficients. The correlation coefficient between the ranking of states by the total employment growth and that by the manufacturing employment growth **decreased** precipitously from 0.89 for the period 1972-77 to 0.51 for 1982-86, while the rank correlation coefficient between the total employment growth and the services employment growth **increased** from 0.81 to 0.86.

Moreover, the rank correlation between the manufacturing employment growth and the services employment growth dropped from 0.72 for 1972-77 to 0.31 for 1982-86. One possible explanation for this new development is that, as a consequence of the declining share of the manufacturing sector, the multiplier effect of growth or decline in manufacturing may have been exerting diminishing impact on the overall economy.\* This implies that autonomous growth in services employment is becoming increasingly more important to the overall performance of a region's economy.

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 \*For the same absolute change in manufacturing and in the absence of any change in the input/output relationship, its multiplier effect should be the same. However, the same relative (percent) change has become a smaller absolute change in the manufacturing belt, because of the reduced base in the regions previously dominated by manufacturing and hence the multiplier effect is also smaller than before.

Figure 1.3  
 MANUFACTURING EMPLOYMENT GROWTH  
 BY STATE: 1982-86

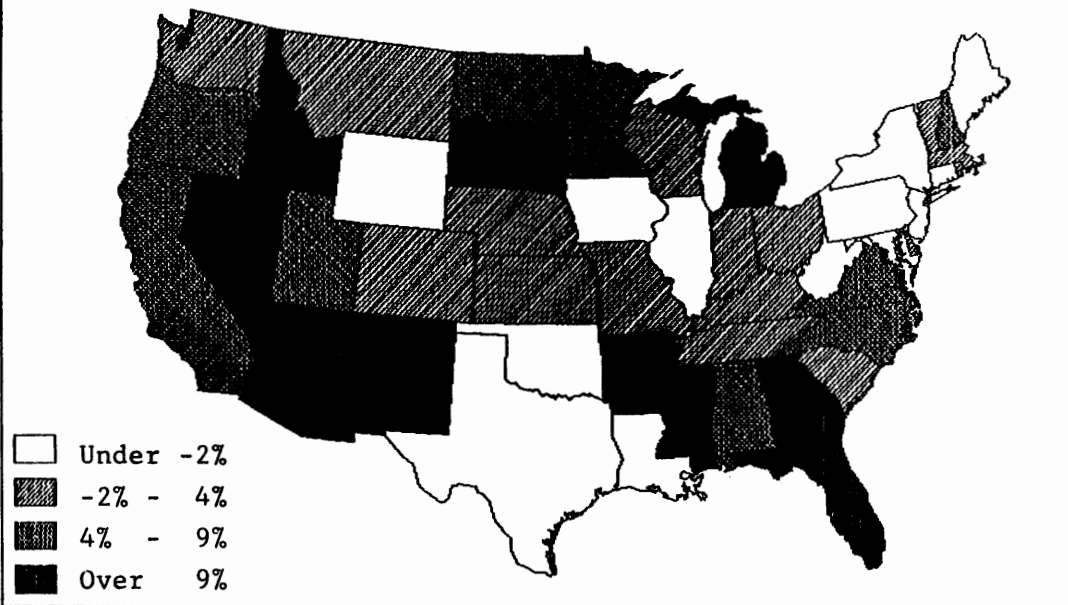


Figure 1.4  
 SERVICES EMPLOYMENT GROWTH  
 BY STATE: 1982-86

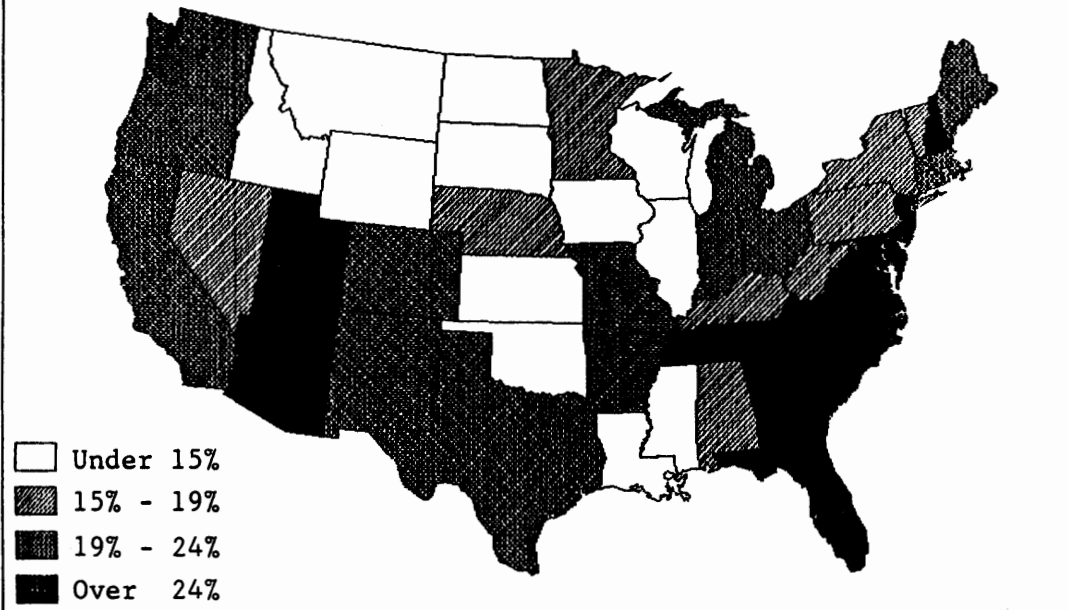
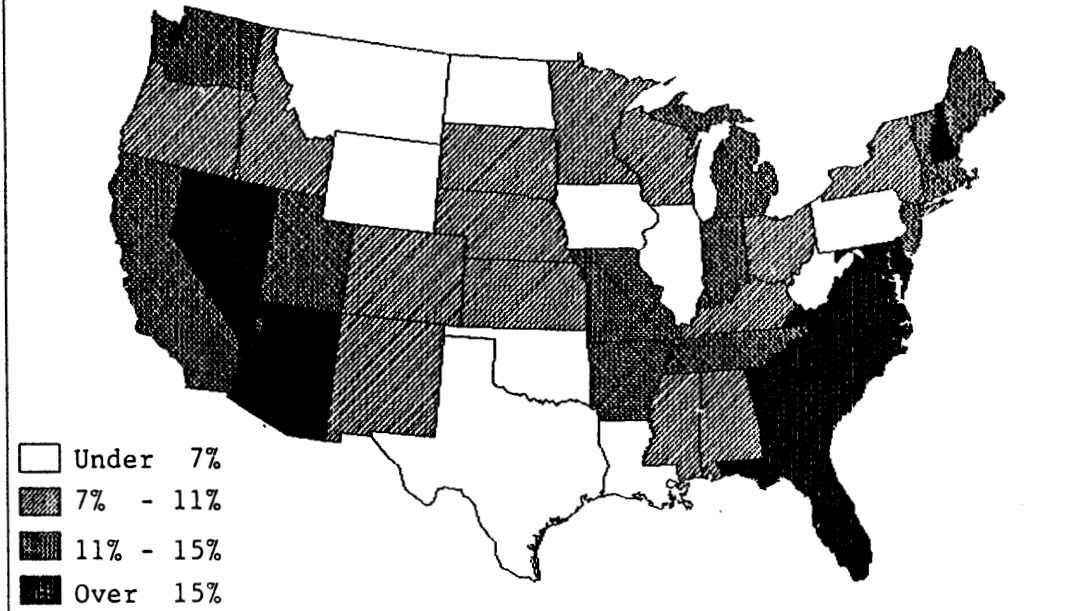


Figure 1.5  
TOTAL EMPLOYMENT GROWTH  
BY STATE: 1982-86



The above observations imply that the growth in services has become increasingly independent of that in manufacturing, and is playing a more prominent role than before in determining the total employment growth. Having established the increasing importance of services in regional economies, we now turn to the shift-share analysis of the employment growths of 15 service industries (two-digit).

The results of the shift-share analysis, which are presented in Table 1.6 lead to the following interesting observations. First, unlike the results for manufacturing, the absolute values of the competition effect do not exhibit a uniformly diminishing trend. Although

the total absolute value did decrease by 20 percent from 1975-80 to 1980-85, large increases in the individual absolute values took place in the North Central region and the South.

Second, a strong improvement in the competition effect was registered in the North Atlantic and the South. As a result, these regions enjoyed rapidly growing services employment during the 1982-86 period (see Figure 1.4).\* In contrast to this, the North Central region suffered a serious deterioration from the previous negative position. Taken together, the above observations indicate that the regional equalization process observed in the manufacturing industries has yet to take place in the services sector. To

\*Although New York and Pennsylvania do not belong to the fast-growing group, the Atlantic coast sections of these states (New York and Philadelphia SMSA's) have been doing very well in recent years.

Table 1.6  
Shift-Share Analysis of Service Industries  
(Thousand persons)

Region	1975-80				1980-85			
	Mix	Effect	Comp.	Effect	Mix	Effect	Comp.	Effect
North Atlantic (N. England plus Mideast)		86.2		-315.3		35.8		-111.0
North Central (Great Lakes plus Plains)		11.9		-177.5		-47.0		-284.4
South (Southeast & Southwest)		-154.8		138.0		-52.9		357.5
West (Rocky Mts. & Far West)		54.4		355.1		63.9		36.0

Note: Figures do not sum to zero because Alaska and Hawaii are not included.

test this hypothesis, variances of state growth rates in services are estimated. The estimates are 1.87 for 1977-82 and 3.10 for 1982-87, indicating a statistically significant increase in the variance at the five percent level.\*

Third, the absolute values of the mix effect also failed to demonstrate a uniformly diminishing trend. Nevertheless, where the absolute values declined (the North Atlantic and the South), the extent of reduction was large, compared to smaller increases in the other regions. As a result, the mean absolute value of the mix effect decreased by 35 percent from 1975-80 to 1980-85, making the competition effect relatively more important than before. This is

consistent with the earlier observation that autonomous growth in services is becoming an increasingly important determinant of the overall growth rate.

#### IV. THEORIES OF REGIONAL ECONOMIC CHANGE

Analysis of the preceding sections suggests that there is a clear trend toward regional equalization of the manufacturing industries, but not in the service industries. Moreover, the secular trends of diminishing relative importance of manufacturing and increasing relative size of services have made uneven regional performances in services more important than ever to the determination of regional variations in the overall economic growth.

\*The increase in the variance of the state growth rates in services had a counter-balancing effect against the decrease in the variance of the manufacturing growth rates. Thus, the variance of total employment growth rates changed very little from 3.01 in 1977-82 to 2.87 in 1982-86.

During the first half of the 1980's, the most rapid growth in services occurred primarily in the states located along the east coast of the United States. In particular, the North Atlantic region has been able to overcome the secular downward trend (albeit at a diminishing rate) in its manufacturing sector and become once again a relatively prosperous region. Thus, the results of this study confirm the frequently suggested conjecture that services are responsible for the revival of the North Atlantic region,\* but do not explain why the most rapid growth is taking place along the east coast. In order to understand the reasons for this development, several alternative hypotheses are reviewed below and a synthesis is offered.

### 1. Olson's Theory

Throughout history, all great nations eventually declined and were overtaken by new powers. Olson's explanation of the causes of the rise and decline of nations can also be applied to that of regional economies. According to his theory:

(1) Stable societies tend to accumulate over time an increasing number of organizations for collective action.

(2) The individual share of the benefits of collective action by a large group (e.g., a consumers union for free trade) is relatively small, and large groups tend to suffer from a free-rider problem. Thus, members of small groups have disproportion-

ately greater organizational power for collective action.

(3) On balance, actions of special-interest organizations reduce efficiency of the economy.\*\*

The above propositions imply that the influences of special-interest groups are not symmetric because small groups tend to exert disproportionate organizational power. In other words, their influences are not neutralized by counterbalancing influences of other groups. Since these special-interest groups tend to accumulate over time in a stable society, a society enjoying a prolonged period of social stability will inevitably become increasingly inefficient. On the other hand, a society which has recently experienced major upheavals or a period of social instability will enjoy, for the time being, economic and political efficiency relatively free of special-interest group pressure. Needless to say, unstable societies cannot enjoy efficiency. However, the paradoxical result of Olson's analysis is that prolonged stability is a blessing and a curse at the same time.

Olson maintains that his theory is applicable not only to nations but also different regions of a nation. For example, within the United States, the older Northeastern region shows significantly slower rates of growth in income and employment during the postwar period, while the so-called "sunbelt" has grown very rapidly. Olson's theory has been put

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\*It should be noted that, by the "revival" of the North Atlantic, we do not imply this region is outperforming the rest of the U.S., but the fact that the region has reversed its past trend of growth slow-down and, more importantly, employment growth is outpacing the labor force growth, resulting in an increasingly tighter labor market.

\*\*Olson presents nine propositions in his book. However, for the purposes of this study, these three will suffice.

to a statistical test, which indicates that the state economic growth rates are negatively associated with the age (measured by years since statehood), unionization rate, and urbanization rate.

Thus, according to Olson, a national or a regional economy, once it has entered into a period of relative decline, cannot regain supremacy unless it undergoes a major upheaval. He attributes the post-World War II economic miracles of West Germany and Japan to their fresh starts with new governmental organizations following their defeat. But, what kind of upheaval has the North Atlantic region of the U.S. experienced in the 1970's? While there have been some significant events, such as the Proposition 2 1/2 in Massachusetts, successful management of fiscal crises in New York City and the State of New Jersey, there has been no major development which led to dismantling of the existing socioeconomic fabric.

Therefore, a straightforward application of Olson's theory to regional economies seems inappropriate. However, let us suppose that there exists an upper limit to the degree of inefficiency caused by collective actions. Over time, younger regions would catch up with the oldest region and all regions would eventually be equally inefficient. In addition, the Olsonian process is also applicable to individual industries and firms. Firms and industries experiencing a prolonged period of success tend to become increasingly inefficient. Thus, once the Olsonian process has run its course throughout the nation and the industries, any systematic variation in the regional economic growth then must arise from some other sources. It is hypothesized

that a newly-emerging industry, which is not yet suffering from the same institutional inertia, is responsible for the revival of the North Atlantic region. We will demonstrate below that information services constitute such a newly-emerging growth industry.

## 2. Product Life Cycle Theory

This theory, as originally proposed by Vernon (1966), is concerned with individual products, but product cycles can be aggregated into industrial cycles.\* This theory has a spatial dimension which has frequently been applied to international trade but can also be applied to regional economic analysis. According to this theory, a product goes through three stages in its life cycle:

(1) Innovation Stage, where a new product is introduced and demand is not very sensitive to price. This stage involves the high cost of research and development and high production cost, and therefore usually takes place in large industrial agglomerations.

(2) Growth Stage, where expansion of foreign demand leads to mass-production and cost reduction through economies of scale. The price-elasticity of demand is higher now.

(3) Standardization stage, where production shifts to low-cost locations, such as peripheral areas of the U.S. or abroad, because of the high price-elasticity of demand. The growth of demand at this stage is significantly slower than at the previous stages.

The spatial manifestation of the product life cycle theory (PLC) implies that the home region which

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\*For this reason, "product life cycle" will be used synonymously with "industrial life cycle" hereafter.

introduced the product will eventually experience slow growth or decline, while peripheral areas grow faster due to transfer of production from home to these regions. Moreover, peripheries can change their roles over time from the recipients of innovations (via branch plants) to the generators of innovations (via indigenous growth) when agglomeration reaches a threshold level (Rees, p. 58).

The PLC theory, like Olson's theory, attempts to explain why older industrial states (or nations) are eventually overtaken by new powers and, therefore, its implications are similar to those of Olson's theory. However, there is one important difference between these theories. In Olson's theory, there is no possibility of role reversal between the older and the younger economies, unless major upheavals occurred. On the other hand, the PLC theory admits a possibility of role reversal, i.e., previous periphery may become new industrial centers and former centers may decline to the status of periphery. Such a role reversal may be repeated over time, resulting in an endogenous regional cycle. However, any such regional cycle must be of extremely long duration. It is rather unlikely that the recent revival of the North Atlantic region is the result of a role reversal of this type.

Nevertheless, the PLC theory can provide an explanation of the recent development in the U.S. economy. Because of increased international competition, aided by rapid improvement in transportation and communication technologies, American industries operating in the third (standardization) stage of the PLC can no longer compete by shifting plants to the southern or western U.S. In other words, peripheries have been exhausted in the U.S. Moreover, as has been witnessed in the high-technology manufacturing industries,

the time spans of the first two stages of the PLC have become shorter than ever, because of the increasing production sophistication of foreign competitors. Thus, even the regions that benefit from the first two stages of the PLC will find their supremacy quickly eroded by foreign competition. In contrast, industries producing nonexportables are not subject to such a rapid deterioration of their positions. **Services**, while not totally nonexportable, are more likely to provide a sustained economic boost to a region (or a nation) than **manufacturing** would.

### 3. Booth's Theory of Endogenous Cycle

Booth also adopts the industrial life cycle as the basis for his theory of endogenous regional cycle. He states that "localities and regions with aging industries suffer through relatively lengthy periods of time without developing substantial economic activity in new, rapid growth industries" (p. 449). Since the relative growth or decline of a region is determined by balance between the industries in the growth phase of the PLC and those in the decline phase, regions that do not develop new growth industries for a long period of time will eventually be dominated by declining industries.

Why do older regions with mature industries lag in new industry development? Booth presents a reasoning fairly similar to, although much less rigorous than, that of Olson's theory. According to Booth, these regions shift their focus from entrepreneurship to management. They not only train managers, but also "provide relatively secure, well paying opportunities for individuals that might otherwise start new businesses" (p. 450). Thus, they sow the seeds of their own decline. However, once employment opportunities have sufficiently declined in these regions, then prospects for new business for-

mation begin to change because managerial opportunities in mature industries have largely disappeared and ambitious and able persons have no alternative but to start new businesses or migrate to other regions.

Booth tested his hypothesis by regressing per capita new business incorporations against population change, dummy variables for regions, and other variables. He finds a statistically significant and positive coefficient for the dummy variable representing the eastern segment of the industrial belt. Unfortunately, Booth's study sheds no light on the validity of his hypothesis, contrary to his claim to have done so. First of all, the positive coefficient for the dummy variable for the eastern region only confirms the fact that this region is bouncing back but in no way lends support to his hypothesis explaining why this is happening. Secondly, our experiments with regression analysis fail to find any evidence that new business incorporations lead to (concurrent or future) employment growth. Thus, Booth's hypothesis is a plausible theory adding credence to the endogeneity of the regional cycle, but it needs further empirical testing.

#### 4. Heckscher-Ohlin Theory

This theory, a foundation of the modern theory of international trade, emphasizes factor-endowment differences among nations as the ultimate source of comparative advantage. In its simpler version, this theory predicts that a nation will export those goods which use its relatively abundant factor more intensively and import those commodities that require an intensive use of the country's scarce factor. Although the Heckscher-Ohlin (H-O) theory is con-

cerned with international trade, its theoretical basis makes no difference whether it is applied to international trade or intranational trade. As a matter of fact, because artificial trade barriers are virtually nonexistent in interregional trade, the H-O theory in its purest form should be better applicable to interregional trade than to international trade.

Traditionally, the H-O theory has been applied to trade flows of labor-intensive goods versus capital-intensive goods. However, within a fully integrated economy such as the U.S. economy, complete mobility of capital makes it an irrelevant factor, and with less-than-complete mobility of labor, relative abundance/scarcity of human capital will be the determining factor of an interregional trade flow. Thus, service industries, particularly those requiring a highly educated labor force, may find that regions around agglomerations of higher-education centers, such as the North Atlantic and the Far West regions, possess a comparative advantage.

This, however, is not a very satisfactory explanation of why services are thriving along the east coast. Labor, particularly educated labor, in the U.S. is highly mobile. Thus, with both capital and labor mobile, comparative advantage is determined by other factors such as rent, taxes, and distance to the market, and agglomeration economies. Services are, in general, less exportable than goods, and nearness to the market may be the most important factor determining the comparative advantage of services.\* Since the east coast is more heavily populated than elsewhere, newly emerging service industries may find this region

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\*This does not mean that services cannot be provided from a distance. Most services can be provided from a distance (e.g., a doctor in one city can fly in to see a patient in another city, or vice versa), but at high costs.

more attractive. In addition, advantages of agglomeration favor the North Atlantic region, and cultural amenities and other factors of quality of life may make an otherwise mobile human capital less mobile and keep the educated labor force attached to the two coast regions. Of course, continued rapid growth of services in these regions will sooner or later saturate the market and other regions will begin to show a higher growth rate. But, for the time being, the North Atlantic region will continue to enjoy a services-led boom.

### 5. A Tentative Hypothesis

The above theories of regional economic change, while not directly applicable to the regional economic cycle, together yield a tentative hypothesis capable of explaining the observed cycle: Once the entire nation has entered into a period of relatively slow growth, due to the Olsonian process of institutional sclerosis, or because of its operating in the final stage of industry life cycle at the aggregate level, a newly-emerging growth industry in the old industrial center can give the region's economy a sustained boost for the time being. This industry may take some time before its growth momentum shifts to other regions as predicted by Olson, and thrive in the meantime, operating in the growth phase of the product (industry) life cycle. Furthermore, in an almost fully integrated economy like the U.S. where both capital and labor are highly mobile, the long-run comparative advantages in interregional trade are not determined by the relative abundance of capital or labor, but by such other factors as agglomeration economies, proximity to the market, rents, taxes, etc. However, in the case of the increasingly important service industries, proximity

to the market and agglomeration economies may be the most important determinants of comparative advantage, while rents, taxes, etc. are less important since services are more difficult to export than goods. Therefore, newly emerging services tend to favor the heavily populated (both in terms of people and of business establishments) North Atlantic region during the early phase of the industry life cycle.

### V. INFORMATION SERVICES AS THE NEW GROWTH INDUSTRY

What then is the newly-emerging growth industry that is responsible for the revival of the North Atlantic region? It has been pointed out that services (SIC 70-89) have become increasingly more important. But, services as a whole have been growing fast throughout the postwar period. How can they be the new wave? An examination of the disaggregated employment data reveals that, of the service industries, business services (SIC 73) grew the most rapidly (about 9 percent per annum) during the last ten years. And, among the business service industries, Computer and Data Processing Services (SIC 737) have been the most rapidly growing during the 1977-82 period. As shown in Table 1.7, however, there has been a significant change in these industries during the late 1970's. While Data Processing (SIC 7374) has experienced a reduction in the employment growth rate by more than half (from 72.01% in 1972-77 to 35.13% in 1977-82), Computer Programming and Other Software Services (SIC 7372) and Other Computer Related Services (SIC 7379) together exhibited a remarkable acceleration of growth from 40.34 percent in 1972-77 to 149.76 percent in 1977-82, despite the fact that 1982 was the year of a business cycle trough. What does this phenomenon imply?

Table 1.7  
U.S. Employment Trends in Computer and Data Processing Services

SIC	Industry	Employment			Growth (%)	
		1972	1977	1982	1972-77	1977-82
737	Computer & Data Processing Services	127449	203852	353549	59.95	73.43
7372	Computer Programming and Other Software Services	37657	51286	126633	36.19	146.92
7374	Data Processing Services	78911	135736	183422	72.01	35.13
7379	Computer Related Services, Not Elsewhere Classified	10881	16830	43494	54.67	158.43
7372 & 7379	Computer Services, Except Data Processing	48538	68116	170127	40.34	149.76

Source: Census of Services Industries, 1982 and Census of Business: Selected Services, 1972 and 1977.

Between 1972 and 1977, Computer and Data Processing Services had been dominated by Data Processing Services (SIC 7374) which accounted for more than 60 percent of total employment and about three-quarters of the total job growth. During the following five-year period, however, the previously less significant industries (SIC 7372 and SIC 7379) together created over 100,000 new jobs, and by 1982 had become roughly equal in size to Data Processing. This implies that Data Processing is an established industry, whereas the other two have been undergoing a revolutionary transformation. The development and popularization of personal computers and other micro- and mini-computers during the late 1970's and the 1980's have redefined these industries, and their employment growth rate of about 150 percent from 1977 to 1982 far exceeds that of any other service industry except Services Allied to Motion Picture Production (SIC 7819), which registered a growth rate of 190 percent with 34,000 new employment. All other industries

experienced less than 100 percent employment growth.

To assess the impact of the newly emerging computer service industries (SIC 7372 and 7379), their combined employment growth during the 1977-82 period and their direct contribution (i.e., not including the multiplier effect) to total services employment growth are ranked by state (Table 1.8). Due to disclosure problems, the census data for these industries were available for only seventeen states. Two other states (Connecticut and Iowa) were nevertheless included in the sample, since their lower- and upper-bound figures permitted comparisons with other states. Table 1.8 shows that the rankings of the nineteen states by the combined employment growth of SIC 7372 and 7379 and by their contribution to total services (SIC 70 to 89) employment growth (measured in percentage points) are not positively correlated, contrary to what can be expected of an established industry. For example, Maryland and Virginia

Table 1.8  
The 1977-82 Employment Growth of Computer and Data Processing  
Services and Their Contributions to Total Services Employment Growth

Rank	Other Computer Svc. (SIC 7372 & 7379)		Data Processing Svc. (SIC 7374)					
	State	(Growth)	State	(Contrib.)	State	(Growth)	State	(Contr.)
1	TN	(816.7%)	MD	(1.951 pnts.)	VA	(96.16)	MD	(1.051)
2	IN	(429.0)	VA	(1.886)	CO	(73.72)	VA	(0.921)
3	CO	(408.6)	MA	(1.322)	MD	(73.56)	CO	(0.865)
4	GA	(363.8)	GA	(1.276)	MA	(69.37)	MA	(0.511)
5	NC	(321.1)	CO	(1.087)	NC	(58.79)	NJ	(0.500)
6	FL	(265.6)	CA	(1.071)	IA	(57.16)	FL	(0.484)
7	OH	(249.3)	NJ	(1.026)	TN	(54.94)	IA	(0.484)
8	PA	(237.9)	CT	(0.897++)	FL	(53.22)	CA	(0.370)
9	MA	(233.3)	TX	(0.810)	IN	(45.32)	IL	(0.348)
10	CT	(218.5+)	OH	(0.567)	IL	(37.20)	NC	(0.342)
11	IA	(212.4+)	PA	(0.547)	NJ	(37.07)	TN	(0.330)
12	LA	(210.8)	FL	(0.524)	PA	(37.02)	PA	(0.256)
13	TX	(145.3)	NC	(0.507)	CA	(34.68)	IN	(0.224)
14	CA	(140.6)	TN	(0.424)	OH	(21.77)	GA	(0.166)
15	IL	(114.5)	IL	(0.401)	LA	(20.31)	NY	(0.142)
16	NJ	(109.3)	NY	(0.386)	NY	(16.28)	OH	(0.138)
17	MD	(97.6)	LA	(0.382)	GA	(12.66)	LA	(0.119)
18	VA	(89.9)	IN	(0.341)	TX	( 0.60)	TX	(0.009)
19	NY	(81.6)	IA	(0.210++)				

+These growth rates are the lower bounds. The true growth rates are not available due to a disclosure problem. The upper bounds are 470.02% for Connecticut and 235.84% for Iowa, but a realistic figure for Connecticut is about 220% to 240%.

++The upper bounds are 1.078 points for Connecticut and 0.217 point for Iowa, but a realistic figure for Connecticut is less than 1.000 point.

experienced fairly low growth rates (ranked 17 and 18, respectively), but the combined employment growth of SIC 7372 and 7379 in these states contributed close to two percentage points to the total services employment growth, ranking first and second, respectively. Such reversals in ranking between the two measures also took place in many other states. The Spearman rank correlation coefficient (-0.191) is not significant at the five percent level (one-tailed test), indicating that there is no positive correlation between the employment growth of these two industries and the impact on total services employment growth.

If the two industries (SIC 7372 and 7379) had been fairly well established throughout the United States and experienced normal growth, their own employment growth and their contribution to the total services employment growth would be positively correlated. Indeed, the rankings of 18 states by these two measures for Data Processing Services (SIC 7374) yield the rank correlation coefficient of 0.8467 which is significantly different from zero at the one percent level. This implies that the Data Processing industry had a more or less balanced distribution of employment throughout the nation and, therefore, an above-average employ-

ment growth in this industry would translate into an above-average contribution to the total services employment growth. On the other hand, the two less-established computer service industries (SIC 7372 and 7379) tend to be concentrated in the more heavily populated North Atlantic states where large absolute employment increases (in the number of jobs) do not necessarily constitute a high growth rate. In contrast, in states where these industries are almost nonexistent, a small increase in employment would result in a very high growth rate. Examples of the former are Maryland, Virginia and New Jersey, and those of the latter are Tennessee, Indiana, North Carolina and Iowa.

Another piece of evidence that SIC 7372 and 7379 are newly emerging industries is found in a previous study by this author which reported that an analysis of nine selected service industries obtained satisfactory regression equations explaining the industry revenue growth for all but one industry -- SIC 737 (You, (1985), pp. 77-78). Since Data Processing Services (SIC 7374) appear to be fairly well established throughout the nation, the inability to estimate a plausible regression equation is in all likelihood because of the influence of the other two industries included in SIC 737. In fact, rankings of 47 states by the employment growth of SIC 737 and by its contribution to the total services employment growth, as shown in Table 1.9, yield a rank correlation coefficient of 0.4274, which is only one half of the same coefficient for SIC 7374. Although the rank correlation is significantly different from zero at the one percent level (one-tailed test), the difference between the rank correlation coefficient for SIC

7374 and that for SIC 737 indicates that the inclusion of SIC 7372 and 7379 in the latter significantly weakens the correlation. This weakness in correlation is illustrated by the fact that many of the Atlantic Coast states are highly ranked by the contribution measure but not by the industry (SIC 737) growth rate.

The states where the two emerging industries made the greatest contribution to the total services employment growth are mostly Atlantic Coast states (the four highest ranking states or six of the top ten states), although they generally ranked low in terms of the industry growth rate. As pointed out above, these states already had a relatively large presence of the two industries, making large absolute increases appear to be small in terms of percent changes. But why have these states experienced large absolute increases in employment? The answer seems to be, as discussed in the preceding section, that these states benefit from economies of agglomeration (at least in the early phase of the industry life cycle) and from the fact that these services are not very easily exportable, making the densely populated states, because of their proximity to the market (clients), more attractive to the newly emerging service industries. It is, of course, true that these computer-related new growth industries cannot fully explain the performance of the entire service industries, much less that of the overall economy. But, to the extent that these two industries illustrate the comparative advantage of the North Atlantic region to the industries in the growth phase of the life cycle, the above analysis suggests the causes of the revival of this region.

Table 1.9  
The 1977-82 Employment Growth of SIC 737  
and Its Direct Contribution to Total Services Growth\*

Rank	State	(Growth)	State	(Contri- bution)	Rank	State	(Growth)	State	(Contri- bution)
1	NE	(175.49)	MD	(3.002)	25	RI	(81.71)	MN	(0.682)
2	CT	(161.30)	VA	(2.807)	26	CA	(78.78)	OK	(0.624)
3	WY	(160.61)	CT	(2.006)	27	WA	(78.45)	WI	(0.593)
4	AZ	(148.89)	CO	(1.952)	28	OK	(77.39)	IN	(0.565)
5	MA	(140.60)	MA	(1.833)	29	IA	(73.69)	NY	(0.528)
6	NM	(137.59)	NE	(1.623)	30	MO	(73.14)	MI	(0.512)
7	CO	(135.58)	NJ	(1.526)	31	WI	(72.69)	LA	(0.502)
8	NV	(133.44)	GA	(1.442)	32	NJ	(66.68)	KS	(0.493)
9	SC	(131.58)	CA	(1.441)	33	LA	(65.24)	VT	(0.474)
10	ND	(127.36)	NH	(1.316)	34	MN	(64.71)	SC	(0.466)
11	NH	(120.59)	AZ	(1.248)	35	AL	(63.78)	WY	(0.440)
12	VT	(115.85)	RI	(1.196)	36	KY	(62.66)	MS	(0.436)
13	TN	(115.55)	MO	(1.161)	37	ME	(58.72)	KY	(0.385)
14	NC	(114.85)	AL	(1.039)	38	IL	(58.27)	MT	(0.356)
15	WV	(102.39)	FL	(1.008)	39	KS	(52.61)	NV	(0.335)
16	IN	(98.32)	NC	(0.849)	40	MI	(50.44)	ND	(0.315)
17	MT	(92.15)	TX	(0.819)	41	NY	(39.27)	WV	(0.246)
18	VA	(91.88)	WA	(0.810)	42	TX	(39.15)	UT	(0.221)
19	FL	(91.10)	PA	(0.803)	43	ID	(27.44)	AR	(0.150)
20	MD	(87.57)	TN	(0.753)	44	AR	(19.34)	ME	(0.150)
21	PA	(87.08)	IL	(0.749)	45	UT	(14.63)	ID	(0.113)
22	GA	(86.85)	NM	(0.716)	46	OR	(-4.26)	OR	(-0.074)
23	MS	(84.07)	OH	(0.705)	47	DE	(-34.55)	DE	(-0.504)
24	OH	(81.85)	IA	(0.695)					

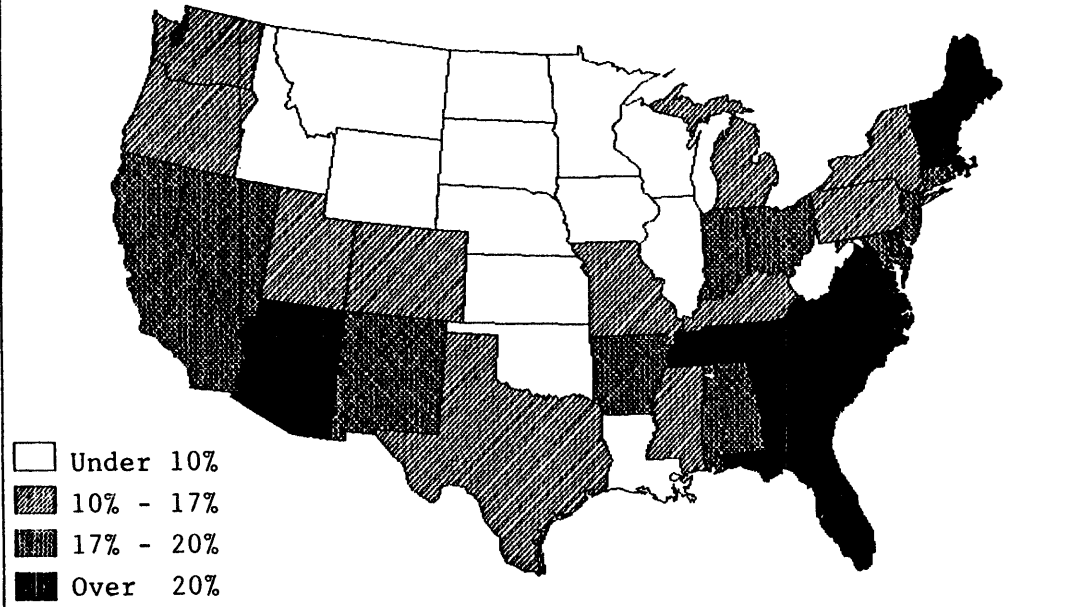
\*Employment growth in percents; contribution in percentage points of total employment growth.

Note: Data for South Dakota are not available due to a disclosure problem.

Therefore, we conclude that information services and other related services made more widely accessible by the breathtakingly rapid development of microcomputers, are the new growth industries of significant consequence. These industries tend to favor the North Atlantic states, which is at least partly responsible for the fact that the east coast, on the whole, exhibited more rapid growth in services in recent years than elsewhere. The significance of this can be found in Figure 1.6 which shows that the pattern of employment growth in wholesale and retail trade in 1982-86 more closely resembles that of the services employment

growth than that of manufacturing. In contrast, manufacturing, services and wholesale and retail trade all demonstrated the same regional growth pattern in 1972-77. This new growth pattern is again illustrated by the changes in the rank correlation coefficients: In the period 1972-77, the correlation coefficient between the ranking of states by the manufacturing employment growth and that by the wholesale and retail trade employment growth was 0.8308, which was higher than that (0.7731) between the services employment growth and the wholesale and retail trade employment growth, but the former declined to 0.3324 in the period 1982-86 while

Figure 1.6  
 WHOLESAL AND RETAIL TRADE EMPLOYMENT  
 GROWTH BY STATE: 1982-86



the latter increased to 0.8045. This phenomenon implies that the multiplier effect of services has become more important than before, and the performance of the North Atlantic region's service industries is largely responsible for the revival of the region.

#### VI. THE ROLE OF MANUFACTURING

It has often been suggested in recent years that high technology industries are the wave of the future. Indeed, California and New England had benefited until recently from the high technology manufacturing boom, and many states have enacted programs to promote high technology industries, hoping that growth in these industries will boost their overall economic growth. However, the boom in high technology **manufacturing** appears to be short-lived, as Japan and other Asian competitors quickly closed the technology gap,

while high technology services are thriving so far in the U.S.

Table 1.10 shows that selected high technology manufacturing industries grew very rapidly for about nine years. They held up strong even in the 1982 recession when other manufacturing industries suffered devastating declines. However, high technology manufacturing industries, except for Medical Instruments and Supplies (SIC 384), have had to cut back employment during the last two years even though the overall economy continued to grow. This is because the growth phase of the PLC of manufactured goods has been shortened by increasingly tougher foreign competition. Thus, American innovators of new products (e.g., computer chips) no longer enjoy a competitive advantage over foreign competitors for a long period of time, just as Japanese innovators (say, of VCR's) are quickly challenged by Korean manufac-

Table 1.10  
Recent Employment Trends in Selected High Technology  
Manufacturing in the United States  
(Employment in Thousands)

SIC	Industry	Trough*		Peak		Percent Change	
		Year	Employment	Year	Employment	Trough to Peak	Peak to 1986
357	Office & Com- puting Machines	1975	286.1	1984	472.9	85.0%	-10.2%
366	Communication Equipment	1976	445.5	1985	652.7	46.5	-3.1
367	Electronic Components & Accessories	1975	338.2	1984	675.9	99.8	-6.8
382	Measuring & Controlling Devices	1975	169.7	1981	258.1	52.0	-4.8
383	Optical Instruments & Lenses	1975	22.2	1984	34.6	56.2	-4.6
384	Medical Instruments & Supplies	1975	109.3	1986**	180.1	64.9	**

\*Relative minimum preceding the peak (absolute maximum).

\*\*No downturn in this industry since the last trough. The 1986 level was taken as the peak value.

turers. High technology services (and most other services), on the other hand, have continued to grow strongly, benefitting from the fact that these industries are not subject to the same kind of international competition because services are not as readily exportable (importable) as manufactured goods. Therefore, services will likely continue to play a leading role in the United States and its regional economies.

What then would be the role of manufacturing, high-tech or not, in a national or a regional economy? There is no doubt that manufacturing indus-

tries are undergoing an equalization process on a global scale, just as they are at the regional level within the U.S. economy. This will inevitably lead to a less dominant role for America's manufacturers and a more prominent role for those of other nations, particularly some of the Asian countries. However, this does not imply that the manufacturing sector of the U.S. will continue to decline indefinitely. At present, U.S. manufacturing is in the process of transition from its previously dominant position to a relatively less dominant position, and the pain associated with negative adjustment

may have made the situation look gloomier than it actually is.

Recently, Browne (1986) presented an interesting analysis of the future role of United States manufacturing in the world marketplace. His analysis is based on the fact that, in the long run, a country must export in order to import and must import in order to export. Obviously, a country cannot import indefinitely without exporting. But, for the same reason, a country cannot export if it does not import, because otherwise the rest of the world will not have foreign exchange to pay for that country's products. Therefore, there must be a limit to how much America's manufacturing can shift overseas and to how much American consumers can buy foreign manufactured goods. Of course, it is possible to import more manufactured goods by exporting more services. However, while international trade in services is growing, Browne thinks it unlikely that trade in services will become large enough to offset most of America's importation of manufactured products.

According to Browne, a more likely development is that the pattern of international trade will increasingly become like that of interregional trade within the U.S. This means that exports and imports will increasingly become similar. For example, the U.S. will not only import Japanese cars but will also export American cars to Japan. In fact, intra-industry (two-way) trade among the developed countries is already substantial and is increasing (see Bergstrand). Even in high technology manufacturing there will be increasing two-way international trade. Browne maintains that just as high technology is not exclusively a New England industry, so too is high technology no longer exclusively a U.S. industry. Growth in worldwide demand, therefore, will be the main

source of industry growth for most of the U.S. manufacturing industries.

This, of course, does not imply that technological and managerial innovations are unimportant. On the contrary, with increasing competition from abroad, innovations will be the key to American industries' survival. However, competitive advantages gained by innovations are not as long-lasting as before because of the technological advance of our foreign competitors. Therefore, only a continuous stream of innovations will keep American manufacturers ahead of the international race. Whether that can be accomplished is an open question and should be an important item on the national agenda.

## VII. CONCLUSIONS

This paper examined interregional economic shifts since 1950 with particular emphasis on the recent resurgence of the North Atlantic region; it also reviewed alternative theories of regional economic change, and offered a tentative hypothesis explaining the causes of the revival of the North Atlantic region. It has been found that manufacturing industries have been undergoing a process of interregional equalization, but no evidence was found that a similar trend existed in the service industries. Moreover, the relative decline in manufacturing's employment share over time has made services increasingly more important. Therefore, the fact that the interregional equalization process is not evident in services makes autonomous growth in services an important determinant of interregional differences in overall economic growth.

The United States economy as a whole has probably been operating for sometime in the final stage of industry life cycle and the Olsonian process of institutional sclerosis, which at first struck the older in-

dustrial regions, may have spread throughout the nation. If that is the case, a newly emerging growth industry which is not yet subject to the Olsonian process and is operating in the growth phase of the PLC can give a boost to a region's economy. For many years, high technology manufacturing has been considered to be the new growth industry capable of lifting the regional as well as national economies. But the faith and hope in high-tech manufacturing proved to be short-lived, as the U.S. industries found their competitive advantage in high-tech manufacturing quickly eroded by the efficiency of foreign competitors and America's high technology manufacturers soon became recipients of charity (U.S. sanctions on Japanese products and other import restrictions). Of course, a continuous stream of innovations can help the U.S. manufacturer maintain competitive advantages in international trade. However, in the absence of major innovation waves, a more sustained boost to the regional economy is to be found not in manufacturing but in services, which are not easily exportable and thus international or interregional competition is a much less serious problem.

This paper examined the disaggregated Census of Service Industries data and tentatively concluded that high-technology services, particularly computer-related services (SIC 7372 and 7379) made more widely and easily accessible by the phenomenal improvement of micro- and mini-computers, are the new growth industries which may find the heavily populated North Atlantic region attractive because of the economies of agglomera-

tion and proximity to the market (clients). Other high-tech service industries operating in the growth phase of the industry life cycle would similarly find comparative advantage in the North Atlantic region, giving it a sustained boost for the time being.

Needless to say, the above analysis is an oversimplification with many caveats. Some of the important qualifications are as follows. First, regions that depend heavily on a single commodity (e.g., Oklahoma and Texas on oil or West Virginia and Montana on coal) will deviate from the regional trend, from time to time, due to fluctuations of the demand for that commodity. Second, migration-led development of a region's economy is possible, where the development takes place as a result of the supply following the demand (e.g., Florida and Arizona). Third, historical accident in the placing of capital stock can have a very long-lasting effect (e.g., the automobile industry in Detroit), which will be eroded only gradually as economic conditions change (Engle, p.183). Fourth, studies have shown that state and local taxes and expenditures can significantly affect regional economic activity (see You (1981) and Helms). There are, of course, many other factors which may complicate the analysis. However, the basic analytical framework of this paper appears plausible both on theoretical and on empirical grounds. Nevertheless, it is only a tentative hypothesis and further theoretical analysis and empirical testing are needed to gain a more definitive understanding of the regional economic cycle.

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APPENDIX

Proof of Proposition 1:

$$\begin{aligned} \sum_{ij} M_{ij} &= \sum_{ij} \sum_i^0 (r_{ij} - r_i) \\ &= \sum_i^0 (r_i - r_i) \\ &= \sum_i^0 r_i - r \sum_i^0 E_i \end{aligned}$$

Note that  $\sum_i^0 r_i$ , the sum of employment growth over all industries in the U.S., is the same as the change in total employment ( $E^1 - E^0$ ), and also that  $r \sum_i^0 E_i = r E^0 = E^1 - E^0$ . Therefore, the right hand side of the above equation becomes zero.

Proof of Corollary:

In this case, the region's employment level in each industry would be a constant fraction of its national counterpart (i.e.,  $E_{ij} = k E_i$ ). Thus,

$$\begin{aligned} \sum_{ij} M_{ij} &= \sum_{ij} \sum_i^0 (r_{ij} - r_i) \\ &= k \sum_i^0 E_i (r_i - r_i) \end{aligned}$$

The right-hand side of the above equation is zero, as demonstrated in the proof of Proposition 1.

APPENDIX (continued)

Proof of Proposition 2:

From equation (3),

$$\sum_{ij} (E_{ij}^1 - E_{ij}^0) = r \sum_{ij} E_{ij}^0 + \sum_{ij} (r_i - r) E_{ij}^0 + \sum_{ij} (r - r_i) E_{ij}^0$$

$$(E^1 - E^0) = rE^0 + \sum_{ij} M_{ij} + \sum_{ij} C_{ij}$$

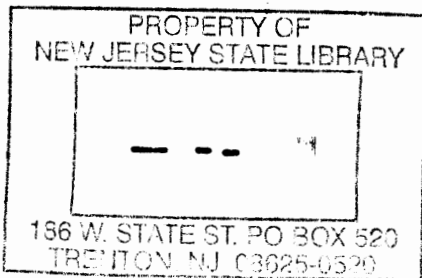
Since the sum of  $M_{ij}$  is zero (by Proposition 1),

$$(E^1 - E^0) = rE^0 + \sum_{ij} C_{ij}$$

$$= (E^1 - E^0) + \sum_{ij} C_{ij}$$

Hence, the second term of the right-hand side must necessarily be zero. This proposition implies the fact that, by the definition of the competition effect, any competitive gain by one region must come from losses by other regions.

Proof of corollary to Proposition 2 is not needed because it is a truism.



## II.

# FINANCING HOUSING THROUGH DEVELOPER FEES: AN ECONOMIC ASSESSMENT\*

A series of historic court rulings in New Jersey determined that the existing patterns of housing across the State were inadequate with respect to the availability of housing for low and moderate income families (Rose, 1983). Originally, judicially established standards were imposed on communities compelling them to alter zoning regulations and make other changes in land use policies in order to increase the number of housing units affordable to low and moderate income families. Widespread dissatisfaction with the involvement of the judiciary in local planning and zoning decisions led to the passage of the Fair Housing Act and the creation of an alternative to judicial intervention (Rose, 1986). Recently promulgated regulations of the New Jersey Council on Affordable Housing (18 NJR 1527) implementing the Fair Housing Act have changed the economic environment in which housing construction and local land use decisions will be made. The purpose of this Chapter is to examine the economic issues related to achieving the goals of the Fair Housing Act through a tax on new construction in N.J.

### I. BACKGROUND

The Council on Affordable Housing has determined that satisfying the

legal requirements for low and moderate income housing will require the construction and/or rehabilitation of 145,707 housing units statewide. This total represents the sum of the individual municipal requirements established by the Council. Though several methods for financing this construction are available, it appears unlikely that the private market will be able to meet these housing needs in a reasonable period of time. Though estimates vary, an approximate average subsidy of \$15,000 to \$20,000 per unit will be necessary to encourage construction of additional housing for low and moderate income families. At this rate, the total subsidy cost of fully meeting the goals of the Fair Housing Act would be between \$2.2 and \$2.9 billion.

Under current financing mechanisms only a fraction of these funds will be available. The six year amount to be raised by the imposition of a realty transfer tax will be approximately \$72 million. Another source of funding, the New Jersey Housing and Mortgage Finance Agency, will add an additional \$15 million. Also, the "builder's remedy," allows builders to construct four units at a market rate for each low and moderate income unit they construct. Several

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\*Prepared by Jeffrey I. Rubin, Associate Professor, Department of Economics, Rutgers University and Joseph J. Seneca, Chairman, Economic Policy Council. We would like to thank Joseph Benedict, James Hughes, Dwight Jaffee, Joyce Paul, Charles Richman and Jerome Rose for comments. Also, we acknowledge the support of the Department of Community Affairs. We would also like to thank Brenda Brockman for research assistance. The conclusions and views are solely those of the authors.

problems accompany the builder's remedy. First, there is the issue of selling the market rate units at a premium in order to realize the needed revenues to subsidize the low or moderate income unit. In essence, the buyers of housing at the "market rate" are subsidizing the low and moderate income housing. Second, the Fair Housing Act restricts the circumstances in which a builder's remedy can be used (Chall, 1985-86). Third, there is a broader public policy issue. For those municipalities using this remedy, the four to one ratio may mean an increase in overall housing density with its concomitant pressures on local services and quality of life.

Another alternative, public construction of low and moderate housing, has a history of mixed results. The involvement of the public sector in housing construction requires substantial resources and management skills. Federal support for housing has been reduced and substantial new sources for financing large scale public housing are unlikely to be available (Congressional Budget Office, 1983).

A final option created in the recently issued regulations allows some municipalities to subsidize construction or rehabilitation of housing in other municipalities. These Regional Contribution Agreements (RCA) (18 NJR 1539) require a local government to raise the revenue needed to subsidize construction in another town. Limits on the total share of a community's low and moderate income housing obligation (50%) also put a cap on the extent to which communities can use this option to shift the location of housing elsewhere. Furthermore, receiving municipalities may require funds to subsidi-

dize not only housing, but other services for persons attracted to the community through this program. These costs may or may not be fully covered by the agreement between the municipalities. Thus, a fiscal burden may be imposed implicitly on the receiving municipality if the agreement does not cover the full costs of the additional housing. Accordingly, the total costs of such an agreement may reduce the long-run effectiveness of RCA.

The fiscal requirements of the housing called for by the Fair Housing Act far exceed what is available from current funding sources. However, as long as the State chooses to seek a more balanced profile of income and housing within its communities, the costs of the needed housing will have to be financed through some form of subsidy.

## II. A DEVELOPMENT TAX

One possible source of funds is a statewide tax on real estate construction, with the revenues dedicated to support programs to increase the supply of affordable housing. Though there have been no statewide programs created to use funds from a dedicated tax on new development to finance low and moderate income housing, some larger cities, notably Boston and San Francisco, have instituted such a program. In New Jersey, a number of municipalities have imposed their own fee systems to raise funds to finance low and moderate income housing. The legality of such programs is being challenged. The difficulty municipalities face in establishing a linkage between the fee and the use of the funds it generates may result in these programs being rejected by the courts.\* Also, the lack of any state legislation to

\*Recently, a New Jersey court ruled that a municipality could not employ a development fee program to fund a program to promote affordable housing. See, New Jersey Builders Association vs. The Township of Chester, Superior Court of New Jersey, Law Division- Morris County, Docket No. L-015902-87.

date enabling municipalities to institute such a program further jeopardizes their legal standing.

However, legislation has recently been proposed to enable New Jersey municipalities to impose such taxes (N.J. Assembly Bill No. 2620, 1986). Variations in the desire for the economic benefits of new construction and in housing requirements are likely to result in different taxes across municipalities. These differences raise concerns about the impact on business location decisions of varying tax forms and levels (White, 1986; Fox, 1981). Differences in taxes on new development may affect the geographical distribution of new development in ways that are contrary to other state objectives (e.g., policies to stimulate urban economic development, state planning and land-use goals, etc.).

A statewide development tax shifts the competition for new construction from the intermunicipal level to the interstate level, thus removing any undesired incentives of intermunicipality competition for new construction. (Of course, municipalities still have available a large array of other economic policies to attract new development.) However, the increase in costs of construction due to a statewide tax may force some developers to reduce their level of construction in New Jersey or relocate some construction outside the State.

### III. APPROACH

The objective of this Chapter is to evaluate the economic issues and the effects of a tax on the value of new construction. This is a complex and uncertain task. Using available data, we estimate the size of the needed tax under varying assumptions regarding the required revenues and the effects of the tax on new real estate construction in New Jersey.

We conduct our analysis under several pre-determined constraints. First, we take as given the number of required housing units (145,707) as specified in the regulations of the New Jersey Council on Affordable Housing. Although the Council has established a required number of low and moderate income housing units for each municipality, our focus on the total amount of subsidy funds needed allows us to concentrate on the aggregate financial implications of subsidizing such housing. We also estimate the required tax revenues and tax rates that would be necessary to subsidize only part, rather than all, of the required housing units.

Second, we do not offer a detailed examination of alternative expenditure programs. The State has many options in choosing how to allocate revenues raised through such a tax. For example, focusing on the supply side of the market, either private or public entities could receive grants enabling them to construct affordable housing. Alternatively, policies could be directed toward the demand side of the market. Low and moderate income families could be given subsidies, perhaps in the form of housing vouchers, of varying amounts, depending on income. Each of the many possible expenditure options will have different economic and distributional effects. Though we believe these consequences are important and require further research, our analysis is limited to the evaluation of a particular tax program.

A third restriction is that we do not consider any alternative tax options that could potentially fund all, or part, of the housing subsidies. Expansion of the personal income tax, sales tax or the imposition of a statewide property tax are all options which could be considered. Differences in equity and efficiency effects of alternative taxes should ultimately serve as the

basis on which to select among the possible sources of funding.

#### IV. EFFICIENCY AND EQUITY CONSIDERATIONS

Raising revenue through taxation requires three decisions: the amount to be raised, the tax base and the rate of taxation to apply to the tax base. This relationship is shown in equation (1).

$$\text{Revenue} = \text{Tax Base} \times \text{Tax Rate} \quad (1)$$

Obviously, once a decision is made regarding any two of these variables, the third factor is determined. The selection of a tax base can be evaluated using two standard public finance criteria: equity and efficiency (Stiglitz, 1986). In considering equity effects we are concerned with who bears the final burden of the tax and who receives the benefits from any expenditure program. Imposing a tax on corporations or individuals does not necessarily guarantee that these parties ultimately have their income lowered by the full amount of the tax. To some degree, it may be possible for the individual or firm to shift the burden of taxation, either to a buyer of the product or to the seller of goods and services used in the production of the product. The extent and direction of tax shifting depends on the underlying supply and demand conditions in the market.

Efficiency consequences of a tax relate to its effect on the way in which society uses its resources, i.e., are economic decisions distorted, if at all, by the presence of taxes (or subsidies)? Thus, for example, if a tax on new real estate development resulted in far fewer office buildings being constructed, it would likely mean that resources are going to some other, less valued, use because of the wedge the tax has

created between the true cost and economic return of a construction project and its actual (post-tax) cost and economic return.

Nearly all taxes cause some distortion in resource allocation decisions. Given this negative consequence, what justification can be offered for taxing at all? The answer is simple: the value to society of what the tax dollars purchase is greater than the cost of the project and any efficiency losses incurred. We can interpret the rationale for a proposed tax on new construction in order to finance affordable housing for low and moderate income families in light of this discussion. Simply stated, New Jersey may prefer some inefficiency in the size, type and location of construction in order to increase the supply of housing to low and moderate income citizens. At some point, though, we expect the "price" of such a tax in terms of the economic distortions it creates, to become too high (Snyder and Stegman, 1986).

Distributional or equity effects can also pose a dilemma in selecting a tax. The answer to the question of who bears the costs of subsidizing low and moderate income housing depends on which type of tax is used. For example, a tax on new office construction could mean builders earn lower profits, thereby incurring part of the costs of the subsidy. If these builders are publicly owned corporations, then shareholders will also bear the burden of the tax. Alternatively, if the market for new office space is strong, then developers may be able to raise prices without experiencing a large decline in demand. In this situation, it is the users of office space, rather than the builders, who bear the burden of the tax. Complicating the argument even further is the possibility that the users of newly constructed buildings will raise the price of the products or services

they sell, or offer lower salaries to their employees or prices to their suppliers, as a way of further shifting the tax burden to someone else. Since overall construction market conditions, as well as the specific use for which the taxed real estate is being developed, have much to do with these distributional effects, we proceed cautiously in reaching any conclusions with respect to the distributional consequences of the proposed tax. Under different market conditions we can expect different distributional outcomes. With a tax on such a volatile market as construction, it may be impossible to predict distributional effects in future years.

Moreover, even once short-term distributional consequences are determined, a judgement about the fairness of the distributional effects is required. Economists have proposed various measures of evaluating the equity of a tax burden. Taxing according to ability to pay is one widely cited measure. Another option is to distribute the tax burden in accordance with the source of the policy problem. For example, taxing firms who have polluted a waterway is one way to fund cleanup programs.

In the case of office and other commercial development, the logic of imposing the costs of subsidies for low and moderate income housing on these developers stems from the effect such development has on housing markets. New construction brings more jobs to a region, which in turn puts pressure on the price of the existing housing stock. New Jersey's employment growth in recent years is partly responsible for the rapid increase in the price of housing. In some parts of the State rising house prices have made the housing market inaccessible to many families with low and moderate incomes. However, following this logic, the limited supply of housing

for low and moderate income families is the result of past decisions, while the proposed tax would apply only to new construction. This raises an intertemporal equity issue. One alternative to consider is a statewide tax on all commercial and/or residential property, both existing and new.

Regardless of the efficiency and equity consequences of any tax, recent legislation, court decisions and public regulations all establish that New Jersey must increase the supply of affordable housing. Moreover, there is a desire to avoid having a concentration of low and moderate income persons in neighborhoods separated from other municipalities which are enjoying significantly higher economic growth. The Courts and Legislature have said that a means must be found to make housing affordable in all communities for those whose incomes are insufficient to purchase or rent such housing at market prices. Public funding appears to be a necessary part of any effort to achieve these goals.

#### V. TAX BASE

Whatever level of revenue is required to fund subsidies for low and moderate income housing, we must determine the base on which to apply a tax rate. We limit our consideration here to new real estate as the commodity to be taxed. Real estate can be separated into residential and nonresidential construction. One version of the tax would be to set a tax based on the square footage of the building. Alternatively, we can consider a tax on the value of any new construction completed during a given period of time. Value could be measured by using the selling price of a new house or building. This measure would include the value of the land, the cost of the new construction before the tax and the return to a builder's investment as the tax base. Another possibility

would be to assess the value of the new construction. This last measure is used here in developing a tax base.

Once a tax base is selected, we can solve for the required tax rate. However, the problem does not end there. A new tax results in a variety of responses, including some which might lower the projected tax base in the future. Thus, some measure of the responsiveness of the construction market to higher costs due to the tax must be considered.

The type of tax being discussed here is classified as a dedicated tax. This means that the revenues from the tax are restricted in their use. New Jersey has several examples of such taxes. For example, revenues from casino taxes are restricted by law to certain uses. Though there is some justification for using a dedicated tax when there is a clear linkage between the tax sources and the benefits of the expenditure program, such as a tax on gasoline to fund highway improvements, it is not clear that a developer tax to finance low and moderate income housing meets this test. (We address this basic issue of who should finance subsidies

for low and moderate income families more fully later.)

The amount of new construction in New Jersey can be measured by the concept of "value put in place." Estimates are available (see the Appendix) on recent levels and future projections of value put in place in New Jersey. The data are disaggregated by type of new construction. Table 2.1 summarizes these estimates for each subsector of the building market.

The maximum possible estimated tax base in 1987 would be approximately \$6.3 billion. A variety of other types of construction generally have been exempt from property taxation (religious institutions, public hospitals, non-profit educational institutions, and public facilities). We follow this precedent and exclude these buildings from the proposed tax base. It would also appear logical to exclude residential construction for low and moderate income families. However, we have not established the annual value for such construction, and no such adjustment is made. We will examine the tax implications of including just commercial buildings, and excluding residential construction.

Table 2.1  
Estimates of Value Put in Place in New Jersey  
(million \$)

Building Type	1987	1988
Industrial Buildings	\$707	\$762
Office	952	990
Other Commercial	561	506
Total Nonresidential	2,220	2,258
Residential	4,122	4,207
Grand Total	6,342	6,465

Source: See the Appendix.

As Table 2.1 shows, we consider data for only two years, 1987 and 1988. The reliability of estimates beyond that period is difficult to evaluate. In particular, the impact of recent federal tax law changes on business investment decisions, economic activity and homebuying further complicates an already uncertain economic outlook beyond 1988.

## VI. TAX RATES

To examine the fiscal implications of a tax on new construction we developed a set of equations relating the tax rate to the tax base. The size of the subsidy and various other factors which could influence the tax rate. The basic relationships are described in Equations (2) and (3).

$$N \times S = R \quad (2)$$

$$T = R/TB \quad (3)$$

The variables in the model are defined as follows: The number of units per year to be subsidized is represented by N. We chose to consider two possibilities for this variable. In Case 1 we assume that the revenue required to subsidize 10% of the needed units will be raised each year. Thus, the entire amount of funds needed to subsidize the required housing will be raised in ten years. In Case 2, we assume the goal is to raise sufficient revenue to subsidize 15 percent of the required units annually. Although the regulations issued by the Council on Affordable Housing pertain to the period from 1987 to 1993, it may not be feasible to collect and distribute funds and construct and/or rehabilitate the required number of housing units by 1993. Even the ten year period used in Case 1 may be optimistic.

It is possible that the goals established by the Council on Af-

fordable Housing could be revised, either by the Council (after a review of municipal requests for reductions in their allotments) or by the Legislature or the Courts. Should this occur, the number of units and the length of time needed to impose a tax can be recalculated. The use of the existing housing goals is likely to be an upper bound for the required funding. The methodology, however, is sufficiently general so that any changes can be incorporated and new results obtained.

We also calculate the yearly revenue required (R) to subsidize the number of units selected above. For purposes of this analysis, we assumed an average subsidy (S) of \$15,000 per unit. We also present analogous results using an average subsidy of \$20,000. In absolute terms, S will have to be adjusted as prices and incomes change in the future. To account for possible increases in the cost of the subsidy, we also consider the case where there is an annual increase of 5 percent in the average subsidy from 1987 to 1988.

There are several specific factors that could alter the average subsidy in the future. Most significant is the potential impact of substantial new subsidies on housing markets. There are limits on the capacity of the housing market to construct new housing. If an excess demand situation is created because of these subsidies, we could expect to find rising construction prices and an increase in revenues needed to meet future housing goals. Also, the maximum fraction of income to be devoted to housing and the specific definitions of low and moderate income determine how large a subsidy is needed to make housing "affordable." A legislative or regulatory change in these factors would also change the average subsidy.

Because we are limited in this study to examining a tax on new con-

struction, the tax base (TB) consists of the value put in place for new residential and nonresidential construction. There are a variety of options available that would lower TB. First, as noted earlier, a decision might be made to exclude residential construction. Such a strategy would provide an economic incentive to use resources for housing construction rather than nonresidential construction. Another option would be to exclude any construction in specially designated areas, such as in Urban Enterprise Zones or urban aid municipalities. All else equal, this exclusion would provide these municipalities with a relative advantage when builders decide where to plan future construction and would be consistent with broader state goals promoting urban economic development and other land-use objectives. Of course, any reduction in the tax base will require an increase in the tax rate to meet any given revenue goal.

We define E as the percentage decline in value put in place of new construction attributable to the imposition of the tax. From an economic standpoint this effect is most critical, and yet it is the most difficult to predict. The whole range of factors influencing the supply and demand for residential and nonresidential construction come into play in determining E. Because the economic consequences to the State and the financing of this program are critically affected by the degree to which a new tax reduces economic activity, it is important to discuss the issues raised in calculating E.

First, we specify how E would affect the calculations described in Equations (2) and (3). The tax base in each year must be adjusted downward from its projected figure. The new tax base is then used to calculate the tax rate in Equation (3). We define PTB as the projected tax base and NTB as the new tax base

after the effects of the tax are included. The relationship is described in Equation (4).

$$NTB = PTB - E(PTB) \quad (4)$$

If the tax rate is small and the demand for new construction in New Jersey is sufficiently strong, we would expect E to be close to zero. Though it is difficult to estimate E precisely, we can describe how various factors might influence the size of E.

We begin by considering some of the underlying determinants of supply and demand in the market for new construction. In any given market, builders and homeowners have a demand for construction sites. For homeowners, the demand stems from a desire for certain characteristics of the community in which they seek to live. The possibilities include community amenities, location to work and transportation, etc.

For developers of nonresidential buildings, the demand stems from their recognition of a demand for space to conduct commercial, manufacturing and retail activities in this location. Economists refer to this type of demand as a derived demand. Therefore, it is important to know more about the original source of the demand.

Like homeowners, businesses have preferences for site locations which depend on such factors as workforce availability, transportation and cost. Some industries are influenced differently than others by these factors. For example, retail businesses will locate near population centers while manufacturing and office operations may be less concerned with the availability of a nearby market for their product. Empirical work supports the hypothesis that certain types of construc-

tion will be more substantially affected by tax differentials than other types of construction (Wasylenko, 1980).

On the supply side, the primary factors controlling the supply of sites for construction include zoning restrictions, the price people are willing to pay for the available land and the value of land in alternative uses. In New Jersey, land prices have increased significantly and more land has become available for construction.

A one time tax on construction, such as the one under consideration here, can be conceived as being much like an increase in the price of land. Several possibilities arise in response to such a tax. First, if the tax is sufficiently small relative to other costs, and if profit opportunities are great, then builders may simply pay the tax and bear the cost themselves in the form of lower profits. If the market for land is weak, then builders may be reluctant to pay higher prices and hence the owners of land may be forced to bear the burden of the tax in the form of lower returns on their land. Finally, if the demand for new construction space is strong, builders may be able to pass some of the higher price of land along to renters and buyers. Each of these circumstances will influence the size of E. If the first or third situations characterize the market, E would likely be low. However, in the case where demand is weak, we would probably observe a relatively large, negative response to a new tax.

In general, we should expect that the demand for sites is responsive to variations in the price of sites. Assuming the market for land is in equilibrium, we can consider the effects of a new construction tax which effectively raises the price of land. If the underlying determinants of demand remain unchanged, we can

expect less land to be demanded at the new, higher market price. Thus, fewer projects will be undertaken, fewer workers will be hired, less income will be produced and less tax revenues from other sources (sales and personal income taxes) will be collected. While the direction of these effects is theoretically predictable, their magnitude is difficult to estimate.

Another factor which affects the magnitude of E is the extent to which there are substitutes for the sites subject to a tax. There is a growing body of literature which examines the effects of intra-metropolitan tax differentials on location choices (Fox, 1978; Wasylenko, 1980). These studies suggest that tax differentials have some effect on location, particularly for those activities that are not tied to some special characteristic of the site or vicinity. But the findings regarding the magnitude of the effect vary and may not be applicable to the issue under study here. We are dealing with a tax which might induce some firms to reduce the size of any project, abandon the project altogether or take the project elsewhere. The studies of intra-metropolitan differentials are primarily concerned with the same total level of activity being located in different places.

Another factor cited earlier is the relative size of the tax. If the tax is small relative to the price of land and the value of construction, then it is unlikely to have a large effect on levels of construction within the State. In our model we are examining the tax relative to the value put in place for new construction. If the tax creates a barrier to new construction, it will lower the tax base over time thereby causing a need for a higher tax rate in the future in order to raise the same level of revenue. To examine the effects of this possibility on tax rates, we have chosen to make our

estimates under four alternative assumptions of the responsiveness of construction activity to tax rates. In the first case we assumed the level of construction is unaffected by the tax. In another case the tax is assumed to result in a 1% reduction in the value put in place. In a third case the reduction is 5% and in the last case the reduction is 10%.

There are a number of aspects of the proposed tax that suggest that there would be a rather limited response. First, the proposed tax is in the form of a one time payment and not a continuing increase added to annual property taxes. Second, it will be applied statewide. Thus, a firm would have to leave the State to avoid the fee. To the extent other features of locating in New Jersey strongly favor the State, it is unlikely firms would make a different location decision on the basis of this fee alone. It is important to realize that the change in value put in place is a reduction from the value put in place that is projected to occur without the tax. The effect of the tax may be to lower the level of new construction relative to the predicted rate but the level of new construction could still exceed the previous year.

## VII. RESULTS

We begin the presentation of our empirical analysis with the case where 10 percent of the total required housing units (145,707 for the ten year period) are to be subsidized annually at a rate of \$15,000 per unit, and with the value put in place of new nonresidential construction (only) serving as the tax base (see Table 2.1). In this scenario we calculate that the tax rate in 1987 would have to be 9.85 percent and in 1988 the rate would be

9.68 percent.\* Future rates will depend on the expected levels of new construction and the possible need for increases in the cost of the subsidy. It should be noted that under this version of the model the funds necessary to subsidize all the needed moderate and low income housing would be raised in ten years. To the extent that other sources of funds are available, a lower tax rate would be sufficient. For example, if half the cost of the typical subsidy is expected to come from other sources, including state programs and municipal governments, the tax rate in the previous case would fall by 50 percent to 4.92 percent in 1987.

One facet of the type of plan we are considering is the possible distortion in building patterns created by the existence of a program which will be limited to a set period of time. As the final year deadline approaches, firms may decide to delay construction to avoid the tax.

Another economic issue to consider is how the tax will work in conjunction with other proposed taxes. For example, plans to finance infrastructure using developer fees are also being considered. Municipalities often require developers to make contributions to fund site-related costs incurred by the municipality. Taken individually, one might feel safe in predicting that no single "developer" tax is going to significantly deter construction activity. But, in sum, fees and taxes may represent such a sizeable share of total costs as to have a significant negative effect on construction activity in New Jersey. We would strongly urge those considering such plans to coordinate their efforts to avoid these additive effects of multiple taxes on a single tax base.

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\*These two rates are calculated as follows:  $9.85\% = (.1 \times 145,707 \times \$15,000 / \$2.22 \text{ billion})$  and  $9.68\% = (.1 \times 145,707 \times \$15,000 / \$2.258 \text{ billion})$ .

There are other effects to consider in evaluating the proposed program. Though these possibilities are beyond the scope of this paper, they are important enough to justify mention and brief consideration. One aspect of a program to subsidize low and moderate income housing is that extra funds will be pumped into local economies. Subsidies will increase the demand for housing-related materials and employees. In the short run we can expect that some of the funds used to stimulate housing will be used to pay higher wages needed to attract the necessary workers to this industry. To the extent the final price of all housing is thereby increased, there will be additional pressure to increase the size of the subsidy.

Also, if the proposed tax negatively affected non-residential construction, the use of funds for residential construction will partly offset the negative effect of the tax. We are then faced with a reallocation of resources away from non-residential construction to residential construction. This may be desirable from a public policy standpoint, but the relative magnitudes of the effect should be studied.

Our model does not fully incorporate all of these uncertain secondary effects in other markets. But, as noted earlier, we do attempt to incorporate the direct effects of the tax on construction activity. Using the same figures as above, but assuming that there will be a 10 percent decline in the value put in place for new construction because of the tax, the tax would have to be increased to 10.94 percent in 1987 and 10.75 percent in 1988.

One method for lowering the tax rate and reducing the distortion in the marketplace is to expand the tax base. A possible option is to include new residential construction in addition to nonresidential construction in the tax base. For the case at hand, inclusion of the value of new residential construction nearly triples the tax base to over \$6.3 billion. As a result, the tax rate could be set at 3.45 percent in 1987 and 3.38 percent in 1988 (assuming zero reduction in construction activity due to the tax). Assuming there will be a 10 percent decline in construction if this tax is implemented, the rates would have to rise to 3.83 percent in 1987 and 3.76 percent in 1988. These figures are summarized in Table 2.2. Table 2.3 provides com-

Table 2.2  
Tax Rates to Fund Subsidies for Low and Moderate Income Housing\*  
(\$15,000 per unit subsidy; revenue for 14,571 units per year)

Year	Tax Base of Non-Residential Construction Only		Tax Base of Residential and Non-Residential Construction	
	0% Reduction in Construction Due to Tax	10% Reduction in Construction Due to Tax	0% Reduction in Construction Due to Tax	10% Reduction in Construction Due to Tax
1987	9.85%	10.94%	3.45%	3.83%
1988	9.68	10.75	3.38	3.76

\*If the proposed tax were used to fund only half the required units, each tax rate could be reduced by 50%.

Table 2.3  
Tax Rates to Fund Subsidies for Low and Moderate Income Housing\*  
(\$20,000 per unit subsidy; revenue for 14,571 units per year)

Year	Tax Base of Non-Residential Construction Only		Tax Base of Residential and Non-Residential Construction	
	0% Reduction in Construction Due to Tax	10% Reduction in Construction Due to Tax	0% Reduction in Construction Due to Tax	10% Reduction in Construction Due to Tax
1987	13.13%	14.59%	4.59%	5.11%
1988	12.91	14.34	4.51	5.01

\*If the proposed tax were used to fund only half the required units, each tax rate could be reduced by 50%.

parable data on tax rates under all the same circumstances except that the per unit subsidy is set as \$20,000.

Clearly, the advantage of including residential construction in the tax base is that there is a substantial reduction in the needed tax rate. But this is perhaps the appropriate place to consider the basic rationale of imposing such a tax on new construction, both residential and nonresidential. If New Jersey is to meet the housing requirements established by the Courts and the Legislature, then we have to ask whether it is reasonable to tax only new construction activity in New Jersey. Other tax bases such as the value of existing property, earned income or consumption expenditures are available. Though taxing any of these sources has its own set of economic effects, these tax bases certainly are distributed across a broader cross-section of all residents, and not just those purchasing or constructing new structures in New Jersey. Also, because these tax bases are quite substantial, the necessary tax rate would be small. A lower tax rate will result in less

distortion in those economic activities or markets being taxed.

We have examined our model under a variety of assumptions regarding subsidy size, market changes and the desired period of time to raise the funds. The estimates in Table 2.2 represent the lowest rates possible using either the nonresidential tax base or that tax base plus residential construction. The highest possible taxes in the various models we examined occur in the case where the initial per unit subsidy is \$20,000, the tax base includes only value put in place for new nonresidential construction, the goal is to fund 15 percent of the needed units each year, the subsidy is expected to rise by five percent between 1987 and 1988, and the tax is expected to reduce predicted value put in place in both 1987 and 1988 by 10 percent. In this case the 1987 tax would be 21.88 percent and the rate for 1988 would be 22.59 percent. Including the value of new residential construction under the same circumstances would lower the rate to 7.66 percent and 7.89 percent for 1987 and 1988 respectively. These results are summarized in Table 2.4.

**Table 2.4**  
**Tax Rates to Fund Subsidies for Low and Moderate Income Housing\***  
(\$20,000 per unit subsidy in 1987, \$21,000 per unit in 1988; revenue for  
21,856 units per year)

Year	Tax Base of Non-Residential Construction Only		Tax Base of Residential and Non-Residential Construction	
	0% Reduction in Construction Due to Tax	10% Reduction in Construction Due to Tax	0% Reduction in Construction Due to Tax	10% Reduction in Construction Due to Tax
	1987	19.69%	21.88%	6.89%
1988	20.33	22.59	7.10	7.89

\*If the proposed tax were used to fund only half the required units, each tax rate could be reduced by 50%.

Tax rates between the highest and lowest reported rates would be attained under the many combinations of variables that are possible in this model. Funding fewer units, extending the time period, lowering the average subsidy and assuming a smaller negative effect of the tax on construction would all lower the required tax rate. The tradeoff which exists between raising taxes and meeting housing goals is evident in the data presented. The choice of how to balance the desire to keep tax rates low with the desire to meet, in a timely manner, the legal requirements of housing for low and moderate income families awaits the outcome of public debate on these competing objectives.

#### VIII. CONCLUSION

The State of New Jersey and its 567 municipalities are facing a difficult task. The Courts and the Legislature have concluded that the combined effects of private sector decision-making and public land use policies have produced, and will continue to produce, an insufficient quantity of affordable housing for low and moderate income persons. The municipalities have been directed to

increase the supply of affordable housing for these groups. Though a number of steps have been taken to meet existing mandates, it is apparent that the goals which have been established will not be met without significant additional resources.

In this Chapter we have examined the economic issues raised by one financing proposal: a statewide tax on new real estate development. We have not analyzed in detail any alternative funding source. Also, we have excluded from consideration any alternative methods to distribute the revenue raised through the proposed tax. Before summarizing our main conclusions and recommendations, we offer some brief comments on expenditure issues.

We would strongly urge that the expenditure side of a program designed to increase the number of housing units available to low and moderate income persons also be given careful study. For example, in our review of the history of the litigation, legislation and results relating to housing policy, we found surprisingly little analysis of how the New Jersey housing market works, especially with respect to the demand

side of the market. Every discussion of alternative solutions to the housing needs of low and moderate income persons begins with an implicit assumption that the only effective strategy is to manipulate the supply side of the market. Usually this entails finding ways to alter the business decisions of builders and landowners. We think there is a strong argument for evaluating subsidies to individuals and families as another method to stimulate demand for housing. An increased ability to afford housing will result in the necessary responses from suppliers. As Federal housing policy appears to be shifting toward a preference for housing vouchers, it would be wise to consider this approach in New Jersey. The issue of determining eligibility for such vouchers, and the possible incentives created for interstate migration of housing-poor individuals would also have to be analyzed.

Another aspect of any statewide expenditure program for housing is its distributional effects, both in terms of municipalities and individuals. Any tax and expenditure program necessarily involves some redistribution from one group or area to another group or area. In the case at hand, we can expect fast growing areas to be the primary source of funds. These funds will then be distributed on the basis of a measure of need among the affected municipalities. The fiscal result will be that new developments in growing municipalities subsidize, in part, the construction of low and moderate income housing elsewhere throughout the State. This may or may not be the desired social policy. The point to recognize is that alternative tax and spending programs produce different distributional effects. In part, these differences should enter into the decision as to which policy to enact. Also, other State programs, including, for example, the activities of the State Planning Commission, may result in a

redistribution of economic growth within New Jersey and further compound these distributional effects.

The distributional effects across individuals are often more difficult to determine than patterns of municipal redistribution. Correctly identifying these effects lies partly in the choice of a tax base and partly in the determination of the degree to which the tax is shifted from the person legally responsible for payment to others. As noted earlier, one type of shifting which might occur is that the builder responsible for paying the tax could charge a higher price for the building. Neither the intermunicipal nor the individual distributional effects may be unsatisfactory to most citizens and representatives. But to the extent that substantial municipal or individual redistribution occurs, one should be prepared for disputes over these issues.

We can now state our basic conclusions:

First, because higher tax rates will, at some point, result in reduced construction spending in New Jersey, we recommend that if a program to tax new construction is adopted, the tax rate be kept low, preferably below 2 percent of the value put in place. Furthermore, if the New Jersey economy shows signs of weakening in the future, we believe this tax could act as a drag on growth. In such situations, officials should be prepared to lower the tax to prevent additional declines in the economy.

Second, though we have not determined the extent to which the tax base would be reduced by excluding certain municipalities or areas (e.g., Urban Aid Districts or Urban Enterprise Zones), our preference is that the tax be applied equally across the entire state. In this way there will be no relative harm to any

municipality because of the tax. At the same time, it is true that the creation of a new tax offers an opportunity to further tilt economic decisions in favor of poorer districts or to reinforce other land-use and planning objectives. If a determination is made that existing programs are not satisfactory and more needs to be done to help these districts grow, an exclusion from the proposed tax should be considered.

Third, we suggest that the tax base be defined as broadly as possible. Thus, we would include all new residential and nonresidential construction, though we see no reason to include construction of properties that are normally tax-exempt. The broader tax base will allow for a lower tax rate. Perhaps, even more valuable, by taxing each use the same, there is no relative incentive to use land for one form of construction over another. If only nonresidential construction were taxed, there would likely be some cases where, on the margin, the differential tax resulted in land not being used in its most valued alternative. Of course, to the extent that society is dissatisfied with the outcome of private decisions, such an incentive may be preferable. We cannot reach such a conclusion nor could we be certain that the "right" type of alternative use would be pursued. Therefore, we restate our preference for the broadest possible tax base.

Fourth, on the question of whether to rely on the State or the municipality to raise the funds, we conclude that the State should be responsible for any tax on new construction for the purposes of funding low and moderate income housing. We reach this conclusion primarily for two reasons. First, allowing individual municipalities to set their own rates, should they even opt for such a program, would insure an outcome of substantial inter-municipality variation in developer fees. (Our

review of recently enacted municipal ordinances confirms this expectation.) As a result, business location decisions will be distorted by varying signals about the true relative costs of construction in different municipalities. A second reason for preferring a statewide tax is motivated by our view of the basic problem cited in housing markets. That is, we envision the lack of sufficient low and moderate income housing as a state problem to be addressed at the state level. In a sense, one could consider housing much like infrastructure. When there is a clear link between development and the increased use of local roads, water or other municipal goods, then it is logical to allow municipalities to assess taxes and fees to finance expansions of such services. But, in the case of housing, the spillovers between municipalities with regard to the demand for, and supply of, housing suggest that any single municipality cannot adequately address this component of the "infrastructure."

In fact, if there are other aspects of regional or state infrastructure development associated with new residential and nonresidential construction, then there is a logical case for incorporating financing for these activities within a single, regional or statewide infrastructure tax. Such an approach would avoid what we see as an undesirable movement toward the development of a piecemeal system of taxation. Separate taxes on new developments in individual municipalities or regions of the State to finance roads, sewerage treatment plants, and low and moderate income housing, to name a few, could quickly add up to represent a substantial burden on developers and a serious disincentive to invest in New Jersey.

As long as it is public policy to correct for the inability of many individuals and families to purchase

adequate housing, a redirection of society's resources will be needed. More resources will have to go to specific groups of consumers and to specific segments of producers than would occur if the construction

market were left undisturbed. The choice of a tax and expenditure system determines which groups and individuals gain or lose, and which construction and other economic activities increase or decrease.

## APPENDIX

### ESTIMATION OF THE TAX BASE

In the model, the size of the tax base is crucial to the calculation of the tax rate. We estimated two different tax bases. The first includes only new commercial construction. The second includes new commercial construction and new residential construction.

Once the activity to be taxed is determined, several decisions are still to be made. One option would be to impose a tax in terms of a given single dollar amount per unit. For example, a developer of each new building could be required to pay a fee on receipt of a certificate of occupancy. Though simple, this approach fails to distinguish between buildings on the basis of value or size. While it could be a minor burden on a developer of a large commercial building, the same tax could act as a strong disincentive to builders concerning smaller projects.

The second form of taxation would be to have a single rate applied to some measure of project size. Two measures of size are feasible. The tax rate could apply to the number of square feet of space being constructed. Many of the municipal ordinances imposing contribution requirements on developers are using various rates applied to the square footage in a project. We have not identified a reliable source on the number of square feet of new nonresidential and residential construction expected in New Jersey. We are pursuing these data and hope to report on the tax rates that would be necessary if the number of square feet is selected as a tax base.

A second option, and the one selected for this Report, is to base the tax on the dollar value of new construction. Estimates for new commercial construction are available in a short term forecast of the U.S. economy prepared by Chase Econometrics (July 29, 1986). The figures are projections of value put in place for industrial buildings, offices, and other commercial construction. We averaged the quarterly data expressed in rates to arrive at a yearly value.

The value of new residential construction was based, in part, on Chase Econometrics forecasts, plus a series of additional calculations. The first value estimated was the number of housing starts expected in New Jersey. By averaging the quarterly rates for New Jersey housing starts, forecasted by Chase Econometrics, we developed an annual figure. To find the value of these new houses, an average price had to be calculated. The average price of new housing was estimated by Chase as a quarterly figure. We assumed that each house would take approximately six months to build. Therefore, we valued each house two quarters after it was listed as a housing start. We then calculated an average yearly market value of the new residential construction in New Jersey from the quarterly figures.

Since the tax would be levied on the developer, rather than on the new home buyer, an additional adjustment was required. To estimate the cost of new construction rather than the market price, we relied on the fact that the cost of residential construction was a fairly standard percentage of the total market value of new housing units including land and builder's return. The percentage we used, 49.2 percent, was based on estimates of the cost of residential construction (see Residential Building Permits, Department of Labor, Trenton, New Jersey, November 1986), and on Chase estimates for the market value of new homes.

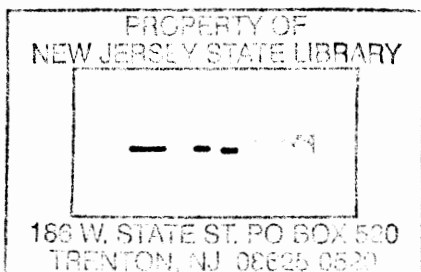
The absolute dollar amount of a possible two percent tax on the value put in place in residential construction would be calculated as follows. Based on the available data, the average price for a new house in New Jersey was projected to be \$144,000. Under the methodology described earlier, the tax base would be 49.2 percent of the figure, or \$70,848. Using a two percent tax rate, the average tax on each new house would be \$1,417.

To confirm our results, we prepared several alternative estimates of the tax base using other indicators of the value of new construction, such as the number of building permits issued and the national value of residential construction. The estimates used for the calculations were consistent with those we derived using these other estimation techniques.

In closing, we should note that it is entirely feasible to increase the absolute size of the tax base by applying the tax rate to each unit's selling price. If this were done, there would be relatively little change in the tax per building. Increasing each unit's value by some percentage would result in a correspondingly lower tax rate. Since the goal is to raise a given dollar amount of funds, the tax cost per unit would not be changed.

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# III.

## NEW JERSEY PROPERTY TAX REFORM: A PROPOSAL\*

### INTRODUCTION

Although the share of property taxes in New Jersey's total tax revenues has recently experienced a decline, it still remains an important segment of New Jersey's tax structure. Due to its specific patterns of distribution, this tax is of special public policy interest.

In Section I trends in the property tax burden are examined. Although there is no single measure of the property tax burden, changes in the overall burden of the property tax are documented by such indicators as: per capita property tax in constant dollars, per capita total property tax as a percent of personal income, total property tax of homeowners as a percent of total gross income and the changes that have occurred in municipalities with high property tax to income ratios. New Jersey's property tax as a percentage of personal income is also compared to a similar national indicator.

In Section II we analyze the available data on property tax distribution by income classes and municipalities. The limitations of these data are discussed and the importance of market value assessment for fair intra-municipality distribution of property tax is illustrated with actual data on under-valuation of assessment in relation to actual market value.

Section III develops a measure that would address the most important concern related to property tax distribution, namely, the relatively high property tax burden for poor and low income homeowners. The intention of the suggested measure is to maximize the relief for low-income taxpayers without the need to increase other taxes. It is shown that an equivalent relief to low income taxpayers by an overall reduction in property taxes would require dramatic increases in other tax revenues and may cause a redistribution between the household and the business sectors.

### I. NEW JERSEY PROPERTY TAX LEVEL IN PERSPECTIVE

No tax, and for that matter, no increase in tax payments, is popular. However, the property tax has for years attracted special attention. Some negative features of this tax have been widely analyzed and there is no need to replicate these here.\*\* It seems, however, that one characteristic of the property tax that contributes to its negative perception has not received much attention. Increases in property tax payments are more explicit and visible than are increases in the two other major taxes. The collection of income taxes increased from \$656 million in FY 1977 to \$1,260 million in FY 1982, without any change in the tax rate. This implies that the dollar amount paid by the average taxpayer in-

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\*Prepared by Jerzy Zachariasz, Office of Economic Policy.

\*\*New Jersey Tax Policy Committee, The Property Tax, Report 2, Trenton, N.J., February 23, 1972.

Table 3.1  
New Jersey Property Tax  
(1970 dollars)

Year	Total Tax Collection (\$ million)	Per Capita	
		Amounts	Index 1977 = 100
1972	\$2,125.1	\$289.64	111.5
1973	2,104.0	286.85	110.4
1974	2,039.8	278.09	107.1
1975	2,036.8	277.45	106.8
1976	2,112.7	287.68	110.7
1977	1,907.1	259.76	100.0
1978	1,812.4	246.39	94.9
1979	1,749.3	237.25	91.3
1980	1,725.2	234.24	90.2
1981	1,753.6	236.85	91.2
1982	1,785.6	240.07	92.4
1983	1,810.3	242.41	93.3
1984	1,815.5	241.58	93.0

Source: New Jersey Department of Treasury, Division of Taxation, Annual Report, Fiscal Year 1985, Trenton, N.J., p. 183.\*

creased by about 60 percent in five years without an explicit tax rate increase. The situation is similar in the case of the sales tax. Here tax collections increased from \$905 million in FY 1977 to \$1,300 million in FY 1982 with no change in tax rates or coverage.

Despite the awareness of its deficiencies, the property tax still remains the most important form of local tax revenue. Currently, real property is the only significant tax base which can be directly tapped by local authorities.

#### Absolute Level of the Property Tax

Per capita property taxes increased in nominal values by over 100% in the 1972-1984 period. How-

ever, in real terms there has been a substantial decline since 1972 (Table 3.1) in constant 1970 prices, 1984 per capita property taxes were \$241.58 compared with \$289.64 in 1972, a decline of over 16%. In the period 1977-84, the decline was seven percent. It should be noted that there was a slight increase in real per capita property tax in the years 1980-83 (from \$234.24 to \$242.41).

#### Relative Level of the Property Tax

Property tax payments as a percentage of personal income are considered a proxy for the property tax burden. By that measure, Table 3.2 shows that the decline of the property tax is even more pronounced. In 1972, statewide total property taxes as a percentage of personal

\*The Implicit Price Deflators for state and local government purchases of goods and services is used in Table 3.1. Other deflators may result in a smaller or larger real tax decline.

Table 3.2  
New Jersey Property Tax as Percentage of Personal Income  
1972-1984

Year	Property Tax Collected* (\$ million)	Personal Income** (\$ million)	Property Tax as Percent of Income	
			Percent	1977 = 100
1972	2,323.7	40,824	5.7	112
1973	2,465.7	44,511	5.5	108
1974	2,629.0	48,289	5.4	106
1975	2,853.8	51,628	5.5	108
1976	3,165.0	56,182	5.6	110
1977	3,138.5	61,245	5.1	100
1978	3,223.9	67,716	4.8	94
1979	3,393.3	74,069	4.6	90
1980	3,675.6	84,425	4.4	86
1981	4,054.3	94,083	4.3	84
1982	4,394.4	102,022	4.3	84
1983	4,765.5	110,383	4.3	84
1984	5,165.5	120,745	4.3	84

\*New Jersey Department of Community Affairs, Statements of Financial Conditions of Counties and Municipalities (various issues).

\*\*18th Annual Report of the Economic Policy Council and Office of Economic Policy, Trenton, 1986.

income were 5.7 percent. By 1984, that indicator was 4.3 percent, or 25 percent lower. During the more recent period, 1977-84, the decline was 16 percent, i.e., from 5.1% to 4.3%.

The ratio of property taxes to personal income is a broad indicator because it relates the total tax to total personal income. The amount of property taxes collected includes payments by industrial and commercial property owners in addition to residential property owners. On the other hand, personal income includes income of the whole population irrespective of home ownership. It is therefore of interest to investigate the trends in the property tax to income ratio for homeowners alone.

Reports of the Research and Statistics Section of the Division of Taxation issued after the enactment of New Jersey gross income tax makes it possible to relate property taxes to incomes of homeowners only. Every year homestead rebate claims are matched with state income tax returns for a large number of homeowners and the results are published. Based on those data, we calculated the property tax to income ratio for the years 1977-1984 (see Table 3.3). The results are similar to that of the broad measure of the "tax burden" shown in Table 3.2. The ratio of property tax to income of homeowners was 5.5 percent in 1977 and by 1984 that ratio was 4.5 percent, a decline of 18 percent in seven years.

Table 3.3  
Property Tax as a Percentage of "Gross Income"  
Owner Occupied Housing Statistic  
1977-1984

Year	Property Tax Collected \$ million	Gross Income \$ million	Property Tax as Percent of Income	
			Percent	1977 = 100
1977	1321.9	24,212.0	5.5	100
1978	1413.0	27,981.1	5.0	91
1979	1498.3	31,369.0	4.8	87
1980	1662.5	35,734.6	4.7	85
1981	1817.2	39,078.7	4.7	85
1982	1942.6	42,199.3	4.6	84
1983	2155.3	46,584.2	4.6	84
1984	2336.3	52,360.9	4.5	82

Source: New Jersey Department of the Treasury, Division of Taxation, Owner Occupied Housing Statistics from Homestead Rebate and Income Tax Data Match (various issues).

Similar declines were also registered for the effective tax rates. These rates are a ratio of municipalities' property tax to the "true" or market value of property. The market value of property is derived by adjusting assessment values using the assessment to sales ratio.

The effective tax rates have been declining steadily since 1972 (see Table 3.4). In the period 1972-1977 that decline was from 3.66 per-

cent to 3.01 percent, or over 17 percent. In the period 1977-1984 the decline was about 14 percent. The similarity between the trends in the two relative measures of the property tax burden (property tax as a percent of income and as a percent of market value of property) suggest that there was a close correlation between income growth and growth in the market value of property at the statewide level over the period examined here.

Table 3.4  
Property Tax as Percentage of Property Value

	Tax Levy \$ million	Market Property Valuation \$ million	Tax Rate %
1972	\$2,452.2	\$66,937	3.66%
1977	3,307.4	108,050	3.01
1984	5,359.9	205,970	2.60

Source: New Jersey Department of Community Affairs, Statement of Financial Conditions of Counties and Municipalities (various issues).

### New Jersey vs. Other States

Interstate comparisons of the tax level are more problematic than comparisons over time involving an individual state. In a time series analysis of an individual state, we deal with the same entity and although some structural changes may have taken place over the period, as a rule these changes are not drastic. When comparing New Jersey with other states, we must keep in mind that other 'states' economic and fiscal conditions may differ substantially from those in New Jersey.

For example, in New Jersey a significant number of residents commute to neighboring states to earn their income but use the local services in New Jersey. The property tax is the most efficient way to have commuters cover their share of the cost of providing local services. New Jersey also has the highest population density of all states and there may be some merit in taxing such a scarce resource as land which is an important component of overall property value.

There is also a good reason to believe that the level of services that are traditionally financed by property taxes are higher in New Jersey than the average level in other states. Those differences are ignored when we compare one state with the United States average. With all these reservations, it is still of interest to compare the New Jersey relative property tax level with that of the nationwide average (see Table 3.5).

To compare New Jersey's relative property tax level with that of other states, we use the Bureau of the Census data which may differ from state data, if only because they are for fiscal years. In FY 1984-85 New Jersey's property tax as a percentage of personal income was 1.23 percentage point higher than the average for all states (4.67% N.J. vs. 3.44% U.S.) This difference has, however, narrowed since FY 1980 when New Jersey's indicator was 1.59 percentage points higher than the all-states average (5.14% for N.J. vs. 3.55% for the U.S.).

Table 3.5  
Property Tax as a Percentage of Personal Income  
New Jersey vs. All States Average

	New Jersey	United States	Percentage Point Difference
1979-1980	5.14	3.55	1.59
1980-1981	4.96	3.47	1.49
1981-1982	4.85	3.41	1.44
1982-1983	4.87	3.47	1.40
1983-1984	4.84	3.53	1.31
1984-1985	4.67	3.44	1.23

Source: United States Department of Commerce, Bureau of the Census, Government Finances (various issues).

## II. DISTRIBUTION OF PROPERTY TAX

### Disaggregation of the Property Tax (Municipalities)

Thus far we reviewed the tax burden at the state level. However, the property tax is a local tax and the dollar value of the tax (per household) differs from municipality to municipality and so do respective levels of income. As a result, the ratio of property tax to income, which is the most important measure of property tax burden, may show significant disparities among municipalities. The existence of disparities should not be a surprise. If for simplification we assume that the property tax in an individual municipality is a function of expenditures only, expenditures would have to be in perfect correlation to income across municipalities to avoid disparities in the tax burden.

While there is actually a positive correlation between the level of income and the level of local expenditures, that correlation is not perfect. Lower income municipalities can't reduce their expenditures proportionally. High income municipalities may not need to have proportionately higher local expenditures. There are also other factors that affect the ratio of property tax to income. One factor is that residential homes are not the only source of property tax revenue, and low income municipalities tend to have a higher proportion of property tax revenue derived from industrial and commercial property owners. This may result in somewhat lower property tax rates than would otherwise be expected.

In Tables 3.2 and 3.3 we presented changes in the average property tax burden for the State as a whole. It is clear that a change in the State average is a function of changes in individual communities. Although the State average tax de-

clined, it is possible that some municipalities experienced a substantial increase in their tax burden. Of special interest are those municipalities with a relatively high property tax to income ratio. There are 23 municipalities with populations over 15,000 where the 1984 ratio of homeowners' property tax to their income exceeded 5.5 percent, or one full percentage point (22%) above the statewide average of 4.5 percent.

All but four of these 23 municipalities experienced a decline in property tax burden in the period 1977-1984 (see Table 3.6). The aggregate of the 23 municipalities shows a decline from 7.4 percent in 1977 to 6.6 percent in 1984 although this decline is somewhat less than that of the State as a whole (see Table 3.2).

Changes in the homeowners' property tax burden are, of course, a function of changes in the tax level and changes in the gross income level. It is crucially important to note that the smaller decline (1977-1984) in the relative tax level in high tax burden municipalities was entirely a result of smaller increases in homeowners' gross income in comparison to the increase for the State as a whole. Homeowners gross income increased statewide by 116 percent in contrast to only 92 percent for the 23 municipalities, while the increases in property taxes were lower for the 23 municipalities than for the State -- 69.4 percent vs. 76.7 percent.

It is of interest to note that the average population of the 23 municipalities is about 60,000. This indicates that a high property tax income ratio is more likely in large municipalities. It should also be noted that New Jersey has four cities with population over 100,000 and three of these four cities are on the list of high tax burden municipalities.

Table 3.6  
Municipalities Where 1984 Homeowners' Property Taxes  
Exceeded 5.5 Percent of Their Income  
(population over 15,000)

Municipality	Population 1984 (1)	Per Capita Personal Money Income* 1983 (2)	Homeowners Property Tax as a Percent of Gross Income**	
			1977 (3)	1984 (4)
Newark	318,098	\$5,897	6.5	5.6
Jersey City	222,532	7,481	7.4	6.1
Paterson	139,564	6,444	6.5	7.3
East Orange	77,228	8,029	9.4	8.8
Irvington	62,513	8,971	9.0	6.5
Union City	56,559	7,049	11.3	9.4
Passaic	53,941	7,243	6.2	5.9
Bloomfield	47,557	11,495	8.5	7.7
North Bergen	47,219	9,870	7.3	7.0
Hoboken	41,735	7,913	9.3	7.0
West New York	41,162	7,732	9.4	7.9
Montclair	38,485	15,583	7.3	5.6
Belleville	35,680	10,453	8.4	7.2
Orange	31,472	9,156	8.6	6.6
Long Branch	29,250	9,448	6.6	5.6
Nutley	29,059	12,265	7.9	6.9
Garfield	26,870	9,448	6.1	6.5
Bergenfield	25,660	11,814	6.8	6.5
Lodi	23,671	10,385	6.9	7.5
Maplewood	22,762	14,804	7.0	5.9
Hawthorne	18,564	11,511	6.4	5.7
Dumont	18,167	11,831	6.7	6.4
Asbury Park	16,587	7,196	6.9	8.1
Total Selected Municipalities			7.4	6.6
N.J. Total		11,179	5.5	4.5

\*New Jersey Department of Labor, Per Capita Money Income Supplement 1979-1983, November, 1985 (latest available).

\*\*New Jersey Department of the Treasury, Division of Taxation, Owner Occupied Housing Statistics from Homestead Rebate and Income Data Match (various issues).

Table 3.6 also presents 1983 data (1984 data are not available) on the per capita money income of the 23 municipalities and the State. This is a broad indicator of the average money income related to the whole population (not only homeowners) and is presented here for reference. A review of col. 2, Table 3.6 reveals that of the 23 municipalities 16 had per capita personal money income below the state average. In the period 1979-1983, the state average per capita personal money income increased by 37.6 percent. However, all but three of the 23 municipalities had a lower increase than the statewide increase (see Appendix 1). This result points out the importance of restoring economic growth, at least to the statewide average in New Jersey's urban areas.

#### **Intra-Municipal Distribution of the Property Tax**

The average municipal property tax income ratio does not reveal intra-municipal disparities. In most municipalities there is significant variation in households' income and, hence, a different relation of income to the assessed home value, to which a uniform (for the municipality) tax rate is applied.

The property tax to income ratio would be the same for individual homeowners only if there is a perfect correlation between the house value of individual homeowners and their income. However, the correlation between house value and current income cannot be -- even in principle -- perfect for several reasons. Different families with the same income will value housing services differently compared to other items of consumption. Housing "consumption" does not adjust as easily to changes in current income, as is the case with other consumption items. If a

middle-income family experiences a drop in current income (let's say because of temporary unemployment), that family is not likely to change its home to a less expensive one for the period of unemployment. On the other hand, a modest increase in current income will probably not induce a simultaneous change to a higher-priced house.

Since 1977, statistics on property tax and house assessment by income group have been published by the Division of Taxation of the New Jersey Department of the Treasury. The statistics are based on matched homestead rebate and income tax data and are presented by counties and municipalities.

The data presented in that publication have, however, serious limitations for our evaluation of the relations among house value, property tax and income. First, the data are incomplete. Out of 1.5 million homestead rebate records, about 1.2 million were matched. In some large urban municipalities, only 50 percent of homeowners are included in the matched data. Second, the data on income are for the "gross income" as defined by the New Jersey income tax law. "Gross income" is, to a degree, a net income measure -- after several exclusions are made such as pension income and other types of retirement income, up to \$10,000. Also, all indicators shown by income classes are aggregated into nine groups. However, the classes have a very uneven distribution: three classes represent two-thirds of the number of total matched tax returns, while six classes cover the remaining one-third. The shares of individual groups of the total vary from 1.3 percent to 25.6 percent. Finally, the house values are given only at assessment value. For many municipalities this assessment does not reflect the current housing market.

Table 3.7  
Distribution of Matched Data Averages by Income Groups  
1984

Income Group	Percent of Homeowners (1)	Value of Average Assessment (2)	Property Tax			
			Average (3)	Index <\$5,000 = 100 (4)	Average Gross Income (5)	Property Taxes/Income (6)
No Gross Income	1.3%	\$44,694	\$1,454		--	--
Under \$5,000	4.7	43,322	1,472	100	2,830	52.0%
5,000 - 9,999	6.5	44,876	1,539	105	7,466	20.6
10,000 - 14,999	6.4	45,704	1,609	109	12,535	12.8
15,000 - 19,999	7.0	45,751	1,633	111	17,531	9.3
20,000 - 24,999	7.6	45,922	1,658	113	22,550	7.4
25,000 - 34,999	17.8	47,396	1,695	115	30,087	5.6
35,000 - 49,999	23.2	53,111	1,863	127	41,960	4.4
50,000 and Over	25.6	80,485	2,619	178	93,476	2.8
Total	100.0	\$56,458	\$1,934	131	\$43,346	4.5

Source: New Jersey Department of the Treasury, Division of Taxation, Owner Occupied Housing Statistics from Homestead Rebate and Income Tax Data Match, December 1985.

With these caveats about the data, Table 3.7 presents available information by income group. Column 3 shows that the average property tax for homeowners with income under \$5,000 is \$1,472. This increases to an average of \$2,619 for homeowners with income over \$50,000. That increase of the property tax is, however, much less than the respective income differential. As a result, the ratio of property tax to income increases dramatically as income declines (col. 6). Some comments are in order here. It is fair to assume that the statistical deficiencies of the data, especially incompleteness of the income data, contributes to this picture. Some homeowners who are, for example, in the under \$5,000 income class may, in fact, have significant pension income that is by definition not included in the data presented. That is one of the basic inadequacies of the data.

There is, however, an important "real" factor that also contributes to the regressivity of the property tax: namely the distorted valuation of real property on which the tax distribution is based. It is true that the dollar amount of taxes to be raised in a municipality in a given year does not depend on the aggregate value of the municipality's property. However, the distribution of the tax to individual property owners is determined by the assessed value of the properties. If the valuation of taxable property (the relative values) is distorted, so is the property tax. Data on true (market) property values are not available by income group. There is, however, available information on the ratio of assessment to sales price of houses sold in 1984 grouped by the level of sales prices attained. A review of these data for several urban municipalities shows that houses which are

Table 3.8  
Assessment vs. Sales Price  
One Municipality with Population Greater Than 100,000  
1984

Property Value Group (\$)* (1)	Midpoint Sales Price (\$) (2)	Assessment to Sales Ratio* (3)	Percent of Undervaluation (%) (4)
0 - 15,999	7,500	99.4%	0.6
15,000 - 29,999	22,500	40.4	59.6
30,000 - 49,999	40,000	26.8	73.2
50,000 - 74,999	62,500	19.9	80.1
75,000 - 99,999	87,500	17.0	83.0
100,000-149,999	125,000	14.1	85.9

\*Source: New Jersey Department of the Treasury, Division of Taxation, Office of Tax Analysis and Local Property Branch of the Division, Average Assessment/Sales Ratio in New Jersey by Taxing Districts by Property Class, Jan. 1985.

recently (1984) sold at relatively higher prices are assessed much lower than houses for which the recent sales prices are low. This relationship is systematic. The higher the actual price, the lower the assessment to sales price ratio.

This implies that more valuable houses are proportionately more under-assessed than lower-priced homes. Obviously, higher-priced houses are likely to be owned by higher-income families. Data presented in Table 3.8 illustrate this point in one of the municipalities with over 100,000 population.

Column 4 shows that houses that were sold for prices between \$15,000 and \$30,000 were undervalued (for tax purposes) by 59.6 percent. The percent of undervaluation for houses sold at prices \$100,000 - \$150,000 was 85.9 percent.

There is a good reason to believe that the link between income of residential owners and their property value is closer when that property value reflects recent sales prices

than when it reflects assessment values. A review of the assessment to sales ratio data suggest that a reevaluation of assessment according to recent sales prices of residential property would significantly reduce the regressivity of the property tax.

Our conclusions from the analysis of Sections I and II are:

-- New Jersey has made, by any measure, substantial progress in reducing the overall burden of the property tax since the early 1970's (Tables 3.1, 3.2 and 3.3).

-- Taken at face value, the New Jersey property tax burden is substantially higher than the national average. Such a comparison does not take into account differences in the level of services and other factors that determine different levels of property tax burden in individual states (Table 3.5).

-- The difference between New Jersey's tax burden and the national average declined substantially since 1972 (Table 3.5).

-- In spite of progress in reducing the overall property tax burden, that burden still remains relatively high in municipalities with a large share of low-income individuals, although most of these municipalities also registered a decline in the burden of property taxes over the period (Table 3.6).

-- Income growth in many of these municipalities has lagged behind the statewide average.

-- Although there are significant data problems, the property tax burden for low income households is relatively high (Table 3.7).

-- A systematic reassessment of residential property would significantly reduce the regressivity of the property tax (Table 3.8).

### III. THE REGRESSIVITY ISSUE

A review of data on property tax payments in New Jersey implies that the most negative attribute of that tax is a relatively high burden for poor and low-income households.

The situation can be improved by a selective reduction of the property tax where it is most burdensome, namely, for low-income families, and in municipalities where economic conditions are unfavorable, or by a general reduction in the overall property tax level.

It seems logical that a selective property tax reduction would be a more effective solution than a general reduction. A selective reduction addresses the main concerns without the need for a major re-shuffling of other segments of the tax system. A general reduction, to be an effective relief to the poor, must be sizable and would therefore require a substantial increase in other tax revenues that may carry

with them their own complicated redistribution effects.

### Household vs. Business in an Overall Property Tax Reduction

Property taxes must be levied at the same rate on both business and residential property. Under that rule any property tax reduction will benefit the business sector automatically. If only personal income taxes are increased to offset the property tax reduction, a shift of tax burden from business to households will result. The following data illustrate this result.

The amount of property tax revenue collected in New Jersey in 1984 was \$5,165 million. About two-thirds, or \$3,477 billion of that revenue was paid by owners of residential property and one-third, or \$1,688 billion by other property owners.

If we assume a reduction of property taxes by 30 percent, the value of such a reduction would be \$1,043 million for residential owners, and \$507 million for non-residential property owners for a total of \$1,550 million.

To be revenue neutral, \$1,550 million must be raised in other taxes. If, as it is sometimes suggested, the reduction in property taxes would be balanced by an increase in the personal income tax only, that increase would require almost a doubling of the average existing income tax rate.

The amount of property tax reduction benefits for residential owners would be \$1,043 million, while the increase in income taxes would amount to \$1,550 million. The household sector will pay on balance about one-half billion dollars more than it receives from a property tax reduction of 30 percent. Alternatively, if the one-half billion dollars is to

be raised by increasing business taxes, it would require, for example, an increase in the Corporation Business Tax of over 50 percent.

The data presented above pertain to the statewide level. Since the proportion of property tax paid by homeowners and businesses differs across municipalities, so would the proportion of benefits of the tax reduction. To illustrate, we present (in Table 3.9) a sample of municipalities with relatively high and relatively low ratios of business benefits to homeowners' benefits\* (col. 4, Table 3.9).

For simplicity we assume that all municipalities will lower property taxes uniformly by 30 percent and the State will increase income taxes to raise the total amount of property tax reduction and then compensate municipalities for their property tax reduction.

Column 1 of Table 3.9 shows the per capita dollar value of the loss of property tax revenue that must be offset by a subsidy from the State.

Column 2 represents the value of benefits to the resident homeowners.

Column 3 shows the benefits to business which is also the amount by which the loss of revenue exceeds the benefits to homeowners for each municipality. This represents the amount of the initial transfer from the household sector to the business sector if the loss of revenue is offset by an increase of income tax.\*\*

Column 4 relates the transfer value (col. 3) to the value of homeowners' benefits (col. 2). For example, a 30 percent reduction of property tax amounts to \$206.40 per capita in Middleton, while the respective reduction for a homeowner amounts to \$174.60. The difference (\$31.80) represents the transfer from homeowners to the business sector (col. 3). For Newark, the per capita transfer amounts to \$70.10, for Bayonne \$101.30, and for New Brunswick \$79.50.

#### A Selective Reduction of Property Tax

A targeted, selective reduction of the property tax can be implemented by a redesign of the homestead rebate so that its level for individual claimants would take into account their income levels.

Presently the homestead rebate is determined as follows:

\$1.50 per \$100 of \$10,000 of equalized value, or two-thirds of equalized value, whichever is less, plus 12.5% of the effective tax rate in the municipality wherein the rebate is claimed, multiplied by \$10,000 of equalized value or two-thirds of equalized value, whichever is less.

An additional rebate of \$50 is paid to claimants who are age 65 or older, qualified disabled and surviving spouses.

If we leave out situations where two-thirds of equalized property

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\*For the purpose of illustration, we define a high ratio to be 100% and over and a low ratio to be 25% or less.

\*\*The ultimate incidence of such a tax change as the one examined here is significantly more complicated, as the increase in personal income taxes may affect labor mobility, wage rates, sales, profits and business investment decisions in difficult to detect, but significant, ways.

Table 3.9  
Transfer Indicators of 30% Tax Reduction Offset by Income Tax  
\$ Per Capita

Municipality	Population (0)	Total Tax Reduction (\$) (1)	Resident Property Tax Reduction (\$) (2)	Transfer (\$) (1) - (2) (3)	Transfer (%) (3) - (2) (4)
Atlantic City (H)	36,701	609.3	63.9	545.4	854
Hoboken (H)	41,735	109.8	33.5	76.3	227
Linden (H)	37,474	215.1	67.3	147.8	220
Newark (H)	318,098	104.4	34.3	70.1	204
West New York (H)	41,162	134.2	48.2	85.9	177
Union City (H)	56,559	128.2	50.4	77.8	154
Hackensack (H)	35,725	266.6	106.9	159.7	149
Perth Amboy (H)	38,413	154.4	63.1	91.3	144
Jersey City (H)	22,532	123.5	54.1	69.3	128
Bayonne (H)	63,731	183.4	82.1	101.3	123
North Bergen (H)	47,219	219.6	99.8	119.8	120
Lawrence (H)	21,381	288.1	130.7	157.4	120
New Brunswick (H)	40,485	147.3	67.8	79.5	117
Kearny (H)	35,348	182.9	84.9	98.0	115
Piscataway (H)	43,291	237.8	111.0	26.8	114
North Brunswick (H)	29,885	235.1	110.4	124.7	113
Elizabeth (H)	107,621	120.6	57.3	63.3	110
South Brunswick (H)	18,453	348.8	166.8	182.0	109
Gloucester (L)	48,857	157.6	126.3	31.3	25
Washington Twp. (L) (Gloucester Co.)	30,416	153.4	124.6	28.8	23
Pemberton (L)	30,800	74.2	60.8	13.4	22
Marlboro (L)	22,260	221.9	183.8	38.1	21
Montclair (L)	38,485	313.0	259.8	53.2	20
Jefferson Twp. (L)	16,736	177.8	148.7	29.1	20
Hazlet (L)	23,016	148.0	124.0	24.0	19
South Orange (L)	15,779	355.0	298.3	56.7	19
Middletown Twp. (L)	66,874	206.4	174.6	31.8	18
Point Pleasant (L)	18,155	175.2	148.1	27.1	18
New Milford (L)	16,630	198.3	168.6	29.7	18
Berkeley (L)	27,398	159.5	136.3	23.2	17
Manapalan (L)	22,419	203.2	172.1	31.1	15
Ridgewood (L)	25,128	355.7	310.2	45.5	15
Westfield (L)	30,497	281.5	246.2	35.3	14
Maplewood (L)	22,762	300.5	266.6	33.9	13
Dumont (L)	18,167	216.3	193.5	22.8	12
Wycoff (L)	15,780	294.0	263.6	30.4	12
Willingboro (L)	39,319	128.8	119.4	9.4	8

(H) = High (100% or over)

(L) = Low (25% or less)

value is less than \$10,000, which means those situations where the equalized value of the property is less than \$15,000, the rebate calculation is simple:

\$150 + 12.5% of the effective rate in the municipality (wherein the rebate is claimed) applied to \$10,000.

Thus, the current rebate consists of a constant (\$150) and an amount determined by the level of the effective tax rate: the higher that effective tax rate, the higher the rebate. In most instances, high effective rates are in low income municipalities. The formula does not differentiate the rebate within the municipality and for all practical purposes is the same dollar amount for each homeowner in an individual municipality.

A selective property tax reduction could be designed to redirect the rebate toward low income households. Such a redistribution has two main options: a) retain the effective property tax rate as one of the fac-

tors that determines the rebate or b) ignore the property tax rates in redesign of the rebate. An example of a formula that would redistribute the rebate toward lower income households and retain the effective tax rate as a factor would be:

(a) tax rebate determined as it is today multiplied by a factor of 2.5, minus 0.6% of income.

In Table 3.10 we use the Treasury data income classes and rebate formula (a) above. Column 3 shows that under the suggested formula the average rebate would increase sharply for the lower income group and moderately for the middle income group. The average rebate for households with no income will increase by 150 percent, while for households in the \$25,000-34,999 bracket (with average income of \$30,087) that increase would be 54 percent. Column 7 shows that the suggested formula would reduce the average property tax by 39 percent in the lowest income group (no income) and 12 percent in the \$35,000-50,000 income class. The highest income group (\$50,000 and

Table 3.10  
Redesigned Homestead Rebate (a)  
1984

	Average Gross Income (1)	Average Rebate			Property Tax		Net Lower Than Nominal %
		Present (2)	New (3)	% Increase (4)	Nominal (5)	Net (6)	(7)
No Gross Income	---	\$225	\$562	150%	\$1,454	892	39%
Under \$5,000	\$2,830	217	525	142	1,472	946	36
5,000 - 9,999	7,466	213	488	129	1,539	1051	32
10,000 - 14,999	12,535	205	437	113	1,609	1172	27
15,000 - 19,999	17,531	199	392	97	1,633	1241	24
20,000 - 24,999	22,550	194	350	80	1,658	1308	21
25,000 - 34,999	30,087	190	294	54	1,695	1400	17
35,000 - 49,999	41,960	187	216	15	1,863	1647	12
50,000 and over	93,476	186	n.a.	n.a.	2,619	n.a.	n.a.

n.a.: not available

over) is too broad for calculating a meaningful modified rebate. It is clear, however, that for a large segment of families in that group, the new rebate would decline in comparison with its present level.\*

It should be noted that the projected rebate does not only depend on income level but also sustains the existing differentiation across municipalities based upon varying effective property tax rates. Thus, at the same level of income, the suggested rebate will be higher in municipalities with higher effective property tax rates. The variation in rebates, depending on the level of the effective property tax rate, seems to be justified by the fact that higher effective tax rates reflect, in most instances, relatively depressed property value due to unfavorable economic conditions in such municipalities.

Table 3.11 illustrates the values of suggested rebates by income

classes at three selected levels of effective property tax rates: 6%, 4%, 2% for each of the eleven income levels. Homeowners who live in municipalities with effective property tax rates of six percent would receive the highest rebates, which range from \$262 for families with income of \$50,000 to \$562 for families with no income. The respective figures for the two percent effective rate are \$437 (no income) and \$137 (\$50,000 income).

The additional annual revenues required to implement the suggested modification are estimated to be \$150 million. This annual cost of adopting a new rebate system could be financed, for example, by a repeal of the Homestead Tax Relief Act which costs over \$130 million. This Act allows deductions of property taxes from a taxpayer's taxable income. Taxpayers with incomes below \$20,000 can deduct \$3,250 if their property tax is lower than that, and for those with income above \$20,000 but below

Table 3.11  
Projected Rebate by Effective Property Tax Rate Levels

	Municipality Tax Rates of:		
	6%	4%	2%
0	\$562	\$500	\$437
5,000	532	470	407
10,000	502	440	377
15,000	472	410	347
20,000	442	380	317
25,000	412	350	287
30,000	382	320	257
35,000	352	290	227
40,000	322	260	197
45,000	292	230	167
50,000	262	200	137
Present Rebate	225	200	175

\*For example, a family with \$50,000 of income and currently receiving a rebate of \$186 would receive \$165 under the proposed formula.

Table 3.12  
Redesigned Homestead Rebate (b)

	Average Gross Income (1)	Average Property Tax (2)	Average New Rebate (3)	Average Present Rebate (4)
No Gross Income	--	\$1,454	\$552	\$225
Under \$5,000	\$2,830	1,472	525	217
\$5,000- 9,999	7,466	1,539	495	213
10,000-14,999	12,535	1,609	461	205
15,000-19,999	17,531	1,633	410	199
20,000-24,999	22,550	1,658	359	194
25,000-34,999	30,087	1,695	283	190
35,000-49,999	41,960	1,863	204	187
50,000 and Over	93,476	2,619	n.a.	186

n.a.: not available.

\$50,000, the respective minimum deductions are \$2,600 and \$1,857. Since the income tax is progressive, the benefit of deduction is, in some instances, higher for taxpayers with higher income. For example, a family with \$30,000 income and \$3,500 property tax receives an \$87 tax savings while a taxpayer paying the same property tax with an annual income of \$20,000 saves only \$70.

As noted earlier, the aim of redirecting the rebate toward low income families can also be achieved without the differentiation that reflects the levels of effective property tax rates. In this approach, the rebate can, for example, be determined as follows:

- (b) Thirty-eight percent of the claimants' property tax minus 1.2 % of gross income. Rebate cannot exceed \$552.

The average value of the rebate by income group using this formula is shown in Table 3.12.

The average "new" rebate (in Table 3.12) by income groups is based

on the average property tax and average gross income of those income groups. The dollar values of the average new rebate for individual income groups (Table 3.12, column 3) differ from those derived using formula (a) (Table 3.10, col. 3), but the differences are modest.

It should be noted that all calculations of the "new" rebate using either formula (Tables 3.10, 3.11, 3.12) are for illustration. The parameters can be adjusted to reflect a desired overall cost and desired degree of redistribution. The essential point is that changes in the existing rebate system offer an opportunity to address, in a meaningful and efficient way, the problem that property taxes represent for low and moderate income individuals.

#### IV. SUMMARY

New Jersey has made substantial progress in lowering the property tax burden. In spite of that progress, the tax burden remains relatively high for low-income households and

for municipalities with a large share of low-income households. This reflects the general situation that property values are not closely related to current income. An additional factor is that the assessed home values on which the property tax is based do not reflect the actual market values.

In principle, the situation can be improved by either a general or a selective property tax reduction. In order for general reduction to be an effective relief to the poor, it must be sizable and would, therefore, require a large increase in other tax

revenues. This may lead to a serious and complicated redistribution of the State's tax burden.

A selective reduction of the property taxes where they are most burdensome, namely, on low- and middle-income homeowners seems to be a more appropriate and effective solution. Such a solution can be implemented by redesigning the existing homestead rebate system in order to direct higher rebates toward low-income homeowners. To assure a meaningful level of rebate for the low and middle income homeowners, the overall cost of the rebate program may have to increase.

Appendix 1  
 Personal Money Income, 1979-83  
 Municipalities Where Homeowners Property Tax Exceeds 5.5% of Gross Income

Municipality	County	1979	1983	% Increase
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Newark	Essex	4,525	5,897	30.3
Jersey City	Hudson	5,812	7,481	28.7
Paterson	Passaic	5,060	6,444	27.4
East Orange	Essex	6,240	8,029	28.7
Irvington	Essex	6,611	8,971	35.7
Union City	Hudson	5,625	7,049	25.3
Passaic	Passaic	5,813	7,243	24.6
Bloomfield	Essex	8,409	11,491	36.7
North Bergen	Hudson	7,529	9,870	31.1
Hoboken	Hudson	5,421	7,913	46.0
West New York	Hudson	6,084	7,732	27.1
Montclair	Essex	11,508	15,583	35.4
Belleville	Essex	7,741	10,453	35.0
Orange	Essex	6,753	9,156	35.6
Long Branch	Monmouth	6,970	9,488	36.1
Nutley	Essex	8,870	12,265	38.3
Garfield	Bergen	7,029	9,448	34.4
Bergenfield	Bergen	8,670	11,814	36.3
Lodi	Bergen	7,653	10,385	35.7
Maplewood	Essex	10,661	14,804	38.9
Hawthorne	Passaic	8,453	11,511	36.2
Dumont	Bergen	8,638	11,831	37.0
Asbury Park	Monmouth	5,446	7,196	32.1
NEW JERSEY		8,127	11,179	37.6

# IV.

## SAVING INVESTMENT COSTS: IDB'S VS. ESOP'S\*

### I. INTRODUCTION

The tax reform of 1986 will, by 1990, all but eliminate a powerful program for inducing and retaining business in New Jersey. Begun in 1974, the State's industrial development bond (IDB) program has registered phenomenal growth since that time. In 1975, the New Jersey Economic Development Authority (EDA) sold \$47 million in tax-exempt bonds to finance job creation and economic expansion in the State. In 1984, EDA's loan totals reached \$1.113 billion for the year. A slight reduction to 1.069 billion was tallied for the year 1985, and in 1986 a drop to \$486 million in financings was registered as a result of new and anticipated federal tax law changes. Cumulative financings from 1975 through 1986 totaled \$6.95 billion.\*\*

It is the purpose of this Chapter to estimate the gains to industry produced by the bond program in the past and to suggest a possible replacement program. To this end, we first estimate the after-tax cost

savings of firms which have financed capital outlays with the proceeds of industrial development bond sales.

Quantifying the cost savings produced by revenue-bond financing assigns numbers to the potential financial savings provided by the program, but the ultimate test of effectiveness is whether or not firms actually respond to those incentives. Accordingly, the second step is to estimate an econometric model to determine the degree to which the bond program has actually procured the intended results, and to estimate investment and employment that will be lost as a result of the 1986 tax change.

Finally, one possible replacement program, involving the expansion of New Jersey's Employee Stock Option Plan (ESOP), is outlined and compared with the revenue bond approach. The analysis is confined to one approach -- the financing of investment -- since it is that aspect of ESOP that appears to be most promising.

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\*Prepared by Laurence H. Falk, Office of Economic Policy. We are grateful to the N.J. Economic Development Authority, especially to Richard L. Timmons, for furnishing data for this study. We are also grateful to Donald Scarry for verbal and written information on Employee Stock Ownership Plans and for his comments on a draft of this report.

\*\*Actually, IDB's per se totaled slightly less than these figures; the difference from 1975-1986 was \$56 million, 0.81 percent of EDA's total financial assistance to industry during that period. The \$56 million total represents conventional loans that are partly guaranteed by EDA plus EDA direct loans. For convenience, because the amount is small and because the effect of this non-IDB aid should not differ significantly from that of IDB's, we have not netted these sums from the totals.

## II. SAVINGS PROVIDED THROUGH IDB FINANCING

At this point, we want to satisfy two objectives: 1) to determine gains to firms produced by tax-exempt IDB financing, and 2) to determine losses to firms resulting from the tax-law change. The first and second objectives are actually identical: what is lost to firms through the change in the law is the same as what was previously gained from utilizing IDB's before the tax change. Moreover, the same figure may be used to establish the subsidy (or cash-flow equivalent) that the State would have to provide, directly or indirectly, if it were to make up the loss itself. Tax-exempt industrial development bonds provide interest savings to firms to finance investment. Yearly payments, covering principal and interest, are lowered because of the interest reduction, and other effects occur as well.\*

Bond buyers are willing to take the lower interest rates associated with tax-exempts, because after-tax interest can still net them as much or more than would higher interest taxable bonds. For example, all other things equal (e.g., bond rating, maturity and other provisions), a bank having a 46 percent marginal tax rate would be indifferent between owning tax-exempt

bonds having a yield of 6 percent and 11 percent taxable bonds. Individuals with a 50 percent marginal tax rate would consider 6 percent tax-exempt bonds to be the equivalent of 12 percent taxables, or individuals in the 25 percent bracket would accept equally 6 percent non-taxable and 8 percent taxable securities. At the given rates for taxable bonds, non-taxable interest rates greater than the six percent break-even rates will result in preferences for the tax-exempt bonds, establishing demand for them. This demand for tax-exempt bonds, given the supply on the market, establishes tax-exempt interest at rates lower than the taxable rate; over the past few years the ratio of tax-exempt to taxable interest rates has been about 77.5 percent -- a savings of 22.5 percent.\*\*

### The Investment Savings\*\*\*

We cannot directly use the 22.5 percent interest savings in estimating savings in financing investment. To make comparisons of alternative expenditures over time, we must first reduce the streams of expenditures to "present value" by discounting them by the firm's cost of capital.

A firm maximizing its return on investment will undertake all in-

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\*Basically, investment must be financed from three sources: debt, equity and internal funds. Throughout this report we compare IDB and ESOP financing to the debt alternative only. We may look at this comparison as occurring only when the equity and own-funds alternatives have already been rejected as being more costly than debt in the eyes of management. This is a logical approach since IDB or ESOP financing is, in fact, opting for debt over the other approaches.

\*\*Average for the interest rates for Corporate Aaa bonds (Moody's) and high grade municipal bonds (Standard and Poor's) for the years 1980 through 1985 as recorded by Council of Economic Advisors, Economic Indicators, September 1986.

\*\*\*The full savings (or differences in expenditures) approach is presented mathematically in the Appendix.

vestments which provide a rate of return greater than (or at least equal to) its cost of capital -- a weighted average cost of debt and equity funds. To see this, consider a firm which arrays all of its investment opportunities by rates of return, from high to low. If the firm accepts every project with a rate of return exceeding its cost of funds, it will maximize its net return (or total return minus total cost).

In competition, new investments can be expected to return the marginal rate of return, which equals the cost-of-capital. At the margin then, one dollar invested by the firm today will be worth one dollar plus  $n$  years' compound interest (at a rate equal to the cost of capital)  $n$  years hence. Conversely, the future amount, including the interest, is worth \$1 today and this present value amount can be arrived at by discounting the future value including accumulated returns, by the cost of capital. Thus, discounting a stream of future sums by the cost of capital provides a present-value amount which can be compared with the present value of other streams having different time profiles, such as principal and interest streams for payments having different interest rates.

Our computation of firm savings entails three time streams, all of which are discounted by the cost of capital. The first stream is the difference in taxable-bond annual payments and IDB, non-taxable bond payments. The second stream reduces the tax savings occasioned by lowered interest payments; it recognizes that, to the extent that less interest is paid under IDB's, more federal and state income taxes must be paid since interest payments are tax deductible. Finally, the third time stream is also a reduction in the IDB cost savings. Firms using IDB financing after the Tax Equity and Fiscal Responsibility Act of 1984

were required to use straight line depreciation rather than accelerated depreciation which was allowed under taxable bond financing. Depreciation is tax deductible, and accelerated depreciation produces a greater present value tax savings stream than does straight line.

We can summarize the savings accompanying IDB financing in the following statement of the three discounted streams. Total IDB savings just prior to the tax law change can be computed as the algebraic sum of:

The differences between discounted taxable-bond payments and discounted IDB bond payments

minus the difference between discounted interest streams (taxable and IDB) x firm's marginal tax rate

minus discounted differences between accelerated depreciation allowances and discounted straight-line depreciation allowances x firm's marginal tax rate

Estimated savings accruing to firms (or loss from no longer having IDB's) depend on a number of variables including cost of capital, interest rates (the before tax cost of debt), the type of depreciation taken by firms and the number of years over which it is taken. Cost of capital is, at best, an elusive concept. Logically, however, it is the cost per dollar of equity and debt financing for the marginal investment, with stockholders' anticipations of future dividends and growth determining the equity rate. Debt cost is the more easily estimated of the two as the actual borrowing cost (interest rate). While anticipations are only in the minds of the stockholders, it is clear that the cost per dollar of equity must exceed the cost per dollar of debt because of the added risk of equity:

equity is riskier than debt since payments to debt holders take preference over dividend payments. While the cost of capital is properly determined at the margin, it may be estimated as the overall weighted average of debt and equity rates with the firm's leverage ratios as the weights.

Cost of capital is, therefore, greater than the after-tax interest rate. (For Aaa bonds the interest rate has recently been about nine percent and our best estimate of the cost of equity is about 11 percent.) Assuming average firm debt leverage on the order of 15 percent, our best estimate of cost of capital for firms using IDB's is about 10 percent.

Table 4.1 below gives cost savings per thousand dollars of IDB's issued for plausible ranges of costs-of-capital, interest rates, depreciation periods and the highest marginal tax rates just prior to the new tax law (46% federal and 9% state).\*

Our estimate for savings is \$25.25/\$1000 given that bond interest rates have averaged close to 9 percent and our estimate of cost of capital is 10 percent. The amounts of IDB's issued in the last two fully effective program years of 1984 and 1985 totaled \$1.113 billion and \$1.069 billion. Thus, the yearly total after tax savings to firms in each of those two years is estimated to be \$1.1 billion x \$25.25 per 1000 or \$27.8 million in present value terms.

The \$27.8 million can be thought of as the yearly after-tax subsidy that would have to be provided if the

IDB loss were to be made up. But any subsidy would likely be in pre-tax funds -- money that would increase a firm's income taxes. Pre-tax, under the old federal income tax rates, the required yearly subsidy would be \$56.6 million to equal the inducing power of the IDB's, and this would pose a severe strain on the state budget if the State were to furnish the necessary funds.\*\*

Put another way, the cost to firms who must forego IDB's is estimated to be, in present value terms, 5.15% (\$56.6 million/\$1.1 billion) of the value of the total bonds issued. A firm investing \$1 million would lose \$51,500 (up front) compared to the IDB approach no longer allowed in most instances. It is hypothesized in the next section that the elimination of IDB's would have a negative effect on investment of firms and employment in New Jersey unless the program is replaced by something as effective (and, because of the budgetary constraints, something which is essentially costless to the State as is the IDB program).

We can vary some of the parameters used in Table 4.1 to see the effect on savings. If the firm financing investment would have chosen to use straight line depreciation, for any reason, whether or not it is financed with IDB's, the after-tax savings of IDB's would be greater than the \$25.25 million discussed above. For example, what we consider the most realistic estimate of savings would more than double from \$25.25 per \$1000 to \$54.32 per \$1000. Our estimate of \$25.25 per \$1000 is, therefore, conservative when this factor is considered. (The same in-

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\*Detailed calculations for cost savings estimations are in the Appendix.

\*\*There would be further impacts on the state budget: additional revenues and expenditures that accompany development. Although there would be some variation from place to place, it appears that these amounts would more or less cancel out.

Table 4.1  
Savings to Firms Per \$ Thousand IDB's Issued

Cost of Capital (%)	Taxable Interest Rate (Non-Taxable = .775 x Taxable) (%)	Discounted Cash Outflows without IDB's	Discounted Cash Outflows with IDB's	Savings (3) - (4)
(1)	(2)	(3)	(4)	(5)
9	7	357.63	343.45	14.18
	8	386.18	363.80	22.38
	9	416.01	384.98	31.03
10	8	353.34	336.10	17.24
	9	380.78	355.53	25.25
	10	409.38	375.73	33.65
11	9	349.66	329.40	20.26
	10	376.10	348.03	28.07
	11	403.58	367.36	36.22

Loans were assumed to be for a 20 year period.

Column (3) calculations based on 175% declining balance depreciation with switchover to straight line (federal) and straight line (state). Depreciable life 19 years federal, 40 years state.

Column (4) calculations based on straight line depreciation. Depreciable life 19 years federal, 40 years state.

Calculations assume 46 percent marginal federal and 9 percent marginal state tax rates. Details of calculations are outlined in Appendix A.

crease would have been obtained if the firm had been allowed to use accelerated depreciation under IDB financing. Using the same depreciation with IDB's as with taxable bonds would produce more than twice the total benefit. As accelerated depreciation was disallowed by the 1984 tax law, IDB's lost much of their glitter even prior to the tax reform of 1986; nevertheless, IDB's will remain an effective inducement until the 1986 tax reform has become fully effective.

If we shorten the payment period and the depreciable life span, the total savings remains substantial, but significantly decreased. If the payment period were 10 years, federal depreciation -- 10 years and state depreciation -- 20 years, the savings would fall to \$13.41 per \$1000 invested; if the firm would have used straight line depreciation in any event, the savings would be \$36.78/\$1000. For a payment span of 15 years, federal depreciation -- 15 years, and state depreciation -- 30 years, the figures would rise to \$19.41, and \$46.57 per \$1,000 if straight line depreciation were used.

IDB's provided **greater** savings to firms with marginal federal tax rates lower than 46 percent. In an extreme case, for a firm with no taxable federal income, but a marginal state rate of nine percent, a cost of capital of ten percent and a taxable interest rate of nine percent, the savings would be \$111.94 per \$1000 compared to the \$25.25 of Table 4.1.

Whatever the choice of parameters, significant savings were available for firm's financing investment with IDB's. We believe the \$25.25 per thousand dollars is a reasonable estimate of actual after-tax savings for the years immediately preceding the tax law change.\*

In the next section we attempt to measure whether IDB's have actually resulted in more investment and employment in the Garden State.

### III. THE EFFECTIVENESS OF IDB'S

To test the effectiveness of IDB's in New Jersey it was hypothesized that investment in manufacturing\*\* responded in a positive manner to EDA's bond issues and to total value added by manufacture in the State. The regression, which supported the hypothesis is described in more detail in the Appendix and the resultant equation was used to estimate total investment induced through IDB's at \$1.455 billion, in 1972 dollars, for the period from 1975 to 1986. This estimate appears reasonable compared to the \$3.556 billion, in 1972 dollars, total bonds issued over the period 1975-86. Our estimate of induced investment is less than total IDB's issued because not all bond issues would actually result in financing which would not have occurred in their absence.

Our estimated induced employment is 134,906 workers. This estimate was also obtained by regression analysis. Here it was hypothesized

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\*If the tax exemption for IDB's were still in effect, the tax rate adjustment may or may not cause a benefit reduction. There would not necessarily be a reduction, as some people believe; the final gain or loss depends on adjustment in the financial markets resulting from the tax rate reduction.

\*\*EDA's assistance to manufacturing firms totaled only 36 percent of the grand total of loans during 1975-1986, but data for non-manufacturing firms (other than EDA data) were not available for our analysis.

that New Jersey's total nonagricultural employment is positively related to investment in manufacturing (again, total investment is unavailable) value added of the previous year and nonagricultural employment in the U.S. net of New Jersey. Again we received support for the hypothesis (see Appendix) and our estimate for the total employment gains from IDB's during the period 1975-86 is 139,887. EDA's estimate of direct jobs created over the same period is 120 thousand. With a multiplier on the order of 2, the 135,000 figure is reasonable; some of EDA's 120,000 jobs would have occurred even in the absence of IDB's.

The IDB program has been of great benefit to the State. New Jersey's investment and nonagricultural employment have been significantly enhanced by New Jersey's use of industrial development bonds. Moreover, the cost to the State has been minimal. The savings to firms has resulted from the tax-exempt status of the bonds; hence, essentially, the federal government has borne the entire cost.\*

Because of the substantial economic development gains, it is very important that a replacement be found for the IDB program. It is suggested, in the next part, that strengthening the State's involvement in Employee Stock Ownership Plans (ESOP's) can go far toward filling the void created by the loss of the IDB program.

#### IV. EMPLOYEE STOCK OWNERSHIP PLANS (ESOP's)

ESOP's have been around for more than twenty years. They have been established in virtually every type of company in the United States ranging from small privately-held companies to some of the largest Fortune 500 firms.\*\* The original ESOP idea was to provide incentive to employers for putting shares of stock in the hands of employees. It was believed that employees would become more productive and more satisfied with their lot if they could become part owners of their employing companies. It was believed most desirable that employees be made "capitalists." To this end, ESOP promoters have for years lobbied for laws that would encourage companies to provide shares to employees. Some of the most powerful and effective lawmakers have been converted to the ESOP philosophy, and have written laws which have expanded and protected the approach.

Unfortunately, much of ESOP's publicity has concerned "employee buyouts" -- takeovers of weak or dying firms that cannot survive after changing hands. This has fostered some undeserved anti-ESOP sentiment. There are many facets to ESOP, and takeovers form but a small part. (But, even in this area, ESOP's are not necessarily useless or bad for the economy: employee buyouts can be a valuable tool for owners who wish to dispose of a closely-held firm -- at retirement, for example.)

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\*Even the federal government may not bear all of the **apparent** loss. Taxes forgone by the U.S. by the tax exemption may be offset to some degree, by additional income taxes generated when investment is actually added to that which would be produced in the program's absence.

\*\*ESOP Association leaflet, Washington, D.C., 1986.

Many options, with benefits of varying degree, are possible under ESOP laws. We believe that one option stands out above all others: financing investment through an ESOP trust or a "leveraged ESOP" as it is called. Accordingly, our analysis is confined to this one aspect, although we do describe some other gains that are possible under an ESOP program.

ESOP's have only recently emerged as important tools of corporate finance as well as innovative employee benefit programs. The 1984 Tax Act contained provisions providing large cash flow gains for firms utilizing ESOP's. For the most part, the 1984 stipulations have survived the 1986 tax reform, and, as a result, ESOP's can be expected to play an increasingly prominent role in the U.S. business world. Nationwide, some 8,100 firms have already established ESOP's, and the number is expected to increase dramatically in the future. Many corporations, both closely held and publicly held, are numbered among the Nation's ESOP companies including companies in the Fortune 500 listing. Over eight million workers participated in ESOP's in 1986. Combined assets of the trust funds total about \$20 billion.\*

#### Leveraged ESOP's

There are basically two types of Employee Stock Ownership Plans (ESOP's): 1) unleveraged and 2) leveraged. In the unleveraged type a corporation establishes a trust to hold stock contributed to the trust by the company for the account of its employees. The fund thus created is similar to stock-pension funds that have been in existence in numerous companies for many years. The major difference is that the fund of an unleveraged ESOP is made up primarily of the founding company's stock,

while other stock-pension plans have outside securities for the greatest percentage of their holdings. Leveraged ESOP's borrow funds which are used to finance company investments. We concern ourselves only with the second type of approach, the leveraged ESOP.

To set up a leveraged ESOP, a trust is established by the company for employee assets. The trust borrows funds (usually from a bank) using corporate guarantees, security interests, or, perhaps, pledges of the stock the trustees intend to buy. The borrowed money is turned over to the corporation for shares of stock in the company, and the shares become the property of employee members.

Loan proceeds are invested by the corporation, and repayment is made through annual payments to the trust. Simultaneously, the trust makes payments on its loan to the bank.

The payments of the company are considered to be contributions to an authorized pension fund and are, therefore, deductible in their entirety, principal and interest, in computing federal income tax liabilities.

In addition, financial institutions lending money to an ESOP can exclude from taxable income 50 percent of the interest income from the loan. Competition between lenders results in a rate to ESOP's that is below the market rate of fully taxable bonds.

#### ESOP Background

The 1983 Employee Stock Ownership Act authorized the New Jersey Commissioner of Commerce and Economic Development to encourage formation of ESOP's to help businesses acquire

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\*New York Times, March 21, 1987.

investment funds and to help avoid plant closures through employee buyouts. Since IDB's are now severely restricted as a tool for economic development, and in light of the important savings potential of ESOP's, this New Jersey law will likely be increasingly utilized. Some items of interest to corporations considering ESOP's in the State include:

#### 1. Employee Benefits

- Company contributions to ESOP may not exceed 25 percent of the total payroll of plan participants or \$30,000 per year for any participant whichever is less. (Exception: certain "highly paid" employees may receive contributions up to \$50,000.)

- Neither employees nor the ESOP trust pay any taxes on stock contributions or earnings. Tax is deferred until distribution at termination or retirement.

- Stock acquisitions are allocated to all participants normally based on annual wages or salaries, but they could be based on other factors including years of service or divided into equal portions for participants.

- Vesting occurs after a relatively short time. There is 100 percent vesting after five years of service, or 20 percent after three years increasing to 100 percent after seven years.

- An employee reaching age 55 can demand that 25 percent of his account be diversified into other assets; at age 60 the percentage increases to 50 percent. ESOP must offer at least three options to meet these diversification requirements.

- There are many permissible times and methods of distribution of employees' ESOP benefits, but they

must start soon after death or age 65. Distribution may be made in a lump sum or through installments.

#### 2. Company or Non-Employee Shareholder Benefits

- Shareholders (including the owners of closely held companies) selling stock to ESOP's may "roll-over" proceeds from the sale. To defer taxation, proceeds need only be invested in the securities of other domestic corporations.

- Dividends paid to ESOP's are tax deductible. In no other instances are corporations allowed to deduct their dividend payments.

- Often heirs have difficulty raising cash to pay estate taxes. Sometimes companies must even be liquidated to pay these taxes. ESOP's can assume estate tax liabilities by acquiring stock from the estate and paying the taxes over many years. Until 1992, there is also a 50 percent estate tax deduction for stock sold to the ESOP.

#### 3. Mergers, Acquisitions and Takeovers

- Employees and management may wish to buy out a closely held company or a division (because, for example, a large shareholder is retiring or seeking liquidity) or bid against a competing firm which is attempting a buyout. An ESOP trust is created which then borrows the necessary funds for purchasing the company's stock.

- Mergers and acquisitions can be financed through leveraged ESOP's. Publicly-held companies can also use ESOP's to go private.

- An ESOP can provide an effective takeover defense by placing a large block of shares in the hands of sympathetic shareholders leveraging

the firm's assets in a manner which protects it against takeover by outsiders.

• Employees may undertake a leveraged buyout of a company which would otherwise close its doors, but this is not recommended for a weak or failing company which would only pass its inherent problems to the employee company. The ESOP trust borrows the necessary money from the bank secured by the assets of the old company with payment guaranteed by the new company. The ESOP uses the funds to buy the new company's stock. The monies received by the company buys plants, equipment and inventories of the old company and a portion is retained for working capital. The new company contributes sums thereafter to ESOP sufficient for repayment of the loan. ESOP members become owners of the new company which repays the loan, and any subsequent borrowing, with payments that are fully tax deductible and which carry low interest rates.

#### Employee Productivity

One important benefit remains which can accrue to employers, employees and to the economy overall. This is the benefit of increased employee productivity. Potentially, the gain in employee productivity can be quite large because, under ESOP, employees become owners of the company who are vitally interested in its profitability and ability to pay dividends. But while employers report substantial productivity gains, no figures are available to substantiate these claims.

Although we tend to accept statements attesting to significant productivity gains during good times, we also feel that the gains can be diminished, or perhaps lost al-

together when profits are reduced by, say, recession. The actual situations remain empirical questions.

#### One Drawback

There appears to be only one objection to ESOP's on the part of employers: Their control of their companies is diluted as employees gain more and more shares. However, loss of control need not be the case. In publicly traded companies, voting rights must be passed through the ESOP trust to employee participants. In closely held companies, voting pass through is required on some matters in some states. But in closely held companies in New Jersey it appears that no voting pass-through is ever required.\*

#### Savings: ESOP vs. Non-ESOP Debt

In the following calculations, two savings are considered: 1) the deductibility of payments, principal and interest, and 2) the reduced interest rate resulting from excludability of interest income. But as we have seen, there are many other benefits accruing to ESOP's and the corporations which establish them. No attempt is made to quantify those other benefits in this report.

In a previous section we examined the savings provided by industrial development bonds which have been lost as a result of the new tax laws. It is our objective in this section to find out to what degree this loss could be offset by firms adopting ESOP's. To answer this question we need to compare the ESOP gain, under the new tax law, to the IDB gain (or loss) under the old.

Again, we can consider cash outflows in the form of payments and cash inflows of tax savings from

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\*New Jersey Department of Commerce and Economic Development, Office of Urban Programs, Employee Stock Ownership Plan (ESOP), undated.

interest and depreciation deductions. We need not concern ourselves with depreciation deductions however (under the new guidelines), since depreciation flows under the new guidelines are the same for ESOP's as they are for normal non-ESOP financing. Hence, there is no difference arising from depreciation deductions.

Total ESOP savings under the new tax law are the algebraic sum of:

Cost of non-ESOP loan = discounted loan payments minus the combined state and federal tax rate times discounted interest payments.

minus Cost of ESOP loan = discounted payments minus (federal tax rate times discounted payments) less (state tax rate times discounted interest payments\*).

Table 4.2 presents cost savings, per thousand dollars of loan amount, for plausible ranges of costs-of capital and interest rates and for the highest marginal tax rates now in existence (34% federal and 9% state). The interest rate for ESOP loans (7.521% below fully taxable) is lower than the fully taxable rate because half of the interest is excluded from interest income. Under the old tax law, when the total federal and state tax rate was 50.86 percent, interest was about 22.5 percent below the taxable bond rate. The tax rate applicable to ESOP payment deduction is 34 percent, representing the federal, but not state, rate because the

state allows deduction of interest payments only, rather than the entire payment. Estimated ESOP interest will therefore be  $(.34/.5086)(.5)(.225) = 7.521$  percent lower than the fully taxable market rate.

The table shows ESOP gains which exceed by far the IDB savings (losses from the new tax law) of Table 4.1. Our best estimate of the ESOP benefit (cost of capital 10%, interest 9%) is \$154.34 compared to only \$25.25 per thousand dollars in Table 4.1. It is reasonable to infer, therefore, that ESOP could reach as many firms as has the highly successful IDB program.\*\*

The difference is likely to remain large for other plausible parameters. Shorter-term borrowing improves the ESOP benefit (vs. the decrease seen under IDB's). When the marginal tax rate goes down, the benefit from ESOP's dwindles; while the opposite is true for IDB's. A decrease in the marginal federal rate by 50 percent, from 34 to 17 percent, would decrease the ESOP-IDB difference\*\*\* from  $(\$154.34 - \$25.25 = \$129.09)$  to  $(\$81.04 - \$25.25 = \$55.80)$  per thousand dollars. To eliminate the ESOP saving, the marginal federal rate would have to fall below six percent. With any likely federal tax rate, the saving from ESOP financing is greater than that produced by IDB's before the tax change.

In the above calculations, we have not attempted to quantify one possible offset to the savings redemption of shares necessitated by

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\*ESOP loan payments are totally deductible for federal, but not for state, tax purposes; however, interest payments remain deductible in calculating state taxes.

\*\*ESOP total would exceed that of savings IDB's, but this may be offset to some degree by the fact that IDB's sometimes have gone to developers who would not have sufficient employees for establishing an ESOP trust. However, firms who would be potential candidates appear to be on the order of 79% of the IDB issues of the past four years.

\*\*\*IDB savings calculated at pre-1986 low tax rate in both cases.

Table 4.2  
Savings to Firms Per \$ Thousand ESOP Loans  
Term of Loan -- 20 Years

Cost of Capital	Taxable Interest Rate	Discounted Cash Outflows Without ESOP's (Payments-Inflows from Deduction of Interest Payments)	Discounted Cash Outflows with ESOP Loans	Difference
(1)	(2)	(3)	(4)	(3) - (4)
9	7	668.30	505.68	162.62
	8	705.34	540.08	165.25
	9	743.85	575.60	168.25
10	8	654.85	503.07	151.78
	9	690.47	536.13	154.34
	10	727.39	570.19	157.20
11	9	642.93	500.87	142.06
	10	677.24	532.67	144.57
	11	712.69	565.34	147.35

employees retiring (or otherwise terminating). We believe that while companies using ESOP's must plan (or fund) for redemption, they should not normally feel that redemption entails a cost offsetting benefit obtained from deductibility of payments and reduced interest rates. Our reasoning considers two cases under which ESOP financing might be used: 1) The employer, in providing a "pension" program with ESOP's would have provided an equivalent pension plan anyway, or made an equivalent addition to his present plan; or 2) The employer, for some reason, would not have provided a pension plan, or addition, if it were not for ESOP financing.

Under the first case, it can be argued that the present-value cost of redeeming shares is essentially the same as the cost of the pension plan the employer would have provided anyway, i.e., there is no net cost of redemption.

In the case 2 situation, logic seems to tell us that there is a cost, but on further consideration, the "cost" may not be real. If the employer really feels that he gains nothing by providing pensions and would not provide an alternative plan (or supplement) if it were not for ESOP's, then the cost of an ESOP plan will be greater than the benefit. As was seen earlier, the estimated bene-

fit provided by ESOP's over alternative financing is estimated at \$159/\$1000 of investment. The employee shares represent all funds borrowed for investment, therefore, in present value terms, redemption will cost \$1000, which exceeds the \$159 benefit.

However, other potential benefits have not been considered. We think it very unlikely that employers believe that pensions for employees provide no benefits for their companies. Otherwise, profit-maximizing employers would not install pension plans. Even if pensions are the result of union pressure, there are benefits from the peaceful labor relations that are fostered.

Ultimately, employer benefits are provided because productivity will likely be enhanced by employees sharing in the ownership in the company. If this is so, a full comparison of benefits and costs would need to include the present value gains from higher productivity.

On balance, we do not believe the redemption question is of great importance to our analysis. In the first case, which we believe covers a large percentage of firms, the redemption cost is irrelevant. In the second case, we can make no absolute determination, but it seems likely that employers will consider the investment-financing savings as we have calculated them, and consider the benefits of higher productivity to equal or exceed the cost of redemption.

In any event, the State need not be concerned that all investors will benefit from ESOP's. Although some may not find ESOP's meeting their needs, it is clear to us that others will.

As an approach to investment for many firms then, ESOP's provide significant cost savings, savings that

exceed, by far, those that were yielded by industrial development bonds before the new tax law. Since the IDB approach has been a clear success in New Jersey, the State should accelerate and intensify its promotion of ESOP's under existing, or if necessary, new statutes.

Probably the most effective way to increase the use of ESOP's in the State is to provide expert assistance to any interested corporation. In the past, the State Economic Development Authority (EDA) has given its guidance to firms which were interested in obtaining IDB financing. Perhaps the ESOP program could be placed under EDA's auspices since the expertise of that agency -- especially working with banks who lend for investment under the present IDB program -- can be readily adopted to ESOP financing. The State Department of Commerce, especially the Division of Economic Development, and the Office of Urban Programs should also intensify their efforts in helping firms obtain ESOP's using advertizing and other promotional means and coordinating their activities with EDA.

#### ESOP as an IDB Substitute

By one criterion, ESOP's can be a potent IDB substitute. Financing investment under a leveraged ESOP can provide savings that are greater than those that were provided by IDB's. There are differences, however, including the most important two which follow:

1. Under some circumstances, voting of shares is diluted by employee stock ownership. Control of the company may be jeopardized. Under most situations, however, this need not be the case. The ESOP trust votes the stock, but usually at the direction of management.

2. ESOP's favor closely-held companies over publicly-held companies. The closely-held company need not

lose voting control under an ESOP, but publicly-held companies can give up control. Under IDB financing no voting rights are forfeitted.

## V. SUMMARY

To summarize the salient aspects:

Prior to the new tax law, IDB's provided significant savings over other methods of borrowing for investment. But if an employer is providing a pension plan anyway, ESOP's can yield savings that far outpace those of IDB's. Other aspects of ESOP's must be considered. Only one item appears to be to the firm's detriment: ESOP shares dilute firm ownership, but since closely-held companies essentially vote ESOP stock themselves (through the trustees they have appointed), they relinquish no control; publicly-owned companies with ESOP's do yield some control however, since the trust must vote according to the wishes of employee-owners of the stock.

The remaining ESOP factors are highly beneficial to the firm. The most significant seem to be these two:

1. Productivity gains can be realized. Employee's become part-owners of the firms and, presumably, this motivates them to push for increased output and profits.

2. Large savings can be achieved by the firm in using ESOP's influencing investment, both through a lowered interest rate and, more importantly, the full deductibility of loan payments.

Other ESOP benefits are also available to the firm, management and shareholders as well as employees. Since ESOP's can provide economic viability for firm's utilizing them as well as encourage company investment and expansion in New Jersey, the State should vigorously promote their use as a replacement for the no longer available IDB's.

APPENDIX

A-1. IDB SAVINGS

Savings produced by IDB's (which also represent the loss of benefits resulting from the 1986 tax law changes) equal the cost of investing using taxable borrowing less the cost of investing under IDB financing. Three types of payment streams are considered for each of the two financial approaches: 1) discounted annual payments, 2) discounted tax savings from interest payments, and 3) discounted tax savings from depreciation deductions. Each of the three streams for interest-taxable and IDB financing are covered below.

Interest-Taxable Financing

1. Discounted annual payments. The stream of constant yearly payments discounted by the interest rate must equal the total loan amount.

$$K_o = P_t \sum_{t=1}^n (1+i)^{-t}, \quad (1)$$

where  $K_o$  is the total loan amount,  $P_t$  is the payment in year  $t$ ,  $n$  is the life of the loan, and  $i$  is the interest rate. Solving, the yearly payment equals:

$$P_t = \frac{K_o}{\sum_{t=1}^n (1+i)^{-t}} \quad (2)$$

and the payments discounted by the cost of capital  $r$  over the life of the loan total:

$$\frac{K_o}{\sum_{t=1}^n (1+i)^{-t}} \sum_{t=1}^n (1+r)^{-t} \quad (3)$$

For each \$1,000 lent for 20 years with interest of 9% and cost of capital equal to 10%, the discounted payments stream totals \$932.63.

2. Discounted tax savings from interest deductions. The tax savings for any years equal the tax rate  $T = (.46 + .09 - .46 (.09))$ , for the federal rate plus the state rate minus the federal deduction of state tax, all times the interest part of the payment in that year

$$TP_t = \left[ 1 - (1+i)^{-(n-t+1)} \right] \quad (4)$$

and the discounted sum of the tax savings from interest payments equals:

$$TP = \sum_{t=1}^n \left[ 1 - (1+i)^{-(n-t+1)} \right] (1+r)^{-t} \quad (5)$$

Given the tax rate of .5086, the total loan of \$1,000, the 9% interest rate and 10% cost of capital, the discounted tax savings on interest is \$308.38.

3. Discounted tax savings from depreciation deductions for any year  $t$  are calculated as:

$$T_f D_t^f + T_s D_t^s \quad (6)$$

with  $T_f$  = the federal tax rate (.46), and  $T_s$  the state tax rate less the federal tax offset (.09 - .09 (.46)),  $D_t^f$  is federal depreciation (175% declining balance - 19 years) and  $D_t^s$  is state depreciation (straight line over 40 years). Total tax savings discounted may be represented as:

$$T_f \left[ \sum_{t=1}^{n'} \frac{D_f}{(1+r)^t} \right] + T_s \left[ \sum_{t=1}^{n''} \frac{D_t^s}{(1+r)^t} \right] \quad (7)$$

where  $n'$  is federal depreciation life (19 years in the example) and  $n''$  is state depreciable life (40 years). Federal depreciation is taken as 175% declining balance with switchover to straight line on the undepreciated balance when the latter becomes greater. For our calculation (7) becomes \$243.47.

### Tax-exempt IDB Financing

1. Discounted annual payments. The calculation is as in (1) above except the interest rate is the non-taxable rate (estimated at .775 times the taxable). The total of discounted payments is \$802.06.

2. Discounted tax savings from interest deductions. Computed as in (5) above but with the new (lower) yearly payments. Total interest savings discounted are \$232.13.

3. Discounted tax savings from depreciation. Calculated as in (3) above but federal depreciation is straight line over 19 years and state depreciation is straight line over 40 years. Total discounted depreciation equals \$214.40.

Finally, the difference between conventional and IDB financing is computed by subtracting the algebraic sum of the three parts for IDB financing from the sum of the three parts calculated for conventional financing

$$\begin{aligned} & \$932.63 - 308.38 - 243.47 - (802.06 - 232.13 - 214.40) \\ & = \$25.25 \text{ per } \$1,000 \text{ of loan} \end{aligned}$$

A-2. ESOP SAVINGS

Considering only 1) the interest rate reduction flowing from the provisions allowing banks (and others) lending to ESOP's to pay income tax on only half of the interest income, and 2) the full tax deductibility of payments (principle and interest) by companies to ESOP trusts, we estimate the savings of firms yielded by financing investment through borrowings from such trusts.

The relevant comparison is now between costs of investing from taxable debt under the new tax law and the cost of using ESOP financing. Under the conventional debt approach, we need to obtain the difference between discounted payments and the taxes saved by the deduction of interest. For ESOP financing we need only calculate  $(1 - \text{federal tax rate}) \times$  discounted payments, since for federal tax purposes total payments, principle and interest are tax deductible. For the State, however, only interest payments are tax deductible, so we must subtract  $.09 \times$  discounted interest.

We begin with the cash outflows rising out of investment using debt with taxable interest payments. As in (3) above the discounted cash outflows represented by annual payments on the loan equal:

$$\frac{K}{\sum_{t=1}^n (1+i)^{-t}} \cdot \sum_{t=1}^n (1+r)^{-t} \quad (3a)$$

For \$1,000, 20 years, interest 9% and cost of capital 10%, discounted payments total \$932.63. And we calculate the tax savings from interest payments as in (5) above; however, the relevant maximum marginal tax rate (T) is now .3994 instead of the .5086 rate prior to the 1986 change.

$$T'P_t \sum_{t=1}^n \left[ (1-(1+i)^{-(n-t+1)}) \right] (1+r)^{-t} \quad (8)$$

Given the new total (federal and state) tax rate, a loan of \$1,000, the 9% interest and 10% cost of capital, the discounted tax savings from interest payments total \$242.16.

Net discounted outflows for conventional borrowing = (3a) - (8) = \$690.47 for the case selected.

ESOP financing costs  $(1 - T') P'_t$  each year, with  $T' = .34$ , the highest marginal federal tax rate, and the yearly payment  $P'_t$  computed on a lower interest rate ( $i'$ ) for ESOP loans equal to 92.479% of the taxable rate of interest; less an offset representing to the State's allowance for interest payments each year.

The ESOP payment is:

$$P'_t = \frac{K_o}{\sum_{t=1}^n (1+i')^{-t}} \quad (9)$$

and the after tax discounted stream of payments totals:

$$(1 - T'_f) \frac{K_o}{\sum_{t=1}^n (1+i')^{-t}} \cdot \sum_{t=1}^n (1+r)^{-t} - T'_s P'_t \sum_{t=1}^n \left[ 1 - (1+i)^{-(n-t+1)} \right] (1+r)^{-t} \quad (10)$$

For  $T' = .34$ ,  $T_s = .09$  a \$1,000 loan, 20 years, interest = 92.479% of the 9% fully taxable rate, and cost of capital 10%, the net cost outflow from ESOP financing is \$586.13, a \$154.34 saving compared to the conventional loan.

Cochrane-Orcutt regression analysis was used instead of ordinary least squares to eliminate a problem of autocorrelation. (The estimates from the two approaches, however, were not materially different.) The basic regression for deflated investment in manufacturing in the State was over the period 1956-1984.

$$\begin{array}{rcll}
 (8) \text{ KXD} & = & C & + \text{VAD}(-1) & + \text{IDBSAV}(-1) & & R^2 & = & .7804 \\
 & & 4.147597\text{E}07 & 7.268172\text{E}02 & 10.4475 & & F(2,25) & = & 44.4188 \\
 & & (.335185) & (6.64063) & (3.91665) & & DW & = & 1.9871 \\
 & & & & & & \text{Observations} & & 28
 \end{array}$$

KXD - investment in New Jersey deflated by the implicit price deflator for nonresidential investment

C - constant term

VAD(-1) - Value added in New Jersey lagged one year and deflated by the producer price index for all finished goods.

IDBSAV(-1) - IDB's in New Jersey lagged one year and deflated by the implicit price deflator for nonresidential investment and multiplied by the difference in interest rates for taxable (Baa) and non-taxable (municipal) bonds. As constructed, this variable moves with the savings produced by industrial development bonds.

Numbers in parentheses are t- statistics. VAD(-1) and IDBSAV(-1) are both significant at the 99 percent probability (.01 significance) level.

EDA's total financings from 1975-86 were \$6.951 billion. Deflated and lagged each year, multiplied by the saving in interest rate, and multiplied by the coefficient of IDBSAV(-1) yields an estimate of real (72 \$) induced investment of \$1,454,681,000.

The equation obtained for New Jersey nonagricultural employment was:

$$\begin{array}{rcll}
 (9) \text{ NJNAEM} & = & C & + \text{KXD} & + \text{T} & + \text{VAD}(-1) & + \text{EUSMINJ} \\
 & & -5.141356\text{E}07 & 9.273992\text{E}-05 & 26,465.2 & 1.991833\text{E}-05 & 2.04290\text{E}-02 \\
 & & (-2.88010) & (1.96655) & (2.91013) & (3.15810) & (6.01365) \\
 & & & & & & \\
 & & & & & & R^2 & = & .9985 \\
 & & & & & & F(4,23) & = & 3713.36 \\
 & & & & & & DW & = & 1.5378 \\
 & & & & & & \text{Observations} & & 28
 \end{array}$$

NJNAEM - Total nonagricultural employment in New Jersey.

C - constant term.

KXD - As before

T - Time (1956, 1957,...1984)

VAD(-1) - as before

EUSMINJ - Nonagricultural employment in the U.S. (net of New Jersey)

Numbers in parentheses are t- statistics. The four variables are all significant at the 95 percent probability level (KXD using 1-tailed test).

Employment is estimated by multiplying the investment result of the first equation (8) times the coefficient of investment in the second (9). The estimate obtained (134,906) for the entire period 1975-86 appears to be reasonable considering EDA's estimate of 121,510 direct jobs. (If only 70,000 of the direct jobs were actually created by IDB's, i.e., the balance would have occurred anyway, the multiplier which is about 2 would put the total at 140,000).



V.  
STATISTICAL TABLES



**Table 1**  
**POPULATION AND EMPLOYMENT, NEW JERSEY, 1960 - 1986**

Year	Resident Population (000's)	Work/ Labor Force (000's)	Total Employment (000's)	Unemployment		Insured
				Number (000's)	Rate (%)	Unemploy- ment Rate (%)
*1960	6,066	2,507	2,337	168	6.7	5.7
1961	6,222	2,543	2,355	185	7.3	6.0
1962	6,370	2,575	2,415	159	6.2	5.2
1963	6,503	2,618	2,448	169	6.4	5.4
1964	6,614	2,655	2,490	162	6.1	4.8
1965	6,720	2,724	2,582	140	5.1	3.9
1966	61821	2,790	2,665	123	4.4	3.2
1967	6,917	2,803	2,701	102	3.6	3.4
1968	7,012	2,829	2,730	99	3.5	3.3
1969	7,103	2,898	2,805	93	3.2	3.3
*1970	7,171	2,996	2,859	138	4.6	4.4
1971	7,281	3,012	2,840	172	5.7	5.4
1972	7,335	3,117	2,935	182	5.8	5.1
1973	7,333	3,190	3,011	180	5.6	4.7
1974	7,332	3,226	3,023	204	6.3	5.7
1975	7,338	3,264	2,929	334	10.2	7.8
1976	7,340	3,318	2,973	346	10.4	6.4
1977	7,337	3,383	3,065	317	9.4	5.6
1978	7,351	3,457	3,209	248	7.2	5.1
1979	7,367	3,570	3,323	247	6.9	4.7
*1980	7,365	3,594	3,334	260	7.2	4.7
1981	7,406	3,593	3,330	263	7.3	4.3
1982	7,428	3,632	3,306	326	9.0	4.7
1983	7,464	3,673	3,385	288	7.8	3.8
1984	7,511	3,828(r)	3,592	236	6.2	3.1
1985	7,561	3,853(r)	3,617(r)	218	5.7	3.0
1986	7,620(p)	3,892	3,696	196	5.0	2.6

\*Population figures for 1960, 1970 and 1980 are April 1 census counts. Estimates for intercensal years are as of July 1, and those estimates from 1981 to 1986 are subject to revision.

\*\*For data prior to 1967, persons involved in labor-management disputes are included in total workforce and excluded from employment and unemployment. After 1966, persons involved in labor-management disputes are included in employment.

NOTES: The rate of insured unemployment is based on weekly averages of insured unemployment (State UI Program) expressed as a percent of the average total number of jobs covered by the State Unemployment Compensation Program.

- Work/labor force, employment and unemployment estimates are adjusted to latest benchmarks.

- Labor force estimates for 1970 to 1986 are published data obtained directly from the Current Population Survey conducted for the U.S. Department of Labor.

(r) - revised. (p)- provisional

SOURCE: N.J. Dept. of Labor, Division of Planning & Research.

**Table 2**  
**WAGE AND SALARY WORKERS IN NONAGRICULTURAL ESTABLISHMENTS, MAJOR INDUSTRY DIVISIONS,**  
**New Jersey, 1960-1986 (in thousands)**

Year	Total Non-Agricultural Payroll Employment	Manu- facturing	Mining	Contract Construction	Trans- portation & Public Utilities	Wholesale & Retail Trade	Finance, Insurance & Real Estates	Services and Miscellaneous	Govern- ment
1960	2,017.1	808.8	3.5	98.7	149.5	374.5	88.0	252.0	242.1
1961	2,033.6	791.5	3.4	100.0	150.1	380.1	90.6	264.2	253.6
1962	2,095.8	812.8	3.4	101.3	150.8	393.1	92.8	279.9	262.8
1963	2,129.4	809.4	3.5	101.2	151.9	405.3	94.5	291.5	272.1
1964	2,168.7	806.7	3.6	106.8	153.4	420.0	96.6	301.6	280.0
1965	2,259.0	837.5	3.5	110.6	157.0	438.5	98.6	315.6	295.4
1966	2,359.1	879.3	3.0	111.2	162.2	459.6	101.0	330.8	312.0
1967	2,421.5	882.8	2.8	112.2	166.3	472.0	104.7	351.6	329.2
1968	2,485.2	885.3	3.1	115.6	166.3	489.5	108.4	372.6	344.4
1969	2,569.6	892.5	3.3	118.1	176.2	514.9	111.3	393.2	360.1
1970	2,606.2	860.7	3.2	120.4	182.2	538.0	116.5	410.4	374.8
1971	2,607.6	818.3	3.0	117.6	181.1	558.3	120.4	421.0	338.0
1972	2,674.4	823.3	3.2	121.6	181.2	577.3	124.6	437.9	405.3
1973	2,760.8	842.6	3.3	126.8	186.4	596.9	131.0	456.8	417.1
1974	2,783.4	825.9	3.2	118.7	185.8	603.5	136.5	469.9	439.9
1975	2,699.9	747.9	2.8	99.2	174.3	599.3	135.2	471.1	470.2
1976	2,753.7	756.2	2.7	93.9	176.0	618.5	138.0	488.0	480.5
1977	2,836.9	767.3	2.9	94.5	178.2	637.3	142.9	509.8	504.0
1978	2,961.9	786.8	2.6	105.3	188.5	665.9	147.7	542.2	523.0
1979	3,027.2	799.1	2.6	113.7	190.4	678.6	153.9	571.0	517.8
1980	3,060.4	781.0	2.4	111.2	194.5	680.3	158.1	603.1	529.7
1981	3,098.9	771.1	2.3	108.7	196.5	690.6	161.8	638.9	529.0
1982	3,092.7	729.6	2.1	107.3	197.1	701.2	167.1	663.3	524.7
1983	3,165.1	715.1	2.0	112.1	203.0	735.3	172.7	703.7	521.2
1984	3,329.3	726.8	2.2	131.3	219.4	787.3	183.0	757.3	522.1
1985	3,414.3(r)	713.0(r)	2.2	141.0(r)	226.0(r)	813.2(r)	194.9(r)	792.8(r)	531.1(r)
1986	3,486.9	692.8	2.2	153.5	229.8	832.8	208.9	831.2	535.7

Series have been adjusted to March 1986 benchmarks. (r) - revised  
 SOURCE: New Jersey Department of Labor, Division of Planning and Research.

Table 3

## WAGE AND SALARY WORKERS IN MANUFACTURING, DURABLE GOODS, NEW JERSEY, 1960-1986 (in thousands)

Year	Total Durable Goods	Lumber & Wood Products	Furniture and Fixtures	Stone, Clay & Glass Products	Primary Metal Industries	Ordnance and Fabricated Metals	Machinery Except Electrical	Electrical Machinery	Transportation Equipment	Instruments & Related Products	Miscellaneous Manufacturing Industries
1960	436.8	5.7	9.8	33.7	42.6	54.8	61.0	122.3	48.5	31.7	26.8
1961	421.9	5.6	9.0	34.4	40.7	54.2	57.3	119.5	41.7	31.9	27.6
1962	436.3	5.8	9.7	34.6	40.1	56.1	60.3	125.2	42.5	32.4	29.9
1963	426.0	5.7	8.9	34.9	38.6	55.7	60.1	121.7	39.0	32.9	28.7
1964	419.1	5.6	9.0	35.6	37.9	57.2	61.4	115.1	35.6	31.0	30.7
1965	438.7	5.6	9.4	36.9	39.8	60.8	65.4	118.4	36.8	32.7	32.9
1966	463.4	5.2	10.5	39.3	40.4	64.7	70.8	129.9	36.4	34.3	31.9
1967	464.6	5.0	11.0	39.1	38.6	66.2	75.0	131.1	32.0	36.5	30.0
1968	460.9	5.3	10.2	38.8	38.5	67.5	75.8	127.6	31.7	35.8	29.7
1969	463.3	5.2	11.0	40.9	39.4	69.8	76.2	124.5	31.4	34.7	30.2
1970	434.3	4.9	10.5	39.6	37.2	67.0	72.8	115.2	26.3	33.2	27.5
1971	404.6	4.5	10.6	39.0	33.3	62.9	66.3	104.6	25.3	32.4	25.6
1972	405.9	5.1	10.8	39.9	31.8	63.5	65.8	102.9	25.7	35.1	25.2
1973	420.5	5.3	10.6	40.8	32.0	66.2	72.1	108.1	25.3	34.4	25.9
1974	413.2	5.0	10.3	40.5	31.2	64.4	76.1	105.1	21.1	33.9	25.6
1975	363.1	4.6	8.9	36.0	26.1	58.1	68.4	88.1	19.3	31.2	22.4
1976	363.0	5.3	8.7	36.1	23.9	59.4	67.5	86.8	19.8	31.3	24.0
1977	370.0	5.8	8.9	35.1	23.0	61.1	71.0	87.9	20.7	32.0	24.5
1978	382.8	6.0	10.0	35.2	24.5	64.1	74.2	89.8	20.9	32.3	25.7
1979	395.9	6.7	10.3	35.3	25.5	64.5	76.4	92.9	21.6	35.6	27.1
1980	384.3	5.9	9.7	33.1	25.7	60.8	75.1	92.2	18.5	37.2	26.1
1981	374.7	6.1	9.6	30.9	25.4	58.8	72.5	91.6	17.5	37.1	25.3
1982	350.1	5.5	9.9	27.1	21.8	54.3	66.5	90.9	14.7	35.7	23.6
1983	341.6	5.9	10.5	26.8	20.7	50.9	60.9	93.1	15.1	34.2	23.5
1984	346.2	6.4	12.6	26.2	21.6	51.1	59.9	95.0	16.1	33.5	23.9
1985	337.4(r)	6.7	12.9(r)	25.2(r)	20.9(r)	50.1(r)	59.1(r)	93.5(r)	14.7(r)	33.6(r)	20.8(r)
1986	324.2	6.8	13.0	24.5	19.9	49.2	55.9	89.8	12.0	32.8	20.2

Series have been adjusted to March 1986 benchmarks. (r) - revised

SOURCE: New Jersey Department of Labor, Division of Planning and Research.

Table 4  
WAGE AND SALARY WORKERS IN MANUFACTURING, NONDURABLE GOODS, NEW JERSEY, 1960-1986 (in thousands)

Year	Total Non-durable Goods	Food & Kindred Products	Tobacco Manufactures	Textile Mill Products	Apparel and Related Products	Paper Allied Products	Printing Publishing & Allied Industries	Chemicals & Allied Products	Petroleum, Refining & Related Industries	Rubber & Miscellaneous Plastic Products	Leather and Leather Products
1960	372.0	62.9	1.7	31.4	77.7	28.0	32.3	86.4	11.5	29.2	11.0
1961	369.6	63.9	1.6	29.1	76.4	28.1	32.6	87.0	11.1	29.2	10.8
1962	376.5	64.2	1.5	28.6	75.8	29.7	33.0	91.0	10.7	30.7	11.5
1963	383.4	64.9	1.4	27.9	74.5	31.4	34.6	94.8	10.5	31.7	11.7
1964	387.6	65.0	1.5	27.8	74.6	31.5	35.8	96.4	9.7	34.2	11.2
1965	398.8	66.4	1.4	28.5	77.3	31.3	37.5	98.9	9.8	36.0	11.5
1966	415.9	67.2	.8	29.6	80.3	33.0	39.6	105.5	10.5	37.2	12.2
1967	418.1	65.3	.6	29.1	78.5	33.7	41.5	110.9	9.6	37.7	11.3
1968	424.5	64.5	.3	30.5	78.7	34.5	42.2	113.1	9.7	39.9	11.5
1969	429.2	63.2	.3	30.8	77.2	35.0	43.3	117.4	10.0	41.4	10.6
1970	426.4	63.5	.3	29.6	72.3	35.3	44.8	120.9	10.1	40.0	9.6
1971	413.7	61.7	.3	29.4	68.9	35.9	43.8	117.5	10.1	36.8	9.4
1972	417.4	59.8	.3	30.5	68.9	35.9	46.0	119.3	10.6	37.2	8.9
1973	422.1	68.7	.2	31.3	68.7	36.8	46.9	124.1	10.9	35.5	9.0
1974	412.7	56.7	.2	28.8	63.1	35.4	47.8	126.6	11.8	34.0	8.4
1975	384.9	53.6	.2	24.5	57.9	32.1	46.4	121.0	12.1	29.3	7.9
1976	393.2	52.7	.2	23.9	61.1	33.2	47.4	122.4	11.9	32.0	8.3
1977	397.3	50.2	.3	22.8	59.7	33.4	49.7	127.2	11.9	34.2	7.9
1978	404.0	49.9	.5	22.4	59.3	33.7	51.7	130.0	11.9	37.3	7.3
1979	403.3	49.5	.4	21.5	56.5	33.9	54.3	129.6	11.9	38.8	6.9
1980	396.8	49.3	.4	20.2	55.7	32.3	55.4	128.2	12.0	37.4	5.9
1981	396.4	48.1	.3	19.0	56.1	31.3	57.7	128.9	11.8	37.3	5.9
1982	379.6	47.2	.3	16.6	50.4	30.6	57.7	124.5	11.2	36.1	5.1
1983	373.5	47.7	.3	15.4	50.6	31.2	58.0	119.1	10.3	36.2	4.7
1984	380.5	47.7	.4	15.1	50.2	31.9	62.7	119.9	10.0	38.4	4.3
1985	375.6(r)	48.1(r)	.3	14.0(r)	46.8(r)	30.0(r)	65.6(r)	120.2(r)	9.3(r)	37.1	4.0(r)
1986	368.6	49.5	.2	13.7	45.1	29.1	65.3	117.5	8.6	36.2	3.4

Series have been adjusted to March 1985 benchmarks. (r) - revised  
SOURCE: New Jersey Department of Labor, Division of Planning and Research.

**Table 5**  
**EMPLOYMENT, HOURS, AND EARNINGS OF PRODUCTION**  
**WORKERS ON MANUFACTURING PAYROLLS, NEW JERSEY, 1950-1986**

Year	Employment (thousands)	Average Weekly Hours	Average Weekly Earnings (dollars)	Average Hourly Earnings (dollars)
1950	n.a.	40.8	61.65	1.51
1951	n.a.	41.1	67.28	1.65
1952	n.a.	41.1	71.02	1.73
1953	n.a.	40.9	74.32	1.82
1954	n.a.	39.8	74.43	1.87
1955	n.a.	40.7	79.16	1.94
1956	n.a.	40.5	82.98	2.05
1957	n.a.	39.9	85.23	2.14
1958	563.7	39.4	86.80	2.20
1959	583.8	40.3	92.45	2.29
1960	580.8	39.6	93.93	2.37
1961	563.1	40.0	97.60	2.44
1962	576.0	40.5	101.66	2.51
1963	567.5	40.5	104.90	2.59
1964	564.4	40.6	108.40	2.67
1965	587.1	41.0	112.34	2.74
1966	616.5	41.3	117.29	2.84
1967	616.7	40.6	118.96	2.93
1968	616.9	40.7	125.76	3.09
1969	621.3	40.8	132.60	3.25
1970	592.6	40.3	139.44	3.46
1971	564.4	40.4	150.29	3.72
1972	561.1	40.9	163.35	3.99
1973	582.3	41.4	176.41	4.26
1974	559.8	40.7	186.11	4.57
1975	500.9	39.9	199.68	4.99
1976	509.7	40.4	215.33	5.33
1977	517.2	41.1	239.20	5.82
1978	528.5	40.8	256.22	6.28
1979	530.7	41.2	276.45	6.71
1980	509.9	40.7	297.16	7.31
1981	503.1	40.6	325.95	8.02
1982	467.7	39.9	345.53	8.66
1983	457.1	40.6	369.87	9.11
1984	458.2	41.1	390.45	9.50
1985	440.5(r)	40.8	402.29	9.86
1986	424.4	41.2	417.36	10.13

n.a. - not available                      (r) - revised

Data have been adjusted to a 1986 benchmark.

SOURCE: New Jersey Department of Labor, Division of Planning & Research.

**Table 6**  
**CONSUMER PRICE INDEXES\***  
**FOR URBAN WAGE EARNERS AND CLERICAL WORKERS, 1955-1986**  
**(1967 = 100.0)**

Year	United States	New York SCA**	Philadelphia SMSA***
1955	80.2	78.2	80.6
1956	81.4	79.4	81.6
1957	84.3	82.0	84.2
1958	86.6	84.5	85.8
1959	87.3	85.6	86.8
1960	88.7	87.3	88.4
1961	89.6	88.1	89.4
1962	90.6	89.4	90.1
1963	91.7	91.3	91.8
1964	92.9	92.8	93.2
1965	94.5	94.3	94.7
1966	97.2	97.5	97.3
1967	100.0	100.0	100.0
1968	104.2	104.3	104.8
1969	109.8	110.8	110.4
1970	116.3	119.0	117.8
1971	121.3	125.9	123.5
1972	125.3	131.4	127.0
1973	133.1	139.7	135.5
1974	147.7	154.8	151.6
1975	161.2	166.6	164.2
1976	170.5	176.3	172.4
1977	181.5	185.5	183.5
1978	195.3	195.4	194.8
1979	217.7	212.8	214.7
1980	247.0	236.8	242.5
1981	272.3	259.9	266.8
1982	288.6	274.1	278.4
1983	297.4	285.0	289.6
1984	307.6	295.1	303.4
1985	318.5	307.3	317.1
1986	323.4	316.1	323.8

\*Annual averages.

\*\*Standard Consolidated Area: New York-Northeastern New Jersey including Bergen, Essex, Hudson, Middlesex, Morris, Passaic, Somerset, and Union counties.

\*\*\*Standard Metropolitan Statistical Area, including Camden, Burlington, and Gloucester counties.

SOURCE: U.S. Department of Labor, Bureau of Labor Statistics.

**Table 7**  
**PERSONAL INCOME, NEW JERSEY AND UNITED STATES, 1955-1986**

Year	Total Personal Income		Per Capita Personal Income			
	New Jersey (millions of dollars)	United States	New Jersey (current dollars)	United States	New Jersey (1967 dollars)	United States
1955	12,434	307,601	2,260	1,872	2,846	2,334
1956	13,494	329,933	2,403	1,972	2,985	2,423
1957	14,349	348,309	2,501	2,044	3,010	2,425
1958	14,559	358,913	2,472	2,061	2,903	2,380
1959	15,675	382,548	2,606	2,160	3,023	2,474
1960	16,502	398,843	2,704	2,216	3,078	2,498
1961	17,281	414,285	2,758	2,264	3,108	2,527
1962	18,537	440,023	2,907	2,369	3,239	2,615
1963	19,461	462,406	2,980	2,454	3,255	2,676
1964	20,858	495,188	3,132	2,592	3,368	2,790
1965	22,472	536,152	3,321	2,772	3,514	2,933
1966	24,320	582,630	3,550	2,980	3,645	3,066
1967	26,183	623,757	3,779	3,161	3,779	3,161
1968	28,740	683,561	4,103	3,430	3,924	3,292
1969	31,890(r)	766,522(r)	4,495(r)	3,808(r)	4,064(r)	3,468(r)
1970	34,549(r)	825,534(r)	4,805(r)	4,051	4,058(r)	3,483
1971	37,161(r)	888,536(r)	5,103(r)	4,296	4,092(r)	3,542
1972	40,290(r)	976,181(r)	5,492(r)	4,665(r)	4,251(r)	3,723(r)
1973	44,012(r)	1,095,289(r)	6,000(r)	5,182(r)	4,361(r)	3,894(r)
1974	47,908(r)	1,204,899(r)	6,531(r)	5,648(r)	4,263(r)	3,824(r)
1975	51,328(r)	1,308,482(r)	6,991(r)	6,073(r)	4,227(r)	3,767(r)
1976	56,070(r)	1,447,002(r)	7,635(r)	6,651(r)	4,379(r)	3,901(r)
1977	61,290(r)	1,602,863(r)	8,348(r)	7,294(r)	4,524(r)	4,019(r)
1978	68,047(r)	1,806,968(r)	9,250(r)	8,136(r)	4,741(r)	4,166(r)
1979	75,769(r)	2,028,510(r)	10,277(r)	9,033(r)	4,808(r)	4,150(r)
1980	85,414(r)	2,254,076(r)	11,579(r)	9,919(r)	4,832(r)	4,016(r)
1981	95,189(r)	2,514,231(r)	12,853(r)	10,949(r)	4,881(r)	4,021(r)
1982	102,666(r)	2,663,498(r)	13,823(r)	11,481(r)	5,003(r)	3,978(r)
1983	111,163(r)	2,834,375(r)	14,894(r)	12,098(r)	5,184(r)	4,068(r)
1984	122,190(r)	3,101,267(r)	16,268(r)	13,114	5,437(r)	4,263
1985	131,542(r)	3,320,099(r)	17,398(r)	13,907(r)	5,573(r)	4,367(r)
1986	141,919	3,529,522	18,626	14,641	5,822	4,527

Personal income data revised as of August 1987.

- a. The average of the Consumer Price Indexes (Urban Wage Earners and Clerical Workers) for the New York Standard Consolidated Area and the Philadelphia SMSA was used to express New Jersey per capita personal income in constant 1967 dollars.
- b. The Consumer Price Index (Urban Wage Earners and Clerical Workers) for the United States was used to express United States per capita personal income in constant 1967 dollars.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis.

Table 8  
 PRODUCTION AND TRADE, NEW JERSEY, 1965-1986

Year	Total	ELECTRIC Large Indus- trial and Commercial Users (kilowatt hours	POWER Small Indus- trial and Commercial Users in thousands)	SALES Value of New Dwelling Units Authorized (\$000)	Construction Contracts Awarded (\$000)	Retail Stores Sales* (\$000,000)	Passenger Cars* (number)	Commercial Vehicles (number)
1965	25,964,004	11,712,402	6,433,961	727,586	1,555,689	10,396	378,768	30,980
1966	28,512,856	12,814,406	7,043,455	588,874	1,651,494	10,711	352,573	31,072
1967	30,146,448	13,147,596	7,620,829	572,646	1,906,577	10,947	302,680	27,471
1968	32,616,153	13,863,329	8,394,581	597,980	2,380,846	12,030	356,762	30,724
1969	35,637,643	15,042,515	9,214,088	562,616	2,205,705	12,582	374,936(r)	34,616
1970	38,156,144	15,396,352(r)	10,185,005	599,034	2,740,746	14,274	336,564(r)	36,027
1971	39,919,508	15,564,483	11,056,580	876,144	2,409,797	15,359	398,194(r)	35,255
1972	42,318,122	16,192,817	12,143,135	1,062,430	2,948,735	16,399	414,232(r)	50,545
1973	45,540,943	17,018,962	13,233,603	1,030,506	2,513,229	17,874	440,099(r)	53,735
1974	43,995,014	16,390,080	12,904,974	588,291	2,353,822	18,024	344,110(r)	51,663
1975	43,477,908	14,927,694	13,509,510	574,101	1,950,095	19,636	308,346(r)	31,493
1976	45,605,101	15,759,346	14,289,144	832,433	2,063,615	21,833	359,833(r)	45,731
1977	46,398,759	15,659,679	14,744,406	998,931	4,805,407	24,076	432,918(r)	61,578
1978	48,113,001	16,386,752	15,474,339	1,262,831	4,096,430	27,748(r)	415,948(r)	65,772
1979	48,783,424	16,593,515	15,782,667	1,274,353	3,613,237	30,623(r)	375,302(r)	63,867
1980	49,851,000(r)	16,345,000	16,446,000	1,010,084	3,789,979	32,751(r)	365,370(r)	56,390
1981	49,635,000(r)	16,311,000(r)	16,741,000	1,022,130	3,568,772	34,244(r)	319,977(r)	39,093
1982	48,752,000(r)	15,233,000(r)	17,263,000(r)	1,003,694	3,675,524	35,819(r)	324,221(r)	38,649
1983	50,924,000	15,380,000	18,176,000	1,837,655	5,621,357	38,981(r)	350,053(r)	48,068
1984	52,611,000	15,708,000	19,315,000	2,274,406	6,426,668(r)	42,613(r)	433,244(r)	66,017
1985	53,764,000	15,640,000	25,750,000	3,139,186	8,076,782(r)	46,203(r)	454,614(r)	n.a.
1986	55,877,000	11,759,000	21,774,000	3,618,204	8,678,383(p)	50,808	508,195	n.a.

\*Years 1965-68 compiled by New Jersey Division of Motor Vehicles. Years 1969-86 are from R.L. Polk & Co.  
 (r) - revised

SOURCES: Electric Power Sales: Edison Electric Institute and U.S. Department of Energy. New Dwelling Units Authorized: New Jersey Department of Labor in cooperation with U.S. Department of Commerce. Construction Contracts Awarded: F.W. Dodge Corporation. Retail Sales: U.S. Department of Commerce. Registration of New Vehicles: New Jersey Division of Motor Vehicles and R.L. Polk & Co.

Prepared by: New Jersey Department of Labor, Division of Planning and Research.

Table 9  
BUSINESS ACTIVITY, NEW JERSEY, 1955-1986

Year	Business Telephones Net Gains	Business Failures (Number)	Liabilities Business Failures (\$000)	New Incor- porations (Number)	New Jersey Turnpike	
					Toll Revenue (\$000)	Number of Vehicles (000)
1955	31,659	456	29,753	8,386	21,123	25,888
1956	37,452	582	33,919	8,839	24,513	31,588
1957	29,856	565	39,604	8,097	29,023	39,270
1958	21,892	778	43,475	8,757	30,159	41,615
1959	35,051	639	27,619	10,436	33,318	46,199
1960	28,825	714	49,071	10,172	35,584	49,083
1961	38,543	717	53,282	9,650	37,193	51,738
1962	39,383	591	58,468	9,984	39,240	54,901
1963	29,716	509	256,075	9,716	40,779	56,677
1964	36,771	442	49,261	10,023	44,149	60,708
1965	47,251	512	96,334	10,439	46,122	64,958
1966	54,650	442	61,191	9,656	48,610	69,850
1967	48,620	414	64,215	10,220	51,230	73,529
1968	53,293	423	42,692	13,168	55,340	78,205
1969	73,211	343	53,141	12,038	57,637	80,618
1970	58,787	463	142,196	13,958	63,934	89,655
1971	45,401	428	102,738	15,563	70,124	98,534
1972	66,989	453	173,428	16,462	75,940	107,933
1973	87,064	491	201,463	16,312	78,997	110,422
1974	55,327	643	110,441	15,410	75,243	106,628
1975	31,164	768	213,209	16,022	84,385	105,633
1976	53,040	660	174,457	18,270	91,082	109,234
1977	76,351	535	194,995	19,366	95,112	113,664
1978	73,114	415	198,834	20,381	100,838	120,623
1979	67,957	421	194,188	21,172	100,885	121,031
1980	69,040	430	182,709	21,484	118,614	122,588
1981	76,340	521	372,568	24,113	126,188	127,212
1982	29,839	512	346,598	22,401	129,922	132,932
1983	*	689	315,383	26,215	139,895	143,855
1984	*	1,005	947,890	27,646	151,913	156,029
1985	*	990(r)	1,342,823	30,458(r)	162,449	167,179
1986	n.a.	905	n.a.	33,130	173,547	178,839

n.a. - not available

\*Effective January 1, 1983 New Jersey Bell stopped the leasing of new telephones as a service. Since business customers are purchasing telephones outright, there are no records as to the number of telephones in service. Therefore, this series has been discontinued.

SOURCES: Business Telephone Net Gains: N.J. Bell Telephone Company. Number and Liabilities of Business Failures and New Incorporations: Dun & Bradstreet, Inc. New Jersey Turnpike - Toll Revenue and Number of Vehicles: New Jersey Turnpike Authority.

Prepared by: New Jersey Department of Labor, Division of Planning and Research.

Table 10  
RESIDENT POPULATION FOR NEW JERSEY COUNTIES  
1970, 1980, 1986

County	C e n s u s		Provisional Estimates*
	April 1, 1970	April 1, 1980	
Atlantic	175,043	194,119	206,300
Bergen	897,148	845,385	836,900
Burlington	323,132	362,542	382,500
Camden	456,291	471,650	492,900
Cape May	59,554	82,266	92,100
Cumberland	121,374	132,866	136,500
Essex	932,526	851,304	843,900
Gloucester	172,681	199,917	210,700
Hudson	607,839	556,972	551,800
Hunterdon	69,718	87,361	96,500
Mercer	304,116	307,863	322,500
Middlesex	583,813	595,893	636,200
Monmouth	461,849	503,173	542,400
Morris	383,454	407,630	418,500
Ocean	208,470	346,038	393,600
Passaic	460,782	447,585	461,500
Salem	60,346	64,676	65,500
Somerset	198,372	203,129	215,200
Sussex	77,528	116,119	122,800
Union	543,116	504,094	504,700
Warren	73,960	84,429	86,600
STATE TOTAL	7,171,112	7,365,011	7,620,000

\*The State estimate is rounded to the nearest thousand and county estimates are rounded to the nearest hundred.

Prepared by New Jersey Department of Labor, Division of Planning and Research.



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