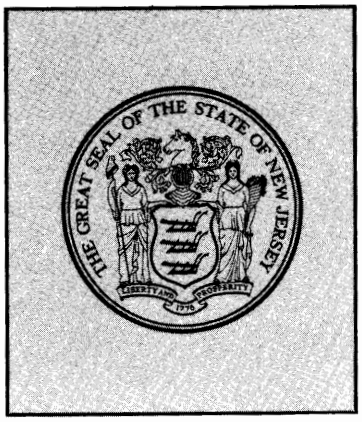

12th Annual Report

Economic Policy Council and Office of Economic Policy

Department of the Treasury
State of New Jersey
July, 1979

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STATE OF NEW JERSEY
OFFICE OF THE GOVERNOR
TRENTON
08625

BRENDAN T. BYRNE
GOVERNOR

TO THE LEGISLATURE

I am pleased to transmit the *12th Annual Report* of the Economic Policy Council and Office of Economic Policy.

Ten years ago New Jersey reached the end of a long period of business expansion and tumbled into a recession from which some observers feel we have never recovered. We did recover, the lessons learned from that difficult experience have led to a greater awareness and more active participation by this Administration in developing State economic policy.

Today as we stand on the brink of another recession we find that the anti-recession initiatives and programs of yesterday are insufficient to cope with today's economic maladies. Our dependence on uncertain oil supplies will hinder economic growth as we gradually accept energy conservation as a way of life.

Although a number of factors such as investment in Atlantic City will cushion the business downturn, we must continue to seek job creating policies for our citizens. Moreover, New Jersey's leadership in fiscal conservatism leaves little room for increases in direct government spending. Instead we must strive for more efficient delivery of State services as well as encouraging private sector growth. The success of Investment Mission 1979 typifies this approach.

A cooperative spirit between the Executive and the Legislature can insure continuing economic success in the upcoming year.

Respectfully,

Brendan Byrne

Governor.

ECONOMIC POLICY COUNCIL

Dr. Joseph J. Seneca, *Chairman*
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Carol Maslowski, *Secretary*

State of New Jersey
ECONOMIC POLICY COUNCIL
142 WEST STATE STREET
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DR. JOSEPH J. SENECA
CHAIRMAN

DR. WILLIAM C. FREUND
DR. DWIGHT M. JAFFEE
MEMBERS

July 15, 1979

THE HONORABLE BRENDAN T. BYRNE
Governor
State House
Trenton, N. J. 08625

DEAR GOVERNOR BYRNE:

The Economic Policy Council is pleased to transmit its *Twelfth Annual Report* in accordance with Chapter 129 of New Jersey Public Law 1966.

This *Report* covers a wide range of economic issues but its common theme is the attempt to better understand the strengths and problems of the New Jersey economy. We have particularly emphasized your priority concerns of providing employment for all New Jerseyans and insuring that the State continues to be an attractive working and living environment.

Two of our economic studies this year respond to your request to assess the potential for improvement in the export and foreign direct investment performances by New Jersey. These studies (Chapters IV and V) document the State's recent export and foreign investment activity and present a series of recommendations to further New Jersey's participation in each area.

Recent attention by the press and business leaders has focused on the costs of meeting environmental regulations. This concern is a legitimate one, particularly in a time of high inflation, a national economic slowdown and energy shortages. However, a neglected but critically important issue for rational policy decisions is to assess the benefits of environmental control efforts. Accordingly, we present an analysis (Chapter VI) of the recent reductions in mortality in New Jersey that can be attributed to improvements in the State's air quality since the late 1960s.

We examine the effect of intergovernmental aid on local government expenditure patterns (Chapter X) and we conclude that in general, intergovernmental aid has stimulated rather than replaced local spending in New Jersey.

We present an optimistic assessment of the long-run prospects of the State's housing future (Chapter VII). We also outline the promise of State input-output analysis in furthering our understanding of the New Jersey economy (Chapter VIII). An introductory study examines the fundamental economic and demographic shifts that have recently occurred within New Jersey (Chapter IX).

We continue our annual tradition of reviewing the State's economy (Chapter II) and the past year's economic legislation (Chapter III).

Our work this year was greatly assisted by many individuals from the public and private sectors. We wish to express our appreciation to Commissioner of Labor and Industry John Horn and to his associates Dr. Arthur O'Neal, Mr. Harry Callaghan, Mr. John Gross, Ms. Vivien Shapiro, Miss Shirley Goetz and Mrs. Rose Nini. The Chancellor of Higher Education Edward Hollander and his associate Dr. Edward Goldberg assisted us in developing the proposal for Small Business Development Centers at the State's universities and colleges. The Treasurer Clifford Goldman, the Budget Director Edward Hofgesang and Messrs. John Flynn, Harry Kyriakoudis, John Polios and Nicholas Caprio continued to lend their support to the work of our Office.

We would like to thank Messrs. Paul Arbesman and Thomas Pluta of the Department of Environmental Protection for their encouragement during the study of air pollution and mortality (Chapter VI).

Our special thanks are directed to Messrs. Donald Edwards and John Cooney of Rutgers University for their support in organizing the Conference on Foreign Trade and Investment. To all participants of this Conference and other experts who shared with us their thoughts on promoting New Jersey in world markets our sincere appreciation.

We thankfully acknowledge the assistance of the Legislative Bill Room and the State Library.

Our secretary Mrs. Carol Maslowski skillfully assisted us in our research and in the preparation of this *Report*.

We are happy to inform you that Dr. Jong K. You, formerly of Rutgers University, joined our Office staff. His many abilities will certainly enhance the quality of our research and policy recommendations. We wish him success in his new posiiton.

Sincerely,

JOSEPH J. SENECA,
Chairman.

JJS:cm

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Appendix: STATISTICAL TABLES

CHAPTER I

THE ACTIVITIES OF THE ECONOMIC POLICY COUNCIL*

Over the past year the Council and its staff have addressed a wide variety of economic policy issues. This chapter provides an overview of our activities during this time and the nature of the economic problems which have recently concerned us. It also briefly reviews the contents of this *Annual Report*.

We do wish to note that in the current economic environment of high inflation, energy shortages, widespread public questioning of the role of government and a consensus forecast for a national slowdown, State economic policy has become both more difficult and more important. The resulting challenge, namely to devise and implement frugal yet effective economic policy, is a task that necessarily deserves increasing attention.

I. Review of Activities

We briefly list below the highlights of our activities during the past year; the specific economic policy issues which underlie these efforts are discussed in the next section.

—In the preceding year we met several times with the Governor and the Cabinet. These meetings covered a diversity of economic problems in addition to our regular reports on the health and direction of the New Jersey and national economies.

—We provided advice and comments on numerous bills pending in the Legislature.

—We met with the Joint Economic Committee and reviewed the *11th Annual Report* and a wide variety of economic issues of concern to the Legislature.

—We testified before the Senate Subcommittee on Urban Tax and Redevelopment Policy.

—We met with several individual departments (Banking, Environmental Protection, Labor and Industry and Treasury) on specific economic issues of concern to each.

—We participated in the preparation for the Governor's 1979 Investment Mission.

—We sponsored a well-attended conference at Rutgers University aimed at designing an export expansion and foreign direct investment program for New Jersey. Two chapters of this *Annual Report* are drawn from our efforts in this regard and a larger, comprehensive report was submitted to the Governor earlier in the year.

—We issued our *Annual Economic Outlook* for the State and continued to provide an ongoing quarterly assessment of the State's economy throughout the year.

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* Prepared by Dr. Joseph J. Seneca, Chairman, New Jersey Economic Policy Council.

II. Economic Issues

In our advice to the Governor, Legislature and Departments during the year, we addressed a large number of economic issues. Some of the most important of these are reviewed below.

Foreign Trade and Investment

At one of our meetings with the Governor, he requested that the Council review the State's export and foreign investment performance and provide recommendations to increase economic activity in each of these areas. This task was a formidable one and in the course of the year we developed a comprehensive foreign trade and investment program based on our studies as well as the contributions of numerous experts from both the private and public sectors. We wish to acknowledge the assistance of these individuals and thank them for the time and knowledge they shared with us.

Foreign trade and investment offer great potential for New Jersey. The national economy is currently in one of those rare historical periods when its foreign sector can be called upon to make a significant contribution to the overall economic development of the country. Exchange rates have recently stimulated U.S. exports. Economic and political stability are leading foreign investors to look towards the largest common market in the world—the United States economy—as a desirable location for new production and distribution facilities.

New Jersey has always played a major role in foreign trade and investment. The Governor's Investment Mission highlighted the State's desire to attract and stimulate foreign trade. Recent data indicate, however, that the State has not kept pace with the national growth in exports and foreign investment. Nevertheless, New Jersey has the potential for large increases in foreign trade—it is located in an extremely advantageous region to export to world markets and it has been a traditional leader in technical innovation, i.e., in those types of commodities which constitute the bulk of U.S. manufactured exports. Increases in exports also carry the promise of subsequent foreign investment in the State as growing international contacts lead to closer economic ties between New Jersey and foreign businesses.

A well-designed State program to promote exports, specifically targeted at small and middle-sized businesses, offers the possibility of large income and employment gains for New Jersey.

Urban Recovery

In these pages last year the Council devoted its entire *Report* to an analysis of the State's urban problems. We presented a comprehensive program aimed at promoting urban economic recovery. Since that *Report* we have continued to pay attention to this critical issue and have further consolidated our previous work into a series of specific recommendations. These include employment tax credits for urban businesses, an urban investment tax credit, a Metropolitan Pricing Commission, urban tax reform such as Fox-Lance revisions and in lieu taxes, etc.

We have discussed these recommendations with the Governor and Legislature in various forums. We continue to believe strongly that the restoration of the economic viability of New Jersey's cities is the single most important economic problem facing the State. Progress has been made in a number of areas and our annual review of economic legislation (Chapter III) documents some of these accomplishments. More remains to be done, however, and the Council will continue to give this issue high priority.

Usury Ceiling

The passage of Chapter 85, Laws of 1979, which raised the State's usury ceiling from 9½% to a maximum of 10¾% represented a step in the direction of the Council's efforts for reform in mortgage lending legislation. While discussion of the usury ceiling often becomes an emotional issue, there is clear evidence that in times of high interest rates, usury ceilings artificially restrain housing market activity. The increase in

New Jersey's ceiling achieved by Chapter 85 will assist the flow of mortgage money in the State.

Although no borrower likes high (er) interest rates and while there is also little doubt that increases in interest rates act as a brake on housing demand and new construction, the "protection" provided by a usury ceiling becomes a meaningless fiction when interest rates rise significantly above the usury limit. When this occurs, as it has recently in New Jersey, borrowers receive the ultimate "protection" against high interest rates; they find they cannot obtain mortgages. Such a situation is undesirable for all concerned—the borrower, the builder, the construction worker and the State's financial institutions.[1]

The solution provided by Chapter 85 was not as broad as we would have liked. The Council has supported an *unrestricted* floating ceiling linked to key national interest rates as both more flexible and effective than Chapter 85's provision limiting the floating rate to no greater than 10¾%. Unfortunately, any future upward pressure on interest rates would again cause problems. The Council expects to continue to bring its advice on this and related mortgage issues to the attention of the Governor and Legislature.

Minimum Wages

The Council reviewed the employment implications resulting from minimum wage laws both on the national and State level. We have suggested that a State minimum wage above the federal level might aggravate the unemployment situation especially among teenagers and proposed a minimum wage differential that creates incentives for on-the-job training.

Tax Stability

The State Treasury faced a possibility of a budget deficit in FY 1979-1980 unless new sources of revenue could be created through an increase in corporate income taxes. We have expressed our concern that such a development might adversely affect the much improved business climate in New Jersey. We are pleased that additional saving opportunities were found that allowed the Governor to propose a budget without increased taxes and that the Legislature approved this prudent fiscal approach.

Economic Monitoring

Throughout last year the Council provided its periodic assessment of New Jersey's economy. The purpose of this monitoring is to inform the public and State government of current economic conditions and trends and to recommend appropriate policies. Chapter II provides our latest review and forecast for the national and State economies.

III. Review of Economic Studies

This *Annual Report* ranges over a number of topics. In addition to our traditional reviews of the economy (Chapter II) and legislation (Chapter III) we have analyzed the State's foreign trade sector, the economic benefits of pollution control, several aspects of the expenditure limitations on local government and various spatial economic issues (housing, industrial structure). We briefly summarize these study chapters below.

Chapter IV.—New Jersey's Export Performance

In the past, New Jersey was a leader in the share of national exports produced in this State. This chapter documents the export performance of New Jersey relative to other states. It examines both the overall total performance and also the performance of various classifications of industries.

The data indicate that New Jersey has not kept pace with national (or even regional) growth in exports. Moreover, this relative decline cannot be fully explained by the general erosion of manufacturing activity away from the Northeast, nor by differences in industry mix between New Jersey and other states. The short-

[1] Nationally chartered banks in New Jersey are permitted to charge the market rate. The more restricted New Jersey usury law applies only to State chartered banks to their competitive disadvantage.

fall in the State's export performance relative to other large exporting states totalled $685 million in the 1966-76 decade. This could have translated into 9 thousand more jobs in the State over this period.

The chapter offers a number of explanations for the below average performance of New Jersey exports. Among the most interesting is some fragmentary evidence suggesting that a significant part of New Jersey's export problem can be attributed to the relatively smaller size of firms in the State. This points to the large potential gains to be realized from State programs to assist the small to middle-sized New Jersey business in entering the foreign trade market.

Chapter V.—Foreign Direct Investment and State Economic Development

New Jersey has traditionally benefitted from a relatively high number of foreign firms located in the State. Currently, New Jersey has 3.5% of all employment in the nation but over twice that, 7.3%, of the total employment in the country by foreign-owned firms.

Chapter V documents the U.S. location patterns of foreign firms by two industrial classifications (trade and manufacturing). The State is contrasted with the nation as a whole as well as several regional breakdowns. In addition, there is an attempt to determine which factors are important in the location decision of foreign firms and whether these factors differ between trade and manufacturing companies. For trade oriented firms, the level of government services available is a significant determinant of location patterns. This implies that state policies aimed at foreign investors have the potential to attract significant amounts of additional foreign investment. In the analyses of the location of foreign-owned manufacturing firms, the important policy variables detected include the presence of significant amounts of research and development, the intensity of the domestic manufacturing sector, wage rate, and the State's share of total national exports. This latter result suggests the complementarity of export expansion programs with subsequent growth in foreign investment.

Chapter VI.—Mortality and Air Pollution in New Jersey

This chapter examines a relatively neglected aspect of the economics of environmental policy, namely, what are the benefits, measured in dollars, of pollution control? Considerable research, as well as public attention, has focused on the costs of compliance with environmental regulations. The very visible cost effects of environmental policies, alleged or true—higher prices, threats to employment, business closings, higher operating costs—have attracted considerable public scrutiny.

However, the obverse issue, what does society gain from a cleaner environment is an equally important though relatively unresearched question. Measurement of these benefits is necessary for the evaluation of existing programs and for judgments about the desirability of future changes. It becomes increasingly important in an era of high inflation and energy shortages; factors which together place legitimate pressures for a cut-back in environmental control efforts.

This chapter estimates the reduction in mortality in New Jersey since the late 1960s that can be attributed to improvements in ambient air quality as measured by two major pollutants —suspended particulate matter and sulfur dioxide. Analysis of mortality rates across the State's counties, as well as over time, indicate that over 2000 lives have been saved annually because of the significant improvements in air quality achieved to date.

This life saving effort is valued at over $116 million annually under a conservative though widely-used method for placing values on human life. Though the very attempt to do this is controversial, a valuation of life is present, implicit or explicit, in all public policy decisions that affect safety and health, e.g., speed limits, health expenditures, safety requirements, *etc.* The estimated mortality effects of this chapter —both in terms of lives and economic savings— should be taken as probable understatements of the true gains that have resulted from air pollution control in New Jersey.

Chapter VII.—New Jersey Housing Prospects

This chapter reviews the historical evidence of housing activity in New Jersey. A decline in the State's housing construction relative to the nation has been underway since the early part of this decade. Basic demographic patterns—declining relative birth rates in the State and a net out-migration of people—are the causes of this decline. As an offset, however, changes in household formation patterns have operated to increase housing demand. Restrictions on the supply side of the housing market—affordability and mortgage availability—are also discussed.

Finally, a forecast of the State's housing future is made. This forecast involves considerable uncertainty since demographic trends, household formation patterns, inter-state migration and housing replacement requirements must be predicted. As a result a range of forecasts is made to include an upper and lower bound as well as the best expected prediction. The conclusion is that the future for residential construction activity in New Jersey is very encouraging, approximately 60,000 units annually between 1979 and 1990. This forecast coincides with comparable national forecasts which reflect anticipated boom conditions in housing for the next decade.

Chapter VIII.—Interindustry Relationships in New Jersey

The use of input-output analysis has become widespread in economic analysis. The main strength of this technique is its ability to detail the resource flows and requirements among the many industrial sectors of the economy. Recently, this tool has been applied to economic issues at the regional and state level.

This Chapter argues the usefulness of developing an input-output table for New Jersey and provides several examples of the application of this tool to specific State problems.

Chapter IX—Interregional Changes in the New Jersey Economy

This Chapter initiates a series of studies that will add a geographic dimension to the overall assessment of economic conditions in New Jersey, in contrast to most of the earlier studies by the Council that have considered the State economy as a single geographically homogenous unit.

An examination of interregional changes in population, income, and employment by industries reveal that major cities experienced a significant decline in economic activities during the 1959-77 period. Although the decline of major cities is not a phenomenon unique to New Jersey, the State is particularly vulnerable to the urban decline due to the fact that New Jersey is highly urbanized and many of its cities are old.

In the major cities, employment in all but the service sector showed an absolute decline, creating a serious urban unemployment problem. The decline in employment is most serious in manufacturing industries. Although the economic decline in major cities has been counterbalanced by a rapid growth in suburban and rural areas of the State, it was not enough to prevent the overall unemployment rate from rising, and created a regional imbalance that remains the State's most serious economic problem.

Chapter X.—Local Expenditure Limitations and Intergovernmental Aid

As part of the extensive fiscal reform in New Jersey in 1976, the Legislature placed expenditure limits on the State's municipalities. The objective of this chapter is to examine the impact that intergovernmental aid has on municipal spending and tax-effect. Historical budget data are analyzed for a broad cross-section of municipalities in the State. Evidence suggests a fiscal imbalance among municipalities with several categories of municipalities receiving too much aid given their fiscal conditions while others are receiving too little. Another key question addressed is whether intergovernmental aid is a substitute for local taxes, or acts to stimulate additional local spending with the resulting pressure on the "expenditure cap" ceiling.

The chapter concludes that, in general, intergovernmental aid stimulates, rather than replaces, local expenditures and thereby creates increased pressures on the existing legally imposed expenditure limitations. Moreover, the form of intergovernmental aid has a differential impact on local spending. Matching grant aid has considerably more of a stimulating effect than non-matching grant aid.

Chapter XI.—Impact of the Public School Education Act of 1975

Last year the Council published a study of the effect of the Public School Education Act on school district expenditures (Chapter VI, *11th Annual Report).* That study concluded that little change to date in spending patterns between poor and wealthy school districts could be attributed to the Act. Because of the importance of this issue, Chapter XI reexamines this question again using both more recent data and a more extensive sample of school districts across the State.

The conclusion of this new study, however, remains the same; namely, although there has been an absolute dollar increase in expenditures by the poorest school districts, the relative position between wealthy and poor districts has either not changed, or has worsened. Pressures to reduce local property taxes have meant that poorer districts have used the additional State aid revenues to lower non-school tax efforts. Moreover, there is little prospect for this situation to change in the future.

IV. Research Agenda

In the course of the next year the Council intends to expand on several of the themes developed in this current *Annual Report.* In particular, we wish to refine and extend the input-output work of Chapter VIII, constructing an input-output table based more directly on New Jersey data and applying it to the particular problem of energy. We want to investigate the implications for New Jersey's industrial sectors of energy supply shortfalls.

We also plan to extend significantly the preliminary analysis of Chapter IX which outlined the recent interregional changes in the New Jersey economy. The shift of population and economic activity within New Jersey from the northern industrialized counties to the rural coastal and southern counties replays in miniature the national economic shifts that have been characterized as Sunbelt vs. Snowbelt economic warfare. We want to document the New Jersey trends in considerably more detail and better understand both the potentials and the problems which these trends present to the entire State.

We also will return to the problems of the State's urban areas and examine on an individual case basis the specific factors behind the economic revival of several New Jersey cities. Related to this, we anticipate access to extensive housing data base for all New Jersey SMSAs. This data will enable us to provide intrastate detail to the analysis begun in this *Report* (Chapter VII) on housing trends and prospects in New Jersey.

Finally, the disturbing results of two consecutive studies on school financing require that we continue to evaluate the issue of school financing. In particular, we will attempt to quantify the effect that expenditure differences across school districts have upon educational achievement, as measured by the standardized tests now annually administered to all students in the State.

II

A REVIEW OF THE ECONOMY AND AN OUTLOOK FOR FISCAL YEAR 1979-80*

This Chapter presents the Economic Policy Council's annual outlook for the national and State economies. The first section discusses the national economic situation and includes a forecast for the current fiscal year. The second section evaluates and forecasts economic conditions in the State. The final section reviews the national energy problem.

I. THE NATIONAL ECONOMY

The slowdown in the nation's economy came with a bang during the first quarter of 1979, in line with earlier predictions by many economic forecasters, including New Jersey's Economic Policy Council. It is now officially conceded that a recession has started.

In terms of measurable impacts, the recession will cause a decline in available jobs, a rise in unemployment, a slackening in the use of industrial capacity, and a softening in corporate profits.

There is, however, a positive aspect to a business slowdown or recession. It serves to cool off an overheated economy by easing some of the pressure on prices and wages . Of course, the slowdown does little to affect inflation stemming from such specialized factors as OPEC price increases and their multiplier effects throughout the economy. There is little a softer economy can do to mitigate the inflation push from oil prices lest it be to persuade the oil exporting countries that soaring oil prices in the end depress worldwide business conditions.

But a weaker level of overall demand can ease pressures stemming from excess spending. Many industries have been producing close to the peak of their preferred operating rates, making it easier to push up prices in response to rising costs. And the existence of full employment in many occupations made it easier to push up wages in line with prices. In this environment, it became extremely difficult to step off the wage-cost-price escalator.

A brief slowdown of one or two calendar quarters would do nothing to ease inflation. Only a more protracted period, with time for softening markets to impact the consciousness of business and labor, offers any hope of moderating inflation.

The recognition seems to be gaining in Washington that continued double-digit inflation is not only bad economics but also bad politics.

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* Prepared by Dr. William C. Freund, member of the New Jersey Economic Policy Council (Sections I and III) and Dr. Adam Broner, Dr. Jong Keun You, George Nagle, staff of the Office of Economic Policy (Section II).

Some slowdown in the employment rate and some inching up of unemployment is becoming a more acceptable alternative to accelerating inflation. The hardship of unfulfilled job expectations is of course a serious social matter. Yet more families than ever are better shielded against the worse impact of unemployment. The recent surge in the number of working women means that more families now enjoy a double paycheck. Transfer payments have been soaring, providing more adequate retirement payments, unemployment compensation, and welfare benefits.

A new political constituency opposing inflation seems to be emerging in the U.S. A new generation, born after World War II is now assuming responsibility and authority. This generation did not know the Great Depression first hand and was not reared on a diet of Keynesian demand stimulation. On the contrary, this generation has been continually disillusioned by Government which contributed to high inflation and low real growth. They have seen Vietnam, Watergate, and stagflation. They now opt for Proposition 13 and Constitutional provisions to restrain government spending. New Jersey has been in the lead of this trend and has had a cap on State and local spending since 1976.

Some of the steam is about to be released from the pressure cooker of economic activity. Contributing to these prospects is not only the easing of aggregate demand but the high cost of energy. We estimate that higher OPEC oil prices will impose a $20 billion tax on U.S. consumers. That is no different from a $20 billion sales tax except that the proceeds are transferred abroad and thus aggravate our balance of international payments. Indeed, the OPEC tax increase completely offsets the Congressional reduction in taxes in early 1979.

The Economic Policy Council expects an actual though modest recession to continue during the second half of 1979 and to last through much of the first half of 1980. Whether each and every quarter will record a negative rate of real growth is uncertain. Such events as an auto strike can produce major and unpredictable fluctuations in the quarterly performance of industrial output. But the overall pace of economic activity over the next year will hover between a slowdown and a recession.

An Analysis of Sectors

Our prognostication for the coming year is based on the following considerations:

Consumer Spending—The consumer was responsible almost single-handedly for fueling the economic recovery following the recession of 1974-1975. With inflation heating up to double-digit levels, the consumer adopted a new attitude to spend more, borrow more, and save less. The ratio of savings to disposable income dropped to a post-war low. Consumer credit, including cashing in on appreciated home values through mortgage borrowing, soared to unprecedented heights.

Consumer budgets became stretched and strained. No wonder that consumers reached a point, widely predicted by economists, where it became necesasry to adopt a more conservative financial strategy. The OPEC price increases, together with actual oil shortages, represented the final coup.

Now consumer spending, in real or inflation-adjusted terms, is declining. We expect that this course of events will persist for close to a year before consumer financial repairs have sufficiently restored savings to allow a more aggressive stance.

Federal policy will also contribute to consumer conservatism. Monetary policy is likely to remain moderately restrictive to avoid another upsurge in business activity and prices and to avert a weakened dollar exchange rate. Although interest rates, particularly short-term rates, are expected to decline modestly by the end of the year, the *level* of interest rates will remain historically high. And no major drop in long-term interest rates is likely until inflationary fires are more effectively banked. Gov-

ernment fiscal policies are also expected to remain relatively firm as the Administration pursues its goal of a closer balance in the Federal budget during fiscal 1981.

Housing—The level of housing activity will remain some 30% below the recent peak rate of two million plus housing starts. With mortgage rates between 10 and 11% nationally, and with down-payment requirements up, the pace of home construction is expected to fluctuate in a range between 1.6 to 1.7 million starts per annum. Recent declines in deposit flows at thrift institutions indicate that the predicted housing decline is not very distant.

Business Inventories—Economic forecasters have commented on the low level of business inventories compared to sales. But with consumer spending weakening, we expect initially some increase in inventory accumulation followed by a subsequent reduction in new orders and inventories thereby removing one of the props to business expansion. Earlier in 1979, there had been some ordering to hedge inflation fears and a shortage psychology. That excess ordering will dwindle fast.

Capital Spending—After lagging seriously during most of the recovery period since 1975, business capital spending has shown new signs of life in recent months. That is not an unusual pattern. Business expenditures for plant and equipment is a lagging economic series, typically rising during the initial stages of a business recession. The recent performance, therefore, accords with historical precedents. However, a delayed reaction in business capital spending should be expected in response to a slowdown in final sales to consumers. In some ways, this pattern is reassuring for it tends to soften the initial downturn in business activity.

Government Spending—The rate of government spending—combining state, local and federal—is expected to keep pace with inflation but provide little further impetus to real expansion. The new public sentiment in favor of restrained government spending at all levels has already been noted. State and local governments will enter a period of fiscal austerity, in part generated by the recession in overall activity. Federal outlays will reflect the recent firming of fiscal policy.

The Outlook for the National Economy in FY 1979-1980

With a substantial increase in the official OPEC oil price at the end of FY 1978-79 representing the last straw, it is now virtually unanimously agreed by economic forecasters that the economy has embarked on a recession. Although there are similarities between the 1975 and current recession, we do not expect the extent of the downturn to be as serious as it was in the previous recession. The increase in official OPEC oil price, though it was substantial, was not as much as it was in 1974; the exacerbation of recession due to sky-rocketing of agricultural prices is absent this time, and cautious inventory management during the long expansion phase has resulted in an absence of excessive inventory accumulation that plagued the economy during the previous recession. Also, plant and equipment spending by business has been extraordinarily restrained this time.

We expect real GNP during fiscal year 1979-80 to decline by about 1%, with the first half experiencing a 2% decline and no growth in the second half. It is likely that the recession will bottom-out in the first quarter of 1980 and a moderate expansion will begin in the next quarter. Despite the recession, the rate of inflation will not decline sharply. It appears that the inflation rate will hover around 9½% most of the time in FY 1979-80 with a gradual moderation toward the end of the period.

The rate of unemployment tends to lag behind the growth rate of real GNP. The average unemployment rate for the next fiscal year is expected to be about 6.8%, though the rate could climb over 7% by the end of that period. It is not likely, however, that the high unemployment rates we experienced in 1974-75 (9%) will revisit our economy this time.

The above forecasts are based on the assumption that no major disruption will take place in the next fiscal year. Given the precariousness of the international economic and political situation, however, the possibility clearly exists that external shocks, such as an interruption of Iranian oil supply or other international conflicts, might again halt the flow of world trade and greatly exacerbate the U.S. recession.

II. THE NEW JERSEY ECONOMY

There were many signs of a slowdown in the third quarter of 1978, but the economy in 1978 ended with a "big bang", registering a 6.9% rate of growth of real GNP in the fourth quarter. The momentum could not be maintained, however, as consumer spending finally relented in the first quarter of 1979. The second quarter experiencd a negative rate of growth. The State economy's performance showed a similar pattern.

Personal Income

Personal income in New Jersey for the 12-month period ending in April 1979 was $68,239 million, compared with $62,204 million for the April 1977 to April 1978 period. This represents a 9.9% increase compared to 11.8% increase in U.S. total personal income during the same period. These increases in personal incomes are, however, mostly due to inflation. The rate of inflation measured by the percentage increase in the average consumer price index for all urban consumers between the two periods was 6.7% in New Jersey and 8.7% for the entire U.S.[1] Consequently, real personal income (personal income corrected for inflation) rose at a much slower rate; 2.9% in New Jersey and 2.8% for the U. S.

While the rates of growth of total real personal income are about the same for both New Jersey and the U.S., the State enjoyed a faster growth in real personal income *per capita* than did the average U.S. citizen because of the State's stable population in contrast with a 1% growth rate of U.S. population. Thus, when the population factor is accounted for, real personal income *per capita* rose by 3% in New Jersey compared with 1.8% in the entire United States. This resulted in an improvement of New Jersey's relative earning power, which is already higher than the national average. During the last twelve months personal income *per capita* in current dollars was $9335 in New Jersey compared with $8090 for the U.S.

Due to the progressiveness of the federal income tax structure, however, the relative earning power of New Jerseyans is reduced somewhat when we compare disposable income (personal income less federal taxes). For example, New Jersey's per capita personal income was 15% higher than the U.S. average in the 12-month period ending in April 1979. This was reduced to 14% after adjusting both State and U.S. incomes for federal taxes. The progressiveness of the federal income tax is also a source of "inflation double-jeopardy." Unless the tax structure is adjusted, a rapid rate of inflation would raise the effective tax rate faster than the growth of real income warrants. An estimation of the inflation-effect on federal taxes shows that a 10% inflation rate would, in the absence of a change in the tax structure, result in a 1.7 percentage point reduction in disposable personal income.[2] Thus, the 6.7% price increase

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[1] These rates are based on the average price levels during the April 1977 to April 1978 period and the average during the next 12-month period. Between April 1978 and April 1979, prices rose by 8.1% in New Jersey and by 10.4% in the U.S.

[2] This estimate is based on the following regression equation:

$$T = \underset{(.28)}{11.252} + \underset{(.068)}{0.169}I - \underset{(.40)}{0.378}D_{64} + \underset{(.47)}{1.266}D_{68} - \underset{(.52)}{0.982}D_{75}$$

$R^2 = .575$; $F(4,13) = 4.396$

Sample Period: 1959 - 1976

where; T is the percent of income paid in federal taxes,
I is the rate of inflation,
D_{64} accounts for the 1964 tax-cut,
D_{68} accounts for the 1968 surcharge,
D_{75} accounts for the effects of the 1975 tax-cut,
and the figures in the parentheses are the standard errors of the estimated coefficients.

in our area between FY 1978 and FY 1979 amounts to about a 1.1 percent reduction in disposable personal income.

During the 1974-1975 recession the N.J. economy experienced a deeper and more prolonged downturn than the National economy. Accordingly, an examination of the State's economic performance during the entire recovery period may shed some light on the question how the State might fare in the ensuing recession.

Table II. 1 presents per capita personal income both in current and constant (1967) dollars. For the U.S., current personal income per capita rose from $5903 in 1974 (calendar year) to $8090 in FY 1978/79, while the same figures for New Jersey are $6716 and $9335, respectively. These represent a 37.1% increase for the U.S. and a 39.0% change for New Jersey. Most of the growth in nominal income, however, is attributable to rapid increases in prices during the period. Measured in terms of real purchasing power, personal income per capita rose by 9.5% for the U.S. and 15.0% for New Jersey. Once again, New Jerseyans benefited from a slower rate of inflation.

TABLE II. 1

PER CAPITA INCOME GROWTH,
1975 - FY 1979

Period	In Current Prices		In 1967 Prices	
	N.J.	U.S.	N.J.	U.S.
1975 ...	$6716	$5903	$4051	$3662
1978-79 .	9335	8090	4658	4011
	(39.0%)	(37.1%)	(15.0%)	(9.5%)

NOTE: Figures in parentheses represent percentage increase

We have previously noted that the 1978/79 level of personal income per capita in New Jersey was 15.4% higher than the national average. The same figure for 1975 was 13.8%. indicating that the relative income of New Jerseyans increased since 1975. In 1967 prices, the increase in per capita income is more impressive because of a slower rate of inflation in New Jersey. Real per capita income in New Jersey was higher than the U.S. average by 10.6% in 1975 and by 16.1% in FY 1979. However, for reasons that follow from the subsequent analysis, the benefit of relatively moderate inflation in our area should not be overemphasized. It cannot be denied, however, that area residents were relatively better off in the sense that they have suffered less from inflation than the average U.S. consumer.

Inflation

The rate of inflation for the national economy during the first five months of 1979 reached double-digit figures for the first time since 1974. Inflation in recent months has been accelerating rapidly, running as high as 13 to 15% on an annual basis.

TABLE II. 2

INFLATION IN 78/79
(May 1978 to May 1979)

Item	N.J.	U.S.
All	8.8%	10.8%
Food & Beverages	9.7	11.2
Housing	8.8	11.3
Shelter	8.3	13.0
Fuel & Utilities	10.3	7.7
Furnishings & Operation.	9.1	7.5
Apparel & Upkeep	3.2	3.9
Transportation	11.8	13.4
Medical Care	7.1	8.9
Entertainment	5.7	6.6
Other Goods & Services ..	6.0	7.5

The sources of the recent slower rate of inflation in our area compared to the national average are presented in Table II. 2. These figures show that the major items that contributed to a slower rate of inflation in New Jersey are food and beverages (9.7 vs. 11.2) and housing (8.8 vs. 11.3). Since these two categories are the most important components of a household budget, slower inflation in these items meant that the lower income residents of New Jersey fared relatively better than the low income U.S. household.

A further disaggregation of housing costs reveals that, while costs of fuel, other utilities, household furnishings and operation rose faster in New Jersey than in the rest of the U.S., a substantially slower rate of increase in cost of shelter (8.3 vs. 13.0) was able to hold down the overall housing cost increase much below the national rate. This seems to be a reflection of the stabilization or a slight decline in New Jersey's population. Since housing supply lacks mobility in the short period, the relative oversupply cannot be counter-balanced by shifting the supply to areas with stronger demand, and, therefore, regional housing prices may differ substantially from the rest of the U.S. In the long run, however, supply could be reduced by a slower rate of construction. Thus, a significantly slower inflation rate in the housing sector in New Jersey compared to the national average can be considered a short-run disequilibrium phenomenon. This cannot be expected to continue for a long period, barring a rapid decrease in the State's population.

Although the causes of inflation lie mostly in the national economy, regional differences in the rates of inflation can be partly explained by regional factors. Table II. 3 presents the rates of inflation for various components.

During the 1975-1979 period, the price level for all items rose by 31.7% for the U.S. compared to 26.4% for New Jersey. As was the case in FY 1979, New Jersey's inflation rates were lower than their U.S. counterparts for almost all of the components. The only exception was cost of transportation. Except for the cost of housing, however, the differences are less than five percentage points. As noted earlier, prices of items whose supply can be shifted from the areas with weak demand to the areas with strong demand tend to become equalized. Thus, it is not surprising to find that housing was the most important factor that helped moderate the area inflation rate. We shall briefly consider the factors that might be responsible for the general moderation of inflation in New Jersey and then examine the specific factors responsible for the lower New Jersey inflation rate in housing costs.

As the ratios of New Jersey's consumer price index to that of the U.S. show (column 3), with

TABLE II. 3

INFLATION, JUNE 1975 TO APRIL 1979

Item	Inflation (% Change)		N.J. Index/U.S. Index	
	N.J.	U.S.	June 1975	April 1979
	(1)	(2)	(3)	(4)
All	26.4	31.7	1.025	0.984
Food & Beverages	25.7	29.8	1.025	0.993
Housing	22.1	32.1	1.030	0.952
Shelter	20.5	36.2	1.034	0.915
Fuel & Utilities	35.0	36.3	1.060	1.050
Furnishings & Operation	19.2	19.3	1.017	1.016
Apparel & Upkeep	15.0	17.0	0.969	0.952
Transportation	37.8	35.4	1.036	1.054
Medical Care	36.1	39.9	1.078	1.049
Entertainment	28.5	29.4	1.028	1.021
Other Goods & Services	28.5	31.2	1.036	1.014

SOURCE: Bureau of Labor Statistics Consumer Price Index.

the exception of apparel and upkeep, New Jersey's indexes were higher than their U.S. counterparts in June 1975. By April 1979, however, New Jersey's indexes were closer to their U.S. counterparts than in 1974 (column 4) with the exception of apparel and upkeep. This is consistent with the equalization hypothesis, and, therefore, relative moderation of our area's inflation rate can at least partly be explained by the fact that New Jersey's prices started at higher levels and that a trend toward equalization of prices within the U.S. resulted in a slower rate of inflation here than the rest of the U.S. It might also be a reflection of the fact that demand growth was somewhat eased by population stability.[3]

Turning to the housing sector, we note that the indexes for New Jersey were higher than their U.S. counterparts in June 1975. However, this cannot explain a 15.7 percentage point slower rate of increase in shelter cost in our area since June 1975. If the moderation is exclusively due to a higher base level, the difference in the rates of increase in shelter costs would be only 4.5 percentage points less for New Jersey than the U.S. average. Thus, there seems to be a major difference between the housing market of New Jersey and that of the U.S. As previously noted, the effects of relative demand slack created by a slight decline in the area population would mainly be felt in price in a short period of, say, five years since supply cannot be easily shifted to other areas. Thus, if the current population projections hold, residents of the State may continue to experience slower rates of inflation in housing costs during the next 2 to 3 years. Given the importance of housing in family budgets, the overall inflation in our area may continue to be slower than the U.S. average.

Employment

For the past twelve months (April 1978/ April 1979) total nonagricultural employment increased in New Jersey by 58,000 or 2 percent. Hence, in terms of employment growth, last year continued to be strong even though the rate of job creation slowed during the last several months.

Over the entire recovery period, from 1975 to April 1979, 300,000 more New Jersey residents were employed. During the same period, the total labor force increased in New Jersey by 210,000. Thus, 90,000 people were able to leave the ranks of unemployed—a reduction in the unemployment rate by three percentage points.[4]

However, the remaining 245,000 unemployed as of April 1979 is still a very high number. Considering the national economic slowdown forecast, any further near term reduction of the unemployment rate might be very difficult. Accordingly, the labor market situation should be of utmost concern to State Government.

In comparison with the recovery on the national level, the following observations can be made:

1. Since 1975, the total civilian labor force in the U.S. increased by 10.3% while in New Jersey only by 6.5%. The labor force participation rate (the labor force divided by the working age population) increased in New Jersey at a rate similar to the U.S.[5] Therefore, the entire difference in labor force growth can be attributed to slower population growth. This is largely due to a net outmigration of population. Whatever the negative implications of a large outmigration of productive age people are, this outmigration has eased the supply pressure in the New Jersey labor market. Without outmigration the State's unemployment rate would have been several percentage points higher. In the future, however, the negative impact of outmigration, especially of skilled labor, will be felt if this trend is not reversed.

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[3] This cannot be critical, however, since per capita real personal income grew faster in New Jersey than in the U.S.

[4] In comparison with the last recession's highest unemployment level (375,000 in the third quarter of 1975), the reduction of unemployed was 130,000.

[5] In New Jersey the labor force participation rate increased from 61.2% in 1975 to 63.2% in 1979; in the U.S., it grew from 61.8% to 63.9%.

TABLE II. 4

EMPLOYMENT BY SECTOR, NEW JERSEY AND THE UNITED STATES

1975-1979 (April)

Sector	1975 Employment (thousands)		1979 (April) Employment (thousand)		Percent Change 1975-1979	
	N.J.	U.S.	N.J.	U.S.	N.J.	U.S.
Manufacturing	748.2	18,323	801.7	20,941	7.15%	14.29%
Contract Construction	99.2	3,525	114.9	4,534	15.83	28.62
Transportation	174.3	4,542	186.6	4,958	7.06	9.16
Wholesale and Retail Trade	599.3	17,060	679.4	19,992	13.37	17.19
Finance, Insurance, Real Estate	135.2	4,165	151.1	4,860	11.76	16.69
Services	472.1	13,892	563.2	16,569	19.30	19.27
Government	470.0	14,685	517.6	15,536	10.13	5.80
Total	2,698.3	76,192	3,014.5	87,390	11.72	14.70

2. Employment growth in various sectors of the New Jersey economy was uneven (Table II. 4). The most successful sector was 'Services' which in addition to personal and business services includes health and education. Growth in this sector over the 1975-1979 period surpassed 19% both in New Jersey and the U.S. In addition, government employment, especially on the local level increased more rapidly in New Jersey than in the rest of the nation. Government employment, however, grew in New Jersey somewhat slower than the rest of the State economy (+10.1% vs. +11.7%). All other sectors of the economy failed to increase their employment at a rate commensurate with the national pace. A significant gap developed in the manufacturing sector where the national growth rate of employment was twice as fast as in New Jersey (+14.3% vs. +7.1%).

As a result of these diverse growth rates, the final distribution of New Jersey employment by sectors closely resembles the national distribution (Table II. 5). New Jersey's share of employment in manufacturing industries is now only 2.6 percent higher than the national share. Thus, even though New Jersey remains a highly industrialized state in terms of manufacturing capacities, and is increasing its *volume* of output, the employment composition is now less vulnerable to economic downturns that disproportionately affect a region predominantly specialized in manufacturing.

TABLE II. 5

COMPOSITION OF EMPLOYMENT IN 1979 (%)

Sector	New Jersey	United States
Manufacturing	26.59%	23.96%
Contract Construction.	3.81	5.19
Transportation	6.19	5.67
Wholesale & Retail Trade	22.54	22.88
Finance, Insurance, Real Estate	5.01	5.56
Services	18.68	18.96
Government (federal, state, local)	17.17	17.78

Earnings

Even more important than the industry composition are the developments in wage costs. New Jersey's workers have significantly contributed to a healthier business climate by moderating wage increases over the entire recovery period. Certainly the State's relatively high unemployment rate was a contributing factor in that moderation. Also the slower rate of consumer price increases in this region, whether a result of or a cause for lower wage increases, is a positive factor in the economic recovery in New Jersey.

Over the last year hourly wages for all manufacturing workers in New Jersey increased by 7.7% (from $6.13 to $6.47). For the U.S. manufacturing sector the increase over the same period was 8.8% (from $6.03 to $6.53). As a result New Jersey shifted its position from a state with somewhat higher than average hourly wage earnings to one with lower than average hourly earnings in manufacturing. This development should have a positive impact on future business decisions. Naturally, there are some exceptions to this overall relationship in particular industries.

Changes over the last year were not a single aberration from the long-term trend. Table II. 6 shows that a similar trend has existed for the entire recovery period.

TABLE II. 6

AVERAGE HOURLY EARNINGS IN MANUFACTURING
JUNE 1975 - APRIL 1979

Industry	United States		New Jersey		April 79/June 75		N.J. / U.S. in April 1979
	June 75	April 79	June 75	April 79	U.S.	N.J.	
	in Dollars				Ratio		
Nondurables	4.32	5.89	4.78	6.35	1.36	1.33	1.08
Food	4.54	6.19	5.12	6.69	1.36	1.31	1.08
Textile	3.34	4.47	4.04	5.12	1.34	1.27	1.15
Apparel	3.16	4.19	3.51	5.01	1.33	1.43	1.20
Paper	4.95	6.86	4.77	6.06	1.39	1.27	0.88
Printing	5.35	6.68	5.55	6.56	1.25	1.18	0.98
Chemicals	5.35	7.47	5.68	7.47	1.40	1.32	1.00
Petroleum	6.38	9.56	6.22	8.72	1.50	1.40	0.91
Rubber	4.33	5.78	4.39	5.25	1.33	1.20	0.91
Leather	3.21	4.18	3.60	4.06	1.30	1.13	0.97
Durables	5.10	6.94	5.03	6.59	1.36	1.31	0.95
Lumber	4.25	5.84	4.00	5.07	1.37	1.27	0.87
Furniture	3.72	4.94	4.13	5.09	1.33	1.23	1.03
Stone, Clay, Glass	4.87	6.72	4.89	6.46	1.38	1.32	0.96
Primary Metals	6.07	8.82	5.19	6.92	1.45	1.33	0.78
Fabricated Metals	5.03	6.63	5.26	6.77	1.32	1.29	1.02
Machinery	5.32	7.08	5.34	6.88	1.33	1.29	0.97
Electric	4.58	6.14	4.76	6.26	1.34	1.32	1.02
Transportation	5.96	8.28	6.30	8.67	1.39	1.38	1.05
Instruments	4.54	5.98	5.22	6.48	1.32	1.24	1.08
Miscellaneous	3.78	5.00	3.72	4.83	1.32	1.30	0.97
Total	4.78	6.53	4.90	6.47	1.37	1.32	0.99

SOURCES: Handbook of Labor Statistics, (for 1975), U.S. Dept. of Labor.
Survey of Current Business, (for 1979), U.S. Dept. of Commerce.
N. J. Economic Indicators, (for both years), N.J. Dept. of Labor & Industry.

In all manufacturing industries except the apparel industry wage increases were significantly lower in New Jersey than in the U.S. For the entire period between June 1975 and April 1979 hourly wages increased in the U.S. manufacturing sector by 37% while in New Jersey the increase was 32%. In 1975 New Jersey wages were 2.5% above the national average. In 1979 they were 1% below the U.S. level. This 3.5% relative wage cost reduction is a significant contribution to the improved competitiveness of New Jersey business. This development should be even more encouraging in light of the fact that output per worker was growing faster in New Jersey than in the U.S. as evidenced by productivity statistics for 1976, the last year for which data are available.

Retail Trade

New Jersey's retail sales grew by $511 million, or by 24.5 percent in the past fiscal year. Nationwide, retail sales expanded by only 12.7 percent. Over the entire business recovery period, sales in New Jersey exceeded national growth rates by 151 to 162 percent.

Although there is little doubt that New Jersey experienced above-average sales growth last year, there are a number of mitigating factors to be considered. For instance, if personal income is used as a crude measure of purchasing power, it is possible that retail sales were below expectations one year ago. New Jersey's share of total national retail sales was 3.3 percent, but its personal income share was 4 percent. The latest statistics show New Jersey's share of sales has reached 3.7 percent which is close to its current share of personal income, 3.8 percent. Thus, New Jersey may have experienced a "catch-up" phase over the past fiscal year. Since New Jersey's share of sales now parallels its share of income, there is little foundation for a similar acceleration of sales next year.

Total retail sales in New Jersey have now reached $27 billion which provides jobs for 472,000 employees. This is an increase of only 4,300; a growth rate of less than one percent.

If the latest monthly sales statistics are adjusted to an annual basis, retail sales per employee is $66,011, a $12,400 increase in sales productivity from the estimated 1978 level of $53,590. Before an accurate conclusion can be reached, however, sales data should be adjusted for price changes so that the real quantity of sales per employee can be measured. Using 1967 as the base period, real sales per employee in 1979 are $33,450 compared to $29,474 last year. This represents a 13.5 percent increase in the real quantity of goods sold by New Jersey retailers.

Although sales per employee is an imperfect measure of labor productivity in this sector, it nevertheless is an encouraging sign since productivity is an integral element in moderating unit labor costs.

The Comparative Economic Index

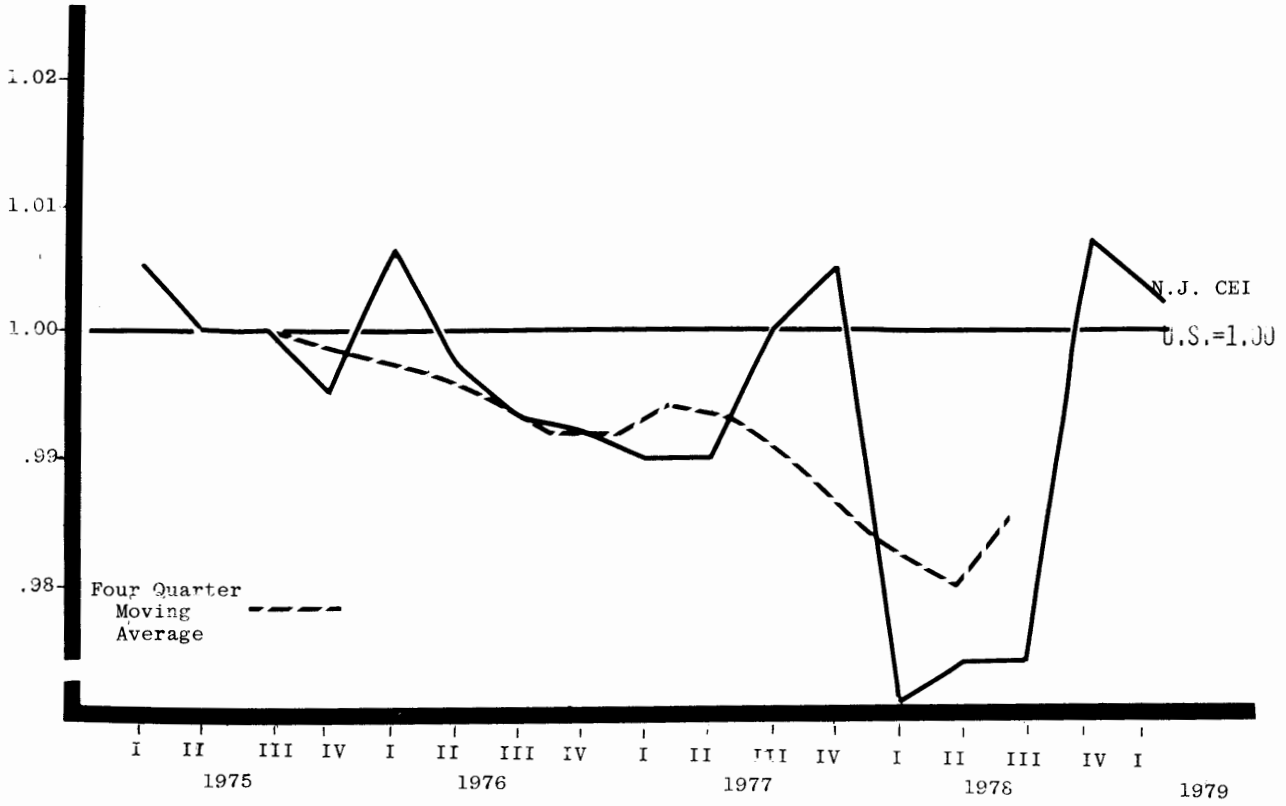
Over the past several years the Economic Policy Council has monitored the performance of the State economy relative to national developments. The Council's Comparative Economic Index (CEI) summarizes the results of the growth of personal income, employment and retail sales both in the State and in the nation. Changes in New Jersey indicators are compared with their national counterparts. A growth rate faster than the U.S. means a CEI value above 1.0, while a slower rate yields a CEI value below 1.0. The combination of all three economic indicators—personal income, employment, and retail sales—is therefore a convenient summary measure of relative economic performance. Since the Comparative Economic Index was designed to monitor the relative strength of the economic recovery, the basis for comparisons is the second quarter of 1975—the trough of the last national business cycle.

The latest available data, the first quarter of 1979, show that the CEI for New Jersey reached the level of 1.00 (Figure II. 1). This result is important, since it indicates that New Jersey has regained a level of economic recovery that is commensurate with national performance. However, this should be interpreted with

FIGURE II.1

COMPARATIVE ECONOMIC INDEX

BASE 1975 (II) = 1.00



caution since it resulted chiefly from an extraordinary hike in retail sales in New Jersey compared to the nation. The other two economic measures—personal income and employment were still below the national mark in the first quarter of 1979. In other words, the growth rate of personal income and employment over the entire period between 1975 (II) and 1979 (I) was slower in New Jersey than in the U.S. Only retail sales growth surpassed the national growth rate, but did so by so large a margin that the composite CEI increased to 1.0.

Economic Outlook for New Jersey in FY 1979-1980

The New Jersey economy in FY 1978-79 fared slightly worse than the national economy in terms of *total* personal income. If we consider real personal income *per capita,* however, New Jersey's growth rate in that period was slightly higher than that for the U.S. We expect that the performance of New Jersey's economy relative to the national economy will follow a similar pattern during the next fiscal year. In other words, while total personal income in New Jersey is expected to do worse than its U.S. counterpart due to a near zero population growth rate in New Jersey, real personal income per capita will fare somewhat better, partly because inflation in our area is expected to be slower than the national average.

Our estimate for the next fiscal year is that total personal income in the State will *decline* by 1.5% to 2% in real terms, i.e., after correcting for the expected inflation. In per capita terms, the State's real personal income is expected to decrease by 1.5% compared to a 2% decrease in the U.S. Inflation in New Jersey is expected to be somewhat slower than the na-

tional average; 8½% for New Jersey compared to 9½% for the U.S. during the next fiscal year.

The unemployment rate in New Jersey, has historically been higher by over a percentage point than the national rate. This is due to differences in labor force characteristics, which we do not expect to change significantly in a short period. Therefore, the gap between the state and national unemployment rates is expected to remain the same as it was at the end of FY 1978-79. This gives an average unemployment rate of 8% compared to 6.8% for the U.S. The 8% unemployment rate is the (expected) average over the entire fiscal year. It is quite likely, therefore, that the unemployment rate in the first half of 1980 may be substantially higher than 8%.

The picture painted above is gloomy. Furthermore, any major disturbance in the flow of international trade may make these forecasts turn out even worse. While the options available to the State are limited, it is important to do our utmost in order to make the coming recession less painful.

III. ENERGY PROSPECTS

Much of the recent concern over energy has been whether there will be enough gasoline over the summer and enough heating oil in the winter to avoid public hardship. There has also been much hand wringing over prospects for business in 1980 now that energy shortage is contributing to a shrink in retail sales and a reduction in industrial activity.

The *short-term* repercussions of the OPEC energy squeeze are and should be of concern to the nation. Memories are still deeply etched by the effects of the embargo and the quadrupling of oil prices in 1973-74. That episode was followed by a deep recession—the deepest since the Great Depression of the 1930s.

Indeed, the decline in business was so sharp by 1975 that the energy shortage itself vanished. Our economy is highly dependent on energy, and the consumption of energy, in turn, depends heavily on the level of economic activity. When the economy loses momentum, the demand for energy drops as well.

The recession of 1980 will once again dampen the demand for energy. At least for a time, any discrepancy between supply and demand is likely to diminish or disappear.[6] Many people will conclude that the energy shortage was contrived only to raise prices and will point to adequate supplies in 1980 as proof. It would be a mistake to draw long-term conclusions from such a period. But the American public must not again allow itself to be lulled into a longer-run sense of security based on a short-run economic downturn.

The Dimensions of the Longer-Run Energy Problem

The longer-run, say over the next decade, *will* require increased supplies of energy. Even with all-out conservation by households and factories, the best estimates of experts anticipate *rising* energy needs over the next decade.

One recent analysis of the growing longer-run demand for energy concludes: "The average of the most reliable estimates that we've been able to review would indicate that our country's total consumption of energy is going to grow from about 80 quads today to approximately 105 quads by 1990, and perhaps 125 quads by the year 2,000."[7]

In short, an increase of 31% in energy consumption is projected between 1980 and 1990. And, the analysis states that: "This growth in energy consumption assumes no deep economic depression, a population growth to approximately 245 million people by 1990, and con-

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[6] Of course, supply always equates to demand either through the price system or through allocations. But the demand at a given level of price can exceed the supply.

[7] Remarks by W. J. Bowen, Chairman, Transco Companies, before the New York Society of Security Analysts, April 11, 1979. A quad of energy is a quadrillion BTUs, or British Thermal Units, a measure of heat. A quadrillion is a thousand trillion.

tinued annual growth in real GNP on the order of 3.5%, which will maintain our economy and our standard of living. It also assumes a continued and dedicated effort to conserve and use of energy more efficiently."[8]

Perhaps an increase of somewhat less than 31% over the decade would suffice if a herculean effort to conserve energy is launched. But the need for increasing supplies by at least, 25%, is apparent.

Will our country be able to raise the supply of energy from 80 quads to somewhere around 100 quads in the next ten years? And what if we do not?

Worth noting at this point is that there is less reason to be concerned about the adequacy of supply by the year 2000 than in the period 1985-1990. The reason is simply that new sources of energy, new technology, are likely to be developed by the year 2000. But it takes from five to ten years to bring major new sources of supply on stream whether through new sources of supply or new technology. The reason for the long delay is primarily the time it takes for the process of issuing permits and construction to be completed. From application to judicial challenge and review (assuming legal obstacles generally on environmental grounds), to actual issuance of a permit often takes five years or more. Only then can actual construction begin.

TABLE II. 7

SOURCES OF ENERGY SUPPLY, 1979
(QUADRILLION BTUs)

Oil		
Domestic	18	
Other	19	
	—	
		37
Gas		
Domestic	18	
Other	2	
	—	
		20
Uranium		4
Hydro		4
Coal		14
	Total	79

Prospects for additional energy supplies in the coming decade can be clarified by identifying first the current sources of energy supply:

As can be seen, of a total supply of 79 quads oil presently contributes 37, gas 20, coal 14, and uranium and hydro-energy 4 quads each.

What can we expect by 1990 assuming that the total supply needed to fuel the American economy rises to the neighborhood of 100-105 quads of energy?

One useful scenario is to assume that the *oil* supply will remain at the present level. OPEC and other sources will be constrained to present levels both because of our reluctance to depend on foreign sources of supply and the reluctance of foreign suppliers in the aggregate to pump more of this limited resource.

Indeed, President Carter announced publicly that our country would try to do better than merely hold oil imports steady. In his July energy message to the American people he pledged a goal "of cutting our dependence on foreign oil by one-half by the end of the next decade—a saving of over four and a half million barrels of imported oil per day." Whether this goal is achievable remains to be seen. In our rather conservative projections, we assume that oil imports will level rather than decline sharply by 1990.

Gas is assumed to increase to 25 quads largely from foreign sources of supply. The assumption that uranium will double from 4 to 8 quads is probably optimistic after the Three Mile Island incident. Hydro-power is a negligible source and will remain so in the future.

That scenario leaves only coal to balance the supply-demand equation over the decade of the Eighties. Fortunately, the U.S. has enormous reserves of coal. It is possible to double the

[8] *Ibid.*

supply of energy from coal but that would require some modification in environmental standards and/or huge expenditures for anti-pollution investments. In any case, under the assumptions made here, the supply of energy from coal would have to rise from 14 to 30 quads by 1990.

TABLE II. 8

PROJECTED SOURCES OF ENERGY SUPPLY, 1990 (QUADRILLION BTUs)

Oil		
Domestic	18	
Other	19	
	—	
		37
Gas		
Domestic	16	
Other	9	
	—	
		25
Uranium		8
Hydro		5
Coal		30
	Total	105

What then can we expect as realistic energy prospects for the 1980s?

Some Practical Alternatives

Above all, we must realize that our country will require more energy in the 1980s to achieve reasonable economic growth. To obtain this required expansion in energy supplies, the U.S. must embark on a crash effort to break through existing barriers to larger domestic supplies, especially from coal and shale. This would not only meet the energy growth needs of the 1980s but help break the oil cartel. Freeing energy prices from present controls would encourage new domestic production and new processes.

Rather than price decontrol as the means to increased supplies (and decreased demands), President Carter has promised a government crash program to develop new sources of supply. At this point what we want to point out is that to meet future energy needs will require substantial *increases* in supply even if oil imports were to remain level rather than decline, as planned by the Administration. Our reliance on alternative sources of energy, especially coal, will grow to a minimum of 30 quads, as shown in the table above. That is a tall order and will be difficult to achieve.

Whatever the government does, it must find a way to expedite the process of authorizing the construction of new power facilities which do not depend on oil. Ways must be found to eliminate or minimize those regulatory delays and appellate procedures which now inhibit the expansion of energy supplies. That does not suggest denial of due process to environmentalists or anyone else. Rather, methods would be instituted to expedite procedures by putting new energy projects on a fast track in reaching administrative and legal decisions. Whatever the outcome, whether approval or denial of a project, the decision would be forthcoming with minimum delays. Both the Federal government as well as the State of New Jersey are urged to proceed with measures to relieve regulatory delays and to expedite all applications and procedures for evaluating and approving new energy supplies.

The importance of achieving greater energy self sufficiency was implied in the agreement reached at the economic summit in Tokyo in June of this year. The communique at the end of that conference stated:

> "The United States adopts as a goal for 1985 import levels not to exceed the levels either of 1977 or the adjusted target for 1979, i.e., 8.5 million barrels per day."

In his energy message, President Carter promised to cut oil imports to 4 million barrels per day by 1990. Obviously, this goes very far beyond the goals set by the heads of state in Tokyo.

The analysis presented here shows that without any increase in oil imports, the projected *increase* in needed energy supplies will have to come from domestic sources. Should the U.S. fail to achieve such an increase, economic growth itself would have to be curbed.

The alternative facing the U.S. is quite clear. We will need more energy in the 1980s to support a moderate rate of real economic growth. Either we break through existing barriers to increasing domestic supplies or there will be fewer jobs, less domestic production, probably larger Federal deficits, and more inflation. The risks of continued energy shortages, which would place a curb on economic growth, are real. To meet our growth objectives, to create more jobs for a growing labor force, will require more energy even with intensive efforts at conversation.

The Economic Policy Council advocates immediate decontrol of domestic oil prices, with or without windfall profits tax legislation, as the best means for mobilizing private resources to increase energy supplies and induce meaningful amounts of conservation. Any undesirable income distribution effects caused by decontrol can be alleviated through general tax policy.

We hope that the sweeping proposals put forward by President Carter in his address in July will lead to a resolution of the long-run energy crisis.

We have not undertaken a study of the specific impact of the national energy outlook on New Jersey. Such a study is being launched by the Economic Policy Council. The study will require a careful examination of the energy needs and output of the commercial and industrial sectors of the State.

Overall, there is little reason to think that New Jersey will fare any better than the nation during any protracted energy squeeze. Indeed, even at this preliminary stage, it seems plausible to expect the national impact to fall with average weight on the economy of New Jersey. As discussed in the previous section, the economic structure of New Jersey has shifted quite remarkably in recent years so that employment patterns by industry now closely resemble the average for the nation.

Energy must be one of the important concerns of New Jersey in the decade ahead.

III

A REVIEW OF ECONOMIC LEGISLATION*

The purpose of this chapter is to review the past year economic legislation and evaluate the impact and import of recently passed, as well as pending, bills on the State's economy. The chapter is organized around several major themes—fiscal climate, regulation, intergovernmental relations, employment, urban recovery, and other economic issues.

I. Fiscal Climate

"My challenge to you is to repeal a law for everyone you pass."

Governor Brendan T. Byrne to the New Jersey Legislature, January 9, 1979**

The above statement reflects the wave of fiscal conservatism that has flooded state houses across the country. Government is shifting its course from one of expanding programs to efficiently delivering services to precise targets. There is also a growing critical examination of state government regulatory activities that discourage price competition and inhibit productivity. Other regulations such as environmental controls, are more frequently being judged on the basis of costs and benefits to society.

Even existing statutes are not escaping the public scrutiny. Sunset provisions, which place a time limit on public programs, are becoming more popular. Overriding these developments is the national drive for states to ratify a resolution to call a Constitutional Convention to consider an amendment to balance the federal budget. Senate 1354, if passed by the New Jersey legislature, would submit a referendum to ascertain the sentiments of New Jerseyans. Aside from the constitutional or political controversies, the economic arguments against the issue are overwhelming.

A balanced federal budget may be achieved by combinations of (1) an increase in taxes, (2) a decrease in federal aid to state and local governments, and (3) a reduction in federal expenditures. The most likely federal response to a balanced-budget requirement would be massive cuts in state/local federal aid. This response would shift the focus of deficit spending to lower levels of government. Since New Jersey's stake in federal aid is significant, $1.2 billion in 1978, an aid reduction would lead to cuts in services or increasing state taxes. If Congress raised taxes to balance the budget, New Jersey might again suffer disproportionately as the State's high levels of income place the average wage earner in a higher marginal tax bracket.

A less obvious objection to the balanced budget amendment is that it would reverse the flexibility of federal fiscal policy. Under present circumstances when the economy enters a reces-

* Prepared by George R. Nagle, Office of Economic Policy.

** All the following quotations by the Governor are from the 1979 Annual Message.

sion (and incomes fall) federal tax liabilities ease somewhat faster and social expenditures rise. In contrast, a balanced budget would call for reduced expenditures or higher taxes at a time which would aggravate rather than counteract the business cycle.

At the state level the impact of mandated spending limits has left little leeway for new programs and initiatives. The net result has been a rather lean diet of economic legislation over the past fiscal year. It would appear that New Jersey's law-making bodies have discovered the difficulty of making all of us better off without making any of us worse off.

II. Regulation

"We must stop regulating activities where regulation imposes costs without commensurate benefits. . . . We should let free market conditions prevail in more cases, not fewer."

Governor Brendan T. Byrne

Two years ago New Jersey created a law that would require an economic impact statement on all legislation relating to the economy or the environment. Earlier this year A-3024 was introduced which would extend the economic impact requirement to accompany changes in administrative procedures by State agencies. The intent of the bill is to provide a dollar estimate of the acclaimed benefits from the rule change and to estimate its effect on competition and employment. The impetus behind this measure stems from the increasing trend to bypass the legislative route in establishing, enforcing or deleting administrative rules, especially those influencing large sectors of the economy. One example is the administrative attempt by the New Jersey Attorney General to deregulate pricing in the State's liquor industry. Another example is the action by the New Jersey Economic Development Authority to require contractors on all assisted projects to pay (at least) prevailing wages. This rule would inflate costs on EDA projects to the point where the interest rate savings on EDA bonds might be offset by higher labor costs. Critics feel minority and other small builders would lose contracts to large unionized firms. A recently introduced Senate Resolution 3004 (and AR 3013) would encourage the EDA not to implement this regulation.

Earlier this year New Jersey found itself with the distinction of being the State with the lowest usury ceiling in the nation. The original purpose of the ceiling was to protect unsuspecting borrowers from unscrupulous lenders. In today's well publicized mortgage markets this threat has been substantially reduced. A usury ceiling below the market rate of interest interferes with mortgage market activity and leads to a reduced supply of available mortgage funds. Economic analysis has shown how New Jersey banks export capital to other regions of the country when the national market interest rate exceeds the State's legal maximum. Chapter 85, Laws of 1979, partially addressed the problem by indexing the usury ceiling to the yields on selected U.S. Government Bonds. The floating index introduces additional flexibility to the usury ceiling in that the ceiling will change along with money market conditions. This will ensure a supply of mortgage money which is considered by many experts to be the critical element in prolonging investment and employment in the construction industry. The legislation, however, falls short of eliminating the usury ceiling problem by imposing an upward limit of 10.75 percent on mortgage loans.

Also affecting the banking industry are Assembly bills 1659 and 1660 which would authorize graduated payments mortgages (GPM) and reverse annuity mortgages, respectively. The long-term, fixed monthly payment, fixed interest rate, conventional mortgage has developed certain perverse features during today's high inflation times. Because the conventional mortgage is stated in fixed dollar amounts, the real cost of the payment declines over time in an inflationary setting. To offset this decline, banks increase the initial nominal dollar value of the monthly payment through higher interest rates, thus often pricing out young families trying to buy their first home. Such home buyers reasonably expect rising income levels over their working lives and thus mortgage contracts with low initial, but

later rising nominal monthly payments fit better the time path of their anticipated income. The graduated payment mortgage starts with a lower monthly payment than conventional mortgages and thus young families can afford the payment in the early years of the mortgage. Over time the monthly payment on a GPM is scheduled to rise in step with inflation rates and the rising income of young families.

Inflation has also greatly affected the housing values of senior citizens. Seniors without mortgage obligations are finding themselves with increasing amounts of equity in their homes and no way to put it to use without selling the house. The reverse annuity contract (outlined in A 1660) converts up to 70 percent of a house's value to a monthly annuity of up to ten years in duration. The Economic Policy Council has long supported innovative and flexible mortgage instruments (see Chapter XIII of the *10th Annual Report*) as efficient ways to stimulate housing activity in New Jersey.

Another step towards less regulation was the enactment of Chapter 32, Laws of 1979, which revised the State's minimum wage laws. Prior to this law the State maintained a minimum wage above the federal rate. The justification was that the higher cost of living in New Jersey required a higher wage to provide a certain standard of living. Numerous studies have shown, however, that minimum wage standards reduce job opportunities for those at the bottom of the job scale. One can surmise that the previous State differential in minimum wage requirements had worsened employment opportunities for teenagers and unskilled laborers. The new law sets the State's minimum wage equal to the national rate. This rate is currently $2.90 per hour and scheduled to rise to $3.10 by 1980.

Deregulation of the retail price of milk is also under consideration. Originally instituted in 1941 to protect small producers, administrative increases in the price floor for milk have now raised the New Jersey price above that of other comparable states. A recent study forecasts a decline in retail milk prices if A-827 (milk deregulation) is passed by the Legislature and signed into law.

Deregulation has gone in the other direction in terms of land use and environmental preservation. Recently signed legislation, Chapter 111, Laws of 1979 (S-3091) sharply restricts development in the New Jersey Pinelands. The bill reflects the point of view that current development in this unique area is random and uncoordinated and poses sufficient threat to the delicate ecology of the Pinelands. The legislation raises a number of difficult questions. Paramount is the extent of owners' property rights versus the public interest. The legislation handles this issue with compensation to land owners in the preservation area. A secondary issue is the efficacy of a measure that further restricts development from a large region that already offers few opportunities for development. Together with coastal development restrictions (CAFRA), the Pinelands bill would eliminate a significant amount of the southern half of the State from development.

Public transportation in New Jersey also faces increasing State involvement if Senate bill 3137 is passed. Subsidization of bus companies has not increased ridership, nor led to significantly improved services, but has led to greater demands for increased subsidies. Senate 3137 would create a public corporation in the New Jersey Department of Transportation with broad powers to acquire and operate mass transit facilities. The success of the corporation hinges upon efficient management and improved services. There is also an inherent risk involved in the uncertain response of consumer demand to improvements in the supply of transit services. For many years consumers have preferred the convenience of automobile transportation to mass transit. Unless the price of mass transit can be held sufficiently low relative to automobile use one might expect little response to bus transit. The proposed corporation must then carefully balance the cost of rehabilitating bus service with the price charged for upgraded service.

Lastly, there are a number of amendments proposing changes to the method of auto insur-

ance rating (S-3283, S-1229, S-1230, A-3049, A-3050). Essentially, these bills prevent auto insurers from basing premiums on geographic location and age. A merit plan would be created based on driving experience.

III. Intergovernmental Relations

"The cities should have first call on any excess state funds we can develop."

Governor Brendan T. Byrne

Intergovernmental relations have become an increasingly important element in managing today's government. Local governments, under restrictive spending limitations, are now relatively more dependent on revenues (intergovernmental aid) from outside sources. State government has also intensified its demands for federal aid to the point where revenue from this source now accounts for more than 30 percent of total state spending. A number of bills strengthening or redefining intergovernmental relations have been introduced during the past year.

Studies have found a direct relationship between the amount of intergovernmental aid and the grantsman or entrepreneurial aggressiveness of local governments. Without a centralized information source local governments often resort to expensive middlemen to fill the information void. Senate 239 proposes a State office of Federal Aid Grant Information which would coordinate and inventory all State and Federal aid moneys available and granted to State and local governments. A related bill, A-1846, would require State budget officials to budget and appropriate federal aid in the same detail as State monies. Currently a significant share of intergovernmental aid bypasses the budget and escapes public scrutiny.

One of the more significant bilis signed into law last year (Chapter 155, Laws of 1978) extended municipal and county spending caps through 1982. The spending caps, however, remain a controversial issue and a number of bills have been introduced to modify the cap. This problem threatens to become severe as high inflation rates continue. One way the State can bypass the cap is to shift fiscal responsibilities to lower levels of government and let them deal with the problem. Preliminary study results suggest a significant share of local spending is related to requirements from higher levels of government. Assembly 3227 recommends an approach to the problem by restricting the State from mandating expenses to counties in excess of 5 percent over the expenditures mandated in the previous year.

Chapter X in this *Annual Report* investigates the local government response to grants-in-aid. One observation found that over time municipalities incorporate aid into their revenue base. Difficulties then arise when that source of income is reduced or eliminated. Earlier this year federal anti-recession aid lapsed and New Jersey municipalities lost $80 million in expected grants. Since most of the aid was targeted to the State's most depressed cities, State action was taken to temporarily appropriate $22 million for fiscal relief (Chapter 34, Laws of 1979). In addition, there were many attempts last year to raise or liberalize exemptions from local spending limits.

Aside from strictly fiscal matters the State is attempting to promulgate housing guidelines for the poor and elderly on local governments. Assembly 3162 would require each county to submit a 'balanced housing plan' to a State Council. The principle objective is to match housing opportunities to employment opportunities within the municipality. Some proponents of this bill feel local areas may be able to avoid the legal ramifications of exclusionary zoning by coordinating its housing plan with its economic development plan.

IV. Employment

"Stimulating new jobs remains the State's top priority."

Governor Brendan T. Byrne

Economic development has always been a top priority of the current administration. Last year the Governor's Conference on Economic Priori-

ties for Jobs Creation pooled business, labor and government leaders together for two days to devise an agenda for action. Some of the following legislative bills are a result of that Conference.

The New Jersey Economic Development Authority has been successful in arranging low cost financing for economic development projects through New Jersey banks. The Agency's middleman role, however, restricts aid only to those projects with well established credit. Senate 3125 proposes to expand EDA's involvement by submitting to public referendum a $50 million bond issue. With this capitalization EDA would lend directly to developers for projects in the State's urban aid municipalities. The tax exempt nature of the public bonds would be passed along to the borrowers in the form of lower interest rates.

A number of tax incentives were proposed last year to stimulate economic development, but recognizing the fiscal limits on incentives most of the bills are targeted toward the State's urban municipalities or those with higher than average unemployment rates. Senate 3120 and 3121 would allow a taxpayer an investment tax credit of three percent of the cost of plant and equipment against the Corporation Business Tax. The bills are targeted to urban aid municipalities. Related measures Senate 3122 and 3123, propose tax credits to those who employ at least five additional employees as a result of capital improvements. A slightly different version, Senate 1456 and 1457, would offer a credit against the Corporation Business Tax in an amount equal to 25 percent of the base wage paid by a taxpayer to each person employed and enrolled in a qualified apprenticeship program (in selected trades). This measure intends to encourage employment as well as skilled training for previously unemployed workers.

One bill supported by the Economic Policy Council, S-535, exempts new capital construction from the Corporate Net Worth Tax. Despite the size of New Jersey's manufacturing sector, the rate of manufacturing investment has been declining relative to the U.S. In 1958, 5.4% of the nation's manufacturing investment was spent in New Jersey; by 1973 the figure dropped to 3.8%. Commensurately, manufacturing output has fallen from 5.5% in 1958 to 4.7% in 1972. Output shares will most likely continue to fall until sufficient investment incentives are established. Most states tax either corporate net income or net worth. New Jersey taxes both. If adopted S-535 might help reverse the State's downward investment trend.

Historically, economic growth in New Jersey has closely paralleled the health of the State's small business sector. Current estimates suggest that over half of the State's working labor force are employed by small businesses. Recently small business development has been hampered by increasing government regulations. This phenomenon hampers small businesses relatively more than large firms since they have neither the manpower nor flexibility to comply with local, state and federal regulatory authorities. Senate bill 1395, the "Regulatory Flexibility Act", attempts to relieve small businesses from selected State regulation.

One aspect of state economic development is currently undergoing Congressional scrutiny. Documented abuse with revenue bonds for single family mortgage lending is leading to tighter controls over what amounts to housing subsidies for middle income families. The greatest demand for housing revenue bonds occurs during times of tight credit when conventional mortgage financing is difficult to obtain. The perversity of this market is that an increased supply of revenue bonds is forthcoming just when policy makers are pursuing restrictive monetary policies. Housing bonds also compete for investment funds which, to some degree, "crowd out" financing for other public and private projects. A resolution by the New Jersey Senate, SCR-3024, however, urges Congress not to eliminate the tax exempt status of State mortgage revenue bonds.

Perhaps introduced at the wrong time are Senate 3094 and 3264 which permit local governments to issue single family mortgage revenue bonds.

One of the more visible public issues last year was the decision to end basic training at Fort Dix. SCR-3020 and AR-3004 requests Congress to reverse this decision. Department of Defense impact studies reveal some cost savings from relocating and consolidating its training activities. However, officials in New Jersey argue that by closing Fort Dix significant social costs will be imposed on surrounding communities that would far exceed military savings. A current estimate places the potential loss of income in the region at $500 million.

V. Urban Recovery

"A year ago I announced that I would create an Urban Growth Task Force to assess New Jersey's progress on urban problems. . . . In October a cabinet level study . . . concluded that much has been accomplished in sparking a comeback for New Jersey's cities."

Governor Brendan T. Byrne

Although a number of programs and administrative actions have aided cities, it is premature to analyze legislative accomplishments in this area since a Senate committee assigned to the task is still drafting responses to last year's urban report. Nevertheless, there were several urban oriented laws passed last year. The Safe and Clean Neighborhoods Act of 1973 was amended (Chapter 56, Laws of 1978) to continue aid to disadvantaged urban municipalities. The Safe and Clean Act is generally recognized as a well-designed, fiscally responsive grant-in-aid program.

The Senate 'urban' committee is expected to release a number of proposals expanding the scope of the State property tax abatement program (Fox-Lance). We are concerned that granting tax abatements puts additional fiscal strain on cities since existing city taxpayers must finance any new tax abatements.

If Fox-Lance tax abatement remains intact, we would suggest improvements in existing facilities be given the same treatment for tax abatements as new investments since most employment expansion takes place in existing firms rather than in newly established ones. Also, the change from tax abatement to a tax paying position should be gradual rather than abrupt. For example, a phase-in period of 3-5 years would ease the financial burden on the company and possibly at the same time prevent some business exodus from the cities. Finally, proposals to broaden the definition of blighted areas might be counterproductive to the objectives of Fox-Lance since the strength of the incentive in the most needy areas will be reduced by giving the investor the opportunity to get the same tax reduction elsewhere.

Assembly 1366 expands the number of municipalities eligible to grant Fox-Lance tax exemptions. A related measure, Senate 1186 redefines "blighted areas" to facilitate municipal property tax abatement requirements.

VI. Other Economic Issues

"New Jersey has been a leader in holding down government spending at all levels . . . I am proud to say that total property taxes collected in 1978 were slightly below those in 1976."

Governor Brendan T. Byrne

In previous years tax policy was often a lead topic in this review. However, spending limits (Chapter 156, Laws of 1978, which extended the expiration date to June 1983) have left little room for increased taxation. A number of bills, however, recommend changes to existing taxes. Inflation has distorted many of the elements of the personal income tax. One adjustment, Assembly 1506, would index the value of the personal exemptions, currently at $1,000 per dependent, to reflect changes in consumer prices. Similarly, Assembly 1699, would provide for an annual adjustment in the property tax deduction for senior citizens and the disabled based upon changes in the consumer price index. The cost of this adjustment will be financed out of the State's Casino Revenue fund which is earmarked for senior citizens programs.

Two years ago the voters of this State approved a referendum legalizing casino gambling. To insure impeccable operations the State required a detailed licensing procedure which only few casinos have been able to complete thus far. These casinos are legalized monopolies and have been earning higher than expected profits. Two bills, Assembly 3318 and 3012 recommend temporarily raising the tax on gross casino revenues until a sufficient number of casinos are licensed and the effects of competition will begin to reduce profits. It should be kept in mind, however, that profits are a reward to risk-taking and also attract other entrepreneurs and investments. Since the objective of casino gambling is to attract investment, measures to reduce profits significantly could be counter-productive to the interests of urban revitalization in Atlantic City. The explicit temporary nature of any surcharge will tend to reduce this negative effect.

An unusual bill, Assembly 3150, seeks to limit the ownership of agricultural land to only U.S. citizens. In some cases there is a legitimate argument against foreign ownership of U.S. assets, especially when sophisticated technology could be easily transferred out of this country. The fixed nature of New Jersey farmland voids this argument altogether leaving little justification for this bill.

"We must review the laws directly affecting employment, specifically worker's compensation and unemployment compensation."

Governor Brendan T. Byrne

Studies comparing business costs between states often identify unemployment and disability compensation as being unusually expensive in New Jersey. In addition, New Jersey is scheduled to begin repaying its unemployment compensation deficit of $695 million incurred during the 1975 recession. The result will be even higher tax rates on New Jersey employers and employees (which are already 54% above the national average). Senate 3230 recommends broad-based reforms aimed at restoring solvency to the New Jersey trust fund.

Companion bills, Senate 1018 and 3196, reform the State's disability insurance program by tightening eligibility requirements on one hand, and by increasing benefits to seriously injured workers on the other.

"As a complex and varied state New Jersey resembles the nation in miniature."

Governor Brendan T. Byrne

With the prospect of another recession on the horizon the health of the State economy and the State budget have suddenly become important issues. Since the State must constitutionally adopt a balanced budget there is little room for stimulating fiscal policies. Yet during an economic downturn there are many demands for public spending, especially for large capital construction projects. Although it is too late to help with the immediate economic situation, Senate 1368 proposes the State establish a countercyclical spending fund to (1) supplement the State budget when tax revenues fall short of expectations and (2) to finance new employment opportunities and investment. The fund would be capitalized with budget surpluses realized during prosperous years.

VII. Conclusion

This past legislative year reflects the impacts of mandated spending caps and an unwillingness to increase taxes to finance expanding State government programs. Instead there appears a trend to reduce the scale of government interference in the economy through the numerous bills decontroling price, commerce, regulation, etc. At the same time, programs such as urban oriented legislation were funded by redistributing scarce tax monies to these areas.

Although the State's unemployment rate is still above the national average, there has been and continues to be a strong interest in the state of the economy by both the Executive and Legislature. The success of measures taken over the past several years to improve the New Jersey business climate suggests a continuation next year of legislation designed to improve business conditions, stimulate competition, and, in general, to broaden the State's tax base.

IV

NEW JERSEY'S EXPORT PERFORMANCE*

Introduction

Large balance of payments deficits experienced recently by the United States have resulted in increased attention to export promotion. The New Jersey Economic Policy Council suggested a broad program of export expansion be developed that will not only contribute to the reduction of the national balance of payment deficit but will expand job opportunities in the Garden State.

The United States has significantly increased its participation in international trade in the last several decades. Despite this, the U.S. share in the world market is declining, a sign of expanded participation by developing countries and the success of economic integration among other western market economies.

New Jersey has not kept pace with national export growth. This paper attempts to find areas where New Jersey is lagging in export performance.

Section I reviews New Jersey's export performance relative to other states and the national total. In addition to the U.S. total, a sample of thirteen states with the highest volume of manufactured exports was selected to provide a basis for comparison.[1] In 1976, the thirteen states plus New Jersey exported $55.4 billion of manufactured goods—2/3rds of the total U.S. exports.

Section II highlights those industries in New Jersey that have lagged in their exports in comparison with other states. It attempts to explain the total shortfall in exports in terms of differences in output growth and export-output ratios.

I. The Symptoms

The analyses in this paper are based on recently published statistics on exports by state and major manufacturing industries.[2] The most general observation is that over the period 1966-1976 U.S. manufactured exports increased by 290 percent (from $21.3 billion in 1966 to $83.1 billion in 1976), while New Jersey's exports grew by only 171 percent (from $980 million to $2,660 million).

Since output of the manufacturing sector in New Jersey has been growing more slowly than in the U.S., the State's export performance should be realigned with its actual output growth. Changes of export-output ratios are convenient measures for this purpose. Output is defined as the total value of shipments experienced in current U.S. dollars. The export-output ratio will always be expressed in per-

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* Prepared by Dr. Adam Broner, Director, Office of Economic Policy.

[1] The selected states are: California, Connecticut, Illinois, Indiana, Massachusetts, Michigan, New York, North Carolina, Ohio, Pennsylvania, Texas, Washington and Wisconsin.

[2] *State Export Series.* U.S. Department of Commerce, November 1978. The publication includes export data for 1960, 1966, 1969, 1972 and 1976. For various technical reasons the analyses in this chapter are confined to manufacturing exports for the period 1966-1976.

centage terms, i.e., the actual ratio (which is always less than 1.0) multiplied by 100. The export-output ratio will be called the propensity to export.

In 1966 the export-output ratio for all U.S. manufacturing industries was 3.96%, while for New Jersey it was 3.93%. By 1976 the U.S. export-output ratio grew to 7.01%. In New Jersey it rose to 5.82%. Hence, New Jersey's exports have lagged behind the national performance even relative to its output growth.

A simple comparison between the United States and New Jersey shows that had New Jersey export-output ratio followed the national growth, its 1976 exports would have reached $3,179 million, over $0.5 billion, or 20% more than in reality. In terms of employment, this difference translates roughly into 7,000 direct manufacturing jobs.[3]

However, it can be argued that New Jersey has the potential for a better than national average performance. First, New Jersey is located in an extremely advantageous region from the viewpoint of exporting to world markets—along the Atlantic shore with one of the largest world sea ports. Second, New Jersey has traditionally been a leader in technical innovation, i.e., in commodities that constitute the bulk of U.S. manufactured exports.

In the past, New Jersey has occupied a leading position in U.S. exports. In 1960 New Jersey's share in total U.S. value added by manufacturing was 5.24% while the State's share in total U.S. manufacturing exports was 5.40%. By 1976, the State's share in value added dropped to 3.97% while the export share fell even lower to 3.2%. If New Jersey held, in 1976, its 1960 market share in exports, after allowing for the general decline in the State's share in manufacturing output, exports would have been 4.09% of the U.S. total, i.e., $3.4 billion or $740 million more than it actually exported.

Following the argument that New Jersey should be a leading exporter among all states, we have chosen to compare the Garden State's performance with the states of Massachusetts and Connecticut. Both these states are similar to New Jersey in terms of geographic and economic attributes that can potentially lead to a better than average export performance. For instance, in 1966 Massachusetts had an export-output ratio of 3.87% which had grown to 9.29% by 1976.

Comparing New Jersey's export-output ratio in 1976 (5.82%) to Massachusett's (9.29%) and Connecticut's (10.64%) reveals a potential for additional New Jersey exports of $1.6 billion and $2.2 billion respectively. In terms of employment, 20 to 30 thousand direct manufacturing jobs could have been created in New Jersey.

Even when New Jersey's export performance is compared with thirteen of the largest exporting states—which is a more modest standard for comparison—the evidence is clear that the State has not kept pace with their export growth. In 1976 New Jersey had the lowest export-output ratio among *all* these states and exhibited the slowest export growth rate during the 1966-1976 period.

A more detailed account of the volume and growth of exports is presented in Table IV.1. As already mentioned, the overall increase in New Jersey's export growth (171% over the 1966-1976 period) was smaller than the total for the thirteen states (259%), Massachusetts (317%), or Connecticut (300%).

The industry breakdown reveals that five major industries,[4] each exporting more than $5 billion annually, supplied 72% of all U.S. exports. Their combined export growth was 325% over the 1966-1976 period. In New Jersey, the same five industries contributed nearly 77% of all manufactured exports in 1976, but the value of their exports increased by only 198%.

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[3] By dividing the U.S. export-output growth (1.77) over New Jersey's growth (1.48) during the 1966-1976 period we get a nearly 20% increase of the State's exports (177/148 = 1.1959). The State's actual exports in 1976 of $2,660 million multiplied by 1.1959 results in $3,179 million of expected exports. It was estimated that in 1976 about 35,000 jobs were related to New Jersey's exports. Hence a 20% growth of exports could increase manufacturing employment by 7,000.

[4] The five major industries are: Machinery (SIC 35), Transportation Equipment (SIC 37), Chemicals (SIC 28), Electric and Electronic Equipment (SIC 36), and Food and Kindred Products (SIC 20).

TABLE IV.1

VALUE AND GROWTH OF EXPORTS, BY INDUSTRY; NEW JERSEY AND SELECTED STATES, 1966-1976

SIC Industry	1976 Value of Exports(millions) N.J.	MASS.	CONN.	13 States	U.S.	Export Growth 1966 - 1976 (1966 =1.00) N.J.	MASS.	CONN.	13 States	U.S.
20 Food & Kindred Products	160.0	25.0	12.0	2549.0	5883.0	2.32	1.04	1.60	2.37	3.08
22 Textile Mill Products	9.0	21.0	8.0	594.0	1224.5	3.60	1.20	3.20	3.67	3.65
23 Apparel & Textile Products	33.0	11.0	8.0	364.0	728.5	1.89	1.47	3.20	2.91	3.66
24 Lumber & Wood Products	3.0	16.0	-	1203.0	1892.0	1.20	6.40	-	9.98	6.65
25 Furniture & Fixtures	4.0	3.0	2.0	122.0	184.5	8.00	6.00	4.00	4.86	5.11
26 Paper & Allied Products	46.0	60.0	22.0	720.0	2260.7	2.71	3.00	2.93	2.75	3.77
28 Chemicals & Allied Products	996.0	287.0	131.0	4551.0	9271.2	3.66	9.90	4.09	3.62	3.80
30 Rubber & Misc. Products	39.0	32.0	10.0	696.0	1270.4	2.05	1.45	1.25	2.95	3.77
31 Leather, Leather Products	12.0	36.0	-	109.0	279.7	4.80	3.60	-	3.13	4.63
32 Stone, Glass, Clay Products	47.0	53.0	4.0	577.0	901.7	2.76	3.31	1.33	3.12	3.18
33 Primary Metals Industry	53.0	23.0	21.0	2046.0	2935.7	0.72	1.77	1.50	2.81	2.72
34 Febricated Metal Products	84.0	104.0	125.0	2573.0	3702.5	1.75	3.15	3.47	3.63	3.91
35 Machinery, Except Electric	412.0	703.0	253.0	11914.0	19036.5	3.10	4.06	2.39	3.19	4.03
36 Electric & Electronic Equip.	242.0	505.0	160.0	6204.0	9169.5	2.52	6.08	4.85	5.20	5.71
37 Transportation Equipment	228.0	202.0	931.0	13275.0	16518.1	2.02	11.54	6.16	4.61	4.78
38 Instruments & Related Prod.	162.0	338.0	215.0	2540.0	3758.3	6.23	4.17	5.66	3.70	4.75
39 Misc. Manufacturing Ind.	56.0	67.0	34.0	976.0	1335.8	1.87	1.49	0.83	1.41	1.37
Other	74.0	16.0	22.0	1772.0	2745.0	2.43	2.91	4.00	2.21	2.22
Total	2660.0	2502.0	1958.0	52784.0	83098.0	2.71	4.17	4.00	3.59	3.90

In Table IV.2 export growth rates from other states were applied to the New Jersey export sector. Under these assumptions, potential exports for each industry were calculated. For the entire manufacturing sector, New Jersey's exports would have been: $1,427 million more using the Massachusetts growth rate; $1,260 million more using the Connecticut growth rate; $809 million more using the 13 states average; and $1,168 million more in comparison with the United States total.

On an industry by industry calculation, the five major industries contribute the lion's share (72%) to New Jersey's total exports shortfall.

II. Diagnosis of the Problem

Export growth rates cannot by themselves constitute a complete yardstick for interstate comparisons. Export growth rates do not account for different output increases among states. The latter result mainly from interstate competition and economic growth policies adopted by states and influenced by the Federal government. One can argue, however, that a vigorous export expansion and promotion policy may significantly contribute to additional output growth. A very convincing example can be found in the Chemicals industry of Massachusetts, where 85% of the industry's output growth was attributed to export expansion.[5] However, in this study the impact of various output growth rates among states on the volume of exports is separated from other factors.

Export potential of a given state cannot be considered in isolation from demand for U.S. goods on world markets. Therefore, the U.S. export propensity must be taken into account in inter-state comparisons. Inter-state comparisons of export-output ratios for 1966 and 1976 for individual industries will reveal how responsive a state's industry was to the export opportunities in the world market irrespective of its output growth. The analyses are conducted in relative terms, i.e., always comparing one state's performance to another state or a group of states. The results are expressed in dollars transformed into amounts of exports that a particular state (in this case New Jersey) could achieve given the export propensity of the benchmark states.

New Jersey's export potential was calculated under the assumption that the State's export-output ratio (E/O) equaled that of the benchmark states. Also accounted for are:

a) the impact of deviations in the 1966 export-output ratios,

b) the growth of export-output ratios during the 1966-1976 period,

c) the different experience in output growth between 1966 and 1976, and

d) different industry compositions in benchmark states.

Table IV.3 provides the necessary information on E/O ratios for the selected states by major manufacturing industries.

On the national level the highest export share is observed in the Machinery industry (SIC 35) where, in 1976, over 18% of total shipments were exported. Other industries that export more than ten percent of their total output are Instruments (SIC 38), Electric and Electronic Equipment (SIC 36), and Transportation Equipment (SIC 37). Chemicals (SIC 28) are being exported at less than nine percent nationally but nearly ten percent in New Jersey. The export share of most of the other manufacturing industries is rather low.

It should be noted that the U.S. does not achieve export-output ratios that are characteristic for most western industrialized nations (These tend to fall in the 30% to 40% range). This is due mainly to the large U.S. domestic market, the distance from major European markets and the relatively less developed markets of Latin American countries. With continued economic progress in Latin America there will be an increasing share of U.S. goods exported to these markets. This will result in higher E/O ratios in the U.S.

[5] State Export Series, Massachusetts. U.S. Department of Commerce, Washington, D.C., November 1978, p. 5.

TABLE IV.2

NEW JERSEY POTENTIAL EXPORTS UNDER GROWTH RATES REALIZED BY OTHER STATES

SIC	Industry	Difference in N.J. Exports if Growth of Exports During 1966-1976 Would Be the Same As In: Massachusetts	Connecticut	13 States	United States
20	Food & Kindred Products	-88.2	-49.6	+3.5	+52.4
22	Textile Mill Products	- 6.0	- 1.0	+0.2	+ 0.1
23	Apparel & Textile Products	- 7.3	+23.0	+17.9	+30.9
34	Lumber & Wood Products	+13.0	-	+22.5	+13.3
25	Furniture & Fixtures	- 1.0	- 2.0	- 0.2	- 1.4
26	Paper & Allied Products	-25.0	+ 3.8	+ 0.7	+18.0
28	Chemicals & Allied Products	+1696.8	+116.5	-11.4	+38.1
30	Rubber & Misc. Products	-11.4	-15.2	+17.1	+32.7
31	Leather, Leather Products	- 3.0	-12.0	- 4.2	- 0.4
32	Stone, Glass, Clay Products	+ 9.3	-24.4	+ 6.0	+ 7.2
33	Primary Metals Industry	+78.0	+58.0	+155.0	+147.2
34	Fabricated Metal Products	+67.2	+82.6	+90.0	+103.7
35	Machinery, Except Electric	+128.0	-94.1	+12.3	+123.6
36	Electric & Electronic Equipment	+341.7	+369.6	+257.0	+306.3
37	Transportation Equipment	+1076.0	+468.0	+293.0	+311.5
38	Instruments & Related Products	-54.0	-14.8	-66.0	-38.5
39	Miscellaneous Manufacturing Ind.	-11.3	-31.1	-13.7	-15.0
	Other	-43.5	-74.0	+26.0	- 6.4
	Total	+1426.6	+1260.0	+809	+1168.0

TABLE IV.3

EXPORTS AS A PERCENTAGE OF TOTAL SHIPMENTS IN 1976 (E/S RATIOS)

SIC	INDUSTRY	N.J.	MASS.	CONN.	13 States	U.S.	GROWTH OF E/S RATIOS BETWEEN 1966 and 1976 (1966 = 1.00) N.J.	MASS.	CONN.	13 States	U.S.
20	Food & Kindred Products	2.82	0.92	1.18	2.67	3.25	1.21	0.55	0.72	1.09	1.36
22	Textile Mill Products	1.02	2.00	2.00	3.48	3.37	2.52	0.97	2.16	2.07	1.96
23	Apparel & Textile Products	2.31	0.95	2.57	1.67	2.10	1.33	0.93	1.82	1.85	2.10
24	Lumber & Wood Products	1.45	9.10	-	8.61	6.06	0.53	3.22	-	3.36	2.29
25	Furniture & Fixtures	1.26	1.06	0.94	1.29	1.30	4.94	4.05	1.54	2.66	2.70
26	Paper & Allied Products	2.55	3.74	3.90	2.77	4.69	1.50	1.75	1.11	1.27	1.60
		-	-	-	-	-	-	-	-	-	-
28	Chemicals & Allied Products	9.84	20.56	10.22	8.22	8.90	1.73	5.44	1.85	1.43	1.49
30	Rubber & Misc. Products	2.48	2.38	1.87	3.24	4.00	0.83	0.76	0.83	1.15	1.42
31	Leather, Leather Products	4.75	4.79	-	3.81	3.90	3.64	3.79	-	2.70	3.24
32	Stone, Clay, Glass Prod.	3.04	8.45	1.16	3.19	2.94	1.45	1.61	0.73	1.54	1.52
33	Primary Metals Industry	2.30	2.77	1.52	3.05	3.16	0.57	1.50	1.25	1.57	1.45
34	Fabricated Metal Products	3.18	5.44	5.65	4.55	4.78	1.02	1.68	1.32	1.46	1.56
35	Machinery, Except Electric	14.69	17.96	11.57	15.57	18.04	1.82	1.22	1.28	1.48	1.78
36	Electric & Electronic Equip.	8.38	16.88	10.11	12.09	12.41	2.33	4.19	2.53	3.06	3.15
37	Transportation Equipment	6.71	13.72	24.36	12.68	11.71	1.18	6.56	3.02	2.39	2.43
38	Instruments & Related Products	12.29	16.11	20.26	13.60	15.02	2.07	1.70	1.76	1.44	1.68
39	Miscellaneous Manufac. Ind.	5.88	6.94	6.06	8.84	8.20	1.02	0.84	0.60	0.73	0.67
	Other	1.32	0.98	2.37	2.04	2.05	0.86	2.11	5.12	0.95	0.86
	Total	5.82	9.29	10.64	7.00	7.01	1.48	2.40	2.06	1.69	1.77

Interstate Analysis—Table IV.3 shows that for the U.S. the total manufacturing E/O ratio growth rate was 77 percent; from 3.95 to 7.01. Above average increases in overall E/O ratios took place in Massachusetts (240%) and Connecticut (206%). The entire group of thirteen large manufacturing exporters was able to increase the share of exported goods by 69 percent. New Jersey's growth was the least impressive—only 48 percent. It should be noted, however, that New Jersey's exports have outperformed the average in the Instruments industry (SIC 38), in Machinery (SIC 35), in Textiles (SIC 22), Furniture (SIC 25) and Miscellaneous Manufacturing (SIC 39).

However, except for Machinery and Instruments, the other improvements have little dollar significance. In the largest exporting industries New Jersey did not have success commensurate with other states. What are the reasons for this performance? An attempt is made to single out several quantifiable factors that account for New Jersey's export shortfall.

In Table IV.4 New Jersey's potential exports, for each industry, are calculated under the assumption that New Jersey's E/O in 1976 is the same as the benchmark states. Comparisons between lines 19 and 20 of Table IV.4 reveal the impact of different industry mixes.

Column 1 shows the impact of differences in the 1966 E/O ratios on New Jersey's export. Column 2 (the algebraic difference between Column 1 and Column 3) accounts for different changes in the propensity to export during the 1966-1976 period. Column 4 shows the amount of exports that could be achieved if New Jersey's output growth during the same period would have been the same as in other compared states.

The Table is constructed so that a plus sign means that New Jersey should have exported more. Conversely, a minus sign indicates that the Garden State should have exported less. For example, in the Food industry, if New Jersey experienced the Massachusetts E/O ratio (1976), it would have exported $107.8 million less. In this particular example of the food industry, New Jersey exported 2.82 percent of total output while Massachusetts exported only 0.92%. Thus, New Jersey is credited with a better performance than Massachusetts.

The Chemicals industry provides an interesting contrast. According to the comparison with Massachusetts, New Jersey should have exported over $1 billion more chemicals. This highly unlikely result occurred because Massachusetts exported over 20 percent of its output of chemicals, while New Jersey only 9.84%. However, New Jersey's export of chemicals in 1976 reached almost $1 billion, while Massachusetts exported only $287 million. Nevertheless, Massachusetts' achievement is remarkable and clearly demonstrates a successful effort, which if repeated in New Jersey, could have an enormous impact on the State's economy.

Comparisons of chemical exports with other states does not confirm such a large deficit. Quite the opposite, in comparison with the total of the thirteen states or the U.S., New Jersey experienced a positive export balance.

A more consistent picture of shortfalls in New Jersey exports is apparent from comparisons of all machine and tool producing industries. Adding Fabricated Metal Products, Electrical and Non-electrical Machinery, Transportation Equipment, and Instruments reveals a total shortfall in New Jersey exports of $388 million in comparison with the thirteen states. The export gap widens to $743 million when the State is compared to the Connecticut E/O ratio.

New Jersey's shortfall in exporting is not caused by a different industry mix. The results show that the industry mix impact is only minimal ($556.6 minus $544.4 = $12.2 million) in comparison with the U.S. (Column 3, line 20 minus line 19).

There are more pronounced industry mix differences between the New Jersey manufacturing sector and that of the other states. In particular, the biggest negative difference for New Jersey is shown in the comparisons with Connecticut. This should be interpreted to indicate that industries with much lower E/O ratios in New Jersey than in Connecticut (Textile,

TABLE IV.4

FACTORS AFFECTING NEW JERSEY EXPORT PERFORMANCE

INDUSTRY	IN COMPARISON WITH: MASSACHUSETTS				CONNECTICUT				13 LARGEST EXPORTING STATES				UNITED STATES			
	Initial (1966) E/O Ratio (1)	E/O Ratio Change During 1966-1976 (2)	E/O Ratio In 1976 (3)	Output Growth During 1966-1976 (4)	Initial (1966) E/O Ratio (1)	E/O Ratio Change During 1966-1976 (2)	E/O Ratio In 1976 (3)	Output Growth During 1966-1976 (4)	Initial (1966) E/O Ratio (1)	E/O Ratio Change During 1966-1976 (2)	E/O Ratio In 1976 (3)	Output Growth During 1966-1976 (4)	Initial (1966) E/O Ratio (1)	E/O Ratio Change During 1966-1976 (2)	E/O Ratio In 1976 (3)	Output Growth During 1966-1976 (4)
1 Food & Kindred Products	-19.6	-88.2	-107.8	+ 2.1	-20.5	-72.5	-93.0	-22.1	+ 3.6	-12.0	- 8.4	-10.4	+1.8	+22.7	+24.5	-24.9
2 Textile Mill Products	+10.2	- 1.6	+ 8.6	+ 0.5	+ 3.2	+ 5.4	+ 8.6	- 0.1	+ 7.8	+13.8	+21.6	- 0.8	+ 8.1	+12.5	+20.6	- 1.1
3 Apparel & Textile Products	- 7.3	-12.1	-19.4	- 2.8	- 3.3	+ 7.1	+ 3.8	- 5.9	- 8.5	- 0.6	- 9.1	- 2.6	- 7.5	+ 4.6	- 2.9	- 5.6
4 Lumber & Wood Products	+ 0.1	+15.7	+15.8	+ 0.7	- 2.5	- 0.5	- 3.0	+ 3.8	- 0.2	+15.0	+14.8	- 1.8	- 0.1	+ 9.6	+ 9.5	- 1.6
5 Furniture & Fixtures	0	- 0.6	- 0.6	+ 0.1	+ 0.7	- 1.7	- 1.0	- 0.5	+ 0.5	- 0.4	+ 0.1	- 0.1	+ 0.4	- 0.3	+ 0.1	- 0.1
6 Paper & Allied Products	+ 4.4	+17.2	+21.6	+ 1.7	+18.1	+ 6.4	+24.5	-14.1	+ 4.8	- 0.7	+ 4.1	- 6.1	+12.3	+26.4	+38.7	- 9.4
	-	-	-	-	-	-	-	-	-	-	-	--	-	-	-	-
7 Chemicals & Allied Products	-91.6	+1176.2	+1084.6	+79.1	- 8.2	+46.4	+38.2	-27.3	+ 2.9	-167.1	-164.2	-117.3	+13.4	-108.7	-95.3	-120.1
8 Rubber & Misc. Products	+ 0.9	- 2.5	- 1.6	+10.5	- 4.7	- 4.9	- 9.6	+18.2	- 1.1	+13.1	+12.0	- 1.7	- 1.1	+25.0	+23.9	- 3.4
9 Leather, Leather Products	- 0.1	+ 0.2	+ 0.1	+ 0.9	- 2.5	- 9.5	-12.0	- 0.3	+ 0.2	- 2.6	- 2.4	+ 0.4	- 0.2	- 1.9	- 2.1	- 0.3
10 Stone, Glass, Clay Products	+25.7	+57.8	+83.5	- 2.7	- 4.2	-24.9	-29.1	+ 1.5	- 0.2	+ 2.5	+ 2.3	- 2.0	- 1.4	- 0.2	- 1.6	- 3.3
11 Primary Metals Industry	-40.1	+51.0	+10.9	+ 5.9	-51.6	+33.7	-17.9	+ 4.4	-38.5	+55.9	+17.4	-39.2	-34.1	+54.0	+19.9	-45.9
12 Fabricated Metal Products	+ 1.9	+57.7	+59.6	- 8.2	+17.9	+47.2	+65.1	-44.3	0	+36.1	+36.1	-37.1	- 0.9	+43.1	+42.2	-38.5
13 Machinery, Except Electric	+109.7	-18.0	+91.7	-218.4	+16.0	-103.5	-87.5	-21.3	+40.4	-15.8	+24.6	-59.9	+34.0	+59.9	+93.9	-74.6
14 Electric & Electronic Equip.	+11.5	+234.0	+245.5	-35.5	+10.7	+39.3	+50.0	-80.6	+ 9.3	+97.9	+107.2	-59.5	+ 9.1	+107.3	+116.4	-70.0
15 Transportation Equipment	-71.6	+310.1	+238.5	- 5.7	+47.3	+552.9	+600.2	-37.3	- 7.6	+210.7	+203.1	-24.9	-17.3	+187.4	+170.1	-29.4
16 Instruments & Related Prod.	+15.5	+34.8	+50.3	+14.3	+24.4	+80.6	+105.0	- 5.2	+15.3	+ 2.0	+17.3	+11.4	+13.1	+22.9	+36.0	+ 4.7
17 Miscellaneous Manufact. Ind.	+13.0	- 2.9	+10.1	+ 1.8	+22.6	-24.3	- 1.7	+13.5	+33.1	- 4.9	+28.2	- 2.7	+33.8	-11.7	+22.1	- 6.3
18 Other	-21.3	+ 2.1	-19.2	+52.4	-21.3	+79.8	+58.5	-64.0	+12.4	+27.7	+40.1	+14.6	+16.9	+23.7	+40.6	+ 7.0
19 Total (calculated for the entire sector)	-15.0	+1601.6	+1586.6	+88.2	+309.3	+1894.4	+2203.7	-107.8	+52.4	+487.4	+539.8	-225.4	+ 7.5	+536.9	+544.4	-362.7
20 Total (summation of industry results)	-58.7	+1830.9	+1772.2	-103.3	+42.1	+657.0	+699.1	-281.6	+74.2	+270.6	+344.8	-339.7	+80.0	+476.3	+556.6	-422.8

Apparel, Fabricated Metals, Electric Equipment, Instruments, and especially Transportation Equipment) exhibit much lower shares in total New Jersey output. Conversely, industries with higher E/O ratios in New Jersey (Food, Rubber, Stone, Clay and Glass) are also those that have higher shares in New Jersey output. The result of summing individual industries (Table IV.4, line 20, column 3 for Connecticut) is therefore much smaller than calculations of the total manufacturing sector (line 19, column 3 for Connecticut).

In addition to calculations of the *total* export differences resulting from deviations in the 1976 export-output ratios between New Jersey and other states (columns 3), the Table separates the effects of changes in E/O ratios during the 1966-1976 period (columns 2).

The objective of this exercise is the determination of New Jersey's 1976 export potential under the assumption that the State increases the propensity to export at the same rate as other states.

The following conclusions can be made from Table IV.4:

1. When compared with the U.S. or thirteen states, New Jersey lost the opportunity to export, in 1976, approximately $500 million due to slower growth in the propensity to export (column 2, line 19). The potential loss of exports reaches $1.6 to $1.9 billion when New Jersey is compared with the States of Massachusetts or Connecticut.

2. Part of these export losses are due to different industry compositions between New Jersey and the other states. The impact of industry mix (difference between line 19 and 20) is the lowest in comparisons between New Jersey and the U.S. ($536.9 minus $476.3 = $60.6). This can be interpreted to mean that the industry mix or the export-output ratios in New Jersey and the U.S. do not differ significantly. More pronounced differences appear in comparisons with Connecticut and the thirteen states. Industries in which Connecticut achieved large export-output ratios are much less represented in New Jersey than in Connecticut. A particularly good example is Transportation Equipment whose share in Connecticut's total output is 20.8%, while in New Jersey is only 7.2%. For these reasons when the shortfalls for each particular industry are summed up (line 20, column 2, $657 for Connecticut) they are much lower than the total manufacturing sector calculations (line 19 showing a total of $1,894.4).

In comparison with Massachusetts the impact of the industry mix indicates a difference in the opposite direction. Here the industry in which Massachusetts achieved a phenomenal result, namely the Chemicals, has a much larger share in New Jersey than in Massachusetts. Hence New Jersey's export shortfall is greater when the particular industry results are summed ($1,830.9 in line 20, column 2).

Continuing the analysis of the impact of changes in the propensity to export (columns 2) by industries, one can see that Transportation Equipment contributes most to New Jersey's exports shortfall.[6] The difference is approximately $200 million in comparison with the U.S. total. It exceeds $300 million and $550 million in comparison with Massachusetts and Connecticut respectively.

The export propensity of the New Jersey Electric and Electronic Equipment Industry has consistently grown slower than that of other states. The shortfalls of exports in this case range between $40 to $230 million. Differences in the neighborhood of $40 to $60 million developed in the Primary Metals and Fabricated Metal Products industries. The Instruments industry shows significant shortfalls mainly

[6] Actually the largest industry difference appears in Chemicals in the comparison with Massachusetts. However, this extraordinary result is not confirmed by other comparisons.

in comparison with Connecticut ($80.6 million) and Massachusetts ($34.8 million).

Results in most other industries are inconsistent and moderate in their impact on the total value of exports. The Food (SIC 20) and Machinery (SIC 35) industries have noticeable successes during the analyzed periods.

3. The impact of export-output ratios achieved *prior* to the 1966-1976 period is, in general, less significant than the changes that occurred during those years (columns 1 in Table IV.4). For the entire New Jersey manufacturing sector this factor accounts for up to $80 million of lost exports compared to the U.S. total, and a nearly $60 million advantage over Massachusetts.

   Electric and Electronic Equipment is the industry that contributed most to the shortfall in exports in 1966. On the other hand, Chemicals, Food, and Transportation Equipment, except in comparison with Connecticut, had higher initial export-output ratios in New Jersey.

4. Finally, the impact of different output growth during the 1966-1976 period is rather significant (columns 4 in Table IV.4).[7] It ranges from $103 million of lost New Jersey exports in comparison with Massachusetts (line 20, column 4, in Table IV.4) to $423 million in comparison with the U.S.

   Growth in Machinery (SIC 35) output was much slower in New Jersey than in Massachusetts during the 1966-1976 period which reduced the State's exports by $218 million. The Electric and Electronic Industry added another $36 million to New Jersey's deficit in exports. Most other industries grew faster in New Jersey thus reducing that shortfall to a total of only $103 million.

   In comparison with Connecticut, all machine producing industries had slower output growth and contributed to the total export deficit of $282 million (column 4, line 20 of comparisons with Connecticut). Basically, the same holds for comparisons with the group of thirteen states or the U.S.

5. After considering the growth in output and changes in the share of output sold in foreign markets, New Jersey's export shortfall totaled $1,876 million (in comparison with Massachusetts), and $685 million in comparison with the group of thirteen large state exporters.

Impact of other factors—Even though the preceding analyses were helpful in underlining some areas of strength and weakness in New Jersey's export performance, they left some crucial questions unanswered. The basic consideration is what are the causes for New Jersey's lagging exports. More specifically, why has New Jersey not increased its propensity to export at a rate similar to other states?

The explanation that New Jersey does not produce enough exportables could be verified only by analyses more detailed than undertaken in this study. A case can probably be made that Connecticut has a much higher export rate of transportation equipment due to its production of helicopters and airplanes. Similarly, New Jersey cannot aspire to compete effectively with Michigan in the export of automobiles. But apart from such extreme examples, the commodity mix thesis cannot provide a complete or satisfactory explanation of New Jersey's lagging overall performance. New Jersey has a well diversified manufacturing sector which should allow for a wide range of exportable commodities.

We hypothesize that the U.S. balance of trade deficit in the last years has been caused, in part, by a slowdown in technical innovation. Since

[7] Note that these numbers appear with minus signs, which according to the convention adopted in this study, means that New Jersey is credited with lower exports due to lower output growth. As already indicated, slower output growth might be to some extent the effect of less aggressive export promotion. Hence, output growth can be looked at both as a cause and effect of export growth.

New Jersey traditionally exported a large share of technologically advanced commodities, it is possible that this factor has contributed to the State's relative decline in exports. However, no evidence is available to confirm or disprove this contention.

Another factor that needs to be considered are price increases for different industries. Since exports are measured in current U.S. dollars, it is possible that prices of commodities exported mainly from New Jersey have risen less than those exported by other states. A review of industry price indices allows us to dismiss this hypothesis.

Higher production costs might be, in some cases, the reason why New Jersey firms are unable to increase significantly their exports. Although higher production costs should not be assumed to be a general feature of New Jersey manufacturing, there are reasons to believe that in some instances modern industrial facilities built in the South and West have a comparative cost advantage. Higher costs of production might appear especially in cases where old production equipment is combined with relatively higher unit labor cost. The slower rate of investment in New Jersey manufacturing during the 1960s and 1970s might justify this contention.[8]

A large part of the explanation can be found in the structure of New Jersey industries. The average size of a firm in New Jersey is often smaller than in the U.S. and in some contiguous states as is evidenced in Table IV.5.

Smaller firms are generally less prepared to enter foreign markets. The cost in terms of managerial and financial resources are high for a company that has never exported to foreign countries. It is interesting that in the Chemicals and Food Processing industries the average size of New Jersey firms is significantly higher than in other states and their export performance is relatively better as well. Conversely, the size of the average firm in the machinery industries is relatively small and it is precisely these New Jersey industries which lag behind their national counterparts in penetrating foreign markets.

TABLE IV.5

AVERAGE SIZE OF ESTABLISHMENT BY NUMBER OF EMPLOYEES, 1976

SIC	INDUSTRY	N.J.	MASS.	CONN.	U.S.
20	Food & Kindred Products	67	46	46	61
22	Textile Mill Products	49	95	98	134
23	Apparel & Textile Products	36	61	50	59
24	Lumber & Wood Products	..	14	10	21
25	Furniture & Fixtures	33	29	51	50
26	Paper & Allied Products	79	88	76	104
28	Chemicals & Allied Products	101	47	75	78
30	Rubber & Misc. Products	56	64	61	67
31	Leather, Leather Products	82	76	48	90
32	Stone, Clay, Glass Prod.	63	38	34	37
33	Primary Metals Industry	78	78	94	159
34	Fabricated Metal Products	37	39	53	49
35	Machinery, Except Electric	33	54	43	48
36	Electric & Electronic Equip.	95	122	93	128
37	Transportation Equipment	97	130	554	196
38	Instruments & Related Products	76	107	121	83
39	Miscellaneous Manufac. Ind.	37	48	51	30

SOURCE: Calculations based on Survey of Manufactures, 1976, U.S. Bureau of the Census.

[8] See Economic Policy Council's *8th Annual Report*, Chapter VI, pp. 45-47.

This hypothesis was tested by calculating the correlation between the relative size of an establishment in New Jersey, Connecticut, Massachusetts and U.S. and the export-output ratios. A positive correlation would mean that higher export rates can be expected for larger companies and vice versa. The actual test was conducted for comparisons between New Jersey-Massachusetts, New Jersey-Connecticut and New Jersey-United States. In all these comparisons, separately, and in combination, the correlations were found to be positive and fairly high. An industry weighted correlation coefficient for the 1976 combined comparisons was 0.68.[9] These correlations allow us to accept the hypothesis that, on the average, smaller New Jersey companies explain a significant part of the State's export performance.

From many conversations with businessmen and industry experts, it appears that there exists strong reluctance on the part of many middle-sized New Jersey firms to think about expanding their operation through foreign trade. This psychological barrier stems from lack of knowledge of export opportunities but even more so from the intricacies of foreign trade operations, and the need to know the commercial practices of foreign countries, their culture, language and even behavioral code. For medium and small size firms these imaginary or real barriers cannot be easily overcome. This is one of the most fruitful areas where State assistance programs might best be invoked.

III. Recommendations

The recommendations in this section are drawn from a broader study designed to develop a State program of export expansion and direct foreign investment in New Jersey.

1. Export promotion through education

A well designed and targeted educational program should be developed that includes the following elements:

a. A series of meetings with potential exporters aimed at presenting actual cases of successful foreign market penerating strategies by small and medium-sized businesses.

b. Technical seminars and conferences dealing with particular aspects of exporting and the specifics of different foreign markets.

c. A significant part of an export expansion program should be the preparation of good quality and well designed promotional literature. It should inform the foreign buyer about the opportunities of importing from New Jersey, the State's potential in many fields of manufacturing, its high technology-based products and services. It should also contain references about which specific agencies can assist the foreign buyers in their inquiries.

d. A continuous effort by all public and private institutions in New Jersey through the mass media and other forums to promote the potential advantages of overseas trade.

2. Major strategies to assist export expansion

There are three directions that can be taken to build up the supportive assistance for export expansion:

a. A much better organized system of assistance utilizing public and private institutions to assure that direct exporters (the 'do-it-alone' small business) get all the help needed in the complex process of exporting.

b. A series of measures to strengthen the existing Export Management Corporations and other 'middlemen' agencies who provide a wide range of export services to manufacturers.

c. Creating a strong Export Trading Company modeled on the very successful Japanese trading companies.

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[9] A correlation coefficient can range between 0.0, indicating no association between the variables, and ± 1.0, reflecting a perfect positive or negative association.

Each of these strategies has advantages and drawbacks and possible elements of conflict. At this stage no priority should be given to one of these directions at the expense of the others. Rather all three routes should be encouraged to develop freely.

3. Assistance to direct exporters

In the area of assistance to direct exporters we recommend:

a. The establishment of an *Export Assistance Center,* a quasi-private enterprise working for a fee from clients but with much reduced service costs through the participation of government, academic, SCORE and ACE experts. Experience of private firms performing such brokerage functions shows that some period is required (usually two-three years) during which brokerage firms have to be subsidized. The State will have to provide some seed money for a limited period of time to start an *Export Assistance Center.*

b. Expansion and improvement in the assistance to small and medium-sized companies now being provided by federal and state agencies, industry associations, chambers of commerce, banks, etc. Assistance should be made available at all phases of the exporting process—starting from assessing the exportability of the companies' products or services through shipping, documentation and sales promotion aboard.

In order that such a multifaceted system of assistance services be put in place and function effectively, it is essential that a New Jersey Export Coordinating Committee be established in the very near future. The ECC should be appointed by the Governor and be authorized to integrate all existing programs and activities into a statewide system of foreign trade promotion and assistance.

The Export Coordinating Committee should coordinate the activities of all New Jersey institutions through voluntary agreements. It should present to the Governor and the Legislature the interests of businesses in the field of exporting and attracting foreign investment to our State.

Accordingly, the ECC should represent all institutions actively involved in promoting export and direct foreign investment in New Jersey. The Export Coordinating Committee should meet personally with the Governor at least once a year and report the state of affairs and the activities undertaken in the area of export expansion and foreign investment in New Jersey.

4. An Export Development Corporation

The Port Authority of New York and New Jersey has completed a feasibility study to determine under what conditions it would be possible for the Port Authority to engage in the formation of an Export Development Corporation (EDC).

The Port Authority of New York and New Jersey is interested in establishing an EDC because increased exports are a direct contribution to the economic development of the two states, and because increased exports will result in increased traffic through the Port.

The geographic strategy of the EDC would be to penetrate all foreign markets, but to seek its clients primarily in New York and New Jersey.

The EDC would differ from the typical EMC in that it would be more open to engaging in barter trade and in third country trading. Also, it would assist manufacturers with pre-manufacturing financing to facilitate the product design and packaging adaptations which may be needed for the foreign market, or to increase capacity to meet the new foreign market demand.

It is therefore recommended that in addition to measures designed to build up the export management corporations, support be given to the concept of an Export Development Corporation suggested in the Port Authority's proposal. It is clear that the economic interests of the State

would benefit from the development of this proposal.

5. Export Financing and Incentives

One extremely important area of government assistance to small and medium size exporters is financing. Its importance stems from the frequent and severe cash-flow problems these businesses experience. This can be especially acute in foreign trade where payment for delivered merchandise normally takes place with considerable delay. On the other hand, the foreign customer usually expects some short- or long-term credit as a condition for purchase.

The Export-Import Bank offers direct loans, export credit guarantees to commercial banks and insurance through the Foreign Credit Insurance Association (FCIA). It also extends financing to foreign customers through a Cooperative Financing Facility. It lends one-half of the funds required for purchase from the United States; the foreign cooperating institution then lends the full amount to its customer.

It is recommended that New Jersey companies be made aware of and assisted in taking advantage of Federal programs designed to facilitate foreign transactions especially by small and medium-sized exporters. Potential exporters should be familiar with the hundreds of overseas banks that are prepared to finance their sales in nearly every country.

There is certainly need for *incentives* to small and medium-sized exporters. However, if some of New Jersey's products do not have a reasonable comparative cost advantage and therefore cannot be sold abroad at a profitable price, there is no economic reason to subsidize their export.

It is recommended that more attention be given to Federal programs that are designed to create incentives for small and medium-sized exporters. Information about these incentives should be disseminated by all New Jersey institutions involved in foreign trade. Assistance to take advantage of these and other existing opportunities should be given to New Jersey exporters.

The State can supplement to a significant degree the financial and in-kind assistance provided by the Federal Government. The State can be especially effective in the second type of assistance through its Office of International Trade and other interested agencies, by organizing trade and investment missions abroad, by providing information on trade leads and inquiries from foreign customers, by promoting New Jersey firms in national trade missions, exhibitions and technical sales seminars, by printing promotional literature and above all by bringing together all resources that promote exports.

In addition, the State should constantly monitor the promotional programs and extent of financial assistance in other states in order to maintain a competitive position by New Jersey exporters.

It is recommended that the State expand its program of in-kind assistance to small and medium-sized exporters and match the incentives provided to exporters by other states.

In particular DISC tax deferral on 50% of export income should be extended to apply to the New Jersey Corporate Income Tax. Appropriate legislation should be introduced immediately.

The State should organize special trade missions for companies that have high chances of successful foreign contracts in particular markets. In organizing such missions the State should fully utilize the assistance and facilities of the Federal Government both at home and abroad.

It is extremely important that State trade missions be headed by the Governor. High level support to a trade mission lends credibility to the participating manufacturers, opens the doors to important customers and therefore increases the chances of commercial success.

We recommend that the Export Expansion and Foreign Direct Investment Program in New Jersey include measures to take advantage of Federally organized exhibitions, trade fairs, catalog exhibitions, technical sales seminars, etc.

The main thrust should be to make more aggressive use of the existing opportunities organized or sponsored by Federal agencies. The State's Office of International Trade should have a full schedule of such events for the coming years and approach prospective participants with information and encouragement.

6. A New Jersey Office in Europe

Many states have established offices in Belgium (12 states), West Germany (6), Switzerland (2), Great Britain (2), and the Netherlands (1). Also, eleven United States Port Authorities have offices abroad. Such offices provide a useful link between a particular state and world markets. The cost of maintaining a foreign office (estimated at about $200 to $250 thousand annually) is more than recouped by commercial leads, contracts and reverse investment that it helps to attract.

New Jersey does not have a foreign office and is represented only indirectly by the Port Authority of New York and New Jersey and the Delaware River Port Authority. The usefulness of establishing a New Jersey office in Europe is unquestionable.

It is recommended that a permanent State representation in Europe be established through which the State government's role in expanding export and foreign direct investment in New Jersey can be enhanced.

However, in terms of priorities, it will be more appropriate to develop first the domestic elements of the export and investment program. Only then will the information and leads obtained through the European office be efficiently utilized. In the interim, arrangements should be made to utilize more fully the services of the European offices of the New York-New Jersey Port Authority and the Delaware River Port Authority.

7. International departments in New Jersey banks

Small and medium-sized companies do not have easy access to the large international banks and their international departments. They have to rely mainly on local New Jersey banks, which do not always have international departments. Without banking services and export financing, many potential New Jersey exporters cannot realistically think about significant penetration of foreign markets.

We recommend that new initiatives be undertaken with New Jersey banks to publicize and create awareness of the Export Expansion and Foreign Direct Investment program in New Jersey. In particular, New Jersey banks should be encouraged to provide foreign trade services through the establishment of international departments where they do not exist. There is an urgent need, for example, to create such facilities in the southern part of New Jersey. An important role in these activities should be played by the New Jersey Banker's Association. Increased exports from New Jersey will create new business for banks and they should be aware of these new opportunities.

These new export opportunities might be lost without the assured assistance from New Jersey banks which are particularly well-equipped to deal with small and medium-sized companies.

8. An International Trade Fair in Atlantic City

Many European and other cities have a long tradition of trade fairs as a means of attracting foreign customers and improved international relations.

In the United States trade fairs are organized only sporadically and are usually limited to a particular line of products. It is our belief that a general trade fair, on a large scale and emphasizing the new and high technology products manufactured in the U.S., can become an important source of improving national export expansion.

We recommend that the Governor take steps to develop a proposal for President Carter to organize an International Trade Fair in Atlantic City sometime in the next two or three years. To this end a special task force should be established to evaluate the feasibility of such a

trade fair and develop all the necesary elements of a proposal. The International Trade Fair Task Force should report its findings to the Governor in a six month period.

Conclusion

Discussions with representatives of many institutions interested in promoting export and direct foreign investment have shown a cooperative attitude toward the main elements of an export expansion program outlined above. Without exception, all contacted institutions expressed a willingness to participate in a coordinated mutual effort aimed at export expansion and increased foreign direct investment in New Jersey. It was also their unanimous opinion that in order to succeed, these efforts require Statewide coordination and the close attention of the Governor.

Most experts believe that a well organized and concerted effort can lead to significant improvements in New Jersey's participation in international trade. A necessary condition for success is a sustained effort in the implementation of the recommendations outlined above. It will also require innovative responses to new circumstances and opportunities that arise in the future. It is, therefore, important that a proper mechanism for a prompt execution of the entire program be immediately established. Such a mechanism should not be limited to the Export Coordinating Committee which will require broad authority and assistance from the State Government, the business community, and organized labor. It might also require the creation of a new office or a reorganization of the existing office to assist the Export Coordinating Committee in carrying out its functions.

From the viewpoint of a possible national economic slowdown or even a recession in late 1979, an energetic program to expand exports and increase foreign direct investment in New Jersey can provide considerable countercyclical relief. This dimension adds further to the need for a prompt implementation of these recommendations.

V

FOREIGN DIRECT INVESTMENT AND STATE ECONOMIC DEVELOPMENT*

Introduction

Increasing public interest and regional competition for economic growth has precipitated substantial changes in State economic development policies. The continuing industrialization of the Sunbelt states is reducing inter-state cost differentials and the comparative cost advantage of that region. Also, the stream of publicly sponsored site location studies has narrowed the inter-state information gap to the point where businesses can more easily evaluate the advantages of alternative locations.

The continuing diffusion of population, manufacturing and economic activity in general has prompted State development officials to evaluate carefully the resources within their states and target their efforts accordingly.

For reasons largely independent of State development programs, foreign-owned businesses have become increasingly interested in penetrating the U.S. market and locating facilities in the United States. During the four year period 1973 through 1977 foreign direct investment (FDI) in the U.S. increased 65 percent, from $20.6 billion to $34.1 billion.[1] Although FDI is still small relative to the size of U.S. direct investment abroad ($149 billion in 1977) it is significant that recently overseas businesses have been investing (in the U.S.) at a faster rate than U.S. direct investment in other countries.

Pursuant to the Foreign Investment Study Act of 1974, the Department of Commerce conducted a benchmark survey of Foreign Direct Investment in the United States.[2] The data provided, among other things, measures of industry affiliation, country of foreign parent, and the location by state of investment and employment. Overall, the survey found 1.08 million persons to be employed by foreign affiliates. Manufacturing represented the largest single industry with 51 percent of total employment, followed by wholesale and retail trade with 22 percent, and petroleum with 9 percent. Among leading foreign investors in the U.S., the United Kingdom held the largest share of FDI with 22 percent, the Netherlands had an additional 18 percent of the foreign investment position, Switzerland 8 percent; Germany 6 percent and France 4 percent.

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* Prepared by George R. Nagle, Office of Economic Policy.

[1] It needs to be emphasized that the $34 billion foreign investment in 1977 significantly understates the total assets of these firms. Some investment escapes tabulation because of errors in data collection, however, more importantly, is the method of accounting for debt financing. Borrowing by a foreign firm to finance a U.S. acquisition would enter into the U.S. balance-of-payments accounts. However, borrowing in the U.S. by a U.S. subsidiary of a foreign firm for the same purpose is regarded as a domestic transaction and would not. In 1974 the latest year for which data are available, the Department of Commerce estimated the total assets of foreign firms at $174 billion.

[2] *Foreign Direct Investment in the U.S.*, Report to Congress, Report of the Secretary of Commerce: Benchmark Survey, 1974, U.S. Department of Commerce, April 1976.

For some areas the spectre of accelerating foreign investment introduces new variables in the design of state economic development programs. This paper reviews characteristics of multinational enterprises and identifies interstate differences in the distribution of employment by foreign affiliates. The conclusion outlines a number of points that deserve consideration in designing a State Foreign Direct Investment Program.

I. The Macro Economics of Foreign Direct Investment

The surge in foreign direct investment is not an isolated, haphazard development but relates directly to changes in domestic and international economic relations. Although foreigners have varied reasons for investing in the U.S., a number of common factors emerge from the current upturn. One key factor was the official devaluation of the dollar in the early 1970s and its subsequent depreciation against other major currencies. The relative appreciation of leading foreign currencies has driven up the price of foreign goods in the United States to the point where European and Japanese firms are finding it advantageous to relocate in the U.S.

The relatively depressed U.S. stock markets present opportunities for acquisition by foreign capital. With equity prices low relative to the value of underlying assets and to the earnings they are capable of generating, foreign affiliates have increasingly explored the acquisition and merger route in establishing a U.S. facility [see (9)]. A related factor cites the emergence of large-sized foreign firms with capable managements and financial resources. The large firm can more easily overcome the often perceived hindrances to investment in the country—such as sophisticated business methods and different and overlapping federal/state/local laws.

Rising oil prices have significantly influenced the economics of transportation. Manufacturers of bulk type final goods may now find it more efficient to locate closer to the U.S. product market rather than closer to the foreign source of raw materials.

Another positive factor often mentioned is political and economic stability (especially labor stability) in the U.S.[3] In general, the overseas business community perceives the U.S. to be freer from internal economic controls and government interference than most countries. Other attractions for overseas investors include a traditional 'open door' policy toward foreign capital.

Another element favoring FDI is research and development which makes the U.S. a leader in many fields of technological advancement. Some researchers have identified research and development as contributing to a general receptivity in the U.S. to new products, methods, and ideas [see (5)].

Since 1975 the U.S. has imported more goods and services than it exported. During this period foreign enterprises penetrated and established U.S. markets. Surveys have shown that the knowledge and experience obtained from exporting (to the U.S.) is an important precursor to foreign direct investment. Thus, the relative rise in U.S. imports has increased the probability of future foreign direct investment.

Despite negotiations in favor of free international trade, some domestic industries have succeeded in obtaining import protection as a result of years of negative trade balances. Some foreign manufacturers have opted to relocate to the U.S. as a way to outmaneuver import tariffs and quotas.

For one or more of the above reasons foreign firms are being attracted to the U.S. market. Without waiting for a national foreign investment policy, states have assumed the initiative and are vigorously competing for the location of multinational enterprises.

II. Foreign Direct Investment and the Multinational Firm

Several studies have attempted to explain the micro economics of the multinational enterprise

[3] For a more complete discussion on these points see Morgan Guaranty (10).

as well as the regional implications of horizontal and vertical investments.[4] Fundamentally, the domestic firm is viewed as maintaining an advantage over the foreign investor in the form of accumulated market knowledge of the legal, institutional and economic environment. This intangible capital is available along with local entrepreneurial services to the domestic firm. The firm expanding overseas, however, must purchase this capital (knowledge) in a foreign environment and to that extent operates at a cost disadvantage. Several economists believe the multinational firm possesses a unique advantage (either a patented invention or a differentiated product) that can more than offset this cost disadvantage [see (3) and (4)].

Product differentiation, however, may not be the only attribute explaining the incidence of foreign investment. It has been noted (8) that the research intensity of American industries is positively related to the relative importance of sales by American subsidiaries in Western Europe. Also, research and development on new products by European firms [see (5)] have been related to technology transfers and the flow of direct investment to the U.S.

One important corollary follows. The multinational corporation in the U.S. with a differentiated product and relatively high expenditures in research and development often maintains a competitive advantage over domestic firms in the same industry. Assuming these observations are correct, it is likely that the foreign investor will: 1) consider 'different' factors than the domestic firm in the site selection process or 2) will place different weights than the domestic firm on the same variables.

III. Regional Location Decisions

The Department of Commerce *Benchmark Survey* provides an insight into the location preferences of foreign-owned firms in the U.S. If multinational enterprises view the market as a domestic firm does we might expect similar employment distributions. In reality, significant differences surface. Figure V. 1 illustrates the state-by-state distribution of total and foreign firm employment. States are ranked by their national shares of total non-agricultural employment from low to high. The 45 degree line represents an equal (state-by-state) distribution of total employment. The farther the actual employment distribution varies from the reference line, the more unequal the concentration of employment. For example, with an equal distribution, ten percent of the states would employ ten percent of the employees but in actuality, ten percent of the states with the largest shares of workers employ thirty percent of the nation's working labor force. By contrast, employment in foreign-owned firms (the dotted line) is relatively and significantly more concentrated. The same states referred to above employ forty-eight percent of the workers in multinational firms.

The importance of foreign investment to New Jersey and the Northeast is shown in Table V. 1. Of the 1.08 million persons employed by foreign-owned firms, 377.4 thousand, or 35%, are located in the Northeast. The expected share of foreign employment represented by the distribution of total employment, is only 24.4%. By dividing these two percentages, a crude measure of the relative concentration of foreign employment is derived. Within the Northeast, New Jersey emerges as the leading state in terms of the concentration ratio (i.e., percent of foreign employment divided by the percent of national employment). New Jersey represents 3.5 percent of the nation's employed but 7.3 percent of employment by foreign-owned firms for a concentration ratio of 2.08. New York leads the nation in the absolute numbers of foreign firm employment with 147 thousand, but the relative concentration of foreign employment is 1.5 as compared to New Jersey's 2.08. Notwithstanding, the remaining regions of the U.S. are relatively deficient in foreign employment as the concentration ratios fall below 1.0.

[4] Horizontal investment amounts to the acquisitions of multiple plants by a firm operating in an industry with sub-markets. Vertical investments can be illustrated by the entry of an established final goods manufacturer to the processing stages of production.

FIGURE V. 1

CUMULATIVE DISTRIBUTIONS OF TOTAL NON-AGRICULTURAL EMPLOYMENT AND FOREIGN FIRM EMPLOYMENT, BY STATES, 1974

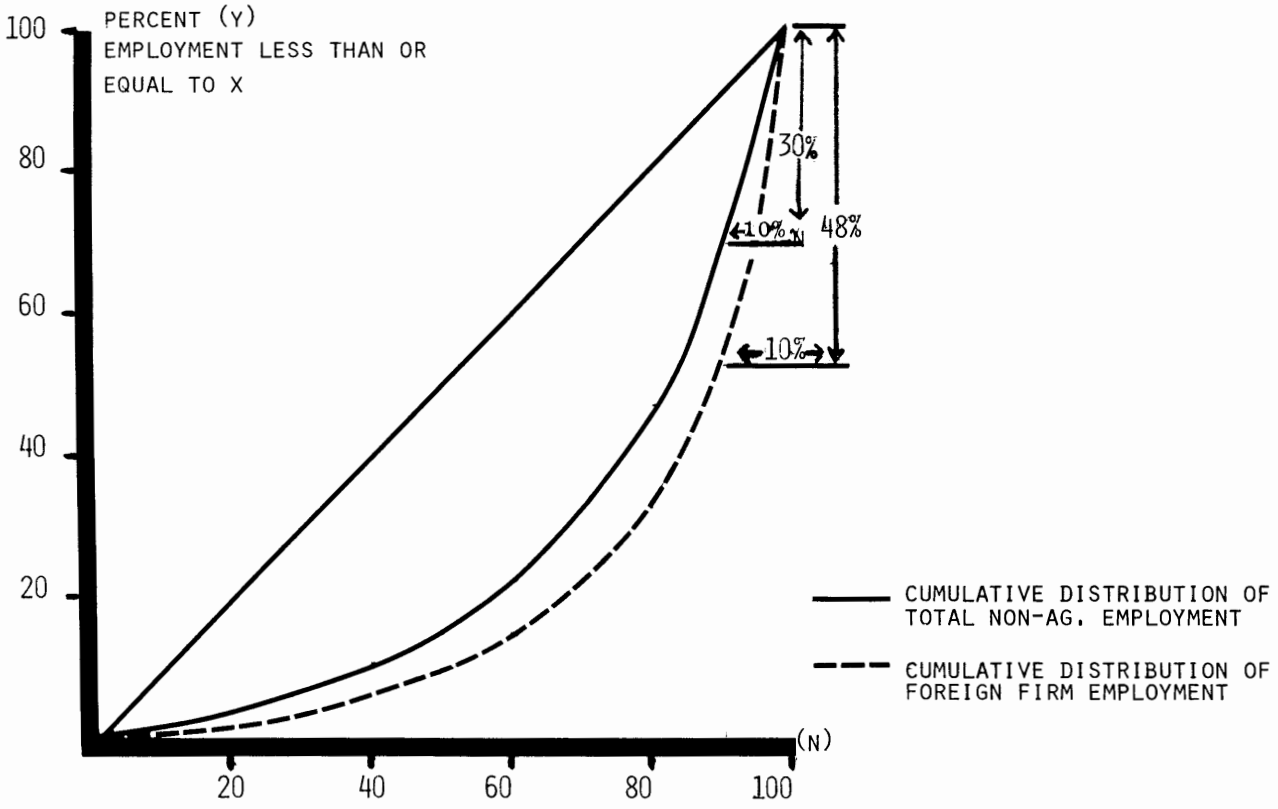

TABLE V. 1

FOREIGN ENTERPRISE—EMPLOYMENT BY STATES, 1974

Region and State	Total Employment In Foreign-Owned Firms (thousands)	Distribution of Foreign Firm Employment by Regions	Distribution of Total Non-Agricultural Employment by Regions	Concentration Ratio (2 ÷ 3)
	(1)	(2)	(3)	(4)
Northeast	377.4	34.9%	24.4%	1.43
New Jersey .	79.4	7.3	3.5	2.08
New York ..	146.6	13.5	9.0	1.50
Midwest	249.8	23.1	27.7	.83
South	289.1	26.6	30.5	.87
West	167.1	15.4	17.4	.86
Total U.S. ...	1083.4	100.0	100.0	1.00

IV. Foreign Firm Employment

The following analyses attempt to explain differences in the distribution of foreign firm employment. Since the foreign investor often differs in structure from a domestic firm, there may be a systematic explanation for the location of multinational enterprises.

In order to improve the location estimates, foreign firm employment was divided into a trade category (wholesale, retail trade) and a goods producing or a manufacturing category.[5] States with less than 1,000 foreign firm employees in either category were eliminated, leaving 40 states in the sample.

A. Trade Industries

In order to describe the location behavior of foreign-owned firms a set of explanatory factors are hypothesized along with a brief explanation of their relation to foreign enterprise. The foreign investor often assumes a greater risk by entering a market away from the home country and as a result insists upon a higher rate of return than they would on a comparable domestic investment project. In part, this extra risk is the result of the high cost of information about foreign markets. Where information costs more, a firm will settle for less of it and put up with more uncertainty. Extra risks are also associated with the uncertainty of exchange rate changes, political actions by foreign governments, etc. Foreign subsidiaries respond by retaining a larger portion of their earnings than a domestic firm [see (1)]. The increased risk associated with foreign investment may establish an effective barrier to entry. Large firms can overcome this barrier by spreading risk across subsidiaries while the small firm, which must confront this problem head on, is often excluded from the market.

If the typical foreign investor is somewhat larger than the domestic counterpart, the foreign firm might be more likely to select a larger market, especially if economies of scale exist. Also, the foreign investor might rely heavily on local services to close the information gap and these specialized services are not available in small sub-markets.

Two variables were defined to represent market size—the State's share of total U.S. population for a measure of absolute, and population density, for a measure of market concentration. In both cases, a positive relationship with foreign trade employment is expected.

It was noted that the multinational firm suffers from a relative lack of knowledge about the new market. From the geographic distribution of foreign employment given above, it appears that foreign investors prefer areas of established industrial concentration. Unfamiliarity with the market drives managers to select 'safe' locations among potential sites to reduce uncertainty and eliminate unacceptable risks.

One factor that should appeal to foreign investors is the level and quality of available government services. In some states the investing firm can obtain from public sources the services it may have to purchase in other areas. Examples include economic development assistance, business advocacy, and employee training. The dollar value of government services per capita is assumed to be positively related to foreign firm employment.

The possibility that foreign wholesale/retail industries were attracted to ports of entry or customs districts was also considered. Two variables, the percent of imports by ports, and a dummy location variable were added to the foreign wholesale/retail employment model.

The above variables were entered into a regression model examining the state-by-state distribution of foreign trade employment. Table V. 2 highlights the foreign wholesale/retail model.

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[5] This grouping process led to the exclusion of foreign firm employment in petroleum, mining, and financial industries, representing approximately 180,000 jobs. Since, these jobs are highly concentrated in the oil/gas producing states and in the New York financial community, little geographic variability in employment was lost.

TABLE V. 2

MULTIPLE REGRESSION—
FOREIGN WHOLESALE/RETAIL
EMPLOYMENT

Variable	Coefficient	Standard Error	t
(X_1) Population	1.4498	.1581	9.17†
(X_2) Gov. Ser. (GS)	.0499	.0150	3.39†
(X_3) Density	.0040	.0015	2.66†
Intercept	−11.851		
	R^2 = .75		
	F (3,36) = 36.47		

NOTE: † indicates significance at the 99% level of confidence.
Unit(s) of Measurement:
i = individual state.
Y = foreign wholesale/retail employment share = $\frac{FTE_i}{\Sigma (FTE_i)} \times 100$

X_1 = Population = $\frac{POP_i}{\Sigma (POP_i)} \times 100$

X_2 = Government Services per capita = $\frac{\$\ GS_i}{POP_i}$

X_3 = Density = $\frac{POP_i}{Mi_i^2}$

Overall, the regression model is statistically significant explaining 75 percent of the state-to-state differences in the distribution of foreign trade employment. The market oriented variables, POP and Density, are positively related to trade employment and jointly account for 78 percent of the explained variance. If a state's share of population were to increase by 10 percent the model would predict a 15% increase in that state's share of employment in foreign wholesale/retail firms. Foreign firms are therefore responding strongly to growing markets. The influence of population density was somewhat weaker. A 10% increase in population density would increase a state's share of foreign trade employment by only .04 percent. A 10 percent increase in per capita government services would increase the percent of foreign trade employment by almost .5 percent.

The initial conclusion seems to support the explanation that foreign investors attempt to reduce risk and uncertainty by locating in or near large markets. It also seems government programs are important as the firm demands these services to build its stock of knowledge about the foreign location (and market).

Several attempts were made to relate the dollar volume of seaports to foreign trade employment. But statistical analysis found little evidence of this and concludes that market considerations far outweigh the transportation and distribution advantages of a location near an international port.

Labor force qualities were also tested as a factor in attracting foreign firms. Studies have shown that the foreign investor supplies a differentiated product and tends to maintain that distinction with above average advertising budgets. It was felt that this would make the firm more dependent on white collar workers and highly skilled managers. Various labor force measures designed to capture this effect were found to be statistically insignificant.

B. Manufacturing Industries

Intuitively the location factors influencing the foreign manufacturing firm should differ from the market oriented purview of trade firms. There is, however, at least one similarity—the desire to reduce risk and uncertainty. In the case of manufacturers the location preference should be for areas of heavy industrial concentration. By locating in developed areas the foreign firm can supplement its limited knowledge from agglomerative economies. The economic relationships and industrial linkages already existing in these areas will provide to the foreign firm easy access to intermediate producers and services needed for the manufacture of a final product. Also, the technically advanced foreign firm can more easily establish a position in an area characterized by industrial specialization. Lastly, manufacturing regions offer a well developed infrastructure which may appeal to the investing firm. The state-by-state share of U.S. manufacturing employment was introduced to measure the degree of attraction between foreign investors and manufacturing areas.

Site location often involves an in-depth analysis of geographically variable costs. However, since a single comprehensive measure of production costs was not readily available, the cost of capital and labor costs were considered as proxy variables. The cost of capital was assumed to occur in national markets and therefore would exhibit little regional variation. In addition, the firms may find themselves facing high capital charges when a large absolute volume of funds is sought. In order to circumvent this barrier, multinational firms often tap earnings retained or borrowed abroad and thereby reduce or eliminate altogether borrowing at the new location.

Labor costs are a major expense and do vary substantially across states. It is expected that an inverse relationship between labor costs per production worker (wages) and foreign manufacturing employment exists.

The U.S. market is viewed differently than other foreign markets in that it is larger, consumers have more income, and domestic producers are generally more technologically advanced. For these reasons, U.S. firms are quick to develop mass produced, technologically sophisticated products.

Why corporations undertake investments abroad to produce the same general line of goods as they produce at home has been explained by market factors and the presence of a differentiated product. If the foreign firm is to maintain a differentiated product, it might be attracted to a region which offers substantial research and development capability. The number of patents per capita was introduced and is expected to relate positively to foreign firm employment. The per capita number of scientists and engineers was also tried, but a significant relationship with foreign manufacturing employment could not be established.

In many cases foreign direct investment reinforces the trade flows between nations. Foreign subsidiaries often import raw materials or intermediate products from the parent firm. Also the subsidiary may 'export' the final product to other countries. All in all, the firm is likely to depend upon port facilities. It is expected that foreign manufacturing firms exhibit a preference for established international transportation networks. The dollar volume of exports from U.S. customs districts (ports), by state, was assumed to have a positive relationship with foreign manufacturing investment.

The equation explaining foreign investment in manufacturing is shown below. The equation explains almost 75 percent of the state-by-state distribution of foreign manufacturing employment. Existing manufacturing centers, accounted for the largest share of explained variance. Overall a 10 percent increase in a state's share of total manufacturing employment will lead to a 8.6% increase in the share of foreign firm manufacturing employment. The significance of this variable highlights the importance of infra-

TABLE V. 3

MULTIPLE REGRESSION–
FOREIGN MANUFACTURING
EMPLOYMENT

Variable	Coefficient	Standard Error	t
(X_1) Manufacturing	.8609	.1138	7.569†
(X_2) Wages	—.4046	.1608	—2.515†
(X_3) Patents	1.8553	1.2666	1.465*
(X_4) Ports	.6212	.6016	1.033
Intercept	3.5185		
	$R^2 = .743$		
	$F\ (4,35) = 29.28$		

NOTE: † significant at 99% level of confidence.
* significant at 90% level of confidence.

Units of Measurement:

$$Y = \text{Foreign Manufacturing Employment} = \frac{FMe_i}{\sum (FMe_i)} = x\ 100$$

$$X_1 = \text{Manufacturing Intensity} = \frac{\text{Man. Employ}_i}{\sum (\text{Man. Employ}_i)} \times 100$$

$$X_2 = \text{Wages} = \frac{\text{Man. Wage}_i}{\text{No. Production Workers}_i} \div 1000$$

$$X_3 = \text{Patents} = \frac{\text{Patents}_i}{\text{Population}_i} \times 1000$$

$$X_4 = \text{Ports} = \frac{\$\ \text{Exports}_i}{\sum (\$\ \text{exports})_i}$$

structure and industrial interdependencies. By locating in developed regions, the multinational firm can more easily supplement its limited stock of market and production knowledge.

As expected, wage rates per production worker were a disincentive to foreign manufacturing employment. A 10 percent increase in wages would lead to a decline of 4 percent in a State's share of foreign manufacturing employment.

A Federal Reserve Bank Study [see (9)] found foreign firms to give greater importance to interstate wage differentials than do U.S. investors. The significance of the WAGE variable in the manufacturing model emphasizes this point. This observation is understandable because hourly compensation and unit labor costs have risen appreciably faster in most industrialized countries than in the U.S. (1967-76). Interstate differences in labor costs, however, ignore differences in labor productivity. High labor costs can be effectively offset through productivity which lowers costs per unit of output. Unfortunately, variables designed to measure labor productivity and unit labor costs were found not to be related to the location of foreign manufacturing employment.

The answer lies within the firm itself. Productivity is a function of labor, capital, and managerial inputs. The quality of labor may contribute to productivity. However, the manner in which these factors are combined are far more important. Therefore, an entrepreneur should not accept a State's measure of productivity as the norm since his own efforts will dictate levels of employee output. What the entrepreneur must accept is the State's prevailing wage rate as depicted by the equation.

Another explanation is that the international firm buys factors of production in either the U.S. or the home country and experiences an advantage over the domestic firm in that it can trade at either of two different sets of resource prices. The multinational firm can shift some of the costs of labor back onto its subsidiaries or forward to consumers. This is possible since the multinational firm is typically an imperfect competitor, in that it maintains some control over the market in terms of price policy.

Union participation rates were also considered to be a deterrent to foreign direct investment but the variable was insignificant and was rejected as a factor in the foreign firm location. Unionization, however, may be implicitly defined in the wage variables as a reasonably close correlation exists between high wage states and the degree of labor unions participation.

The indicator of research and development (patents) accounts for 10 percent of explained variance and significantly improved the equations estimating ability for states such as New Jersey and Delaware.

The ports variable was not significant at acceptable standards of statistical reliability. It was left in the equation because it is still assumed to influence the location of foreign investment. Perhaps difficulties in allocating exports to states introduced a bias which reduced the variable's estimating ability. Other studies [see (9)] have found a significant relationship between foreign investment and port facilities.

V. Summary and Findings

The activities of foreign investors in the U.S. have been increasing. There is ample evidence that such investment contributes far more in social benefits than in costs. If the new investment reduces the volume of previously imported goods to the U.S., it improves the balance of payments. Most of the income generated and received by the foreign-owned firm is returned in payment for U.S. factors of production. Also, studies have shown that the prospect of foreign firm entry substantially reinforces competition, lowers costs and leads to more competitive pricing [see (4)].

The objective of this analysis was to identify specific regional location factors that account for the distribution of employment in foreign-owned firms. Firms in the trade industry responded to basic market considerations while manufacturers responded to business climate

indicators as well as the influences of research and development activities.

Foreign direct investment entails considerably more risk than a domestic venture. New markets, exchange rates, and an unfamiliar economic and legal environment, contribute to the hazards of establishing a profitable operation. Multinationals have attempted to reduce risk by entering the new market by exporting. Overall, export expansion is often considered a precursor to foreign direct investment. The suspected relationship between the location of FDI and port facilities emphasizes the importance of this point. Therefore, the State should be able to increase the number of likely investors by encouraging foreign trade. Trade promotion and investment promotion should go hand in hand. If foreign businesses initially develop close business relationships in the State, there is a greater likelihood they will choose New Jersey as a location for their first overseas investment.

VI. Policy Recommendations

The following recommendations are not necessarily based upon the previous chapter but were developed from a broader Economic Policy Council study of foreign direct investment in New Jersey.

The Council recommends the State promote the establishment of foreign distribution centers and other foreign operations that often precede manufacturing investment. This development can lead to on-going relationships which ultimately will lead to the acquisition or construction of manufacturing facilities in New Jersey.

As long as foreigners invest in the United States, New Jersey will continue to attract a certain share of those new firms. Recently, however, active economic development efforts by Sunbelt and other states have siphoned foreign investment away from the eastern seaboard. A broad promotion campaign might lead to new investments, but its associated cost might be high relative to the number of serious respondents. Since there are limited funds for investment promotion it is suggested that a targeted country by country approach be used to solicit leads from individual firms expressing an interest in investing in New Jersey.

The Council also recommends that the State establish a Foreign Investment Office that would provide 'one-stop' investment services to foreign businesses. The Foreign Investment Office should develop a package of specialized services for the foreign investor. Examples include soliciting, receiving, and processing investment 'leads', assisting in site selection, and informing the foreign investor of the rules and regulations affecting his operations at all levels of government—national, state and local. It should also include consulting arrangements on legal, tax and important matters. Finally the Foreign Investment Office should assist the State in organizing and arranging investment missions abroad.

The successful 'Investment Mission 1979' led by Governor Byrne underscores the importance of this form of foreign investment promotion. It is recommended that the State continue well planned foreign investment missions based on thorough economic and political analyses. Such missions should become part of an ongoing cooperative effort between State officials and private businesses.

Foreign banks play an important role in the process of investing by foreign businesses. First, they act as a representative of the businesses' home bank in dealing with all financial and credit matters. Second, they are often the most trusted advisers to the prospective foreign investor. They can also serve as a source of certification of businesses less well-known in our State. Finally, foreign bank offices are often used as guides in searching, locating, and acquiring of real estate and production facilities. Therefore, it is recommended that the State pass legislation permitting foreign banks to open representative offices in New Jersey cities.

Since information is an important element in foreign trade, it is recomended that promotion literature be made a high priority task in the Foreign Direct Investment Program of New

Jersey. In particular, the State should be promoted as a place with highly concentrated research and development facilities, innovative talent, high quality labor supply, and an economic climate conducive to technological progress.

Cultivating good relations between foreign and domestic firms and between existing foreign companies and the State government is no less important than searching for new investors. The State and the private sector should consider organizing annual meetings of foreign and domestic firms with government officials. The aim of such a meeting would be to create a good neighbor climate and an opportunity to exchange information and personal contacts. Such meetings could result in closer commercial ties among all New Jersey businesses. The State Foreign Investment Office and other State agencies should use these meetings to disseminate information about the State economy, services and business opportunities.

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VI

MORTALITY AND AIR POLLUTION IN NEW JERSEY*

I. INTRODUCTION

This chapter attempts to define quantitatively the mortality benefits associated with air pollution control in New Jersey since the late 1960s. The chapter is adapted from a larger study of the benefits of air pollution abatement in New Jersey, written under the auspices of the New Jersey Department of Environmental Protection.[1]

The task is an important one. Environmental protection programs, like all other public activities, create potentially significant costs and benefits for society. Assessment of these magnitudes is necessary to rational policy planning, for without some basis for comparison of costs and benefits, it is impossible to judge whether continuation or expansion of programs is worthwhile—i.e., economically "efficient."

A. Magnitude of the Problem

Although air pollution is now recognized as an important public problem, comprehensive estimates of its magnitude are lacking. The Council on Environmental Quality has recently estimated the nationwide cost of compliance with federal air pollution standards at $13.1 billion for 1978.[2] In the Council's view, the benefits of compliance to date far exceed this figure.

Fragmentary estimates of pollution impact vary widely. The American Lung Association states that the current national health costs of air pollution may amount to $10 billion per year. A study sponsored by Resources for the Future places the health benefits of reducing non-automotive pollution sources alone at $23 billion annually. The Council itself estimates actual annual benefits of air pollution abatement to date to be $22 billion (in 1977 dollars).

Much uncertainty remains in quantifying precisely the national air pollution problem. There can be little doubt, however, that the order of magnitude is such as to demand immediate and extensive efforts to do so. The larger report from which this chapter is drawn, is a response to such needs.

B. Pertinent Legislation

Legal authorization for state efforts to control air pollution is provided by the Clean Air Act

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[1] See Joseph J. Seneca and Peter Asch, *The Benefits of Air Pollution Control in New Jersey*, Center for Coastal and Environmental Studies, Rutgers University, April 1979.

[2] *Environmental Quality*, Ninth Annual Report of the Council on Environmental Quality, Washington, D.C., December 1978.

of 1970 and its subsequent amendments. Under this legislation, Congress requires the Administrator of the (federal) Environmental Protection Agency (EPA) to identify all air pollutants which "adversely affect public health and welfare;" and then to prescribe a *national* primary ambient air quality standard for each pollutant that will, with an "adequate margin of safety," protect the public health.[3] The EPA also is required to establish national secondary standards for each pollutant that will "protect the public welfare."

Although the ambient standards are determined and applied nationally by the federal EPA, the individual states are required to develop, implement and enforce policies and regulations (subject to EPA approval) that will achieve the federally mandated goals. Accordingly, New Jersey's Department of Environmental Protection has promulgated a series of air pollution control codes designed to achieve the national ambient standards. These codes are specific to each individual pollutant and prescribe the source control measures and reduction standards to be met for each pollutant.

In addition, the State's implementation plan may go beyond regulations on stationary emission sources, and include controls on mobile source emissions such as traffic restrictions, emission testing procedures, parking fees, car pooling plans, *etc.*

C. Chapter Organization

This chapter is organized as follows. Section II discusses the implications of air pollution change for economic efficiency. The empirical approach to benefit measurement, termed "epidemiological," is described in Section III. Section IV presents the model to be tested, the data and the empirical results. Based on these results, mortality reductions are estimated in Section V and valued in Section VI. Finally, Section VII concludes the chapter and discusses some qualifications to the results.

II. AIR POLLUTION AND ECONOMIC EFFICIENCY

A central economic question in discussions of air quality improvement is the efficiency of pollution abatement programs. In simplest terms, an efficient activity is one whose benefits exceed its costs. Measurement of both benefits and costs is therefore necessary to the evaluation of existing programs, and to judgments about the desirability of future changes.[4]

The costs of public projects are often visible and readily measured. In the case of environmental protection, for example, such factors as increased expenditures on pollution control equipment and higher production costs are both immediate and abvious; secondary effects such as increased product prices and reduced employment are less direct, but may be widely publicized as well.

Program benefits on the other hand may be less evident,[5] and their measurement poses difficult problems. In the case of pollution abatement, the measurement difficulty is unusually complex. The first problem is to define with some precision the direct effects of reduced pollution. It is reasonable to expect, for example, that mortality may decline with air quality improvement, but to what extent? So many factors influence mortality experience, that the isolation of an air pollution effect becomes a formidable task.

The second major difficulty is the valuation of estimated pollution effects. In the case of human life and health, valuation presents particularly thorny problems. The very effort to attach dollar values to human lives is controversial, especially outside the discipline of economics.

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[3] Sections 108 and 109, Clean Air Act (42 U.S.C., 1857 *et seq.*)

[4] Such judgments are ordinarily left to the private marketplace. Because of the public goods nature of pollution and pollution abatement, however, the market does a poor job of balancing social costs and benefits. For fuller discussion, see *The Benefits of Air Pollution Control in New Jersey, op. cit.*

[5] Suppose, for example, that because of improved air quality, an individual does not become ill. This is an important benefit of pollution abatement, yet in the specific instance neither the individual nor society may be aware of it.

Whatever the difficulties, the estimation of air quality benefits is most timely in light of current economic conditions. General pressures to limit public spending and taxes are likely to affect environmental quality programs more severely than many other areas. And energy "shortages", current or imminent, create strong and obvious incentives to relax standards of environment protection. During periods of economic stress, some modification of pollution abatement effort may be both appropriate and unavoidable. Estimates of abatement benefits, however, will be most important in defining what will be lost should reduced efforts be undertaken.

III. THE EPIDEMIOLOGICAL APPROACH

A. Background

Much research in economics and public health has focused on relationships between ambient air quality and mortality. Evidence from studies encompassing a wide range of locations, time periods, pollutants, and sample populations, shows that ambient levels of particulates, sulfates, sulfur oxides, and some other air pollutants have statistically discernible effects on mortality.[6]

Defining the effects of air pollution on human mortality, however, is not entirely straightforward. Because laboratory-type experiments are impossible, an epidemiological approach must be taken. Populations are studied, and relationships between ambient pollution levels and mortality are analyzed. The task is complicated by the fact that statistical correlations observed among populations cannot, by themselves, prove cause-and-effect relationships.

In the case of pollution and mortality, the *direction* of causality is not in question. No one seriously proposes, for example, that higher death rates cause higher pollution levels. Rather, the problem is to *isolate* the effects of pollution among the many factors that influence mortality. These factors very likely include such demographic characteristics as age, race, sex, and income distribution, population density, and occupation mix; environmental characteristics such as climate, radiation levels, and type of home heating; and personal characteristics such as diet, exercise habits, smoking habits, medical care, and genetic background.

The difficulty may be illustrated with the following example: suppose it is observed that county *A* has higher air pollution and a higher mortality rate than county *B*. Yet county *A* also has an older, less affluent, more densely crowded population. In these circumstances it is not obvious why county *A*'s mortality rate is higher. Any or all of the factors noted may be to blame; and isolating the contribution of pollution to mortality becomes a more difficult problem than merely observing how the two factors move together.[7]

Fortunately, the evidence on pollution and mortality is now sufficiently strong that the existence of some causal link is beyond serious question. We do not, therefore, need to argue that the observed relationships reported below are "real" rather than "accidental." Nevertheless, control of other influences on mortality is necessary.

In some instances, control is relatively simple. Age, race, sex, and income distributions, population densities, and occupation mixes, are often readily measurable and may therefore be included along with pollution levels in efforts to explain mortality experience.

Other factors, however—most notably the personal characteristics of the population—are effectively beyond control in this type of epidemiological analysis. Comprehensive information on diet, exercise, and smoking habits for the relevant New Jersey populations, e.g., is simply un-

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[6] Lester Lave and Eugene Seskin have provided the most comprehensive analysis to date of the mortality effects of ambient air quality. *Air Pollution and Human Health*. Baltimore: Johns Hopkins Press, 1977.

[7] Viewed more broadly, a problem is created by the fairly consistent association of pollution levels with an urban environment. If both pollution *and* other elements of urban life contribute to mortality, it may become exceptionally difficult to separate statistically the independent effects. This problem—a close association between explanatory variables—is termed *collinearity*.

available. We attempt to avoid this difficulty in part by examining pollution and mortality rate *changes* over time.

Whereas population characteristics may vary widely from place to place, the personal attributes of a population in a given location are likely to be *relatively stable* over a period of a few years. It might be, for example, that residents of Hudson County smoke more heavily than residents of Hunterdon County. If they do so in 1970, however, it is likely that they also do so in 1977. Examination of mortality rate *changes* between these years may thus serve to abstract from smoking, which primarily affects the *level* of mortality rather than the *rate of change.*

This study relies heavily on multivariate regression analysis, perhaps the most widely used tool in empirical economic research. This technique is well suited to the attempt to define the pollution-mortality relationships that exist *after the influence of other factors* is taken into account.

Weaknesses in the application of regresion analysis to questions of pollution and health are well known. There is no comprehensive theory of mortality to suggest which variables should be included in or excluded from an investigation. Some factors that appear pertinent may not be readily measured; while other relevant magnitudes can be measured only imperfectly. These are not deficiencies of the regression technique itself, but rather of the state of knowledge surrounding the pollution-health relationship. Caution in the interpretation of regression findings, however, is essential.

B. Application to New Jersey

Application of the epidemiological approach to New Jersey proceeds in the following way. Ambient levels of total suspended particulates (TSP) and sulfur dioxide (SO_2) are examined for all counties within the State for which monitoring data are available. Regression equations are tested to explain (statistically) mortality rate variations across counties in terms of pollution levels and relevant, measurable population characteristics. The regressions are performed both on a cross-section basis (for a given year) and over time; the latter equations utilize rate-of-change measures of all variables for the period under examination.

Pertinent coefficients in the regresion equations measure the effects of pollution variation on mortality rates. These effects, stated as elasticities, are then applied to each county in order to estimate the mortality effect of actual pollution changes within that county.

The estimated mortality rate effects are translated into numbers of lives—in general, lives saved as the result of reduced pollution levels—and dollar benefits are assigned, using a conservative, widely employed valuation technique.[8]

IV. EMPIRICAL MODEL AND RESULTS

A. Model

The general form of the epidemiological model specifying the mortality relationship in New Jersey is given by the linear equation:

(1) Mortality Rate$_i$ = (Socio-economic Variables$_i$; Ambient Air Quality$_i$)

The county (i) is the level of aggregation used in the empirical analysis. Thus equation (1) specifies that the variation in mortality rates across New Jersey counties is attributable to county differences in socio-economic characteristics and ambient air quality.

Dependent Variable

In all cases the mortality rate of each New Jersey county (i) is the dependent variable. The total mortality rate is used and this rate is not adjusted for age, sex, and race. These characteristics are controlled for by the independent variables.

[8] The valuation procedure is discussed in Section V.

Independent Variables

1. Socio-economic

The independent variables included in the general form of the model attempt to control for the non-pollution factors which systematically influence mortality. These variables cannot account for all the factors that bear on mortality. However, there is no strong *a priori* reason to expect the omitted personal factors that affect mortality to be correlated with air pollution (e.g., exercise habits, nutrition and genetic effects); the omission therefore should not bias estimates of the relationships between air pollution and mortality. On the other hand, the omission of relevant environmental factors that are correlated with air quality *may bias the estimated relationship.*[9]

Each of the socio-economic variables used in the empirical analysis is discussed below. In all cases variables are measured for each New Jersey county.

a. Median Income

In general, people with higher levels of income are able to afford better health care which leads in turn to higher life expectancy. Therefore, an inverse relationship between mortality and income is expected.

b. Percentage of Population Sixty-five Years and Older

Since an older population will have a higher mortality rate, the relationship between this variable and mortality is expected to be direct.

c. Percentage of Non-whites in the Population

In general, the non-white population is underprivileged vis-à-vis the white population in terms of education and income level, and tends to have a higher mortality rate for a number of related reasons. Relatively poor nutrition and health care are two possible reasons for an expected positive relationship between mortality rates and this variable.

d. Percentage of Females in Population

Although there is no *a priori* expectation as to the relationship between the female population and total mortality, it is observed that women have average life expectancies greater than men. This suggests that for a population of given age distribution, higher proportions of females may imply lower mortality rates.

e. Percentage of Workers Employed in Manufacturing

Because of greater job hazards, the relationship between the percentage of workers employed in manufacturing and mortality is expected to be direct.

f. Population Density

A priori, a positive relationship is expected for this variable since congestion tends to increase the chances of contracting disease and incurring accidents. In addition, density may also be a proxy for other urban factors (tension, anxiety, *etc.*) that are suspected contributors to mortality.

g. Per capita Health Care Expenditures

Greater per capita health expenditures (measured by municipal, county, and federal expenditures) within a particular county would imply a lower mortality rate within that county, other things equal. The relationship between mortality rates and health care expenditures is therefore expected to be inverse. However, it may be that health care expenditures *respond* to higher mortality rates, where rates are higher partly because of greater pollution. The estimated statistical effect may thus be confused.

[9] In such situations, the air pollution variable will capture the statistical effect on mortality that in reality should be attributed to the omitted variable.

2. Air Quality

Total suspended particulates (TSP) and sulfur dioxide (SO_2), are used to measure ambient air quality. Both these pollutants are extensively monitored in the majority of New Jersey's counties and have been shown to have adverse effects on human health.[10]

When air quality improves in a county, it is often the result of an overall reduction in the levels of both SO_2 and TSP, since both pollutants tend to be generated from similar sources (e.g., fossil fuel combustion). For this reason, there is a tendency for levels of the two pollutants to be collinear—i.e., correlated with each other. If both TSP and SO_2 are entered in the same equation, the separate effect of each on mortality is difficult to isolate statistically. To avoid this problem an additive pollution variable (ADD) is formed. This variable sums the readings for TSP and SO_2 and examines their joint effect on mortality. The additive pollution variable captures the average effect of the *combined* level of pollutants on mortality.

Alternatively, the pollutants might have a multiplicative interaction effect on mortality. If a synergistic relationship between the pollutants exists, the use of the additive variable underestimates the mortality-air pollution relationship. Therefore, the examination below also tests for a synergistic effect by using a variable which is the product of the TSP and SO_2 readings.

B. Specification

There are two specifications of the model. One examines the relationship between air pollution and mortality using variables measured in *level* or *base year*, form; while the other analyzes the relationship with the variables expressed as *rates-of-change*.

The *base year* specification (equation 1 above) is a *cross-sectional* examination over counties in which the variables are measured for the initial year of observation of the pollutant in question. [11] This analysis attempts to isolate the air pollution effect on mortality by investigating the differences in average air quality across the counties of New Jersey. Because average pollution levels vary considerably across counties, the cross-sectional analysis is able to support inferences about the long-term (chronic) effects of pollution exposure. However, the cross-sectional approach is limited in that data constraints make it impossible to account for all the variables that may influence mortality.

The *rate-of-change* specification is able to circumvent some of the problems of excluded variables. This specification measures the rate of change of all variables from the beginning to the ending year of observation of the pollutants. This analysis accounts for the variables that do change; while those that do not—but do affect mortality—need not be included in the specification. For example, excluded variables such as a county population's smoking habits, the job hazards faced by its work force, diet and exercise habits, or climatological conditions, are not likely to change substantially over the periods of time examined here (four to six years).

If it can reasonably be assumed that the relevant omitted variables do not change over time (or, if they do, that the rates-of-change do not vary across counties), then their omission from the rate-of-change analysis will not affect the results.

Accordingly, the rate-of-change specification provides more control over factors that are not easily quantifiable and included in the data set. The general equation for this specification is:

(2). $\%\triangle$ in Mortality Rate$_i$ = ($\%\triangle$ Socioeconomic Variables$_i$; $\%\triangle$ Ambient Air Quality$_i$)

Multivariable regression analysis is used to estimate the variation in mortality rates attri-

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[10] See, e.g., John J. Gregor, *Intraurban Mortality and Air Quality: An Economic Analysis of the Costs of Pollution Induced Mortality*, U.S. Environmental Protection Agency. EPA-600/5-77-009, July 1977.

[11] Data corresponding to the year when observation on the individual pollutant begins are not available for all of the variables. Therefore, some of the variables are measured for the closest year for which data are available.

butable to the pertinent independent variables for both specifications. The relationship between air pollution and mortality is defined by the coefficients of the pollution variables. Using the coefficients of the pollution variables, the sensitivity of mortality to ambient air pollution, specific to New Jersey can be estimated.

The general objective in reporting the empirical results below is to present equations that test *a priori* expectations concerning the mortality relations, but also *include* (where significance tests indicate) those variables which might statistically act as proxies for air pollution (e.g., population density, non-white population, manufacturing employment). Imposing this condition on the equation selection insures that the air pollution coefficients will not be *overstated* and we will not, as a result, attribute to air pollution the mortality effects associated with other factors (which are, fortuitously or not, correlated with air quality). This approach is consistent with the objective of providing a *conservative* estimate of the health damages of air pollution.

C. The Data

Mortality Rates

Total mortality rates used in the analyses closely correspond to the years of observation for the pollution variables, and were derived from the *Vital Statistics of the United States and New Jersey Health Statistics* for each of the relevant New Jersey counties.

Socioeconomic Variables

County measures of median income, percentage of population sixty-five years and older, percentage of non-whites in the population, percentage of females in the population, percentage of workers employed in manufacturing, population density, and health care expenditures, are the socio-economic variables included in the analyses.

Pollution Variables

1. Air Quality Monitoring

New Jersey's ambient air quality levels are monitored by the State's Department of Environmental Protection (DEP). At the time of this study the monitoring system consisted of the 22 stations of the Continuous Air Monitoring Network and 86 stations of the High-Volume Sampling Network.

Almost all monitoring stations are located in center city, suburban, residential, and commercial/industrial locations in order to measure population exposure to ambient pollution levels. Every county in the State now has at least one monitoring site; the more populous counties are more heavily represented.

The 22 stations of the Continuous Air Monitoring Network provide hourly and daily data for ten pollutants.[12] The data are published monthly by the New Jersey Bureau of Air Pollution Control. The 86 sites in the High-Volume Sampling Network measure total suspended particulates (TSP).

Summary statistics for all monitored pollutants are published annually by the DEP and form the basis for the ambient pollution records used in this study.

2. Air Quality Evidence

Data provided by the Department of Environmental Protection have been used to measure ambient air quality levels and trends on a county basis over the past six to ten years. These estimates cover the two most extensively monitored pollutants, suspended particulates (TSP) and sulfur dioxide (SO_2).[13]

In every instance the reported county pollutant level is a weighted average of readings at DEP monitoring stations within that county. The pollutant level recorded at each site has been weighted by the population of the com-

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[12] The ten pollutants are: nitrogen oxide, nitric oxide, nitrogen dioxide, sulfur dioxide, ozone, aldehydes, carbon monoxide, hydrocarbons, smoke shade and carbon dioxide. Each monitoring station, however, does not measure all ten pollutants.

[13] In the main study cited above (footnote 1) the relation between mortality and carbon monoxide in New Jersey is also analyzed. No significant association was detected. See *The Benefits of Air Pollution Control in New Jersey, op. cit.*

munity in which the site is located. The resulting county pollution level thus attaches primary importance to conditions in major population centers, a procedure appropriate to the study of pollution health effects.

Tables VI.1 and VI.2 show the level and change of ambient concentration of the two pollutants (TSP and SO_2). The procedure for measuring levels of the two pollutants can be illustrated by reference to Table VI.1 which lists ambient air quality data for suspended particulates for 19 of the 21 New Jersey counties.[14] Columns (2) and (3) show the number of monitoring sites reporting base year TSP levels in each county, and the percentage of the county's population living in the communities where these monitoring sites are located.[15] The next three columns provide the equivalent information for the ending year, 1977 for all counties. Finally, column (7) lists the percentage change in ambient TSP levels between the base and ending years. In order to develop meaningful comparisons over the period of study, the pollution data have been restricted wherever possible to monitoring sites which had identical locations in the base and ending years.[16]

TABLE VI.1

TOTAL SUSPENDED PARTICULATES: ANNUAL AVERAGE
(Micro Grams per Cubic Meter)

County	(1) Base Yr. TSP	(2) # of Stations	(3) % Pop. Covered	(4) EndYr.* TSP	(5) # of Stations	(6) % Pop. Covered	(7) %△ TSP
Atlantic	51.04	2	33.75	42.37	2	33.75	—16.99
Bergen	84.15p	4	12.50	42.66	4	12.50	—49.30
Burlington	41.37	3	4.94	39.02	4	7.50	— 5.68
Cape May	25.58	2	20.30	30.21	2	20.30	+18.10
Camden	104.87p	2	36.48	76.40p	4	41.53	—27.15
Cumberland	n.a.	n.a.	n.a.	37.65	2	55.69	.....
Essex	89.74p	6	62.15	55.85	7	66.83	—37.76
Gloucester	48.00	1	7.47	44.50	1	7.47	— 7.29
Hudson	105.12p	5	54.72	65.68	5	64.30	—37.52
Hunterdon	32.70	1	3.87	33.60	1	3.87	+ 2.75
Mercer	61.65	4	60.08	47.06	5	65.78	—23.67
Middlesex	75.40p	6	34.60	53.22	9	42.30	—29.42
Monmouth	68.42	2	6.34	46.07	4	7.66	—32.67
Morris	37.27	2	6.01	41.20	3	7.45	+10.54
Ocean	48.00	1	20.76	41.32	5	33.59	—13.92
Passaic	83.00p	1	31.35	70.66	1	31.35	—14.94
Salem	n.a.	n.a.	n.a.	n.a.	5	43.18	.....
Somerset	36.10	1	3.19	36.40	1	3.19	+ .83
Sussex	29.40	1	3.56	27.80	1	3.56	— 5.44
Union	84.02	4**	37.82	55.48	5**	47.58	—33.96
Warren	53.30	1	24.10	43.25	3	36.96	—18.86

* The end year is 1977 for all counties. The base year varies from county to county.

** State data supplemented by Exxon monitoring site for Linden.

n.a. = (not available).

p = violation of national primary standard (75 $\gamma g/m^3$).

[14] There are no particulate readings in the early 1970s for Cumberland and Salem Counties, thus no comparison of the change in particulate levels can be made. It should be noted that both counties now contain monitoring sites, and future comparisons will soon be possible.

[15] For example, the two monitoring stations in Atlantic County in 1972 were located in communities (Atlantic City and Hammonton) which contained 33.75% of that county's population.

[16] This restriction has necessarily resulted in a loss of information for some counties.

TABLE VI.2

SO_2: ANNUAL AVERAGE
(Micro Grams per Cubic Meter)

County*	(1) Base Yr. SO_2	(2) # of Stations	(3) % Pop. Covered	(4) End Yr.** SO_2	(5) # of Stations	(6) % Pop. Covered	(7) %△ SO_2
Atlantic	18.33	1	27.23	20.95	1	27.23	+14.29
Bergen	44.52	1	4.00	31.43	1	4.00	—29.41
Burlington	31.43	1	6.96	44.52	1	6.96	+41.67
Camden	120.47p	2	22.41	53.69	2	22.41	—55.43
Essex	259.28p	1	40.95	47.14	1	40.95	—81.82
Gloucester	57.62	1	4.67	39.28	1	4.67	—31.82
Hudson	108.95p	2	54.72	51.86	2	54.72	—52.40
Mercer	39.28	1	34.29	31.43	1	34.29	—20.00
Middlesex	65.47	1	6.62	36.67	1	6.62	—44.00
Monmouth	15.71	2	24.84	15.71	2	24.84	0
Morris	36.67	1	10.39	28.81	1	10.39	—21.43
Ocean	15.71	1	20.76	15.71	1	20.76	0
Passaic	36.67	1	31.35	28.81	1	31.35	—21.43
Salem	44.52	1	9.47	41.80	1	9.47	— 5.88
Somerset	31.43	1	6.86	23.57	1	6.86	—25.00
Union	78.05	3***	28.32	48.97	3***	28.32	—37.25
Warren	57.62	1	24.09	23.57	1	24.09	—59.09

* Cape May, Cumberland, Hunterdon and Sussex not available.

** End year is 1976 for all counties. The base year varies from county to county.

*** State data supplemented by Exxon monitoring site data for Linden.

p = violation of national primary standard (80 $\gamma g/m^3$). The DEP reports SO_2 is parts per million (ppm). The ppm readings are converted to micro grams per cubic meter by multiplying by 2619, the conversion factor used by the DEP.

Columns (3) and (6) show a wide range in population coverage over the 19 counties. For example, in Table VI.1 seven counties have population coverage of less than ten percent. These counties, however, tend to have both low pollution readings and relatively small populations. [17] The population coverage for SO_2 is lower than for TSP, reflecting the smaller number of monitoring sites for this pollutant.

The data indicate that ambient pollution levels have, in general, declined for both pollutants. This is true for 15 of 19 counties for TSP, and 13 of 17 (with two showing no change) for SO_2. In fact, recent TSP and SO_2 levels in almost every county for which measurement was possible, now comply with primary federal standards (annual criteria).[18]

The base year annual average pollution readings (column 2 of Tables IV.1 and VI.2) are the measured pollution variables used in the cross-section *level* analysis (i.e., equation 1 above) and the percentage change measures (column 7 of Tables VI.1 and VI.2) are the pollution variables used in the *rate-of-change* (equation 2 above).

D. Empirical Results

A large number of equations discussed in the main report to DEP represent different combinations, forms and tests of the independent variables. This extensive analysis consistently reveals a significant and direct association between ambient air pollution and mortality in New Jersey. This effect is present both in cross-sectional analysis at a point in time (the *base year* studies) and when comparing changes in pollution and changes in mortality over time (the *rate-of-change* analysis). The results are remarkably robust in the presence of other

[17] The seven counties are: Burlington, Cape May, Gloucester, Monmouth, Morris, Somerset and Sussex. Their combined 1976 population was 19.3% of the State's population.

[18] The only exception is TSP for Camden County.

variables that are associated with higher mortality rates, and which are also often closely correlated with air pollution (e.g., population density, manufacturing employment, non-white population). Although the magnitude and statistical significance of the pollution coefficients varied with different combinations of independent variables, the effect of pollution on mortality was consistently positive.[19]

Accordingly, we report below a representative equation for each of the two basic specifications. In each case, care has been used to select an equation whose form and composition provide a *conservative* estimate of the air pollution-mortality relation. Equation 3 based on the *initial year* cross-section data, relates county mortality rates (MR) to a series of independent variables. It contains the additive pollution variable (ADD), population density (DENS), median income (MEDINC) and elderly population (POP 65) as independent variables.[20]

(3) MR = .4587E-05 (ADD) − .4103E-06 (MEDINC) +
(1.84)** (3.11)*
.5884E-01 (POP 65) + .7338E-07 (DENS) +
(8.79) * (1.32)
.7254E-02 (CONSTANT)
(3.67)*
R^2 = .964
F (4,11) = 73.15

(Numbers in parentheses are t-tests.)
* Significant at .05.
** Significant at .10.

The additive pollution variable is positive and significant, the income variable is negative and significant, and the age variable is strongly significant and positive. The population density variable is positive as expected, but weak (t = 1.32). The R^2 (.96) is remarkably high for cross-section data.

Although the density variable is insignificant (at conventional levels), care has been taken to select an equation which contains an "urban" measure. There has been considerable speculation that what is often identified as a pollution effect on mortality is really the effect of a complex of urban factors (e.g., smoking, congestion, anxiety, stress, and greater job hazards, all of which tend to be closely associated with an urban environment.) It should be re-emphasized that this equation contains *both* a pollution variable and a population density variable (to account for the so-called "urban factor") and that the separate effects of each upon mortality have been estimated. Accordingly, the pollution variable has been purged of any proxy role it might play in reflecting an urban factor.[21]

The effects on mortality of age and income are also accounted for by separate variables.

Equation 4 is based on the *rate-of-change* data and is representative of the results of that specification. The equation relates the *percentage change* in mortality rates (% △ MR) over the sample to the *percentage change* in the additive pollution level (% △ ADD), the population proportion of elderly (% △ POP65), and the proportion of manufacturing employment (% △ MFG).[22]

(4) % △ MR = .1373 (% △ ADD) +
(2.24)*
.5104 (% △ POP65) + .2831 (% △ MFG) −
(2.42)* (2.25)*
3.84 (CONSTANT)
(1.40)
R^2 = .652
F (3,12) = 7.50

(Numbers in parentheses are t-tests.)
* Significant at .05.

Equation (4) indicates that the change in mortality rate is directly and significantly related to changes in air pollution, elderly population and manufacturing employment.

[19] This result is even more remarkable in light of the small samples involved (16 to 19 observations). Studies using national data bases (e.g., Lave and Seskin, *op. cit.*) have reported similar results, but from data sets with over 100 observations.

[20] The additive pollution variable (equal to the *sum* of the TSP and SO_2 base year levels for each county) was used because high collinearity between the two pollutants (r = .58) made statistical identification of separate effect for each pollutant difficult. Other socioeconomic variables, e.g., non-white, sex, manufacturing employment, and health care expenditures did not improve the significance of the relation. A multiplicative form of the pollution variable (TSP x SO_2) also did not provide a superior explanation than the additive variable.

[21] It should also be noted that the pollution variable is more significant (t = 1.84) than the urban measure (t = 1.32).

[22] The addition of other *rate-of-change* variables did not improve these results. This does not mean that the *level* of other pertinent socio-economic variables fails to influence mortality *levels*, but only that the *change* in these variables shows no association with the *change* in mortality. See the discussion under Section II.B. above.

E. Elasticity

The use of *elasticity* values derived from the equations reported above, permits the estimation of the mortality change attributable to the change in air pollution. Elasticity is a ratio: the percentage change in the mortality rate divided by the percentage change in ambient air pollution.

In the context of the *level* analysis specification (equations 1 and 3) the elasticity (E) of air pollution with respect to mortality is:

$$(5)\quad E = \frac{\%\ \triangle\ MR}{\%\ \triangle\ ADD} = \frac{\triangle\ MR}{\triangle\ ADD} \times \frac{ADD}{MR}$$

where the first term is the estimated coefficient of the (ADD) variable in equation (3) and the second term is the ratio at the means of the sample data.

Thus, for equation (3),

$$E = .4587E\text{-}05 \times \frac{130.542}{.009617} = .0623$$

For the *rate-of-change* specification (equations 2 and 4) the estimated coefficient of the pollution variable (.1373) is the elasticity value since both the mortality rate and pollution variable in the regression are measured in *percentage change* form.

Given the elasticity value, the percentage change in mortality can be solved for any specified percentage change in pollution levels. This procedure will be used in the next section to estimate the mortality reduction achieved in New Jersey that is attributable to the general decline in ambient TSP and SO_2 pollution tion since the late 1960s.

V. MORTALITY REDUCTION ESTIMATES

A. Elasticity Estimates

Equation (3) above will be used to estimate mortality reductions attributable to air pollution declines. There are three reasons for this selection.

1. The equation includes a population density variable to account explicitly for the "urban" effect on mortality.[23]
2. The elasticity value (.06) is considerably smaller than that derived from the *rate-of-change* equation. The use of the lower elasticity is consistent with the objective of providing *conservative* estimate of the benefits of air pollution control.
3. The linear specification of equation (3), using *base year* cross-sectional data permits the estimation of an elasticity which *varies* with the severity of pollution levels.[24]

The last reason provides an important statistical property. Although the estimated equation is a linear relationship between mortality rates and air pollution (and other socio-economic variables), the elasticity of a linear function is not constant but changes in value along the regression line.

Since the entire multivariable regression equation is linear, the *partial* relationship between mortality (MR) and the pollution variable (ADD) is also linear, as portrayed in Figure VI.1. As previously indicated, the elasticity (E) of this linear function is given by the expression:

$$E = b \times \frac{ADD}{MR}$$

where,

b = the coefficient of the pollution variable in the linear regression.
ADD = the value of the pollution variable at a given point on the regression line.
MR = the value of the corresponding mortality rate at the same point.

One statistical property of regression analysis is that the fitted regression line passes through

[23] The rate-of-change specification did not show any significant relation between the *change* in county population size and the change in mortality rates.

[24] Recall, in the rate-of-change specification the elasticity is the estimated coefficient of the pollution variable and is constant in value regardless of the level of pollution.

the mid-points of the sample data. In terms of Figure VI. 1 this implies that the regression line passes through the mean value of the mortality rate variable (MR) and the mean value of the pollution variable (ADD). This is represented by point W in Figure VI.1. The elasticity at the means (i.e., evaluated at point W) is therefore,

$$E = b \times \frac{ADD}{MR} \text{ (or .0623 as previously noted)}$$

The slope of the regression line, indicated by the letter *b* in Figure VI.1 is, of course, a numerical constant,[25] but the ratio of (ADD) to (MR) changes over the regression line. Specifically, as we move along the regression line away from its vertical intercept,[26] the ratio of (ADD) to (MR) increases.[27]

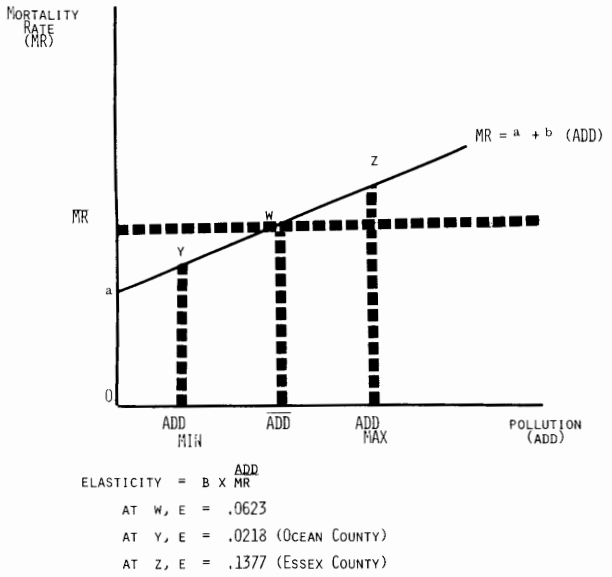
Accordingly, as pollution levels increase (i.e., as ADD rises by moving to the right along the horizontal axis), the value of the elasticity increases. Conversely, as pollution levels decrease (moving towards the origin on the horizontal axis), the elasticity value declines.

This variable elasticity property implies that a *given* percentage change in pollution in a county where the initial pollution level is *high* will result in a *larger* percentage change in mortality rates compared with the same percentage change in pollution in a county with a low(er) initial pollution level. This property is intuitively appealing and permits the estimation of differential effects of pollution reductions depending on the initial level of ambient air quality in each county.

In terms of Figure VI.1, the elasticity at the means is .0623 (point W). For all counties with initial pollution levels (ADD values) less than the mean of the sample (i.e., to the left of point W), elasticity is smaller than .0623; for counties with initial pollution levels higher than the mean (i.e., to the right of point W), elasticity is greater than .0623.

FIGURE VI.1

THE ELASTICITY FROM A LINEAR REGRESSION



The elasticity for each of the 16 counties which comprise the sample are estimated and reported in Table VI.3, column (3). The computation procedure is straightforward. The elasticity for any county is equal to the ratio of the county's pollution level[28] to the mortality rate of that county (MR) as estimated by the regression; multiplied by the regression coefficient of the (ADD) variable.[29] In Table VI.3 the computed elasticities range from a low of .0218 for Ocean County to a high of .1377 for Essex County, reflecting the minimum and maximum of the range of the pollution variable (ADD = 63.71 for Ocean County and 349.02 for Essex County).

These elasticity extremes are represented in Figure VI.1 by points Z (maximum) and Y (minimum). The elasticities of the remaining 14 counties fall within this range. Higher elasticities occur in counties with high levels of

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25 In the equation selected, the value of b = .4587E-05.

26 The intercept is indicated by letter *a* in Figure VI-1. In the equation selected, this is the value of the coefficient of the CONSTANT, or, .7254E-02. See equation (3) above.

27 This ratio increases because b<1.

28 As measured by the *actual* value of the (ADD) variable for the county (given by Column 2 of Table VI.3).

29 For example, in Table VI.4 for Atlantic County ADD = 69.37, MR = .0139; and ADD/MR = 4990.65. This ratio times the regression coefficient *b* (.4587E-05) equals .0229, the elasticity reported for Atlantic County in Column (3).

pollution while elasticities are lower in the relatively cleaner-air counties.

B. Mortality Reduction Estimates

The elasticities of Table VI.3 are used to compute the reduction in mortality in New Jersey attributable to recent air quality improvements.

These estimates appear in column 6 of Table VI.4. The estimates are derived by multiplying the percentage change in pollution (column 3)[30] by the elasticity (column 4). The product of this multiplication is the percentage change in the mortality rate attributable to the change in pollution. This product is then multiplied by the average annual number of deaths in each county (column 5)[31] to obtain the estimated annual reduction in deaths (column 6).

The total statewide reduction in deaths attributable to the general decline in TSP and SO_2 pollution is 2017. Over 94 percent of this reduction (1904) occurs in six of the sixteen counties (Bergen, Camden, Essex, Hudson, Middlesex and Union). These six counties were characterized by high initial pollution levels, often in excess of federal primary standards. In the base year, all six violated the TSP standard, and three of the six (Camden, Essex and Hudson) exceeded the SO_2 standard. These counties include the most populous in the State, accounting jointly for 49 percent of New Jersey's population in 1976.

TABLE VI.3

ELASTICITY ESTIMATES BY COUNTY

County	(1) MR	(2) ADD	(3) E
Atlantic	.0139	69.37	.0229
Bergen	.0085	128.67	.0696
Burlington	.0068	72.80	.0488
Camden	.0096	225.34	.1075
Essex	.0116	349.02	.1377
Gloucester	.0083	105.62	.0582
Hudson	.0123	214.07	.0802
Mercer	.0093	100.94	.0496
Middlesex	.0073	140.88	.0889
Monmouth	.0091	84.13	.0426
Morris	.0069	73.94	.0492
Ocean	.0134	63.71	.0218
Passaic	.0100	119.67	.0550
Somerset	.0067	67.53	.0463
Union	.0095	162.07	.0782
Warren	.0107	110.92	.0476

$$E_i = b \times \frac{ADD_i}{MR_i}$$

where,

E_i = the elasticity of county i; and i = 1 to 16 counties.
b = the estimated regression coefficient of the (ADD) pollution variable from the selected equation.
ADD_i = the value of the (ADD) pollution variable in county i.
MR_i = the value of (MR) as estimated by the regression equation for county i.

[30] See Table VI.1 and VI.2 for the *initial* and *end* year values for TSP and SO_2. The sum of the initial levels of TSP and SO_2 is reported in column 1 of Table VI.4, and the sum of the two pollutant levels in the end year is given in column 2. The percentage change between the initial and end year readings is listed in column 3.

[31] As measured over the same period of observation as the pollution change.

TABLE VI.4

MORTALITY REDUCTION ESTIMATES

County	(1) Initial Year ADD	(2) Ending Year ADD	(3) % △ ADD	(4) E	(5) D	(6) △ D
Atlantic	69.37	63.32	— 8.72	.0229	2617.3	— 5.2
Bergen	128.67	74.09	—42.42	.0696	7617.2	—225.0
Burlington	72.80	83.54	+14.76	.0488	2157.8	+ 15.5
Camden	225.34	130.09	—42.27	.1075	4277.1	—194.3
Essex	349.02	102.99	—70.49	.1377	9883.3	—959.1
Gloucester	105.62	83.78	—20.67	.0582	1442.5	— 17.4
Hudson	214.07	117.54	—45.09	.0802	7049.9	—254.8
Mercer	100.94	78.49	—22.24	.0496	2898.5	— 32.0
Middlesex	140.88	89.89	—36.19	.0889	4135.7	—133.1
Monmouth	84.13	61.78	—26.56	.0426	4400.6	— 49.8
Morris	73.94	70.01	— 5.31	.0492	2637.7	— 6.9
Ocean	63.71	57.03	—10.48	.0218	3095.5	— 7.1
Passaic	119.67	99.47	—16.88	.0550	4483.9	— 41.7
Somerset	67.53	59.97	—11.19	.0463	1390.8	— 7.2
Union	162.07	104.46	—35.55	.0782	4967.3	—138.1
Warren	110.92	66.82	—39.76	.0476	823.7	— 15.6
Total						—2017.8

In conclusion, the mortality reduction derived —2017—is the best current estimate of annual health benefits within the State attributable to declining ambient TSP and SO_2 pollution levels. This estimate has two distinct advantages: first, it is based solely on New Jersey experience; and second, it incorporates differential mortality effects depending on the initial level of pollution. The estimate will be used below as a basis for assigning dollar values to the mortality decline attributable to improved air quality.

VI. VALUATION OF MORTALITY IMPROVEMENTS

A. The Debate

Perhaps no issue in modern cost-benefit analysis provokes more controversy than the valuation of health improvements that result from public projects. Efforts to place a dollar value on human life and suffering are regarded by some as an absurdity. Yet if meaningful judgments are to be reached about whether such programs are worthwhile, some valuation procedure is inescapable.

Serious difficulties attend any effort to value life-saving activity, even after the potential emotionalism of the issue is stripped away. Economists generally agree that the appropriate theoretical measure of such programs is the amount that affected individuals would pay collectively to secure whatever reduction in risk is provided. As is the case with morbidity, however, direct evidence is at best fragmentary.[32]

A large economic literature on the subject yields three distinct approaches to the problem of valuing life-saving activity: (1) willingness to pay, as noted above; (2) foregone earnings as the result of premature death; and (3) implicit valuations based on both public-agency and private-individual decisions.

B. Alternative Valuations of Mortality

Three alternative valuations of mortality effects are considered.

[32] The problem of valuing mortality may be even more basic for it is not clear that the relevant magnitudes can be assessed meaningfully. What, for example, is an individual willing to pay to reduce his or her risk of dying from cancer next year from one in 30,000 to one in 40,000? The most common—and honest—response to such a question might be: "I don't know."

1. *Foregone earnings*

Although shortcomings of the foregone earnings approach are well known[33], it provides useful conservative estimates of the value of life-saving activity. We employ the earnings of an *average* New Jersey resident (in 1975) regardless of age, sex, or race, discounted at 10 percent.[34]

Use of average earnings will undoubtedly produce somewhat larger estimated values than would result from examination of the actual earnings of pollution victims.[35] The victims of pollution, however, are not readily identifiable, and data on their earnings would be unavailable in any case. Moreover, any increase in the estimated value of life saving due to this procedure will not begin to offset the inherent downward bias of the foregone earnings approach. Accordingly, there estimates remain a highly *conservative* benchmark in the valuation of mortality reductions.

2. *Thaler-Rosen valuations*

Thaler and Rosen have estimated the magnitude of "one important component of life value" —the "price" that persons implicitly attach to their own safety.[36] This price is measured by the wage premiums that are paid to induce people to enter hazardous occupations.

Thaler and Rosen examine, for a "representative" sample, the relationship between wage rates and the "extra"—i.e., above normal—hazard of various occupations; while taking account of various personal and occupational characteristics that also influence wages.[37] Equations are estimated in which job hazard is one among several determinants of observed earnings.

Thaler and Rosen observe implicit values ranging from $139,000 to $260,000 per life. They conclude that their estimates center around $200,000 with a range of ± $60,000, and term this a "rather conservative" measure of the value of life.

3. *Viscusi valuations*

Viscusi has recently reported value of life estimates based on a methodology similar to Thaler and Rosen, but using a different data set and somewhat different measures of personal and occupational characteristics.[38]

Viscusi concludes that workers in his sample implicitly attach a value of $1 million to their own lives. Precisely why Viscusi's estimate is so much higher than those of Thaler and Rosen, is uncertain. As Viscusi points out, it may simply be that there is a broad distribution of valuations across the population—that is, different individuals attach different values to their lives, and no single dollar value could be correct for all members of society.

We employ the Viscusi estimate as a liberal, upper-bound valuation of mortality reductions.

C. The Estimates and Their Interpretation

Table VI.5 lists the three alternative values of life discussed above. Table VI.6 applies each of these three values to the estimated mortality reduction and lists the estimated dollar value of mortality reduction in each case.

The value of total mortality reductions ranges from over $116 million, under the foregone earnings approach, to almost $2.1 billion, under the Viscusi estimates.

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[33] See, for example, E.J. Mishan, "Evaluation of Life and Limb: A Theoretical Approach," *Journal of Political Economy,* Vol. 79 (July/August 1970), pp. 687-705.

[34] Discounting is an adjustment to reflect the fact that the *present value* of future earnings (or other sums) depends upon *when* those earnings are received. Present values decline, the further time of receipt is deferred. To count the foregone earnings of an individual (which would be received over a relatively long period) without such adjustment, would substantially overstate their present value. For fuller discussion, see, *The Benefits of Air Pollution Control in New Jersey,* Appendix II-B, *op. cit.*

[35] The earnings of pollution victims will tend to be lower to the extent that they are elderly and in poor health. Death of an elderly person also may imply sacrifice of a relatively shorter stream of future income than that of the average New Jersey resident.

[36] See Richard Thaler & Sherwin Rosen, "The Value of Saving a Life: Evidence from the Labor Market," in Nestor E. Terleckyj. (ed.), *Household Production and Consumption* (New York: National Bureau of Economic Research, 1975).

[37] These include: age, marital status, unionization, race, urban/nonurban location, region of the country, education, type of industry (manufacturing or service) employment, family size, and hours worked.

[38] See W. Kip Viscusi, "Labor Market Valuations of Life and Limb," *Public Policy,* Vol. 26 (Summer 1978).

TABLE VI.5

ALTERNATIVE ESTIMATES OF VALUE PER LIFE

Method	Dollars
1. Foregone Earnings	56,228*
2. Thaler-Rosen	200,000
3. Viscusi	1,000,000

* Average New Jersey personal income in 1975 discounted at 10%.

TABLE VI.6

NEW JERSEY MORTALITY REDUCTION ESTIMATES AND VALUATIONS

a) Pollutant	Mortality Reduction
Total TSP and SO_2 Combined Effect	2071.8
b) Valuation of Mortality Reductions	
Total TSP and SO_2 Combined	
1. Foregone Earnings estimate .	$116,493,170
2. Thaler-Rosen estimate	414,360,000
3. Viscusi estimate	2,071,800,000

Read literally, these figures tell us that the *annual benefits* of reduced mortality in New Jersey *attributable to already-achieved improvements in air quality* are at least $116 million, and may be as high as $2.1 billion.[39] There is no clear basis for choosing a most likely "true" value within this range. Even the lower bound of the range is impressive, however. Should one choose, conservatively, to define the value of life solely in terms of its economic contribution (i.e., the foregone-earnings approach), the life-saving benefits of reduced pollution in New Jersey are at least in the neighborhood of $116 million. Under less restrictive definitions of the value of human life, the benefits are very substantially higher.

VII. CONCLUSIONS

The conclusion of this analysis is that reductions in ambient levels of TSP and SO_2 in New Jersey since the late 1960s have had a substantial impact on mortality. This finding, however, must be viewed in light of three primary qualifications:

1. *Extraneous effects on mortality.* The most troublesome single problem in epidemiological analyses, is the inability to control all relevant influences on the variables in question. This shows up clearly in the analysis of human mortality, which is affected by a host of factors other than air pollution. It is therefore conceivable that observed relationships between pollution and mortality do not represent "true" causal links.

This problem is potentially so serious that considerable care has been taken, as described, to determine and minimize its role. The checks used suggest strongly that the observed effects of air pollution levels on mortality rates are not attributable to other influences such as an independent urban factor. This possibility of some distortion cannot be ruled out entirely, however.

2. *Threshold pollution effects.* The estimation above assumes that *any* level of air pollution has *some* mortality effect—i.e., there is no threshold beneath which pollution is "safe." Although this assumption is supported by considerable evidence in the literature, the possible existence of thresholds remains an arguable issue; and different assumptions in this regard would lead to somewhat different mortality estimates.

3. *Limited data availability.* Confinement of the analysis to TSP and SO_2 for most, but not all, New Jersey counties, clearly understates the total mortality effect of air quality improvement

[39] It should also be noted that this is only the estimated effect for reduction in particulates and sulfur dioxide. Measurements were not possible for nitrogen dioxide and hydrocarbons because of insufficient data. No mortality effect could be discovered for carbon monoxide. *Morbidity* benefits are also not included in any of the estimates. However, the larger report also estimates morbidity and property damage savings attributable to air pollution control.

within the State. How large the effects of unmeasured pollutants (e.g., ozone, CO, NO) may be, is unknown; but the potential magnitude of understatement is plainly significant.[40]

As these qualifications suggest, the mortality effects of reduced pollution have not, and cannot, be defined precisely and certainly. Whenever alternative means of estimation or valuation were available, however, our procedure was to choose the most conservative. The estimated mortality effects—in terms of both lives and economic savings—should accordingly be read as a probable understatement of the true gains that have accrued to air pollution control in New Jersey.

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[40] Omission of some counties for which TSP and SO_2 were not monitored, is less troublesome. The excluded counties tend to be rural and to have low pollution levels, and their inclusion thus would not have altered the estimates substantially.

VII

NEW JERSEY HOUSING PROSPECTS*

Introduction

Activity in residential construction and related financial markets is being affected currently by many important and far-reaching, though often countervailing, factors. For housing demand, the arrival of the post-war "baby-boom" generation at home-buying ages and the very bullish recent returns on housing as an investment asset, made 1978 nationally an excellent year for housing starts. But continuing concern is voiced whether young families, as first-time entrants into the housing market, can afford this housing. Prospects for multi-family construction appear very good in view of relatively low recent production rates and the resulting record low vacancy rates in this sector of the market. But the possibility of reinforced rent controls makes builders timid. Very strong mortgage commitment and mortgage origination activity, together with critical increases in usury ceilings in some states (including New Jersey), are a positive sign. But mortgage interest rates have passed well into double-digit levels, and thrift institutions, the major lenders in the market, are facing the double wedge of a high cost of funds and a low flow of funds.

With such a cross-current of developments, it is useful to review in a longer term perspective the status of housing markets in New Jersey and the prospects for the future. Section I provides a historical review to New Jersey housing market activity. Relative to U.S. national trends and cycles, housing activity in New Jersey has been slowing since the mid-1960s, and has been dramatically slowing in many areas since the early 1970s. Demographic factors such as population, migration, and household formations are the key variables for explaining this down trend in New Jersey housing activity.

Section II concerns the prospects for housing construction in New Jersey during the 1980s. The overlook is quite positive, though this is based on the key assumption that net migration in New Jersey will again reflect at least a zero net outflow and more likely some positive net inflows. The recent change in the State's usury law on mortgage interest rates also provides grounds for optimism. Nationwide, the prospects for housing appear exceptionally bright, with the post-war baby boom generation providing the key stimulus to demand. Thus, if New Jersey succeeds only in stopping its down trend relative to the U.S., and thereby moves in tandem with national developments, New Jersey housing will be very good indeed.

I. A Historical Perspective

Table VII. 1 shows on an annual basis the number of building permits issued in New Jersey between 1960 and 1978. Building permit activity levels are not a perfect indicator of housing activity since not all permits result in housing starts, and not all housing starts result in completed units. Also, permits in one year may result in completed units in a later year; this problem is most prominent for multi-family

* Prepared by Dr. Dwight M. Jaffee, member, Economic Policy Council.

TABLE VII. 1

NEW JERSEY BUILDING PERMITS
Thousands of Units

		PRIVATE		PUBLIC
	Total	Single Family	Multi Family	
1960	43.145	29.910	9.939	3.296
1961	46.376	29.039	16.950	0.888
1962	45.411	28.246	16.703	0.462
1963	54.281	27.681	25.919	0.681
1964	68.660	27.287	40.173	1.200
1965	63.408	30.416	31.308	1.684
1966	49.742	23.929	23.467	2.346
1967	46.344	24.252	19.998	2.094
1968	42.323	24.083	17.414	0.826
1969	38.599	21.652	16.145	0.802
1970	39.596	19.635	19.961	0.000
1971	57.949	28.692	28.194	1.063
1972	65.261	30.836	33.446	0.979
1973	52.290	28.352	23.420	0.518
1974	25.917	15.730	10.187	0.000
1975	23.440	16.004	7.222	0.214
1976	30.750	20.699	10.051	0.000
1977	34.665	23.541	11.124	0.000
1978	34.184	25.537	8.647	0.000

SOURCE: U.S. Bureau of the Census.

units with long construction periods. Still, the relatively poor performance in recent years is clearly apparent. In particular, between 1974 and 1978, each of the series is below the historical average, with the minor exception of single-family permits in 1978:

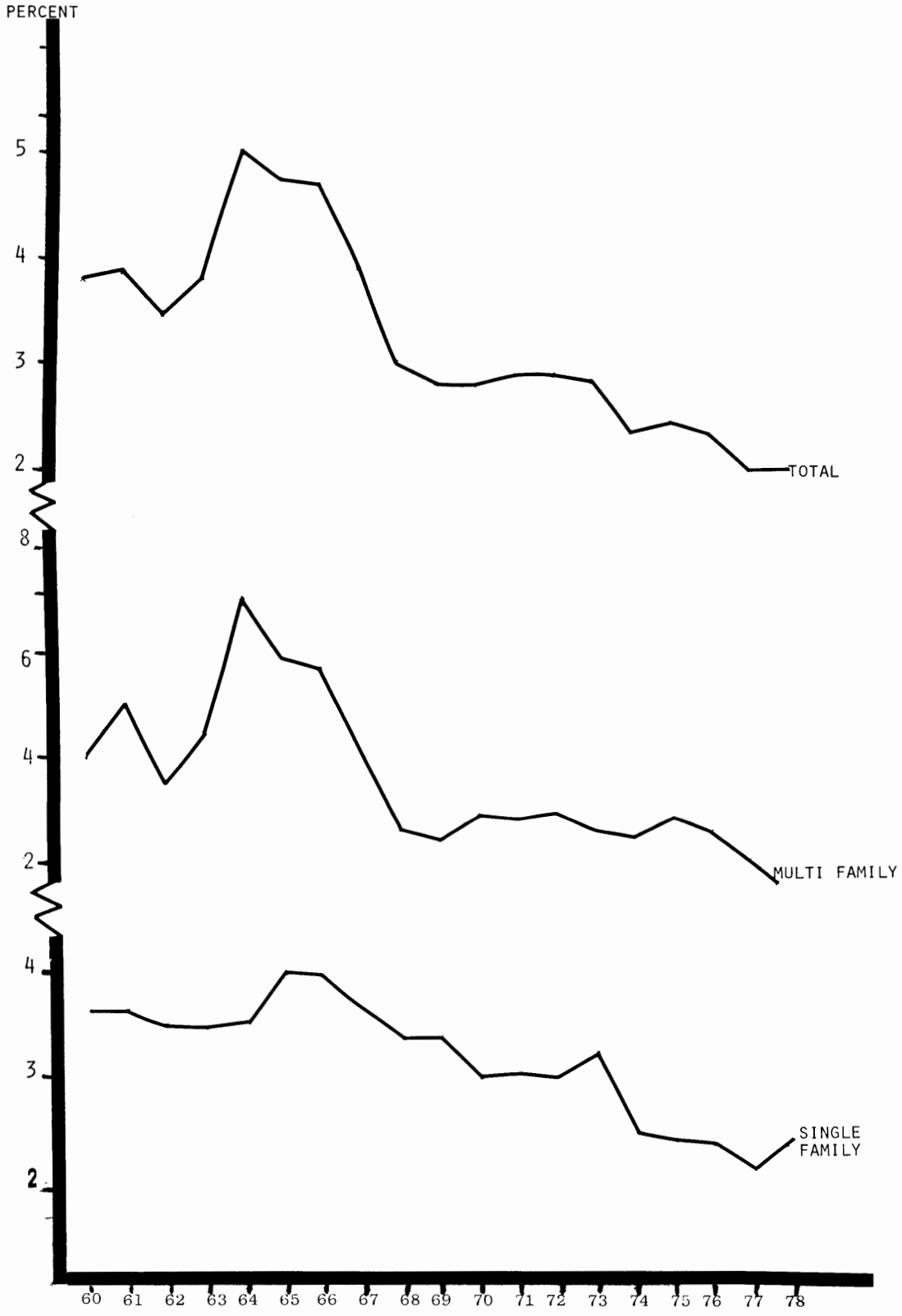
Looking at the components of the total, single-family permits have declined less than other components between 1974 and 1978. The worst year was 1974 with single-family permits about 60% of the average, but by 1978 single-family permits slightly exceeded the historical average. For multi-family permits, 1975 was the worst year, with little better than 33% of the average multi-family permit level, and 1976 to 1978 show little sign of improvement. Publicly-originated permits have never been a significant factor in the New Jersey housing market, with public permits exceeding 3% of private permits only in 1960, 1966, and 1967, and public permits have become essentially zero in recent years.

Figure VII. 1 compares the permits performance of New Jersey for the total and structure-type components to the U.S. as a whole. Here the more extended period of weak housing activity in New Jersey is apparent. With only very minor reversals, housing activity in New Jersey has declined in each category since the mid-1960s. Thus, although New Jersey housing activity was numerically quite strong between 1971 and 1973, even then the State was declining relative to the nation, and this has continued through the present. Overall, New Jersey's share of total national housing construction has fallen roughly in half from the early 1960s.

State demographic trends provide the key explanation for this relatively poor housing performance. Table VII. 2 shows a number of measures relating to State population trends over the period 1960 to 1978. Column 1 shows the total resident population of the State. State population growth essentially ceased in 1972, with the 1978

FIGURE VII.1

BUILDING PERMITS: NEW JERSEY AS A PERCENTAGE OF THE NATION



total population actually below the comparable 1972 value. Column 2 shows the State population as a percentage of the national population. The peak here occurs in 1971 with a distinct down trend since then. Column 3 shows the annual percentage change in the New Jersey population. The annual growth rate averaged in excess of 2% during 1960 to 1965. A very distinct slowing in growth then started in 1966 and continues to the present with the very negative growth of the last six years clearly evident. Column 4 shows the ratio of New Jersey population age 25 to 34 to the national population of the same age group. This age group is critical to household formation and home-buying activity. The ratio peaked in the mid-1960s, and has declined significantly since then. Finally, Column 5 shows the ratio of births in New Jersey to births in the nation. This series also peaks in the mid-1960s, and has fallen quite steadily since then.

The slow growth of, and even declining, population levels in New Jersey are the result of the declining relative birth rate in the State and the net out-migration of people. Mortality experience in principle could also be a factor, but in fact New Jersey mortality rates have closely followed national trends. Relatively low birth rates, as already noted, have been a factor since the mid-1960s. The net out-migration of people is a more recent development, starting in 1972-1973. Prior to that, the State had positive net migration, indeed enough to create a rising relative population level even in the presence of declining relative birth rates. The net out-migration of people in New Jersey is part of a trend common with neighboring Northeastern states. In fact, prior to the early 1970s, New Jersey stood out as unique among these states in maintaining a strong state income growth and a net in-migration of people. Much slower relative income growth and net

TABLE VII. 2

NEW JERSEY STATE POPULATION TRENDS

	New Jersey Population July 1 (000)	New Jersey / United States	Percentage Change to Previous Years	NJ Age 25-34 / US Age 25-34	NJ Births / US Births
1960	6103	3.391%	NA	3.493%	3.109%
1961	6265	3.424	2.654%	3.485	3.172
1962	6377	3.433	1.788	3.509	3.161
1963	6533	3.466	2.446	3.550	3.239
1964	6662	3.485	1.975	3.559	3.151
1965	6769	3.498	1.606	3.552	3.202
1966	6854	3.505	1.256	3.554	3.219
1967	6931	3.510	1.123	3.542	3.205
1968	7009	3.515	1.111	3.536	3.167
1969	7098	3.525	1.284	3.495	3.191
1970	7193	3.529	1.338	3.481	3.129
1971	7290	3.535	1.349	3.485	3.086
1972	7333	3.522	0.590	3.462	2.994
1973	7331	3.493	−0.027	3.405	2.962
1974	7329	3.467	−0.027	3.352	2.884
1975	7336	3.443	0.096	3.313	2.922
1976	7339	3.419	0.041	3.276	2.866
1977	7338	3.391	−0.014	3.236	2.744
1978	7327	3.360	−0.150	3.194	2.697

SOURCE: U.S. Bureau of the Census.

out-migration of people then occur at about the same time. It is tempting to explain the recent New Jersey out-migration partly on the basis of "life-style" effects common to the Northeast, and partly on the basis of state-specific income growth.[1]

Although underlying population trends are important for understanding housing activity, the more direct link is between households and household formations and housing activity. Following Bureau of the Census definitions, a "household" is essentially a group of people living in a common "housing unit." Thus, households and occupied housing units are essentially the same thing. Households and population can be linked by what is called the "headship rate;" that is, the ratio of households to the corresponding population group. Households and headships rates can be distinguished between "families" and "individual" households, depending on whether the people occupying the housing unit are related or not. Since family households have had a high propensity to live in single-family units and individual households have had a high propensity to live in multi-family units, the trends of family versus individual household formations are important to the *type* of structures that are constructed.

The data shown in Table VII. 3 illustrate these points. The ratio in New Jersey of total permits issued to the annual change in population is shown in column 1. The ratio is relatively stable through 1970 with values near to .5, indicating that one new permit is issued for each population increment of two people. Since 1972, however, the ratio is erratic since population growth is negative or only slightly positive, while permit levels remain distinctly positive, though declining.

TABLE VII. 3

NEW JERSEY POPULATION, PERMITS AND HOUSEHOLDS

Year	Total Permits / △ Population	Total Permits / △ Households	Households / Population	Private Single Family Permits / Total Private Permits	Husband-Wife Households / Total Households
	(1)	(2)	(3)	(4)	(5)
1960	NA	NA	0.296	0.751	0.764
1961	0.289	1.171	0.294	0.631	0.758
1962	0.405	1.217	0.285	0.628	0.758
1963	0.348	1.967	0.292	0.516	0.759
1964	0.532	1.631	0.293	0.404	0.756
1965	0.593	1.263	0.296	0.493	0.746
1966	0.585	1.413	0.297	0.505	0.744
1967	0.602	1.296	0.299	0.548	0.742
1968	0.550	0.830	0.303	0.580	0.737
1969	0.429	0.632	0.308	0.573	0.725
1970	0.417	0.822	0.310	0.496	0.719
1971	0.597	1.120	0.313	0.504	0.707
1972	1.518	1.230	0.319	0.480	0.704
1973	−26.145	1.415	0.324	0.548	0.696
1974	−12.959	2.371	0.326	0.607	0.688
1975	3.349	0.780	0.329	0.689	0.678
1976	10.250	0.733	0.335	0.673	0.668
1977	−34.665	1.507	0.338	0.679	0.660
1978	−3.108	0.935	0.344	0.747	0.658

SOURCE: U.S. Bureau of the Census.

[1] I expect to carry out a more formal and complete study of such explanations for inter-state migration soon.

The ratio of total permits issued in New Jersey to the annual change in the number of households (i.e., household formations), is shown in column 2. The ratio averages about 1.25 over the period 1960 to 1978 implying 1.25 permits are issued on the average for each net household formation. The ratio is greater than unity because housing is constructed both to shelter new households and to replace deteriorating and removed units. An increase in the number of vacant units will also cause this ratio to rise above unity. Although the permit/household formation ratio is more stable than the permit/population change ratio, the former also fluctuates year to year, reflecting years of over and under building. Since 1974, there are signs of a declining ratio, although to some extent this may be offsetting the very high ratios in 1973 and 1974. The declining ratio is also consistent with the declining and very low vacancy rates that are currently observed.

Column 3 shows the ratio of total households to total population, that is, the headship rate, for the State. The ratio is relatively stable through 1965, but then rises steadily through to the current time. The same trend is evident in the corresponding national data. This rising trend in headship rates is an important part of the explanation for why New Jersey housing construction has held up at all in recent years, given that the State population is actually declining.

Column 4 shows the ratio of permits issued for private single-family units relative to total private permits in New Jersey. This ratio is somewhat erratic, but a distinct decline is evident in the early 1960s, and a clearly seen rise is evident in the last seven years. A possible explanation for these changes in the structure mix of housing construction is the corresponding change in the type of households being formed. Column 5 shows the ratio of "husband-wife" households to total households in New Jersey. It might be expected that this ratio would correlate with the ratio of single-family permits to total permits. In fact, however, the husband-wife household ratio has declined steadily throughout the period, whereas the single-family ratio has not, and, as just indicated, indeed the latter has been rising since 1972. It appears that the rising relative demand for single-family housing in recent years is the result of non-family households shifting to single-family units; because of rising income levels, the desire for single-family units for investment purposes, and the effect of high divorce rates that create two households, both of which may opt for single-family units.

This historical experience is summarized in Table VII. 4 in which the total number of permits are divided into three "source" groups: population change, headship rate change, and production for removed units and vacant units. Column 1 shows the population change during the period multiplied by the headship rate at the beginning of the period. The result is the number of households (or equivalently, housing demand) due to population change given the then current headship rate. The second column shows the number of households (or housing demand) due to changes in the headship rate over the period. For example, during the period 1960 to 1965 the headship rate was essentially constant, and thus population change accounted for the total of 197,000 household formations that occurred during this period. In later periods, as already indicated, the headship rate rises, and thus a significant number of household formations are due to this factor. The sum of the first two columns equals total household formations during each period.

Column 3 shows the demand for housing permits that is due to replacement of removed units and to net changes in the number of vacant units. The fourth column is the total number of permits issued during each period. The third column is calculated as a residual, by subtracting the sum of the first two columns from the fourth column. The erratic movements in the third column are also the result of this residual statistical technique, but partly indicate that removal replacements and changes in the number of vacant units in fact show erratic changes over time.

Overall, population change and headship rate change have accounted about equally for over

TABLE VII. 4

NEW JERSEY TOTAL PERMITS BY "SOURCE"

(Thousands of Permits – Years dated July 1)

Period	PERMITS DUE TO: Population Change (1)	Headship Rate Change (2)	Removal Replacement and △ Net Vacants (3)	Total* Permits (4)
1960-65	197	0	61	258
1965-70	125	106	9	240
1970-75	44	139	58	241
1975-78	–3	105	–13	89
1960-78	363	350	115	828
% of Total ..	44%	42%	14%	100%

* Total permits are calculated on a one-year lagged basis; for example, the 1960-1965 total is the sum of the annual totals for the five years 1960 to 1964. Since there is a lag between permits and housing completions, a better correspondence with household formations is achieved this way.

SOURCE: Author's calculations.

85% of total permits issued in New Jersey between 1960 and 1978. Removal replacement and the change in vacant units has accounted for less than 15%.

The availability of mortgage finance is another dimension of housing demand and supply that is important to consider. New Jersey has been and continues to be a capital surplus state in the sense that mortgage funds available within the State exceed the demand generated within the State. An indicator of this situation is that New Jersey mortgage interest rates, even when not held down artificially through usury ceilings, tend to be below the corresponding national average. Thus, relative to the nation the availability of housing finance should not be a problem in New Jersey.

Unfortunately, the imposition of severe usury ceilings on mortgage rate levels in New Jersey has created a housing finance problem where there would be none otherwise. Data shown in Table VII. 5 illustrate the problem. Prior to 1973, the usury ceiling in New Jersey was maintained at or more generally below the corresponding national mortgage interest rate. In some years, in fact, the New Jersey usury ceiling was more than 50 basis points below the national average. The situation improved between 1974 and 1976, with the usury ceiling exceeding the national average; and the effective rate in the

TABLE VII. 5

NEW JERSEY AND NATIONAL EFFECTIVE MORTGAGE RATES, ALL LENDERS

	N.J. Effective Rate	N.J. Usury Ceiling	U.S. Effective Rate
1965	NA	6.000	5.940
1966	NA	6.000	6.349
1967	NA	6.000	6.527
1968	NA	6.750	7.020
1969	NA	7.500	7.843
1970	NA	7.850	8.512
1971	NA	7.638	7.788
1972	NA	7.500	7.630
1973	7.603	7.725	7.964
1974	8.675	9.120	8.918
1975	9.021	9.270	9.047
1976	8.929	9.240	9.040
1977	8.644	9.000	9.041
1978	8.959	9.250	9.576
1979[1] ...	9.570	9.500	10.240

SOURCE: Federal Home Loan Bank Board.

[1] First quarter of 1979 only.

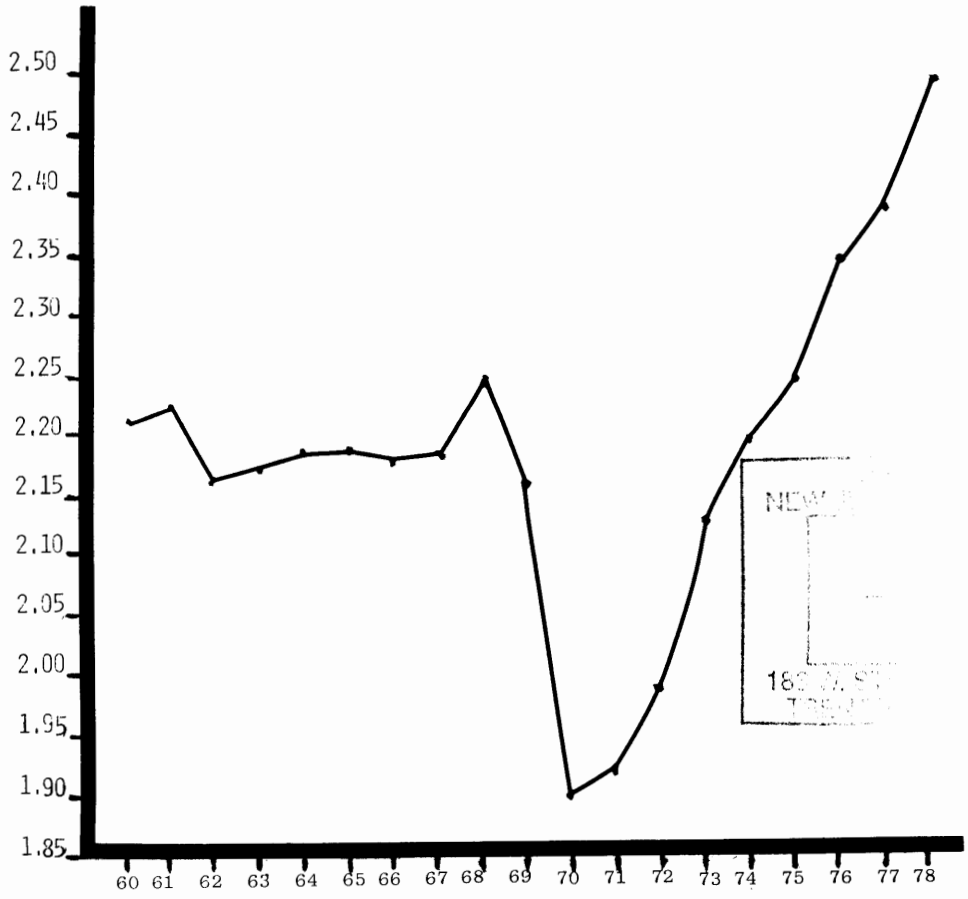
State was determined at levels below both the ceiling and the national average. During 1978 and the first quarter of 1979, however, the situation again deteriorated with the ceiling falling progressively below national interest rates, over 25 basis points in 1978 and near to 75 basis points during the first quarter of 1979.

The outcome of restrictive usury ceilings is that state lenders either originate mortgages out of state or do not originate mortgages at all. In these periods, then, housing construction declines sharply, and would-be demanders cannot obtain the financing necessary to make their demand effective. As discussed below, the situation has improved recently with new usury ceiling legislation.

The ability of young, new households to afford housing is one other important aspect of housing demand. Affordability tends not to be an issue for older, established households, since they typically already own a house, and with accumulated capital gains, they have little difficulty moving to more expensive dwellings if they so desire. Figure VII. 2 shows the median price of new homes relative to average personal income per household in the United States. It can be seen that the price/income ratio declined in the U.S. between 1960 and the early 1970s. Since 1970, however, the ratio has been rising, and in recent years quite fast, so that the price/income ratio is now at its highest point since 1960. The available evidence for New Jersey suggests a very similar trend. Taken together with mort-

FIGURE VII.2

MEDIAN PRICE OF NEW HOMES RELATIVE TO PERSONAL INCOME PER HOUSEHOLD FOR THE UNITED STATES



gage interest rates at, or fast approaching, double-digit levels; affordability is considered a serious issue by many.

The fast appreciation in housing prices in recent years, however, also has had a positive implication for housing demand. With house price inflation exceeding the general inflation of the Consumer Price Index, housing is now considered an excellent investment, over and above the obvious value of its shelter services. Indeed, it appears that these two aspects of house-price inflation—the negative aspect of affordability and the positive aspect of anticipated appreciation—have tended to offset, leaving no significant net impact. Thus, the affordability concern has probably been overstated as a factor reducing aggregate demand for housing, although it clearly remains a serious issue for some young, newly formed, households. Even then, however, many of these households have found solutions in terms of two-earner households and by taking advantage of newly offered "graduated payment" mortgages.

II. Future Prospects

The approach used here to evaluate the New Jersey housing future prospects is a two-step procedure. First, the demographic factors are calculated using the same methodology applied to the historical data in Table VII. 4. Second, other factors, such as financial market conditions, and house prices are evaluated. Both steps necessarily involve a significant degree of uncertainty and difficulty. The calculation of demographic forces are uncertain because interstate migration, headship rates, and the net change in removed units and vacant units have varied significantly in the past and thus might well change in the future. Consequently, three cases are separated—expected, optimistic, and pessimistic—for these demographic calculations. The evaluation of the non-demographic factors is difficult because econometric techniques are necessary to estimate formally the relationship between these factors and the housing market activity. Other similar studies have found that these factors can significantly affect the timing of housing activity—and thus year to year variations—but they have a relatively modest impact on the long-run accumulated level of housing activity so long as the factors remain within standard bounds.

Demographic Calculations

Table VII. 6 shows the results of the calculations carried out to provide estimates of New Jersey housing activity between 1979 and 1990. The first column shows the effect of the natural

TABLE VII. 6

NEW JERSEY PROJECTIONS 1979 TO 1990

TOTAL PERMITS BY SOURCE

(thousands)

	PERMITS DUE TO:					
Projection	Population Change (1)	Headship Rate Change (2)	Net Migration (3)	Removal Replacement and △ Net Vacants (4)	Total (5)	Annual Average (6)
Optimistic . . .	343	366	+83	195	987	90
Expected	343	183	0	130	656	60
Pessimistic . . .	343	0	−83	65	325	30

SOURCE: Author's calculations.

increase in the New Jersey population. The underlying number is the Bureau of the Census projection that natural change factors alone will cause the New Jersey population to grow from 7,327 thousand in 1978 to 8,326 thousand in 1990. Since the headship rate in New Jersey in 1978 is .34, with the headship rate assumed constant, the population change of essentially 1 million translates into new housing demand of 343,000 units. This number is assumed the same for all three cases.

The second column shows the component of housing demand that can be attributed to changes in the headship rate. The historical data have been presented above in Table VII. 3. The most pessimistic case, is that headship rates will remain constant at the current level; in this case no additional demand results from this factor, as shown in the pessimistic case for Column 2. For the optimistic case, the assumption is made that the headship rate will rise by 5 percentage points over the future period, essentially duplicating the historical results. This is optimistic, in that the historical period was characterized by dramatic sociological and economic changes in the American household, and it is unlikely that future changes will equal, let alone exceed, these trends. For the expected case, an increase in the headship rate of 2.5 percentage points is used, indicating continued growth, but at declining rates over the period. The range of additional demand due to headship rate changes is thus between zero for the pessimistic case and 366,000 for the optimistic case.

The third column shows the component of housing demand that can be attributed to net migration of people to or from New Jersey. As already indicated, net migration patterns for New Jersey were distinctly positive prior to the mid-1970s, but have turned significantly negative in recent years. The situation in New Jersey is likely to improve in coming years, both as a result of improving economic and environmental conditions in New Jersey, and as a result of relatively deteriorating conditions in the South and West where most of the migrants have gone in recent years. The pessimistic case extrapolates current trends, with net out-migration of 22,000 a year or −242,000 net migration over the full period. The expected case is set at a zero net migration level. The optimistic case assumes a net in-migration of 22,000 per year, or +242,000 over the full period. Although the optimistic assumption may appear very high relative to recent experience, it remains less than half the rate experienced over the period between 1960 and the early 1970s; also some of the people that recently left may decide to return. For all cases, these numbers are translated in housing unit demand by multiplying by the 1978 headship rate.

Column 4 shows the projections for production necessary to replace removed units and for the net change in vacant units. As shown in Table VII. 5, the historical experience with this component has been highly varied, while on average about 14% of permits issued were attributed to this category. Were the 115,000 of such units for the 18 year period 1960 to 1978 prorated to the 11 year period 1979 to 1990, the result would be a total of 70,000 units here. On other measures, however, this figure appears quite low. The total stock of residential housing in New Jersey currently is on the order of 2,600 thousand units. Were 1/2 of 1% of this stock to be removed and replaced annually, the total required production would be 140,000 units. In addition, vacancy rates are now at their lowest levels of the last twenty years. It certainly would not be surprising to find that production equal to 2% of the stock, or about an additional 50,000 units, will occur to bring the inventory back to more normal rates. Extending the extreme slightly to obtain a symmetrical distribution, demand for replacement and for the net change in vacant units has been set at 65,000, 130,000, and 195,000 for the three cases as shown in Table VII. 6.

Summing the components of demand, total projected housing activity between 1979 and 1990 is 987,000 for the optimistic case, 656,000 for the expected case, and 325,000 for the pessi-

mistic case. The corresponding annual average production levels are 90,000, 60,000, and 30,000 respectively. Both the range of the estimates and their levels are impressive. The wide range between the upper and lower projections make clear that considerable uncertainty exists in projecting housing production on a state basis over an extended period. The level of the projections is highly encouraging for residential construction activity in New Jersey. The pessimistic prediction of 30,000 units annually is, in fact, the average of actual production over the last five years, and is only slightly below the activity levels of 1977 and 1978. In this sense, the worst that is projected for the future is a continuation of where we are now. This is perhaps not surprising, however, since current activity levels are very depressed on an historical basis. But apparently things are not likely to get worse.

The expected case of the projection results in 60,000 units annually, a value well above the average activity of the last eighteen years, and only slightly below in activity in the peak years of 1964, 1965, and 1972. These numbers, while seemingly very high, are actually in line with comparable forecasts on the national level, which anticipate boom conditions in housing markets over the coming decade. The expected case projections then amount to New Jersey returning to its normal share of national production in a setting of high national activity.

The optimistic case, with 90,000 units annually, however is truly optimistic, with average production projected to exceed by a wide margin any observed historical level. The critical factor in understanding how such high levels can be projected is that housing activity is determined in important part by the rate of change of demographic factors such as population and households. Relatively small percentage changes in the level of population and households correspond to very large absolute change values, and this is reflected in the projected values. The problem with anticipating that 90,000 units will be produced in New Jersey annually is not on the demographic or demand side, but on whether other factors act as supply side restrictions. We now turn to these factors.

The Influence of Other Factors

The two primary factors that may act to restrain housing demand are the availability of housing finance and the affordability of homes if housing prices continued to inflate without comparable growth in income levels. However, neither factor is likely to become a significant constraint for either the pessimistic or expected case of Table VII. 6 but these factors, especially house prices, may become an issue in the optimistic case.

Considering housing finance, it has been noted already that New Jersey is a capital surplus state, with currently a significant proportion of mortgage funds used for originations out of state. In the absence of usury ceilings, these funds would be directed to satisfy state demand. Under the expected case, mortgage demand will be at levels comparable to previous peaks. Conditions in the mortgage market are likely to tighten, even with State mortgage rates perhaps rising somewhat relative to national levels and with loan to value ratios declining. But in the absence of constraining usury ceilings, it would appear housing finance will satisfy this demand as it has at previous peaks. The optimistic case, on the other hand, is likely to generate mortgage demands that exceed the supply from normal channels of housing finance. Additional supply must then be achieved by placing mortgages with out of state holders, thus reversing the pattern evident in recent years. The key problem then is that mortgage interest rates within the state are likely to rise significantly relative to the national average, no doubt moving the state from below average to above average. Obviously usury ceiling constraints would have to be absent in this situation. In turn, some reduction in demand would be likely to occur.

The variation in housing prices across the three projections depends on how easily resources can be returned to the construction industry and on the degree to which consumers

will postpone their demand as these resources are mobilized. Under the pessimistic scenario, demand will be weak in New Jersey relative to national levels, with the likely outcome that housing price increases will be moderate. Indeed, inter-state migration patterns are expected to become increasingly sensitive to relative house prices, suggesting additional in-migration were the pessimistic case to unfold. In this sense, the demographic projections for the pessimistic case are likely to be too low.

House prices in New Jersey under the expected case are likely to rise very much in line with national averages, particularly since New Jersey housing production would be similarly in line with national activity. Temporary and local area shortages may then appear, much as has been evident in recent boom markets such as California. Indeed, nationally such conditions are likely to become more common, and thus New Jersey would not be unusual. Over the full period, some structural change in mortgage lending supply may be required, but such change is already anticipated by the industry, and New Jersey will be in the mainstream, not an exception.

Were the optimistic scenario to unfold, with high rates of net in-migration, household formation, and replacement demand, serious shortages and a speculative boom in house prices become more likely. Public policy would then become concerned with the resulting social and economic dislocations, and it is likely some portion of the demand would be unsatisfied. Successful policy would attempt to moderate speculative bubbles, and to postpone some of the demand into the 1990s, a period otherwise likely to be featured by more moderate housing demand.

III. Concluding Comments

Overall, the outlook for housing activity in New Jersey during the next decade is highly encouraging. The range of projections run from a pessimistic case with activity at roughly current levels to an optimistic case with major boom conditions. Reaction to these outcomes are colored, of course, by the fact that New Jersey housing activity has been declining relative to national production since the mid-1960s and has declined more sharply and directly in numerical production since the early 1970s. Thus the expected projection is actually a return to more normal conditions, in line with the encouraging outlook nationally for housing markets.

This study has not considered the short-run timing of housing activity, for example in terms of expected 1979 and 1980 activity. The expectation is that New Jersey will remain subject to swings generated on the national level and through capital market conditions, but probably with some upside bias. Thus, with declines of perhaps 25% in 1979 and 15% in 1980 forecasted on the national level, New Jersey is also likely to decline but by a smaller percentage. Data for early 1979 in New Jersey are actually more encouraging, showing very high levels of activity compared both to national results and to New Jersey results in 1977 and 1978; but these data are difficult to interpret because of varying weather conditions.

VIII

INTERINDUSTRY RELATIONSHIPS IN NEW JERSEY*

Introduction

Over past years considerable attention has been given by the Economic Policy Council to identifying those factors which underlie the performance of the New Jersey economy. This has been particularly true about the manufacturing sector. Among the factors studied have been unit labor costs; rates of capital investment; energy, transportation and tax costs; research and development expenditures and technology growth; and regulatory impacts (e.g., environmental control requirements). The objective of this chapter is to demonstrate that understanding of State economic activities may be furthered through utilization of input-output techniques. Consequently, policy actions chosen to direct development toward the State's economic objectives may be better evaluated and targeted.

The chapter is divided into two sections. Section I briefly describes input-output modeling and discusses its potential roles in formulation of State economic policy. Section II is a case study based upon one portion of an estimated input-output table for New Jersey. The case study examines the relationship between interindustry linkages and industry performance in New Jersey.

I. Input-Output and Its Policy Applications

A. Interindustry Linkages

To understand any complex system we need to be able to analyze the components of the system, how they act, how inputs are related to outputs, how the system as a whole performs, and, finally, how the development of a quantitative model of performance will help us understand the system.

The ideal method to establish New Jersey economic linkages is through a New Jersey input-output (I-O) table. A New Jersey I-O table will show the transactions (purchases and sales) of New Jersey industries with each other, with industries outside the state and with a final-demand sector (e.g., personal consumption, capital formation, inventory changes, government purchases, imports and exports). These transactions are displayed as the distribution of outputs (sales) and inputs (purchases) between each sector of the economy and all the remaining sectors. For example, an I-O table might show that to produce one dollar of output in the printing and publishing industry requires the purchase of $.20 of inputs from the paper industry, $.03 from the wholesale industry, $.02 from the trucking industry, and so forth. It will also show what other sectors are purchasing

* Prepared by Andrew Findeisen, Governor's Office of Policy and Planning and John Stapleford, Office of Economic Policy, State of New Jersey.

inputs from the paper industry. Similar information will be available for every sector of the State economy. With such information, the direct impact on the State economy from an increase or decrease in demand can be estimated and can be traced back to every sector of the economy. The interaction or 'transactions' table is determined for one point in time and future users of the model must assume fixed proportions in the production process for each industry. Drastic changes in the technology of production can make the I-O table less accurate. Accordingly, in five to seven year intervals the gathering of basic production information must be repeated.

B. Policy Applications

From the discussion above we have seen that a complete New Jersey I-O table will provide empirical information on the strength of the linkages among sectors of the State's economy and it can be manipulated to provide multipliers showing the impact on sales, personal income, employment and government revenues stemming from any change in economic activity. Like any theory or model the I-O table has many limitations, nevertheless, it is currently the best available tool for understanding the myriad of detailed interrelationships among the parts of an economy at any point in time. The information obtainable from an I-O table has a variety of practical applications, many of which are in the area of state economic policy. To date, the most common applications of I-O information by state governments are for performing impact analyses, assisting in state economic development and forecasting employment, personal income and tax revenues.

Federal and state agencies have a rapidly growing interest in the regional impacts of policies, programs and projects. Examples where impact analyses are required or sought by a state include: the siting or closing of power plants, oil refineries, military establishments and prisons; proposed changes in federal government spending in the state; the construction of a highway or shutdown of railroad trunk lines; the introduction of a new plant or major activity (such as gambling); and the implementation of new federal or state regulations (e.g., pollution standards).

I-O table reduces the time and effort needed to perform impact anayises in these and other cases, and I-O is the only available technique which disaggregates impacts by industry. For example, a cutback in defense spending in New Jersey could be traced from the prime contractor to the subcontractors and firms supplying, both, to the changes in personal income, consumption and private investment, and finally to the flow of state tax revenues. Or, if new regulations on the drug industry were submitted to Congress, the expected impact on the New Jersey drug industry employment could be calculated and the impacts on important intermediate drug industry suppliers such as paper, glass, petroleum, wholesale and trucking could be determined as well. Not only would this information be rapidly available to the State's congressional delegation, but representatives for the various secondary industries would be more completely aware of their stake in the performance of the New Jersey drug industry.

Similar applications of I-O data can be very useful in guiding state economic development efforts. For instance, the employment potentially available to the state through the opening of a major steel plant or other primary metal facility could be traced. With the deterioration of the quality of North American ore and the increasing water based import of foreign ore, New Jersey is actually in a position to bid for such a facility. The extent of the financial commitment the State may be willing to make could be balanced against the likely employment gains in primary metals and strongly related purchasing industries such as transportation equipment, fabricated metals and machinery. State economic development priorities might then be set by ranking industries according to the total employment or personal income they would generate per dollar of state-local government subsidy with the size of the government subsidy adjusted for the expected tax revenue gains.

In addition, out-of-state industries which currently supply New Jersey industries can be identified for development within the State, thereby internalizing more of the indirect effects from exchanges of intermediate goods and services in New Jersey. Facts documenting potential markets could be passed to firms or investors through a state market information service. In Georgia, for example, the release of a report documenting large volumes of tin can imports by the State's active food processing industry was rapidly followed by the establishment of Georgia plants by Crown Cork and Seal and by American Can.[1] In New Jersey from an estimated interindustry table (see Section II) we found that overall the lumber, furniture, transportation equipment and hotel-lodging industries were not of sufficient size to satisfy even State interindustry demands. Better and more detailed I-O data could allow specific firms to be contacted about opportunities for expansion into New Jersey.

Forecasting is, at best, an inexact science, yet the maintenance of stability in fiscal management requires New Jersey to achieve a modicum of forecasting accuracy. Currently, most economic forecasts for the State are based upon national forecasts and assumptions concerning relationships between the State's industries and their national counterparts. An I-O table can improve the quality of the State's economic forecasts by correcting for the impacts of interactions among New Jersey's industries and of multiple rounds of intra-state consumption and investment. In particular, forecasts will be improved for industries which supply local markets (e.g., miscellaneous professional services) and supply more nationally oriented New Jersey industries. Better forecasts of employment and income will help to maintain planned state expenditures within the bounds of probable tax revenues and will allow economic policy efforts to be directed toward dampening the potential fiscal cycle.

The construction of a New Jersey I-O table from survey data would take considerable effort and time. In order to give a specific demonstration of the utility of I-O analysis, we have constructed the interindustry portion of a state I-O table from national data. While the assumptions involved in the construction of such a table introduce an unknown degree of error in the numerical estimates, the relationships are more representative of New Jersey than the national input-output relationships would be. Despite the table's limitations, the analysis of the table in Section II provides a strong case for the development of a survey-based New Jersey I-O table.

II. A Case Study—Estimates of Interindustry Linkages in New Jersey

A. Spatial Proximity of Interindustry Sales

Demand for state products does not come solely from external markets. Many state industries producing final goods and services sell to local consumers. Spatially these industries are tied to state consumer markets. Moreover, industries making final products usually have backward linkages to other industries for the intermediate goods and services essential to final production. The drug industry, for example, must purchase containers from the glass or plastic industries. Although a strong flow of goods and services among a subset of industries is sufficient, it is not a necessary condition of spatial proximity among those industries. For instance, engine blocks and other parts needed by New Jersey's automobile assembly plants are shipped in from all over the northeast and midwest.

Table VIII. 1 below compares mean distances shipped for manufacturing products in New Jersey and the nation. Overall, New Jersey manufacturing products are shipped little more than half the distance of manufacturing products in the nation. This is the result of the dense spatial concentration of industries and consumers in the mid Atlantic region.

New Jersey industries with average shipment distances higher than the national average, such as chemicals (131% higher), miscellaneous man-

[1] William A. Schaffer, *On the Use of Input-Output Models for Regional Planning*, Martinus-Nijhoff, Netherlands, 1976, p. 80.

TABLE VIII. 1

MEAN DISTANCES SHIPPED FOR MANUFACTURING PRODUCTS IN NEW JERSEY AND THE UNITED STATES–1972

	Mean Distances Shipped (miles)		
	New Jersey	United States	N.J. ÷ U.S.
Food and Kindred	221	370	.60
Textile	NA	456	NA
Apparel	520	552	.94
Lumber	NA	535	NA
Furniture and Fixtures	487	522	.93
Paper	130	459	.28
Chemicals	1010	438	2.31
Petroleum	114	542	.21
Rubber and Plastics	554	531	1.04
Stone, Clay, Glass	165	198	.83
Primary Metals	345	322	1.07
Fabricated Metals	240	419	.57
Machinery, Except Electric	717	609	1.18
Electrical Machinery	515	603	.85
Transportation Equipment	NA	753	NA
Instruments	573	741	.77
Misc. Manufacturing	785	661	1.19
Manufacturing Average	235	430	.55

SOURCE: U.S. Department of Commerce, Bureau of the Census, *1972 Census of Transportation.*

ufacturing (19% higher) and non-electrical machinery (18% higher), would be more export oriented and less sensitive to changes in State and regional economic conditions. Industries with lower than the national average distances shipped such as petroleum (79% lower), paper (72% lower), fabricated metals (43% lower) and food (40% lower) would be more sensitive to changes within the state or the region in the demand for their products. For example, employment in the New Jersey paper industry, with a mean product shipment distance of 130 miles, would be expected to fluctuate with changes in consumers' demand for paper and for the output of paper purchasing industries in New Jersey and the region.

To understand or anticipate the performance of a New Jersey industry we must supplement knowledge of the spatial distribution of the industry's market with information on the industry's major consumers. I-O researchers separate market demand for an industry's products into two components: final demand and interindustry (intermediate) demand. While the exact distribution of sales between final demand and interindustry demand is not available for New Jersey industries, estimates can be made by adjusting the 1972 U.S. input-output transaction table (expressed in dollars) for the New Jersey industry mix (Table VIII. 2). Interindustry sales run from 95.5% of total demand for primary metal industry output to 12.1% of total demand for furniture industry output. Overlooking transportation costs, the industry mix in New Jersey or any state can be expected to have an impact upon demand and thus the levels of production within certain industries. A decrease in final demand among key industries purchasing intermediate goods will ripple back through intermediate supplying industries. Moreover, a decline in key supplying industries may affect costs and economic performance in purchasing (final demand) industries. To the extent that spatial proximity exists among linked industries the State will capture a greater

TABLE VIII.2

INTERINDUSTRY DEMAND AS A PERCENT OF TOTAL DEMAND FOR SELECTED INDUSTRIES IN NEW JERSEY—1972

Industry	% of Total Demand	Industry	% of Total Demand
Primary Metals	95.5	Chemicals	46.1
Lumber	88.5	Finance and Insurance	45.5
Stone, Clay and Glass	87.7	Real Estate	33.1
Paper	80.1	Hotels; Personal and Repair Services	27.8
Textiles	78.7	Wholesale and Retail Trade	25.7
Transportation	58.6	Transportation Equipment	20.5
Machinery, Except Electric	58.2	Furniture	12.1
Petroleum	52.9		
Printing and Publishing	49.3		

SOURCE: U.S. Dept. of Commerce. BEA, *Survey of Current Business*, February 1979, Volume 59, #2, pp. 46-51.

proportion of the intermediate output changes stemming from changes in final product demand. A major task of I-O analysis is to identify these interindustry linkages in detail so industry performance can be better understood.

B. An Example of New Jersey Input-Output Model

In the absence of a New Jersey input-output model the National Direct Requirements Table was utilized as a first approximation. The direct requirements table shows the total number of jobs required to produce a billion dollars of output by each sector of national economy and the distribution of those jobs between all sectors. The table was converted into a New Jersey matrix of potential transactions by weighting the national figures for the New Jersey industrial mix.[2] Because the conversion process was very time consuming and the resulting estimates were only approximations of the actual relationships among New Jersey industries, complete linkages were calculated for only twenty-four industries. The selected sectors are New Jersey's top and bottom twelve industries (Table VIII. 3) based upon their 1975 shares of industry employment in the nation and upon the growth of their shares between 1958 and 1975.[3] These industries have performed relatively better and relatively worse than the average New Jersey industry which had a national employment share of 3.47% in 1975 and had increased 0.13% since 1958. By focusing only upon the high and low performing state industries, we can more readily see the importance of interindustry linkages as a factor determining industry health.

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[2] (1) $GSP_j = \dfrac{W_j^{NJ}}{W_j^{US}} \cdot GNP_j \cdot \dfrac{VA_j^{NJ}/PR_j^{NJ}}{VA_j^{US}/PR_j^{US}}$

(2) $a_{ij} = GSP_j \cdot A_{ij}$

Where

GSP_j = 1975 New Jersey Gross State Product for Industry j.

W_j = 1975 wages by industry j for New Jersey and the U. S. as defined by the U.S. Department of Commerce Bureau of Economic Analysis.

GNP_j = 1975 Gross National Product for industry j as defined by the U.S. Department of Commerce Bureau of Economic Analysis.

VA_j/PR_j = Value added per dollar of payroll by industry j for New Jersey and the U.S. as listed in the U.S. *1972 Survey of Manufacturers.*[a]

a_{ij} = An estimate for New Jersey of required inputs by industry j for potential sales by industry i in terms.

A_{ij} = National average of the employment inputs required by industry j from industry i to produce a billion dollars of output.

[3] Categories were based upon the U.S. Office of Management and Budget, *1972 Standard Industrial Classification Manual.*

TABLE VIII. 3

HIGH AND LOW PERFORMANCE NEW JERSEY INDUSTRIES

HIGH PERFORMANCE*	% Share In U.S. Change In Share 1958-75	% Share In U.S. 1975 Share	LOW PERFORMANCE	% Share In U.S. Change In Share 1958-75	% Share In U.S. 1975 Share
1. Chemical and Allied Products	+1.77	11.95	1. Transportation Equipment	−1.86	1.19
2. Water Transportation	+1.75	7.27	2. Primary Metals	−1.28	2.27
3. Local and Suburban Transit	+0.74	6.08	3. Railroads	−0.76	1.73
4. Petroleum and Related	+0.58	6.08	4. Hotels, Lodging	−0.54	1.99
5. Miscellaneous Services	+1.09	4.22	5. Furniture and Fixtures	−0.24	2.17
6. Trucking	+0.58	5.34	6. Lumber and Wood	−0.31	0.61
7. Transport Services	+1.00	4.01	7. Textile	−0.88	2.71
8. Printing and Publishing	+0.67	4.14	8. Real Estate	−0.72	2.89
9. Stone, Clay, and Glass	+0.15	5.82	9. Retail Building Materials	−0.31	2.54
10. Retail Sales	+1.00	3.60	10. Credit Agencies	−0.30	2.40
11. Paper	−0.07	4.89	11. Construction	−0.37	2.82
12. Wholesale	+0.57	3.71	12. Machinery, Except Electric	−0.89	3.29

SOURCE: Data from the New Jersey Department of Labor and Industry.

* Since the focus is upon private sector performance, two public sector categories were omitted: education (ranked 3rd) and local government (ranked 12th).

The results of the conversion process are presented as a percentage distribution in order to facilitate comparisons of the proportional linkages among industries. Table VIII. 4 represents the percentage distribution of inputs for each purchasing sector while Table VIII. 5 represents the percentage distribution of outputs for each selling sector. An example of the linkage between the construction sector and the stone-clay-glass sector will explain the relationship between the two tables. In this case "construction" is a purchaser and "stone" is a seller. The value 12.83% (Table VIII. 4) means that "construction" has to purchase 12.83% of its inputs from "stone" in order to produce a billion dollars of output. The value 39.41% (Table VIII. 5) represents the same transaction taken as a percentage of total interindustry sales by the stone-clay-glass sector.[4]

The sales were not further adjusted to differentiate between inputs supplied by New Jersey and non-New Jersey firms due to the limitations of the available adjustment methodologies. Adjustment methods such as location quotients or cross-industry quotients assume a constant relationship between each supplying industry and each local purchasing industry.[5] Rather than utilize a weak assumption as a basis for further interindustry estimates, the input requirements of New Jersey industries in 1975 were taken as an estimate of potential interindustry sales given 1975 levels of output in state industries.

C. *Industry Performance and Interindustry Linkages*

It was asserted above that changes in production among key purchasing industries will ripple

[4] Copies of the complete tables showing the percentage distribution of inputs for each purchasing industry and the percentage distribution of intermediates sales from each supplying industry by 39 sectors may be obtained from the Office of Economic Policy.

[5] In this case the location quotients would simply be the New Jersey employment in industry i as a percentage of total New Jersey employment divided by a similar national percentage for industry i. A location quotient less than one would be assumed to indicate that input imports were required to support State production. The cross-industry quotient is the New Jersey proportion of the national employment of supplying industry i to that for the final producing industry j.

TABLE VIII.4

ESTIMATED PERCENTAGE DISTRIBUTION OF INPUTS (PURCHASES) FOR SELECTED NEW JERSEY INDUSTRIES

PURCHASES FROM \ SELECTED INDUSTRIES	(L) CONSTRUCTION	(L) TEXTILES	(L) LUMBER	(L) FURNITURE	(H) PAPER	(H) PRINTING & PUBLISHING	(H) CHEMICAL	(H) PETROLEUM	(H) STONE, CLAY & GLASS	(L) PRIMARY METALS	(L) MACHINERY	(L) TRANSPORTATION EQUIPMENT	(L) RAILROAD TRANSPORTATION	(H) TRUCK TRANSPORTATION	(H) WATER TRANSPORTATION	(H) WHOLESALE TRADE	(H) RETAIL TRADE	(L) CREDIT AGENCIES	(L) REAL ESTATE	(L) HOTEL & LODGING	(H) MISC. PROFESSIONAL SERVICES
CONSTRUCTION	.08	.87	1.38	.86	1.65	.89	1.61	10.24	1.81	1.40	.76	.64	32.35	.96	3.30	.58	2.88	.52	15.34	6.75	.19
TEXTILES	.37	56.40	--	6.94	1.25	.52	.23	--	.70	--	.05	.72	--	--	.85	.84	--	--	--	.47	--
LUMBER	12.18	.06	49.15	18.24	2.18	.04	.16	--	1.09	.76	.33	4.76	--	--	--	1.01	.28	--	--	.16	--
FURNITURE	1.62	.09	1.92	8.84	.08	--	--	--	.80	--	.31	1.63	--	--	--	.57	--	--	--	--	--
PAPER	--	1.77	1.81	--	39.76	22.16	5.13	2.25	5.19	--	.43	.04	.34	.28	.28	2.00	3.28	.75	.14	.74	.70
PRINTING & PUBLISHING	--	.49	--	.14	4.41	35.87	.47	.08	.12	--	.49	--	.56	.29	.07	2.15	.90	1.15	1.20	.16	2.11
CHEMICAL	1.89	16.15	2.55	1.47	3.77	1.77	25.19	6.09	2.30	1.11	.26	.38	.50	--	.61	1.60	.12	--	.71	.70	--
PETROLEUM	.49	.02	--	--	.16	.04	.65	4.65	.19	.05	.08	.05	.89	1.14	.74	.45	.36	.03	.63	.31	.17
STONE, CLAY & GLASS	12.83	.75	2.34	2.04	.29	--	3.59	1.31	15.39	5.41	1.42	.49	--	--	--	1.28	.61	--	.28	.43	--
PRIMARY METALS	4.05	--	--	6.56	.58	.25	.49	.42	.87	44.23	14.84	15.85	4.41	.07	2.97	.41	--	--	--	--	--
MACHINERY, EXCEPT ELECTRIC	2.92	1.13	.85	1.62	1.40	.23	.28	1.22	2.43	6.82	22.81	8.68	1.45	.17	1.53	2.94	4.43	--	--	--	--
TRANSPORTATION EQUIPMENT	--	--	.32	.57	--	--	.04	--	.29	.76	2.42	22.11	--	.37	2.34	.96	--	--	.49	--	--
RAILROAD TRANSPORTATION	1.32	.64	4.89	2.23	5.27	1.22	1.90	1.34	3.11	.22	.57	1.61	17.77	2.17	.59	.17	.29	.05	2.29	.23	.12
TRUCK TRANSPORTATION	3.42	3.50	2.66	2.52	6.60	2.27	3.95	7.99	6.79	4.67	1.55	2.57	2.57	37.52	6.62	6.16	1.17	.22	1.43	1.25	.91
WATER TRANSPORTATION	.09	.13	.96	--	.36	--	.30	7.82	.40	.55	.04	--	.22	.26	18.88	.09	.10	--	--	--	--
WHOLESALE TRADE	6.67	5.57	12.66	10.55	10.45	6.31	8.24	9.68	6.59	12.18	6.87	9.90	5.20	14.85	5.42	8.20	6.27	1.23	2.70	4.76	4.24
RETAIL TRADE	3.21	.68	1.28	1.33	1.01	2.85	7.86	.81	31.45	.79	5.49	2.84	.89	13.10	1.25	17.17	7.01	.10	11.11	7.37	23.15
CREDIT AGENCIES	.15	.09	.21	.10	.31	.27	.45	3.17	.21	.16	.20	.10	.28	.03	.31	.11	.11	30.54	.45	6.90	.05
REAL ESTATE	.45	.79	.75	.90	1.23	2.60	2.90	4.98	1.16	.45	1.48	.77	5.53	1.16	1.49	4.22	11.66	2.35	3.13	8.69	5.68
HOTELS AND LODGING	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18.09	--	--
MISC. PROFESSIONAL SER.	11.23	.85	.85	.95	1.50	2.49	3.81	1.14	1.09	1.03	1.30	.95	1.79	1.10	2.82	11.66	5.29	8.90	9.14	5.73	43.76
OTHER MANUFACTURING	28.13	3.26	7.88	26.47	7.05	4.71	16.25	3.09	7.43	9.07	30.50	20.57	3.01	1.00	7.60	15.05	2.50	--	5.37	6.79	.91
COMMUNICATION & UTILITIES	.26	1.40	1.84	1.62	2.56	2.99	2.28	4.54	3.06	2.53	1.78	1.21	4.03	3.37	2.17	5.46	9.82	5.95	1.49	7.92	5.11
BANKING & INSURANCE	2.07	1.11	1.81	1.76	1.02	1.69	1.74	6,07	1.43	1.71	1.27	1.14	2.63	6.53	6.45	7.46	11.90	32.57	12.89	6.32	4.31
SERVICES & OTHER	6.49	4.26	3.83	4.33	7.12	10.78	12.42	23.13	6.06	6.00	4.77	3.00	14.75	14.30	21.26	8.27	14.25	12.20	10.96	34.12	8.60
GOVERNMENT	.02	--	--	--	--	--	.08	--	.06	.10	--	--	.84	1.31	12.48	.20	16.76	3.43	4.65	.23	--
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

H - high performance industries

L - low performance industries

Columns may not add up to 100% due to the roundings.

back through intermediate supplying industries. This would lead one to expect high (low) performance intermediate supplying industries to be linked predominantly to high (low) performance purchasing industries, all other things being equal. A rough test of this hypothesis can be made by collapsing each industry's output distribution (from Table VIII.5) into sales to itself and to high and low performance industries. Table VIII.6 summarizes this distribution.

Generally, intermediate sales by high performance industries to other high performance industries in New Jersey exceed their sales to low performance industries. A weighted average for the high performance industries in Table VIII. 6 shows their intermediate sales to high performance purchasers to be almost one and a half times their sales to low performance purchasers. The leader in high perfomance sales is the paper industry with 45.7% of its intermediate sales going to other high performance industries and only 2.9% being to low performance industries. The most notable exception among the high performers is stone-clay-glass with 18.3% and 48.5% of intermediate sales to high and low performance purchasers respectively. However, while stone-clay-glass is listed as a high performance industry on the basis of its 1975 national share, its share growth rate since 1958 has been nearly zero, indicating a substantial downward trend in performance.

Similarly, intermediate sales by low performance industries to other low performance industries in New Jersey exceed their sales to high performance industries. A weighted average for the low performance industries in Table VIII. 6 shows their intermediate sales to low performance purchasers to be more than one and two-thirds greater than their sales to high performance purchasers. Leaders in intermediate sales to low performance purchasers include the hotel-lodging, lumber and the furniture industries. Among the exceptions to the general trend among low performance industries are real estate and machinery. By way of explanation it can be noted that real estate is primarily dependent upon final, and not interindustry, demand.

The data appear to support the hypothesis that high (low) performance industries are frequently linked through their interindustry sales. This pattern may then be a critical factor in explaining industrial performance in the State. To add additional support to the argument we will next examine an individual high and a low performance New Jersey industry in detail.

D. High Peformance Industries—Chemicals

To understand the importance of interindustry linkages, they must first be placed in the context of all the major factors which influence an industry's performance. The leading performer among New Jersey industries in recent decades has unquestionably been the chemical industry. Chemicals is the least cyclically sensitive New Jersey manufacturing industry and this is in no small measure due to the predominance of the drug industry which comprises nearly 38 percent of New Jersey's chemical sector, and almost 23 percent of the national drug industry.[6]

The New Jersey interindustry Table (VIII.4) reveals that chemical products are the largest category of inputs to the chemical industry, comprising more than one quarter of all inputs. This is further evidenced by the distribution of chemical outputs (Table VIII.5), since over half (52.55%) of the intermediate sales in chemicals are intra-industry. In fact, chemicals have the highest level of intra-industry sales among all the sectors in the interindustry table. The indication is that among independent firms the chemical industry is intensely vertically integrated. Drugs and cleaning products are final demand oriented with 77 percent of their sales to final consumers, while the remainder of the chemical industry sells slightly more than 15 percent of its products directly to final consumers. Vertical integration is a primary reason

[6] Demand for drug products is relatively insensitive to price and income fluctuations. Moreover, the whole New Jersey chemical industry is characterized by high levels of exports (37% of the State's 1976 exports) and foreign ownership (three times the New Jersey proportion of foreign ownership in manufacturing and over six times the proportion for all state businesses).

TABLE VIII.5

ESTIMATED PERCENTAGE DISTRIBUTION OF OUTPUTS (SALES) FOR SELECTED NEW JERSEY INDUSTRIES

	SALES TO / SELECTED INDUSTRIES	CONSTRUCTION	TEXTILES	LUMBER	FURNITURE	PAPER	PRINTING & PUBLISHING	CHEMICALS	PETROLEUM	STONE, CLAY & GLASS	PRIMARY METALS	MACHINERY	TRANSPORTATION EQUIPMENT
(L)	CONSTRUCTION	0.05	0.09	0.02	0.03	0.29	0.15	0.98	0.70	0.32	0.15	0.31	0.10
(L)	TEXTILES	1.03	25.53	--	1.29	0.85	0.42	0.65	--	0.57	--	0.09	0.51
(L)	LUMBER	60.14	0.05	7.24	6.02	2.64	0.06	0.81	--	1.57	0.69	1.10	6.04
(L)	FURNITURE	29.84	0.29	1.05	10.84	0.35	--	--	--	4.25	--	3.79	7.69
(H)	PAPER	--	0.78	0.14	--	25.95	16.73	13.58	0.67	3.95	--	0.75	0.02
(H)	PRINTING & PUBLISHING	--	0.18	--	0.02	2.31	22.17	1.01	0.02	0.07	--	0.70	--
(H)	CHEMICAL	3.90	5.61	0.16	0.20	1.90	1.05	52.55	1.43	1.38	0.42	0.36	0.20
(H)	PETROLEUM	7.98	0.05	0.05	--	0.61	0.20	10.64	8.59	0.87	0.15	0.82	0.20
(H)	STONE, CLAY, GLASS	39.41	0.39	0.21	0.42	0.21	--	11.17	0.46	13.78	3.07	2.94	0.39
(L)	PRIMARY METALS	7.28	--	--	0.78	0.26	0.13	0.89	0.08	0.45	14.62	17.88	7.30
(L)	MACHINERY, EXCEPT ELEC.	6.47	0.42	0.06	0.29	0.76	0.15	0.62	0.31	1.57	2.78	34.27	4.93
(L)	TRANSPORTATION EQUIPMENT	--	--	0.07	0.27	--	--	0.27	--	0.60	0.98	11.37	39.80
(L)	RAILROAD TRANSPORTATION	5.84	0.48	0.65	0.66	5.71	1.56	8.51	0.67	4.01	0.18	1.69	1.83
(H)	TRUCK TRANSPORTATION	5.50	0.95	0.13	0.27	2.59	1.04	6.42	1.46	3.17	1.38	1.67	1.06
(H)	WATER TRANSPORTATION	1.22	0.39	0.50	--	1.56	--	5.29	15.65	2.06	1.78	0.50	--
(H)	WHOLESALE TRADE	6.16	0.87	0.35	0.65	2.37	1.68	7.72	1.02	1.77	2.07	4.26	2.35
(H)	RETAIL TRADE	2.91	0.10	0.03	0.08	0.22	0.75	7.23	0.08	8.31	0.13	3.34	0.66
(L)	CREDIT AGENCIES	0.93	0.10	0.04	0.04	0.46	0.46	2.77	2.20	0.37	0.17	0.81	0.15
(L)	REAL ESTATE	0.93	0.27	0.04	0.12	0.62	1.54	6.05	1.17	0.69	0.17	2.05	0.40
(L)	HOTELS & LODGING	--	--	--	--	--	--	--	--	--	--	--	--
(H)	MISC. PROF. SERVICES	12.89	0.15	0.03	0.07	0.40	0.77	4.16	0.14	0.39	0.20	0.95	0.26

H - high performance industries

L - low performance industries

Rows may not add up to 100% due to the roundings.

RAILROAD TRANS-PORTATION	TRUCK TRANS-PORTATION	WATER TRANS-PORTATION	WHOLESALE TRADE	RETAIL TRADE	CREDIT AGENCIES	REAL ESTATE	HOTEL & LODGING	MISC. PROF. SERVICES	OTHER MANUFACTURING	COMMUNICATION & UTILITIES	BANKING & INSURANCE	SERVICES & OTHER	GOVERNMENT	TOTAL
1.10	0.27	0.29	0.42	1.61	0.06	16.68	0.33	0.08	1.35	4.83	1.57	3.56	64.23	100.0
--	--	0.34	2.81	--	--	--	0.11	--	64.70	--	--	.09	--	100.0
--	--	--	6.01	1.27	--	--	0.06	--	6.27	--	--	--	--	100.0
--	--	--	12.53	--	--	--	--	--	29.37	--	--	--	--	100.0
0.05	0.35	0.11	2.12	7.99	0.37	0.67	0.16	0.24	18.57	0.56	3.63	2.20	1.10	100.0
0.07	0.30	0.02	5.53	1.80	0.47	4.66	0.03	0.60	7.70	0.35	21.56	25.71	4.77	100.0
0.06	--	0.18	3.96	0.22	--	2.64	0.12	--	11.61	--	--	6.38	5.63	100.0
0.82	8.69	1.74	8.59	5.47	0.10	18.46	0.41	0.36	2.69	1.79	0.46	7.83	12.79	100.0
--	--	--	4.73	1.76	--	1.53	0.11	--	14.98	--	--	3.65	0.76	100.0
0.95	0.06	0.77	0.88	--	--	--	--	--	48.00	0.15	--	--	--	100.0
0.18	0.18	0.49	7.80	9.15	--	--	--	--	17.81	0.35	--	10.80	1.04	100.0
--	1.25	2.38	8.10	--	--	6.25	--	--	18.65	--	--	8.46	1.51	100.0
4.47	4.57	0.38	0.91	1.19	0.04	18.33	0.08	0.07	11.83	4.46	1.07	3.05	17.69	100.0
0.23	28.60	1.54	11.85	1.75	0.06	4.14	0.16	0.19	12.94	1.18	1.49	2.21	7.95	100.0
0.22	2.17	48.13	1.84	1.56	--	--	--	--	7.62	--	--	0.99	8.35	100.0
0.27	6.52	0.73	9.09	5.41	0.22	4.52	0.36	0.52	16.26	1.49	3.65	14.07	5.63	100.0
0.04	5.65	0.16	18.69	5.94	0.02	18.25	0.54	2.78	6.50	3.49	2.89	9.33	1.86	100.0
0.10	0.08	0.27	0.79	0.64	35.44	5.34	3.42	0.04	7.84	3.17	19.27	0.27	14.80	100.0
0.65	1.14	0.44	10.95	22.44	0.92	11.68	1.46	1.55	5.21	3.43	10.59	11.37	4.54	100.0
--	--	--	--	--	--	99.45	--	--	--	--	--	0.54	--	100.0
0.11	0.56	0.44	15.07	5.32	1.83	17.82	0.50	6.24	3.41	0.82	10.63	8.07	10.11	100.0

why next to drugs, industrial chemicals is the fastest growing sector within the New Jersey chemical industry.

Besides industrial chemicals there are other industries which input into chemicals in a significant way, and as Table VIII.6 indicates, high performance industries are frequently linked to the high performance chemical industry. From the interindustry table it may be seen that sales to the chemical industry rank first or second among all interindustry sales for the paper, petroleum, stone-clay-glass, trucking and wholesale industries, all high performance New Jersey industries. While not as sizeable, sales to the chemical industry ranked fourth among interindustry sales for the retail industry. Among all the industries with significant sales to chemicals, only one, the railroads, is a low performance New Jersey industry. However, with drugs and cleaning products the least dependent upon rail transportation of all the chemical sectors, the New Jersey chemical industry's utilization of railroads per dollar of output is roughly 37 percent below the national chemical industry average.

Certainly their linkages to the chemical industry are not the sole reason these intermediate supplying industries are among the State's high performers (paper, for instance, sells 16.7% of its output to printing and publishing the eighth-best performing industry in New Jersey), but as Table VIII. 7 indicates, it is an important factor of their growth.

TABLE VIII. 6

PERCENTAGE DISTRIBUTION OF INTERMEDIATE SALES IN NEW JERSEY

	To Itself	To High Performance Industries	To Low Performance Industries	Total
High Performance Industries				
Chemical and Allied Products	52.6	10.1	15.4	78.1
Water Transportation	48.1	30.1	4.6	82.8
Petroleum and Related	8.6	37.2	29.0	74.8
Miscellaneous Services	6.2	27.3	34.8	68.3
Trucking	28.6	30.0	15.6	74.2
Printing and Publishing	22.2	11.7	5.5	39.4
Stone, Clay and Glass	13.8	18.3	48.5	80.6
Retail Sales	5.9	43.9	26.1	75.9
Paper	26.0	45.7	2.9	74.6
Wholesale	9.1	27.7	22.1	58.9
Low Performance Industries				
Transportation Equipment	39.8	12.6	18.9	71.3
Primary Metals	14.6	3.5	34.2	52.3
Railroads	4.5	27.6	29.8	61.9
Hotels, Lodging	...	...	99.5	99.5
Furniture and Fixtures	10.8	17.1	42.7	70.6
Lumber and Wood	7.2	12.4	74.1	93.7
Textile	25.5	5.6	3.0	34.1
Real Estate	11.7	46.6	6.9	65.2
Credit Agencies	35.4	8.1	11.1	54.6
Construction	0.1	5.1	18.9	24.1
Machinery, Except Electric	34.3	21.0	15.1	70.4

SOURCE: Table VIII.5.

TABLE VIII. 7

EMPLOYMENT RELATED DIRECTLY TO SALES IN THE NEW JERSEY CHEMICAL INDUSTRY (1975)

Industry	Actual*	New Jersey Chemicals Performing at the New Jersey Manufacturing Average	% Change in Total Employment Due to Reduction in N.J. Chemicals
Paper	1636	457	−3.8
Petroleum	208	58	−1.3
Stone, Glass, Clay	1144	319	−2.3
Trucking	1261	352	−1.6
Wholesale	2630	734	−1.2
Retail Sales	2509	700	−0.4
All Industries	31908	8896	....

* Assumes no net interindustry imports in New Jersey.

As Table VIII.7 indicates if the New Jersey chemical industry had been performing equal to rather than above the New Jersey manufacturing average in 1975 total employment in the high performance industries would have fallen anywhere from 3.8 (paper) to 0.4 (retail) percent of actual levels.

Generally, our examination of the chemical industry has shown that many factors may influence an industry's performance and location, and interindustry linkages are certainly among those factors. Moreover, although intermediate sales vary substantially as a proportion of total sales for individual industries, high performance industries are seen to be most frequently linked to other high performance industries.

E. Low Performance Industries— Primary Metals

Since nearly all the output of the primary metals industry is sold to other industries, primary metals is a critical supply industry. Unfortunately, primary metals is the second poorest performing industry in New Jersey. Major purchasers of primary metals products besides construction include fabricated metals (34.4% of intermediate sales), non-electrical machinery (17.9%), and electrical machinery (9.4%) and transportation equipment (7.3%). Transportation equipment and non-electrical equipment rank first and twelfth among the low performance New Jersey industries. Although electrical machinery and fabricated metals were not included in the low performance group on the basis of their above average 1975 national shares, they respectively had the first and fourth largest decline in shares of all New Jersey industries between 1958 and 1975. Apparently, as Table VIII. 6 indicates, the low performance primary metals industry is extensively linked to other low performance industries in the State.

The interindustry evidence, however, is not instructive as to whether the decline in primary metals was caused by declines in the major New Jersey industrial purchasers of primary metal products or by changes in the State's primary metal industry itself. Certainly the slowdown in population growth influenced the construction industry; moreover, the fall-off of manufacturing growth has stabilized the Northeastern markets for fabricated metals, non-electric and electric machinery. This also meant a relative increase in demand for specialized steel products by Northeastern industry. Because of limited regional demand and lower transportation costs than structural steel, specialized steel product firms are not constrained to sites near the Northeastern market.[7]

[7] Stan Czamanski, *Study on Spatial Industrial Complexes,* Institute of Public Affairs, Dalhousie University, Halifax, Canada, 1976, pp. 46-54.

On the supply side there have been significant changes in the primary metals industry since World War II when over 70 percent of the national output came from the Pittsburgh-Youngstown-Wheeling area.[8] Most notably, primary metals output per unit of coal has more than doubled. Firms are thus less constrained to locations near Pittsburgh seam coal and the anthracite coming down the Lehigh, Schuylkill and Delaware Rivers. Changes in technology have also reduced industry labor requirements. The man-hours per ton of steel has declined from about 33 in 1935 to less than 9 in 1975. With automation concurrently reducing labor skill requirements, the high skill labor markets of the Northeast are less critical to the primary metals industry. Prices beyond production costs are now based upon freight charges from the mill to the point of delivery. The result of all these changes is a greater market orientation among primary metals plants. Consequently, the Pittsburgh-Youngstown area and New Jersey shares of output have declined while the Detroit, California, and southern shares have experienced pronounced growth.

Once again, linkages among low performance industries are confirmed although interindustry product streams cannot alone resolve the importance of demand and supply factors to the performance of an industry such as primary metals. Changes in industry supply factors may be readily identified since many supply factors (e.g., labor and energy) are relatively site associated. Identifying changes in intermediate product demand is more difficult. The addition of spatial proximity to product linkages would help to place geographic boundaries upon market demand. Primary metals, for example, have been found to form spatial clusters with industries such as fabricated metals (e.g., metal cans, cutlery and wire products), automobile and railroad equipment, office furniture and coal mining.[9] Better information, however, could be obtained directly from a New Jersey I-O table based upon survey data.

[8] Stan Czamanski, opp. cit., p. 59.
[9] Stan Czamanski, opp. cit.

III. Conclusion

The practical applications of input-output tables in the formulation of state policy are manifold. The growing complexity of our technocratic society requires models which can trace the impacts of policies and events (e.g., changes in the supply of petroleum products) through the many interrelated components of an economy. At present, input-output is the most efficient and effective tool available for performing impact and other analyses, and I-O is the only available technique providing a useful disaggregation of information by industry.

Using estimated data the case study in section II of this chapter demonstrated the potential effectiveness of a New Jersey I-O table in explaining State industrial performance. Such information, if more accurate, would allow State economic development resources to be distributed on the basis of expected employment, income and tax revenue gains, adjusted for interactions among all sectors of the State economy.

To obtain more accurate data efforts should be initiated to examine alternative methods for constructing an original State input-output table. The State already has sufficient computer, programmer and research analysis capacity to perform much of the work. Surveys of firms are continually conducted by various State departments and input-output information could be collected simultaneously with little additional cost. Survey data could be combined in varying degrees with federally collected data on New Jersey as a means of reducing research costs and maintaining quality control. Ideally, this analysis would be developed so as to coincide with the establishment of the proposed State Data Center.

IX

INTERREGIONAL CHANGES IN THE NEW JERSEY ECONOMY*

Introduction

Over the years the Economic Policy Council's studies have considered the State economy as a single geographically homogenous entity. This approach was justified as a necessary first step in understanding the New Jersey economy. However, it left out many new developments that are taking place in the location of business activities throughout the State. The changing economy of the State's cities, the spreading of commerce and industry to the suburbs and the population shift from the highly congested northern counties toward the center and the south are phenomena that were awaiting systematic analyses.

This Chapter initiates a series of studies that will add a geographic dimension to the overall assessment of economic conditions in New Jersey. It examines intra-state changes in the distribution of population, income and employment. This first study will be followed by more detailed investigations that will further improve our knowledge about the State's economic conditions.

In order to discuss spatial changes in the New Jersey economy, it is useful to classify the State counties into various groups based on their degree of urbanization. Four regional classifications will be used in this study: major cities, urban counties, suburban counties and rural counties. The classification for major cities is somewhat arbitrary, but is chosen because of the common characteristics of relatively large size cities. The six largest cities (Newark, Jersey City, Trenton, Camden, Elizabeth and Paterson) comprise this classification.

The second classification, urban counties, is defined as a county that contains one of the six major cities in it. This definition is adopted mainly because the income cannot be separated between major cities and counties.[1]

The category of suburban counties is determined by excluding those counties that are distinctively rural in their characteristics from those counties which share the border with an urban county. By this criterion, Bergen, Burlington, Gloucester, Middlesex, Monmouth and Morris counties are classified as suburban counties, while Atlantic, Hunterdon and Sussex are classified as rural counties although they share the borders with urban counties. Among the suburban counties, Bergen County is highly urbanized throughout. However, for the reasons discussed above, it is not classified as an urban county. A map displaying urban, suburban, and rural counties is shown in Figure IX.1.

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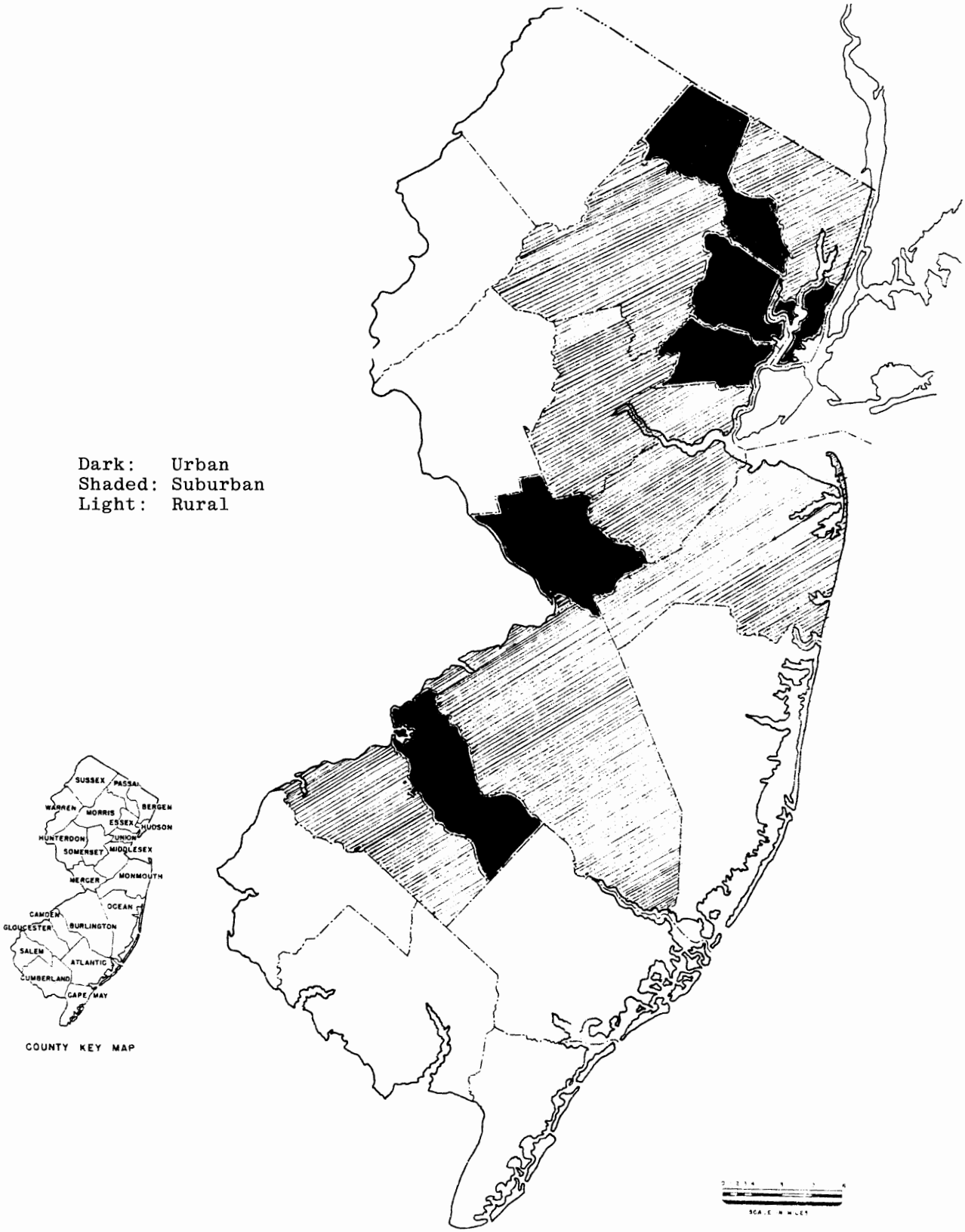
* Prepared by Dr. Jong Keun You, Office of Economic Policy.

[1] By adopting this definition of urban counties, a comparison of the total figures for the same area is possible.

FIGURE IX.1

REGIONAL CLASSIFICATION



1. Regional Distribution of Population

Table IX.1 presents the regional distribution of New Jersey's population for the years 1960 and 1977, and the changes during that period. New Jersey's total population increased by 21.1 percent during 1960 to 1977. This compares with 20.0 percent growth in U.S. population during the same period. Regional population growth rates are, however, highly uneven; while the suburban and rural counties experienced very rapid growth in population, population of major cities showed an absolute decline.

Table IX.1 also presents the regional shares of population. In 1960 slightly more than half of the New Jersey population lived in urban counties and about 9 out of 10 individuals lived in urban or suburban counties. By 1977, because of an absolute decline in major city population and relatively slow growth in the rest of urban counties, urban and suburban counties have about equal shares of the New Jersey population. It is also interesting to note that the share of rural population has increased due to its rapid growth. This indicates that many parts of "rural" counties have become suburbanized during the period.

The observed changes in spatial distribution of population over the past two decades are consistent with economic theory of residential location. Transportation costs cause concentration of economic activities and population in areas where it is convenient to transport raw materials and/or finished goods. Since cost of transportation increases with distance from the major market place—land value, housing price and rents will decrease as the distance from the major market place increases. Consequently, population density, capital and labor input per acre decrease geometrically with the distance. This phenomenon is depicted by curve A of Figure IX.2.

As income per capita increases and improvements in transportation technology permit a decrease in transport costs, households will increase their demand for land due to an income effect, and will be willing to move away from the central market place to the suburbs where land is cheaper, since lower transport costs will compensate for the greater distance. Similar reasoning also holds for industrial location. This process will flatten the density gradient as shown by curve B in Figure IX.2.

Figure IX.3 which is a modified version of Figure IX.2 applied to New Jersey confirms the flattening trend predicted by location theory. What is the significance of this trend? An attempt is made to find an answer to this question in the following sections.

2. Regional Distribution of Incomes

As discussed above, residential and industrial locations are closely related. Therefore, the "spreading out" trend in population is also

TABLE IX.1

REGIONAL DISTRIBUTION OF POPULATION

Region	Population (in thousands) 1960	1977	Change	Population Share 1960	1977	Density (per square mile) 1960	1977
Urban Counties	3,103.6	3,179.9	2.5%	51.2%	43.3%	3,385	3,468
Major Cities	1,164.0	1,001.9	—13.9	19.2	13.6	15,479	13,323
Rest of Urban Counties	1,939.6	2,178.0	12.3	32.0	29.6	2,305	2,588
Suburban Counties	2,314.0	3,122.1	34.9	38.1	42.5	787	1,062
Rural Counties	649.8	1,046.8	61.1	10.7	14.2	179	288
Total	6,067.4	7,348.8	21.1	100.0	100.0	809	980

SOURCE: *1960 Census of Population*, U.S. Dept. of Commerce;
1977 New Jersey Population Estimates, N.J. Dept. of Labor and Industry.

FIGURE IX.2

TYPICAL DENSITY GRADIENT AND ITS SHIFT OVER TIME

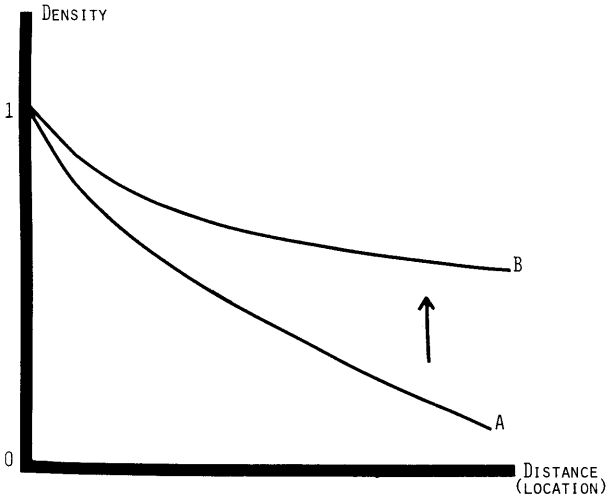
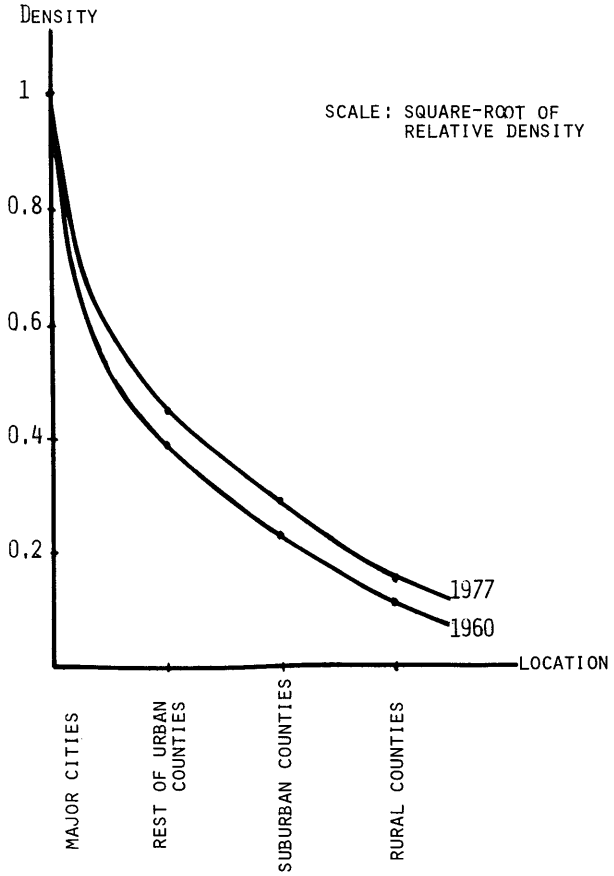


FIGURE IX.3

NEW JERSEY'S POPULATION DENSITY GRADIENTS



expected to be found in employment and income generation.

Table IX.2 presents regional distribution of labor and proprietors' income measured at the place of work by industry classifications. In 1959, 44 percent of total earned income in New Jersey originated in the manufacturing sector, of which 61 percent was earned in the urban counties. By 1977, the share of manufacturing industry in earned income was reduced to 36 percent, and urban counties accounted for 49 percent of the manufacturing sector's earned income.

The rate of growth of total labor and proprietors' income in New Jersey during the period 1959-1977 was 221 percent compared to 285 percent for the U.S. during the same period. The relatively slow growth of earned income in New Jersey can be attributed to two major sources; decline in New Jersey's manufacturing industries and the decline of all industries in urban counties. While relative decline in urban area industries is due to dynamic forces of spatial distribution of economic activities observed throughout the U.S., the fact that New Jersey is highly urbanized means that the State is more vulnerable to these changes. This can be demonstrated by the fact that when urban counties are excluded labor and proprietors' income increased in New Jersey by 297 percent and in the U.S. by 285 percent.[2]

Between 1959 and 1977 New Jersey's labor and proprietors' income excluding the manufacturing sector increased by 269 percent, slightly lower than in the U.S. Thus, the decline in manufacturing alone cannot fully account for the relatively slow growth in New Jersey's earned income. However, it is clear that the decline in urban counties and manufacturing industries did play a major role in slowing down New Jersey's earned income growth relative to the rest of the U.S. A significant increase in the share of service employment in New Jersey

[2] A comparison of non-urban counties in New Jersey with a similarly defined aggregate in the U.S. would reveal whether New Jersey kept pace with the rest of the nation. No such comparisons have been made yet.

TABLE IX.2

LABOR AND PROPRIETORS' INCOME BY PLACE OF WORK

	1959				1977				Percent Change			
	Urban	Suburban	Rural	Total	Urban	Suburban	Rural	Total	Urban	Sub-urban	Rural	Total
Manufacturing	$2,911,654	$1,511,510	$324,587	$4,747,751	$6,055,909	$5,349,820	$995,876	$12,401,605	108.0	253.9	206.8	161.2
Wholesale & Retail	1,101,859	706,212	195,552	2,003,623	3,339,267	3,176,143	674,552	7,189,962	203.1	349.7	244.9	258.8
Trans. Com. & Util.	625,934	218,907	64,482	909,323	1,921,282	1,342,768	264,864	3,528,914	206.9	513.4	310.8	288.1
Services	867,788	541,712	127,333	1,536,833	3,601,178	2,903,999	649,594	7,154,771	315.0	436.1	410.2	365.6
F.I.R.E.	408,346	149,226	44,112	601,684	1,190,101	666,322	195,503	2,051,926	191.4	346.5	343.2	241.0
Contract Construction	375,227	295,211	82,065	752,503	746,580	778,746	318,896	1,844,222	99.0	163.8	288.6	145.1
Ag. Mining and Others	18,919	79,778	73,461	172,158	46,192	131,019	89,248	266,459	144.2	64.2	21.5	54.8
Total	$6,309,727	$3,502,556	$911,592	$10,723,875	$16,900,509	$14,348,817	$3,188,533	$34,437,859	167.8	309.7	249.8	221.1

SOURCE: *Personal Income for New Jersey Counties*, New Jersey Dept. of Labor & Industry.

caused the slowdown in earnings, since service jobs are relatively low paid.

While growth rates are an important indicator of economic welfare, a more important indicator is the level of per-capita income. A slower growth rate than the national average may imply either a narrowing or a widening gap between New Jersey's per capita income and its U.S. counterpart, depending on whether New Jersey's per capita income was initially higher or lower than the national counterpart.

Table IX.3 compares the levels and growth rates of labor and proprietors' income and personal income per capita for New Jersey and the U.S. New Jersey's per capita labor and proprietors' income has been below the national average and the gap is widening. This is true whether or not urban counties are excluded from New Jersey's data. Per capita personal income, on the other hand, has been higher in New Jersey than the U.S. average, although the gap is slowly narrowing. This is not a puzzle; it reflects the fact that over 10% of those who are employed work outside the State,[3] and also the fact that residents of New Jersey are doing substantially better than the national average in making incomes from such sources as dividends, rents and royalties and interest.[4]

Compared to the national growth rate, Table IX.2 showed that New Jersey's suburban counties experienced a growth of labor and proprietors' income higher than the national average and, among the industries in New Jersey, transportation, communication, public utilities, and services did better than the national average in generating labor and proprietors' income. In particular, the service sector did considerably better than the national average, even in the urban counties. This is not surprising, since the service industry relies heavily on economies of agglomeration. It also suggests that, by further improving the eco-

[3] Per capita labor and proprietors' income adjusted for the proportion of workers employed outside the State is estimated to be higher than its national counterpart. This factor, however, does not fully account for the 14 percent excess of New Jersey's per capita personal income over its U.S. counterpart.

[4] Personal income is formally defined as labor and proprietors' income plus rents and royalties received by persons, dividends, personal interest income, and transfer payments received by persons minus personal contribution for social insurance.

TABLE IX.3

PER CAPITA INCOME

Year	Labor and Proprietors' Income			Personal Income	
	U.S.	N.J.	N.J. excl. Urban Counties	U.S.	N.J.
1959	$1,832	$1,799	$1,491	$2,166	$2,656
1977	5,333	4,686	4,207	7,019	7,994
	(191)	(160)	(182)	(224)	(201)

NOTE: Figures in the parentheses indicate percentage changes.
SOURCE: *Statistical Abstract of U.S.*, U.S. Department of Commerce.

nomies of agglomeration (e.g., convention center, crime prevention, *etc.*) urban economies can benefit from a more rapid growth of the service sector.[5]

Table IX.4 presents regional shares of income by place of work for each industry and industry total. In 1959, close to 60 percent of total labor and proprietors' income in New Jersey was created in urban counties. By 1977, however, urban counties accounted for slightly less than half of the New Jersey total, and the shares of urban counties decreased in all but agriculture, mining, and others, which account for less than 1 percent of the total.

It is interesting to note that almost all of the decreases in shares of urban counties are recovered by suburban counties, except for the construction industry. Construction industry grew much more rapidly in the rural counties than in the suburban counties, indicating that the suburbanization of many parts of rural counties is under way.

3. Regional Distribution of Employment

While the rate of growth and the levels of income (total or per capita) are important factors in determining economic welfare, employment is the basic source of income for most people. Furthermore, employment in itself is a source of pride and joblessness a social stigma. How successful has New Jersey been in creating jobs for its growing labor force? What areas of the State and which industries have been most (or least) successful and why?

Table IX.5 lists regional and industrial shares of "Covered Jobs" in New Jersey and their changes between 1959 and 1977. Since "Covered Jobs" include only full and part-time employees covered by New Jersey Unemployment Compensation Law it cannot be compared with total employment. However, covered employment will, nevertheless, provide useful information about employment trends.

Between 1959 and 1977 the manufacturing sector showed an *absolute* decline of 3.1 percent. At the same time the share of the manufacturing sector in total covered jobs in New Jersey declined from 53 to 34 percent by 1977. Furthermore, manufacturing industries in major cities were reduced to nearly half of the 1959 level. Given the importance of manufacturing industries in New Jersey, this clearly demonstrates where New Jersey's employment problem lies.

As mentioned above, the relative decline of manufacturing industries in New Jersey was to some degree inevitable due to the equalization of industrial composition across the nation. As Table IX.6 demonstrates, the manufacturing sector in New Jersey provided 41 percent of

[5] Needless to say, this is not the only workable strategy. Besides, it would be unreasonable to build convention centers in every major city without a careful analysis of costs and benefits. For a detailed discussion of urban revitalization strategy, see Chapter IV, *11th Annual Report*, Economic Policy Council, Trenton, 1978.

TABLE IX.4

REGIONAL SHARES OF LABOR AND PROPRIETORS' INCOME BY PLACE OF WORK

	1959				1977				Change		
	Urban	Sub-urban	Rural	Total	Urban	Sub-urban	Rural	Total	Urban	Sub-urban	Rural
Manufacturing	61.3%	31.8%	6.8%	100.0%	48.8%	43.1%	8.0%	100.0%	—12.5	11.3	1.2
Wholesale & Retail ..	55.0	35.2	9.8	100.0	46.4	44.2	9.4	100.0	— 8.6	9.0	—0.4
Trans. Comm. & Util.	68.8	24.1	7.1	100.0	54.4	38.1	7.5	100.0	—14.4	14.0	0.4
Services	56.5	35.2	8.3	100.0	50.3	40.6	9.1	100.0	06.2	5.4	0.8
F.I.R.E.	67.9	24.8	7.3	100.0	58.0	32.5	9.5	100.0	— 9.9	7.7	2.2
Contract Construction	49.9	39.2	10.9	100.0	40.5	42.2	17.3	100.0	— 9.4	3.0	6.4
Ag. Mining & Others .	11.0	46.3	42.7	100.0	17.3	49.2	33.5	100.0	6.3	2.9	—9.2
TOTAL	58.8	32.7	8.5	100.0	49.1	49.7	9.3	100.0	— 9.8	9.0	0.8

TABLE IX.5

DISTRIBUTION OF COVERED JOBS

	1959					1977					Percent Change				
	Cities	Rest of Urban	Sub-urban	Rural	Total	Cities	Rest of Urban	Sub-urban	Rural	Total	Cities	Rest of Urban	Sub-urban	Rural	Total
Manufacturing	232,194	278,859	237,921	59,875	808,849	120,922	265,085	328,289	69,670	783,966	—47.9	—4.9	38.0	16.4	—3.1
Wholesale & Retail ..	98,498	85,901	95,412	32,891	312,702	66,929	202,691	284,646	79,238	633,504	—32.1	136.0	198.3	140.9	102.6
Trans. Com. & Util. ..	48,014	33,369	30,839	9,750	121,972	47,773	48,014	63,955	14,569	174,311	— 0.5	43.9	107.4	49.4	42.9
Services	38,699	58,185	36,862	17,943	131,689	70,301	152,318	178,904	55,967	457,490	81.7	298.9	385.3	211.9	247.4
F.I.R.E.	33,504	14,883	10,213	4,894	63,494	30,244	47,482	47,868	14,958	140,552	— 9.7	219.0	368.7	205.6	121.4
Contract Construction	15,861	24,141	31,702	8,749	80,453	8,365	31,208	40,805	17,230	97,608	—47.3	29.3	28.7	96.9	21.3
Ag. Mining and Others	446	1,768	3,511	1,874	7,599	334	3,154	6,738	3,153	13,379	—25.1	78.4	91.9	68.2	76.1
TOTAL	467,216	477,106	446,460	135,976	1,526,758	344,868	749,952	951,205	254,785	2,300,810	—26.2	57.2	113.1	87.4	50.7

SOURCE: *Covered Employment Trends in New Jersey*, New Jersey Dept. of Labor & Industry.

TABLE IX.6

SHARE OF NON-AGRICULTURAL EMPLOYMENT

Industry	1959		1977	
	U.S.	N.J.	U.S.	N.J.
Manufacturing	31.3%	40.9%	23.8%	27.0%
Trade	20.9	16.0	22.3	22.4
T.C.U.	7.5	6.4	5.6	6.3
Services	13.4	7.5	18.7	18.1
F.I.R.E.	4.9	3.3	5.5	5.1
Construction	5.6	4.0	4.7	3.4
Gov't. & Others	16.4	21.9	19.4	17.7

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

non-agricultural employment in 1959, compared to 31 percent in the U.S. The decline of the manufacturing sector in New Jersey reduced its share of nonagricultural employment to 27 percent by 1977, compared to 24 percent for its U.S. counterpart, and by 1979, New Jersey manufacturing sector's share has almost become equal to its national counterpart. (See Chapter II).

The effects of the decline in New Jersey's manufacturing sector on job creation are dramatized by the fact that New Jersey's total employment grew faster than its national counterpart, if we exclude the manufacturing sector from both New Jersey and the U.S. employment figures. As Table IX.7 shows, while total employment in New Jersey increased by 32.5 percent compared to a 40.1 percent for the U.S., without the manufacturing sector the increase in New Jersey was 52.2% compared to 48.0% in the U.S. In the major cities covered employment in manufacturing declined by nearly 50 percent during the 1959-1977 years. Conversely, covered jobs in the manufacturing sector outside the major cities increased by 15 percent during the period, almost keeping pace with the growth of U.S. total manufacturing jobs (17 percent). Of course, the decline in New Jersey's manufacturing sector cannot be solely attributed to the urban problems. The equalization of industrial composition did play an important role in New Jersey manufacturing sector's decline. However, the decline in manufacturing employment does exacerbate the urban problems, which, in turn, accelerate the decline of manufacturing in urban areas resulting in a vicious circle.

In addition to manufacturing, major cities experienced negative growth in covered jobs in all but the service sector (see Figure IX.4 and Figure IX.5). As a result, outside of major

TABLE IX.7

EMPLOYMENT IN NEW JERSEY AND THE UNITED STATES
(in thousands)

Year	Total		Excluding Manuf. Sector	
	U.S.	N.J.	U.S.	N.J.
1959	64,629	2,303.2	47,954	1,500.0
1977	90,546	3,051.0	70,992	2,283.3
	(40.1)	(32.5)	(48.0)	(52.2)

NOTE: Figures in parentheses are percent changes.

SOURCE: *Statistical Abstract of U.S.,* U.S. Dept. of Commerce and *11th Annual Report,* Economic Policy Council and Office of Economic Policy.

FIGURE IX.4

MANUFACTURING INDUSTRY
COVERED JOBS BY REGION

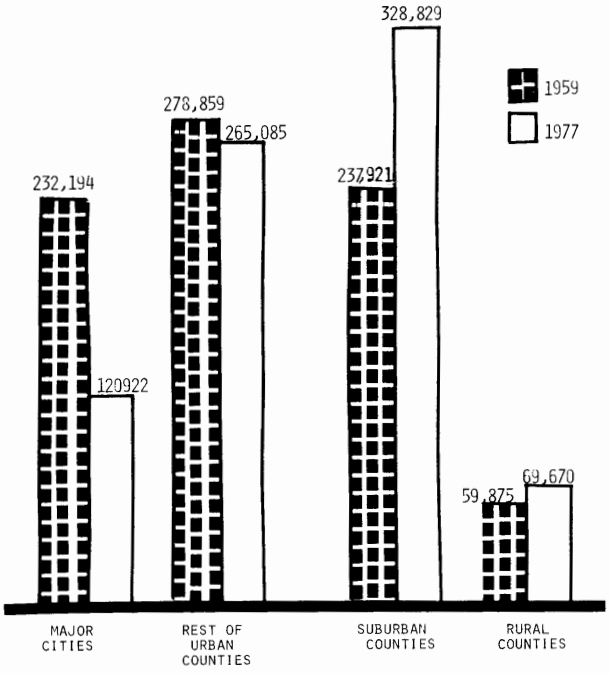
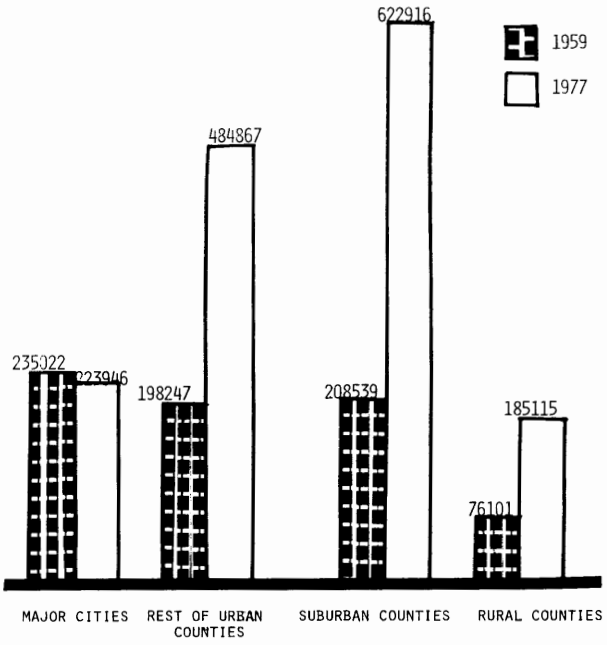


FIGURE IX.5

NON-MANUFACTURING INDUSTRY
COVERED JOBS BY REGION



cities, covered jobs increased by 84.6% while in the entire State they grew only by 50.7%.[6]

It appears, therefore, that two major factors influenced New Jersey's economic performance relative to the national economy: the overall decline in employment in manufacturing industries and the decline of employment in all but the service sector in major cities. The intersection of these two factors, the manufacturing employment decline in major cities appears to be a major cause of New Jersey unemployment problem. This is demonstrated by Figure IX.6 in which dark areas represent those counties that experienced a decrease or less than 2 percent increase in manufacturing sector's covered jobs. Except for Salem and Cumberland Counties, the rest of the negative or low growth areas are the urban counties.

As depicted by curves A and B of Figure IX.2, the suburbanization process will not completely reverse the relative densities of economic activities in the cities and in the suburbs. In order to find out the extent of changes in employment densities and to determine if the cities still provide more jobs relative to their populations, Table IX.8 presents covered jobs per one thousand residents for each region and industry.

Despite the decline in the manufacturing sector, it still provides more jobs per one thousand residents than any other industry, and precisely because of this sector's importance in providing jobs, its decline creates a serious employment problem. As expected, covered jobs per one thousand residents in the suburbs increased substantially during the 1959-1977 period. In 1959, covered jobs per thousand residents of suburbs was less than half of its counterpart in the cities and was less than its rural counterpart as well. This implies that, in 1959, suburban residents were more likely to be commuting to the

[6] Using the ratio of covered-job growth rate to total-job growth rate for the adjustment of job-growth in non-city areas, the estimate for total job growth outside the cities is 54.2 percent, compared with 40.1 percent increase for the U.S. total employment.

FIGURE IX.6

COUNTIES WITH LOW GROWTH IN MANUFACTURING JOBS

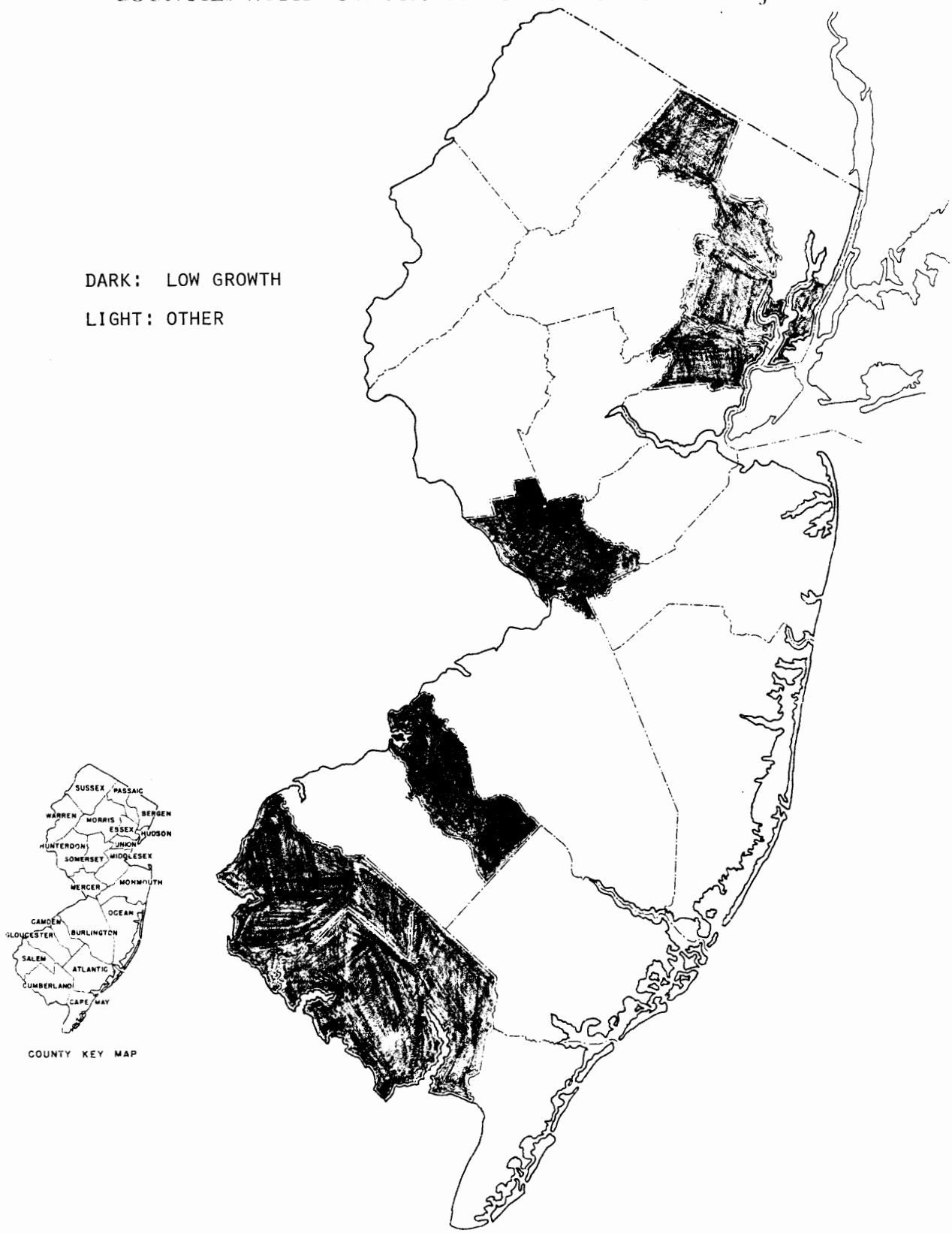


TABLE IX.8

COVERED JOBS PER 1,000 PERSONS

	1959					1977				
	Cities	Rest of Urban	Sub-urban	Rural	N.J.	Cities	Rest of Urban	Sub-urban	Rural	N.J.
Manufacturing	199.48	143.77	102.82	92.14	133.31	120.69	121.71	105.15	66.56	106.68
Wholesale & Retail	84.62	44.29	41.23	50.62	51.54	66.80	93.06	91.17	75.70	86.21
Trans. Com. Util.	41.25	17.20	13.33	15.00	20.10	47.68	22.04	20.48	13.92	23.72
Services	33.25	19.69	15.93	27.61	21.70	70.17	69.93	57.30	53.46	62.25
F.I.R.E.	28.78	7.67	4.41	7.53	10.46	30.19	21.80	15.33	14.29	19.13
Cont. Const.	13.63	12.45	13.70	13.46	13.26	8.35	14.33	13.07	16.46	13.28
Ag. Mining & Others	0.38	0.91	1.52	2.88	1.25	0.33	1.45	2.16	3.01	1.82
Total	401.39	245.98	192.94	209.26	251.63	344.21	344.33	304.67	243.39	313.09

cities than rural county residents. This was no longer true in 1977 since covered jobs per thousand residents of suburbs exceeded its counterpart in rural counties.

The increase in covered-job density outside of major cities coupled with its decline in the cities substantially narrowed the gaps between the regions. In 1959, the covered-job density of suburban counties was less than 50 percent of its city counterpart. However, in 1977, the covered-job density of suburbs reached close to 90 percent of that of major cities. A similar trend is also observed in the covered-job density of rural counties. Once again, the trend can be explained by the dynamic theory of spatial distribution of economic activities as shown by curves A and B of Figure IX.2. Furthermore, as predicted by the theory, covered-job density is still higher in the urban areas than in the suburban and rural areas, although the gaps are narrowing. This implies that, despite the decline of economic activities in the major cities, they still are a net importer of workers from the suburban and rural counties.

4. Conclusion

In this paper interregional changes of population, income by place of work and by industry, and covered jobs by industry have been analyzed. The findings of the analysis are as follows:

First, the trends in spatial distribution of New Jersey's population, income and employment during the 1959-1977 period are consistent with the dynamic theory of spatial distribution of economic activities. While this is not a surprising finding, but because of the fact that New Jersey is highly urbanized, the predicted decline in urban areas caused more than usual economic problems for the State.

Second, New Jersey's labor and proprietors' income per capita has been lower than its U.S. counterpart and the gap has been widening. On the other hand, New Jersey's per capita personal income has been higher than the na-

tional average and New Jerseyans still enjoy 11 percent higher per capita personal income than the U.S. average level, although the gap is slowly narrowing. This is not a paradox; it reflects the fact that many New Jerseyans work outside the State and that New Jersey residents, on the average, make much more of "capitalistic" income than the residents of the rest of the U.S. If indeed the propensity to save out of this type of income is higher than from the labor income as hypothesized by many economists, then New Jersey possesses an excellent source for a more rapid capital accumulation than many other states. The question is whether the investment will remain within the State and what should be done by the State to insure this.

Third, the decline of manufacturing industry in New Jersey was to some extent inevitable because of the trend toward an equalization of industrial composition to that of the U.S. This decline, however, took place mostly in the cities, exacerbating the urban problems. Furthermore, due to this sector's importance in providing jobs, the decline of manufacturing was responsible for the relatively slow growth of jobs in New Jersey compared to the national economy. In fact, New Jersey's employment excluding manufacturing industry's employment increased faster than its U.S. counterpart.

Fourth, despite the decline of cities, they still are net importers of workers from the suburban and rural counties. That, however, is not enough to keep the urban economies thriving since the unemployment rate in the urban areas is substantially higher than that of non-urban areas. In order to revive the urban economies, more urban jobs will have to be created.

One final point of observation is that the decline of the manufacturing industry can be expected to slow down in the near future since the share of manufacturing sector in total employment is almost equal to that of the national economy. In the long run, the State's industries will grow at about the same rate as the same industries in the rest of the country. However, this is not a call for complacency. New Jersey cannot afford to wait for the long run equalization to revive the State's manufacturing industry.

X

LOCAL EXPENDITURE LIMITATIONS AND INTERGOVERNMENTAL AID*

In 1977 an expenditure limitation, or 'cap' of five percent was imposed upon New Jersey municipalities. With inflation currently well above 5 percent per annum, the New Jersey 'cap' would appear to be quite severe. Exemptions, however, are liberal and include capital outlays, emergency appropriations, expenditures approved by referendum and all expenditures funded from sources other than the municipal tax levy.[1] A major source of these non-tax revenues for municipalities over recent years has been federal and state aid. The objective of this paper is to examine the effect of intergovernmental aid on the local tax effort in New Jersey and the implications with regard to the spending limitation.

I. Public Sector Growth

Citizen demand for spending limitations has evolved in no small measure from the continuing expansion of the public sector. In real terms, government expenditures have risen from approximately 7 percent of GNP at the turn of the century to 10.4% in 1929, 23.1% in 1950 and 31.6% in 1978.[2] Government expenditures were 40.2% of 1978 national income.[3] With indirect economic effects taken into account, the 1978 proportions rise to 52.3% of GNP and 64.7% of national income.[4] Since the turn of the century the number of public sector employees per thousand population has risen from 14 to over 70. Twenty-five years ago nearly one dollar out of every nine of the average middle class family's income went to taxes; today the same family pays nearly one dollar out of every four.[5]

What these aggregate statistics do not reveal is that since World War II there has been a significant fiscal shift within the public sector. Between 1950 and the present, the number of federal employees per capita has declined about 5%, while the state-local number has more than doubled. Within the federal budget, direct expenditures on goods and services have grown most slowly while grants-in-aid and transfers have grown most rapidly (Table X.1). Over half of the federal expenditure activity now involves conduiting monies to individuals and state-local governments (transfer

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* Prepared by George R. Nagle and John E. Stapleford, Office of Economic Policy.

[1] New Jersey Assembly bill 2214, October 1976 and A-2260, November 1976.

[2] U.S. Department of Commerce, BEA, Survey of Current Business, Vol. 59, 1; and R.A. Musgrave and P.B. Musgrave, *Public Finance in Theory and Practice*, McGraw-Hill, 1976, p. 132.

[3] Gross National Product (GNP) is the dollar value of all final Goods and Services produced in an economy annually. National income is GNP less depreciation of plants and equipment and less indirect business taxes (e.g., sales taxes).

[4] A multiplier of 1.66 was applied to federal, state and local government purchases and transfer payments. For derivation of the multiplier see Irving Stern, "Industry Effects of Government Expenditures," in U.S. Department of Commerce, BEA, *Survey of Current Business*, Vol. 55, #5, May 1975.

[5] Michael Bell and L. Richard Gabler, "Government Growth: An Intergovernmental Concern", in ACIR *Intergovernmental Perspectives*, Fall 1976, Vol. 2, #4, p. 9.

TABLE X. 1

GOVERNMENT EXPENDITURES IN THE NATIONAL INCOME ACCOUNTS
(Billions)

	1949		1959		1970		1978	
	Amount	% of Total Expenditures	Amount	% of Total Expenditures	Amount	% of Total Expenditures	Amount	% of Total Expenditures
Federal								
Purchases of Goods & Services	$19.3	48.7%	$54.7	60.2%	$97.0	49.6%	$153.7	33.3%
Transfer Payments	13.1	33.1	21.6	23.8	57.0	29.1	185.4	40.2
Domestic	8.1	20.5	19.8	21.8	55.0	28.1	181.9	39.4
Foreign	5.0	12.6	1.8	2.0	2.0	1.0	3.5	0.8
Grants-in-Aid	2.1	5.3	6.2	6.8	22.6	11.6	76.9	16.7
Net Interest Paid	4.3	10.9	5.9	6.5	13.6	6.9	35.5	7.7
Subsidies Less Current Surplus of Government Enterprises	.8	2.0	2.4	2.6	5.4	2.8	9.8	2.1
Total Expenditures	$39.6	100.0%	$90.9	100.0%	$195.6	100.0%	$461.3	100.0%
State and Local								
Purchases of Goods & Services	$18.0	89.1%	$43.7	93.2%	$123.2	93.2%	$280.2	93.5%
Transfer Payments	3.0	14.9	5.1	10.9	14.6	11.0	33.4	11.1
Net Interest Paid	.1	0.5	.1	0.2	—2.0	—1.5	—7.9	—2.6
Subsidies Less Current Surplus of Government Enterprises	—.9	—4.5	—2.0	—4.3	—3.6	—2.7	—5.9	—2.0
Total Expenditures	$20.2	100.0%	$46.9	100.0%	$132.2	100.0%	$299.8	100.0%

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

payments and grants-in-aid). In contrast, the distribution of state-local expenditures among the categories shown in Table X. 1 has remained relatively constant. The level of state-local purchases has increased at the rate of 10% per annum compared to 7.4% for federal purchases. Thus, for every dollar of federal purchases in 1949 state-local governments purchased $.93 of goods and services, while last year state-local governments had $1.82 of purchases per federal dollar of purchases.

Certainly, intergovernmental aid trends must be an important explanatory factor in the growth of state-local government. As Table X. 2 indicates, intergovernmental aid has become a critical revenue source at both the state and local levels. From 19.8% of state and 38.6% of local own-source general revenues in 1940, intergovernmental aid has become equal to 40.2% of state and 75.4% of local own-source general revenues. While state aid to local government is nearly four times the amount of federal aid, the gap is closing. Between 1950 and 1970 state aid to local government increased 9.7% per annum as federal aid increased 13.4% per annum. Since 1970 the state aid growth rate has climbed to 12.2% while the federal aid growth rate has increased dramatically to 30.3%.

Whether growth in intergovernmental aid is a stimulus or a result of growth in local public sector activity promulgated by those alternative forces is a complex issue.

Spending limitations will assuredly curtail growth in local expenditures. However, if local expenditure growth has resulted from inflexible demand and supply conditions, expenditure pressures will accumulatively mount upon the fiscal 'cap'. Since intergovernmental aid is a *substitute* for local revenues, local expenditure pressure upon the cap will be relieved. To the extent that intergovernmental aid is *stimulative,* local expenditure pressure upon the cap will in-

TABLE X. 2

INTERGOVERNMENTAL AID AS A PERCENTAGE OF OWN SOURCE GENERAL REVENUES FOR STATE AND LOCAL GOVERNMENTS IN THE UNITED STATES

	Intergovernmental Revenue			
	TO STATES		TO LOCAL GOVERNMENTS	
Year	From Federal Govts.	From Local Govts.	From Federal Govts.	From State Govts.
1977	37.9%	2.3%	16.3%	59.1%
1970	33.5	1.7	5.1	52.4
1960	31.0	1.8	2.6	41.6
1950	25.7	1.7	2.2	44.0
1940	18.2	1.6	5.6	33.0

SOURCE: U.S. Dept of Commerce, Bureau of the Census, *Historical Statistics of the U.S., Colonial Times to 1970,* and *Governmental Finances in 1976-77,* GF 77 No. 5., Nov. 1978.

crease. Descriptive information does not indicate what effect intergovernmental aid has had on expenditures. To explore the issue further, detailed information on New Jersey municipalities will be analyzed.

II. Intergovernmental Aid to New Jersey Municipalities

In 1977 New Jersey paid $1.25 in federal taxes for every dollar of federal grants received. Only six other states experienced higher tax burdens per dollar of aid. The high tax burden per dollar of aid results in large measure from a combination of high nominal dollar personal income in New Jersey and federal grant formulas which allocate on the basis of nominal rather than price-adjusted dollars (e.g., general revenue sharing and Medicaid). Consequently, despite the State's significant urban problems, federal aid was 37.0% of state and 12.1% of local own-source general revenues in 1977 as opposed to the national averages of 37.9% and 16.3%.

Even these aggregate statistics, however, are a poor method for measuring the effectiveness of intergovernmental aid. The level of non-educational aid varied considerably among New Jersey's 567 municipalities in 1977. Newark, for instance, received $1.19 in state and $.32 in federal aid for every dollar of own-source general revenue. Meanwhile Cherry Hill, an affluent suburb of Camden, received $.06 of state and $.06 of federal aid per dollar of own-source revenue.

The mix of grants-in-aid varies with the characteristics of communities. Table X. 3 shows the per capita distribution of aid among New Jersey municipalities in 1973 and 1976. Two years were chosen in order to demonstrate the changing distribution of aid outlays by state and municipality, and the particular years 1973 and 1976 were the earliest and most recent years for which detailed information on federal aid by municipality was available.

The categories of municipalities utilized in Table X. 3 are a rough stratification by municipal fiscal and economic conditions. The State's Big Six cities (Newark, Jersey City, Trenton, Paterson, Elizabeth and Camden) are clearly an individual class of disadvantaged urban centers. Other municipalities receiving state urban aid comprise the second category. Typically, these are smaller cities and townships that also experience big city problems. Third, there is a category of municipalities which are not receiving urban aid but are designated by the U.S. Community Services Administration as recipients of major amounts of federal aid. The remaining 515 municipalities make up the fourth category.[6]

[6] Atlantic City and eight other urban aid municipalities were completely omitted due to statistical reporting problems.

TABLE X. 3

MEAN PER CAPITA INTERGOVERNMENTAL AID TO NEW JERSEY MUNICIPALITIES: 1973, 1976
(dollars)

	1973				1976			
	Big Six Cities (N=6)	Other Urban Aid Municipalities (N=13)	Other Major Aid Receiving Municipalities (N=24)	Remaining Municipalities (N=515)	Big Six Cities (N=6)	Other Urban Aid Municipalities (N=13)	Other Major Aid Receiving Municipalities (N=24)	Remaining Municipalities (N=515)
Grants Per Capita	88	47	15	20	349	122	93	19
=								
Non-Matching Grants Per Capita	75	37	14	20	312	106	92	19
+								
Matching Grants Per Capita	13	10	1	NA	37	16	1	NA

SOURCE: *Federal Outlays in New Jersey,* U.S. Community Services Administration, Washington, D.C., FY 1973, FY 1976 and State of New Jersey, Dept. of Community Affairs, Division of Local Government Services, *Thirty-Ninth* and *Thirty-Fifth Annual Report,* 1977 and 1974.

The two most notable aspects of Table X. 3 are the spread in per capita aid across municipal categories and the growth in per capita aid between 1973 and 1976. With more than four times the per capita aid of the majority (the 515 municipalities in column 4) of New Jersey's municipalities in 1973, Big Six aid expanded to over 18 times that of the majority of municipalities by 1976.

Per capita total aid is subdivided further into non-matching and matching grants. Past research indicates that the local expenditure impact of aid varies by grant form,[7] being greatest for a matching grant and least for a non-matching grant.[8] The per capita aid gap between the Big Six and other urban aid municipalities widened slightly over the same time period in total per capita grants and in both the non-matching and matching subcategories.

Changes in non-matching grants closed the gap between the Big Six and other major aid municipalities despite the continued inability of (or lack of desire by) the other major aid municipalities to compete successfully for matching grants. Overall, for local governments in New Jersey non-matching aid is increasingly dominant, rising from 85% to 91% of total aid between 1973 and 1976.[9]

Expansion of non-matching aid relative to matching aid should lower the cost of aid to local governments and lessen aid differences among localities stemming from differences in grantsmanship abilities. As local matching capacities and local entrepreneurship play a diminished role in the distribution process, the distribution of aid should more closely conform to the policy objectives of the aid programs. Basically, the objectives of aid programs are: (1) fiscal equali-

[7] For an excellent survey of aid impact research, see ACIR, *Federal Grants: Their Effects on State-Local Expenditures, Employment* Levels, Wage Rates, A-61, February 1977, Washington, D.C.

[8] A matching grant requires the receiving government to supply a specified share of the program's cost (i.e., welfare). Non-matching grants are outright transfers to a local government.

[9] The major federal non-matching grant programs include state and local fiscal assistance, CETA and Community Development Block Grants. The major federal matching grant programs include Community Action, Economic Development-Public Works, and construction of wastewater treatment facilities; many lesser grant programs are included as well. Public assistance funds were excluded as administration occurs at the county and state levels. Aside from the Safe and Clean Streets Program which provided funds for foot patrols and street lighting, all state aid was non-matching.

zation, both between the federal-state and local revenue bases and among local governments; and (2) mitigation of certain local differentials in social and economic conditions. To the extent that the distribution of aid coincides with local fiscal disparities a reduction in pressure on the spending limitation would be expected. Effective distribution according to variations in local social and economic conditions should likewise reduce pressure on the spending limitation by easing the demand for locally financed social services and by strengthening the tax base through economic development.

Table X. 4 displays indexes of 1976 aid by fiscal, social and economic conditions in New Jersey municipalities. All indexes are based upon the Big Six, the municipalities with the most aid and the worst fiscal, social and economic conditions. In general, given the distribution of conditions, the thirteen "other urban aid" municipalities are receiving too little aid. Their fiscal capacity as measured by mean per capita property value is 23 percent greater (Index = 123) and their social and economic conditions measured by percent of persons in poverty are approximately 20 percent less (Index = 79) severe than the Big Six, yet "other urban aid" municipalities receive 65 percent (Index = 35) less aid per capita then that received by the state's six largest cities.

The twenty-four 'other municipalities receiving substantial aid' and the remaining 515 municipalities have ample fiscal capacity. Mean per capita property values are both 313 percent (Indexes = 313) as compared to the Big Six cities, yet they are receiving relatively too much aid given their fiscal conditions, 27 percent and 5 percent, respectively. Although economic conditions are approximately equal between 'other substantial aid' municipalities (Index of per capita income = 152) and the remaining municipalities (Index = 144), the latter communities receive over five times less aid per capita. Overall, given the indicators in Table X. 4, the aid

TABLE X. 4

INDEX OF MEAN INTERGOVERNMENTAL AID, FISCAL CAPACITY AND NEED INDICATORS AMONG NEW JERSEY MUNICIPALITIES

Index Category	Big Six Cities (N=6)	Other Urban Aid Municipalities (N=13)	Other Municipal Receiving Substantial Aid (N=24)	Remaining Municipalities (N=515)
Mean Grants Per Capita (1976)[a]	100	35	27	5
Fiscal Capacity				
Mean Per Capita Property Value (1976)[b]	100	123	313	313
Mean Per Capita Debt Service (1976)[b]	100	66	46	34
Mean Per Capital Municipal Expenditures (1976)[b]	100	69	51	51
Social Conditions				
Mean % Persons in Poverty (1970)[c]	100	79	27*	32
Percent Inadequate Housing (1970)[d]	100	83	33*	61
Crime Rate Per 100,000 (1976)[e]	100	80	59	53
Economic Conditions				
Mean Per Capita Income (1975)[c]	100	131	152	144
Per Capita Retail Sales (1972)[f]	100	129	185	136
Per Capita Service Receipts (1972)[g]	100	87	100	88

[a] See Table 4.
[b] State of N.J., Dept. of Community Affairs, Division of Local Gov't. Services, *39th Annual Report*, 1976.
[c] U.S. Dept. of Commerce, Bur. of the Census, *General Social & Economic Characteristics, N.J.*, 1970, PC (1)C32.
[d] U.S. Dept. of Commerce, Bur. of the Census, *General Housing Characteristics, N.J.*, 1970, HC (1)-A32.
[e] State of N.J., Div. of State Police, Uniform Crime Reporting Unit, *Uniform Crime Reports—1976.*
[f] U.S. Dept. of Commerce, Bureau of the Census, *1972 Census of Retail Trade, N.J.*, RC 62-A-31.
[g] U.S. Dept. of Commerce, Bureau of the Census, *1972 Census of Selected Service Industries*, SC72-A-31.
* 1970 U.S. Census data not available for townships so N = 11 for this category.

distribution system is most effective with regards to fiscal capacity, less effective with regards to social conditions, and least effective with regards to economic conditions.

For easing short run aid related pressures upon the cap in New Jersey, attention should be given to the mechanics of how the system of state and federal aid under-responds to urban aid municipalities other than the Big Six. For the long run, the inability of state and federal aid allocation formulas to respond to variations in local social and economic conditions needs to be investigated.

III. Fiscal Impacts of Grants-in-Aid

Generally, researchers have avoided the difficult question of measuring the fiscal impact of grants on local governments by aggregating the state and local sector with little regard for the design of the grant (matching vs. non-matching) or end-recipient of the grant. For example, past research would conclude that welfare grants are stimulative, yet welfare is a transfer program to individuals largely independent of local government discretion. The leeway afforded states in determining the level of expenditures is often indirectly related to behavioral responses within the State's fiscal network.

By and large, previous studies have viewed grants as stimulating expenditures because they were assumed to lower the price of a public good through a price effect. Grants also increase the purchasing power of state and local governments through an income effect. The use of regression analysis has been widespread as many researchers attempted to measure the fiscal impacts of grants by controlling for differences in the demand for public goods among states with such variables as urbanization and the level of income. The difficulty in constructing time series data led most researchers to accept a less than desirable cross-section approach.[10] The majority of the work published used state-local government spending per capita as a measure of the value of public goods and services.

Since federal aid is employed as an explanatory variable for total expenditures (which includes federal aid), a statistical bias is introduced as higher levels of grants must generate higher total expenditures. In this study statistical bias is reduced by using the equalized property tax rate as a proxy for local government spending.[11]

The data problems involved with federal grant statistics have encouraged researchers to avoid separating the state government sector from the local government sector. Inherent dangers of double-counting are present as some federal grants are cited as a state expenditure and then appear again as a local expenditure as the grant is filtered through the fiscal systems. This approach also neglects the growing contribution of *state* grants to local governments. We have controlled for these influences by isolating fiscal responses and by adding the contribution of state grants-in-aid to local governments. A model has been estimated for two years (1973, 1976) in order to provide some control over the cross-section problem.

IV. The Model

A sample of 43 New Jersey municipalities receiving significant quantities of federal and state aid were studied.[12] The sample included the State's Big Six cities as well as a representative number of other urban and suburban communities. It should be noted that the sample represents a wide range of economic and social conditions across the State. The dependent variable representing local government spending is the equalized tax rate (per $10,000 of equalized value). In New Jersey the tax rate is a close

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[10] ACIR, *op. cit.* p. 5., The time series approach directly measures the response of state-local expenditures to changes in grants. The cross-section, however, looks at a particular year. If the year chosen is early in the grant's existence, and the program is attractive to localities, there is a greater chance of observing a highly stimulative relationship between expenditures and the grant. If the year selected falls late in the programs' existence, local interest may have waned and the grant may now be observed as a substitute for local spending.

[11] The equalization process simply adjusts the assessed value of real property to current market value. It is a proxy for spending since it represents the wealth basis of the community.

[12] Local government budgets are summarized in the *Annual Report* of the Division of Local Government Finance, New Jersey Department of Community Affairs, selected years.

approximation of spending since 83% of local own-source expenditures are financed directly from the property base.

Explanatory variables included the amount of federal and state matching and non-matching aid per capita. Based on past research one would hypothesize a positive (stimulative) coefficient for matching aid. Non-matching grants, however, are often used for local fiscal relief. This introduces a negative relationship (substitution effect) between grants and own-source spending. A number of demand and behavioral variables were also introduced to control for differences among communities in the desired level of public services.

As the population density of a municipality grows, there are increasing demands for labor intensive social services. Previous studies[13] found New Jersey's Big Six cities to spend 50 percent above the statewide average for public safety per capita (police, fire) and over 100 percent more for human services. Also, as population density grows and the share of labor intensive social services increases, there are few opportunities to offset rising wages with gains in productivity. Public spending (and the tax rate) will rise as the number of manhours devoted to social services increases. A positive relationship between density and the tax rate is expected. The per capita tax base (equalized property value per capita) was employed as an indicator of local ability to pay and also represents a limit or budget constraint on own-source expenditures and thus the tax rate. The tax base should have a negative relationship with the local tax rate since any given level of public services can be financed with a lower tax rate if the property base is expanding.

TABLE X. 5

DETERMINANTS OF MUNICIPAL PROPERTY TAX RATES, 1973

	Constant	Density	Base	Total Grants	Non-Match	Match	R^2
1.	40.628	.0079	−.0022	.6092			.803
	(1.65)*	(6.077)**	(−1.467)*	(2.287)**			
2.	39.674	.0078	−.0022		.7931		.803
	(1.62)*	(6.000)**	(−1.467)*		(2.400)**		
3.	51.017	.0088	−.0026			1.3732	.784
	(2.045)**	(6.769)**	(−1.625)*			(1.342)*	

NOTE: t-statistics in parentheses.
* Significant at the 90% confidence level.
** Significant at the 99% confidence level.

Definition of Variables:

(X_1) Density $-\frac{\text{Population}}{\text{Sq. Mile}}$ = Thousands of persons per square mile.

(X_2) Base $-\frac{\text{Equalized Value}}{\text{Population}}$ = Equalized property value (in thous. $) per person.

(X_3) Total Grants $-\frac{\text{Total Fed. \& State Grants}}{\text{Population}}$ = Total federal and State grants (in hundreds $) per person.

(X_4) Non-Match $-\frac{\text{Total Non-Match}}{\text{Population}}$ = Total non-matching federal and State grants (in hundreds $) per person.

(X_5) Matching $-\frac{\text{Matching}}{\text{Population}}$ = Total matching federal and State grants (in hundreds $) per person.

(Y) Equalized Tax Rate—General Tax Rate x Equalization Ratio = The equalized tax rate is the tax rate that would apply if the property taxes were assessed at (true) market value. The equalization ratio, based upon an annual survey of real estate sales, represents the average ratio between assessed and market property value.

[13] Nagle, G. R., "Urban Revitalization and Fiscal Problems," *11th Annual Report*, Office of Economic Policy, 1978.

Overall, a hundred dollars of additional federal and state aid per capita was found to generate a $.6092 increase in the local tax rate per $10,000 of equalized value (see equation 1, Table X. 4). The density variable was positive, as expected, and strongly significant. The base variable was significant and its negative sign confirms the expected inverse relationship between the local tax rate and base.

Separate regressions representing the fiscal impact of matching and non-matching grants were run to minimize the possible correlation between types of federal aid. Matching grants (equation 3), significant at the 90% level, were found to generate the largest increase in the local tax rate, $.0137 per dollar of per capita matching aid. This finding accords with theory which predicts a stimulative response to a matching grant since both a price effect and income effect are at work.

Previous studies have shown that a non-matching grant is often a substitute for own-source spending as only an income effect is present. The community which finds itself relatively more wealthy may purchase more public goods and simultaneously use part of the grant to finance a tax cut.

Within the sample of New Jersey municipalities non-matching grants (equation 2) were also found to be stimulative, but less so than matching grants. For each per capita dollar of aid, the local tax rate increased by $.0079.

A second cross-section sample using 1976 fiscal data was drawn to confirm the 1973 results. Using the same 43 municipalities, the following were observed:

In 1976 total intergovernmental grants appeared to be *less* stimulative than in 1973. An increase of one hundred dollars in per capita grants (equation 4) now generate only a $.2089 increase in the local tax rate. It should be noted that during the 1973-76 time period the average level of per capita aid in New Jersey rose from $51 to $200. Thus there appears to be a relationship between the level of intergovernmental aid and the degree of fiscal response. In all instances the density and tax base variables displayed the correct sign and were significant at the 99% confidence level.

Matching grants (equation 6) were, once again, the more stimulative grant design, however the degree of stimulation (.734) was only about one-half that measured in 1973 (1.37). The sharpest decline in fiscal response was observed, however, for non-matching grants which had experienced relatively faster growth since 1973 (equation 5). Whereas in 1973, a dollar of per capita aid generated an $.008 increase in the local tax rate; in 1976 the local response was only $.002.

Finally, a statistical test (analysis of covariance) was conducted to determine if the 1973 and 1976 equations were significantly different from one another. Statistically significant differences in the coefficients would indicate that a major change in local attitudes toward intergov-

TABLE X. 6

DETERMINANTS OF MUNICIPAL PROPERTY TAX RATES, 1976

	Constant	Density	Base	Total Grants	Non-Match	Match	R^2
4.	100.535	.0079	−.0055	.2089			.726
	(2.382)**	(4.158)**	(−2.619)**	(2.360)**			
5.	106.774	.0079	−.0059		.2200		.720
	(2.531)**	(4.158)**	(−2.809)**		(2.134)**		
6.	109.834	.0085	−.0051			.7344	.716
	(2.59)**	(4.474)**	(−2.318)**			(1.974)**	

t—Statistics in parenthesis.
** Significant at the 99% confidence level.

TABLE X. 7

DETERMINANTS OF MUNICIPAL PROPERTY TAX RATES, 1973 AND 1976 POOLED

	Constant	Density	Base	Total Grants	Non-Match	Match	R^2
7.	69.630	.0084	−.0040	.2538			.749
	(3.23)**	(7.90)**	(−3.31)**	(4.36)**			
8.	73.149	.0084	−.0043		.2767		.744
	(3.38)**	(7.76)**	(−3.51)**		(7.47)**		
9.	66.405	.0091	−.0032			.9872	
	(2.71)**	(6.44)**	(−1.88)			(3.34)**	.738

t−statistics in parentheses.
** Significant at the 99% confidence level.

ernmental aid had occurred. The fact that the stimulative effect of aid on the local tax rate had dropped by more than half between 1973 and 1976 might well mean that intergovernmental aid was being incorporated into the long run local revenue base. The test results showed, however, that the equations for the two years were not significantly different from one another. An equation pooling the data for both years is then an acceptable and even desirable alternative to the equations for individual years. The pooled equations are found in Table X. 7.

V. Summary and Policy Implications

Over the past quarter century public sector growth, with state and local governments leading the way, has far exceeded the expansion of the private sector. Municipal spending limitations, such as enacted in New Jersey, will assuredly curtail growth in local expenditures. Yet the exclusion of intergovernmental aid from the local spending limitation will produce complications since intergovernmental aid has been the fastest growing component among all federal and state outlays.

In New Jersey during 1977 the average municipality received $.51 of aid per dollar of own-source revenue, with a high of $1.51 per dollar in Newark. This leaves anywhere from one-third to almost two-thirds of the local budget outside of the fiscal cap. Second, ineffective distribution of aid makes the cap more of a hardship for some municipalities than others. For example, New Jersey urban aid municipalities other than the Big Six appear to be receiving less aid per capita than their fiscal capacity would warrant while the majority of other municipalities receive more aid than warranted.

Third, as this research shows, intergovernmental aid stimulates local own-source expenditures, and matching grants stimulates own-source expenditures more than non-matching grants. Samples selected for two years yielded consistent conclusions with regard to the stimulative properties of both grant designs. Any increase in the proportion of matching aid relative to non-matching aid by the state or federal governments will therefore increase pressure on the cap by raising the own-source revenue-expenditure efforts by municipalities.

XI

IMPACT OF THE PUBLIC SCHOOL EDUCATION ACT OF 1975*

In 1973 the New Jersey Supreme Court declared the Bateman Act unconstitutional on the basis of the fiscal disparity findings of the lower Court, although for somewhat different legal reasons.

Judge Botter had found wide interdistrict per pupil expenditure disparities, a strong relationship between property wealth and per pupil expenditures and an inverse relationship between per pupil expenditures and local tax rates. He concluded that these disparities could not generally be explained by such legitimate factors as cost of living variances, varying concentrations of children with high cost educational needs, or other legitimate variations in resource costs or administrative efficiency. He held that the inequities which result from heavy reliance upon local property taxes violate both State and Federal guarantees of equal protection because taxpayers in poor districts pay higher taxes than taxpayers in wealthy districts while their children get inferior education compared to children in affluent districts.

The New Jersey Supreme Court in 1973, rejected the equal protection arguments. Instead it held that the Bateman Act could not assure the "thorough and efficient system of free public schools" required by the State Constitution. The Court ordered the Legislature to spell out the content of the educational opportunity the Constitution requires, and to create a new funding system which would enable each school district to meet the educational requirements of the new Act.

On October 1, 1975, the Legislature responded to the Court mandate with the Public School Education Act of 1975. In January 1976, the Court held the new Act to be facially constitutional, waiting for future factual circumstances to determine whether it could "pass constitutional muster".[1] The Court placed particular reliance on the authority of the Commissioner to examine the causes of local failure and the power to mandate changes in procedures and local budgets to overcome those failures. It held that the State aid plan was the Legislature's best estimate of what was necessary to meet "the system of public education that will emerge"[2] from the interaction of the required local planning process and the Commissioner's evaluation role.

The purpose of this paper is to examine whether the new Act has in fact reduced the fiscal disparities which existed under the former unconstitutional Bateman Act. It will look at the following fiscal criteria which were discussed by the Courts: interdistrict disparities in per pupil expenditures; fiscal neutrality; taxpayer equity; urban needs; and pupil needs.

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* Prepared by Lawrence Rubin, Ed.D., Rutgers University.

[1] Robinson v. Cahill, 69 N.J., 455, (1976).

[2] Ibid., 465.

Evaluation Criteria

In their 1973 decision, the New Jersey Supreme Court agreed with Judge Botter that the constitutional demand had not been met, on the basis of discrepancies in dollar input per pupil, saying "we deal with the problem in those terms because dollar input is plainly relevant and because we have been shown no other viable criterion for measuring compliance with the constitutional mandate."[3] In their 1976 decision the Court reaffirmed this focus when they justified their approval of the new law as having "taken positive steps to eliminate gross disparities in per pupil expenditures and tax resources."[4]

This study will, therefore, examine whether the interdistrict disparities in per pupil expenditures which existed under the old law have been diminished since the implementation of the new law.

The evaluation criteria also include: the correlation between school tax rates and per pupil expenditures (taxpayer equity), urban needs and pupil needs.

Statistical Design

This study compares the years 1974-75 and 1977-78; 1974-75 was the last year funded in accordance with the old Bateman Act formula, while 1977-78 is the first year in which the new law was effectively implemented, and the first year which can be used to measure the impact of the new law.

This study examines all districts, other than county vocational districts, which had more than 50 pupils and which operated for a full fiscal year.

Current Expenditures Per Enrolled Resident Pupil. The enrollment figures used in this study are resident, not actual. Some districts serve students from other districts and receive tuition revenue. The latter were subtracted from total current expenditures. Also excluded were federal-supported programs.

Total Expenditures Per Resident Enrolled Pupil. In addition to current expenditures as defined above, these include capital outlay and debt service.

Pupil Needs Index. An index was created to represent each district's relative pupil educational needs. It is based upon each district's enrollment of pupils in State approved and supported categorical aid programs and the "additional cost factor" for each program which appears in the current State aid formula.

School Tax Rate and Non-School Tax Rate. Are taken from NJEA Basic Statistical Data.

Community Type. Districts were classified into 10 categories in accordance with the system used by the Joint Committee on Public Schools.[5]

Percent Above State Standard. The New Jersey State Department of Education has conducted an educational assessment program since 1972. In October 1976, a statewide minimum standard was created for reading and mathematics for grades 4, 7, and 10. The "Percent Above State Standard" is the average of the six percentages of children above the statewide standard in the two subjects and three grades. It is a very approximate indicator of a district's cognitive achievement level.

Analysis of Fiscal Impact

Interdistrict Disparity in Per Pupil Expenditures

Overview

There are at least nine statistics which are used to measure variance in expenditures per pupil. Those which are commonly used in New Jersey are, the range; the band of equality; and the coefficient of variance and are listed in Table XI.1.

The variation in expenditures per pupil among New Jersey school districts is extreme.

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[3] Robinson v. Cahill, 62 N.J., 515-516, (1973).

[4] Robinson v. Cahill, 69 N.J., 467, (1976).

[5] Joint Committee on Public School *Monitoring Program 2 Impact of State Aid on Taxes,* (Trenton: Joint Committee on the Public Schools, January 21, 1977), pp. 6-9, pp. 38-49.

TABLE XI.1

MEASUREMENT OF INTERDISTRICT DISPARITIES IN TOTAL EXPENDITURES PER PUPIL IN NEW JERSEY SCHOOL DISTRICTS, 1974/75 VS. 1977/78

	1974/75				1977/78			
Range	High	Low	Difference	Ratio	High	Low	Difference	Ratio
Highest to Lowest	$3,474	$ 816	$2,658	4.26	$4,507	$1,078	$3,429	4.18
95th to 5th Percentile ...	2,104	1,144	960	1.84	2,684	1,551	1,133	1.73
90th to 10th Percentile ..	1,945	1,228	717	1.58	2,487	1,659	728	1.50
Band of Equality	High	Low	Difference	% Of All Pupils In Band	High	Low	Difference	% Of All Pupils In Band
95%-105%	$1,642	$1,486	$ 156	22.3	$2,161	$1,955	$ 206	21.5
90%-110%	1,720	1,408	312	37.6	2,264	1,852	412	47.1
85%-115%	1,799	1,329	470	53.0	2,367	1,749	618	65.1
Coefficient of Variation .				.19				.16
Mean Average				$1,564				$2,058

In 1974-75 there was a difference of $2,658 between the highest and lowest spending districts in the State. Red Bank Regional spent $3,474 per pupil, which was 4.26 times the $816 per pupil spent in Interlaken. In 1977-78 the absolute gap between the highest and lowest districts had increased to $3,429 per pupil. Deal spent $4,507 per pupil which was 4.18 times the $1,078 spent by Interlaken.

In terms of the range of absolute values, variation in expenditures has worsened during this period. However, one can also take the view that the relative difference between the highest and lowest spending districts has declined somewhat from 4.26 to 4.18 times the lowest district expenditure level.

One need not examine only the extremes to illustrate expenditure disparities in New Jersey. Eliminating the ten percent of districts with the highest and lowest expenditures per pupil, the difference between the highest and lowest spending districts among the remaining ninety percent increased from $960 per pupil in 1974-75 to $1,133 in 1977-78, although the ratio between the highest and lowest declined from 1.84 to 1.73. Going further and eliminating the 20 percent of districts with the highest and lowest expenditures per pupil, the difference in the remaining 80 percent increased from $717 to $728 per pupil, while the ratio of the highest to lowest in this group declined from 1.58 to 1.50.

Based upon the absolute changes in expenditures per pupil at the extremes or using only the middle 90 percent or even 80 percent, it is evident that per pupil expenditures disparities have worsened in New Jersey between 1974-75 and 1977-78. However, if one judges expenditure disparities on the basis of relative change, the data show a modest decline in the ratio of expenditures per pupil between the highest and lowest districts in each of the three groups.

The Band of Equality

This statistic measures the percentage of pupils who fall within a stated percentage above

and below the statewide average expenditure per pupil. Progress is evidenced when there is an increase in the percentage of pupils within a band over time. Using the band between 85% and 115% of the statewide average, a recent report of the New Jersey Legislature's Joint Committee on Public Schools concluded that expenditure disparities in the State had been reduced because the proportion of the State's students within this band had increased from 62.9% to 63.7% between 1975-76 and 1976-77.[6] However, the range of this band in 1977-78 is a very large $618 per pupil.

The proportion of the State's students in the 95%-105% band of equality, with a range of $206 per pupil, actually declined during this period from 22.3% to 21.5%. At the same time, the proportion of the State's students below 95% increased from 48.0% to 54.5%, while the proportion above 105% went down from 29.7% to 24.0%.

The Coefficient of Variation

This statistic, which measures total variation or dispersion and evidences progress towards equality of expenditures as it is reduced over time, showed a modest reduction. This result supports the evidence of the range statistic and enables one to conclude that there was a modest decline in the overall magnitude of interdistrict disparities in per pupil expenditures, when measured in relative terms. However, when measured in absolute terms, interdistrict per pupil expenditure disparities increased between 1974-75 and 1977-78.

Analysis of Specific Districts

Table XI.2 compares the K-12 districts with enrollments in excess of 1,000, which were the ten highest and ten lowest spending districts in the State in the 1977-78 school year. The lowest spending districts included a diversity of community types, were geographically diverse, low socioeconomic, low property wealth districts with relatively high pupil needs and low achievement. The high spending districts are almost all suburban and are concentrated in Bergen County. They are high property wealth districts with relatively low pupil needs and high achievement levels.

Despite the fact that all the low spending districts were far below the State average expenditure level in 1974-75, and had substantially above average educational needs, they all increased their per pupil expenditures by less than the State average increase.

Millville, for example, which was the lowest spending K-12 district in 1974-75, and which has an average pupil needs index, but whose student body showed below average achievement levels, was still the lowest spending K-12 district in 1977/78. In fact it spent $358 below the State average in 1974/75 and $578 below in 1977/78. Similarly, Paterson, with the highest pupil needs in the group, spent $359 per pupil below the State average in 1974/75 and $536 below the 1977/78 State average.

By contrast, the high spending districts all had expenditure levels in 1974/75 which were substantially above the State average, had relatively low educational needs, and all but two increased their expenditure level by far more than the State average.

Tenafly, for example, a district with low pupil needs and very high achievement levels, increased its expenditures by $508 per pupil to a level in 1977/78 more than double the per pupil expenditure in Millville, and almost double that of Paterson. Leonia increased its expenditures by $871 per pupil or 31 percent over the 1974/75 level. These large increases took place despite an expenditure cap provision in Chapter 212 which was intended to limit the expenditure increases of the high spending districts to 3% to 4% per year. Waivers of the cap by the Commissioner and reductions in enrollment are the major reasons for the failure of this provision to achieve its purpose.

The average low spending district received an increase in State aid of $207 per pupil, and increased its per pupil expenditures by $360 per pupil. By comparison, the average high spending

[6] *The Fiscal Impact of Budget Caps in 1976-77*, (Trenton: Joint Committee on the Public Schools, 1977), p. 88.

TABLE XI.2

COMPARISON OF TEN LOWEST AND TEN HIGHEST SPENDING K-12 DISTRICTS, 1974/75 VS. 1977/78*

	Comm. Type	DFG	Pupil Needs Index	% Above State Stand	Enrollment 10/1/77[1]	Wealth Per Pupil 10/1/77	Total Expenditures Per Pupil 74/75	77/78	Diff.	Incr. Aid 74/77	School Tax 74/75	77/78	Diff.	Non-School Tax 1974	1977	Diff.
State Average			106	77%[2]		$79,320	$1,564	$2,056	$492	$281	1.83%	1.63%	—.20%	1.16%	1.10%	—.06%
Low Expenditure Districts																
Millville (Cumb.)	RC	B	106	66	5,357	41,745	1,118	1,478	360	258	1.66	1.43	—.23	2.16	1.74	—.42
Paterson (Pass.)	MUC	A	113	40	27,197	29,668	1,205	1,520	315	269	1.88	1.65	—.23	2.22	2.44	—.22
Pemberton Twp. (Burl.)	SR	C	106	67	8,168	27,237	1,155	1,529	374	198	1.07	1.31	+.24	1.29	1.29	....
Clayton (Glouc.)	SR	C	106	65	1,282	45,937	1,235	1,529	294	240	1.75	1.54	—.21	1.08	1.04	—.04
Gloucester City (Cam.)	US	A	109	74	2,435	46,004	1,090	1,530	441	216	1.56	1.42	—.14	1.81	1.61	—.20
Paulsboro (Glouc.)	RC	A	108	63	1,446	44,023	1,247	1,590	343	168	1.51	1.43	—.08	1.91	1.48	—.43
Monroe (Glouc.)	SR	B	106	67	3,986	54,833	1,330	1,608	278	162	1.81	1.54	—.27	.79	.63	—.16
Pt. Pleasant Bor. (Ocn.)	S	D	112	82	3,408	79,699	1,247	1,611	364	178	1.60	1.51	—.09	.98	1.03	+.05
Keansburg (Mon.)	S	B	112	60	2,020	39,061	1,185	1,629	444	305	1.90	1.61	—.29	1.96	1.91	—.05
Garfield (Berg.)	OUC	A	107	73	3,215	109,226	1,246	1,640	394	76	1.25	1.25	....	1.15	.88	—.27
AVERAGE			109	66%	5,851	$51,743	$1,206	$1,566	$360	$207	1.60%	1.47%	—.13%	1.54%	1.41%	—.13%
High Expenditure Districts																
Tenafly (Berg.)	US	J	103	92%	2,696	$133,122	$2,457	$3,037	$580	$41	2.17%	2.09%	—.08%	1.35%	1.49%	+.14%
Mahwah (Berg.)	SR	H	104	82	2,216	148,494	2,307	2,934	628	106	1.83	1.70	—.13	.88	.71	—.17
Hackensack (Berg.)	UC	D	112	71	4,456	147,367	2,178	2,910	732	99	1.59	1.65	+.06	1.56	1.33	—.23
Paramus (Berg.)	S	H	105	87	5,235	178,299	2,106	2,902	796	89	1.62	1.43	—.19	.84	.59	—.25
Teaneck (Berg.)	US	I	106	80	6,327	98,739	2,011	2,836	825	73	2.20	2.46	+.26	1.60	1.63	+.03
Glen Rock (Berg.)	S	J	106	92	2,126	119,894	2,141	2,820	679	52	2.23	2.00	—.23	1.11	1.01	—.10
Leonia (Berg.)	US	I	105	85	1,297	112,066	1,940	2,811	871	80	1.97	2.17	+.20	1.24	1.20	—.04
Englewood (Berg.)	UC	G	109	66	3,501	128,598	2,495	2,794	299	99	2.03	1.87	—.16	2.08	1.91	—.17
Millburn (Essex)	S	J	103	91	3,507	184,782	2,177	2,777	600	31	1.38	1.28	—.10	1.86	1.95	+.06
Princeton (Merc.)	S	J	104	91	3,004	188,616	2,366	2,762	396	43	1.45	1.29	—.16	1.49	1.42	—.07
AVERAGE			106	84%	3,437	$143,998	$2,218	$2,858	$640	$71	1.85%	1.79%	—.06%	1.40%	1.32%	—.08%

[1] This Table includes only districts with enrollment over 1,000.
[2] Estimate.
* The abbreviated terms used in the tables in this study are as follows:

MUC — Major Urban Center
OUC — Other Urban Center
US — Urban Suburban
S — Suburban
SR — Suburban Rural
R — Rural
RC — Rural Center
RCR — Rural Center Rural
SEA — Seashore
REG — Regional

DFG—District Factor Grouping is a term and concept developed by the New Jersey State Department of Education as a composite indicator of the socioeconomic characteristics of a school district. The DFG ranges from a low of A to a high of J.

district received an increase in State aid of $71 per pupil, and increased its expenditures by $640 per pupil.

The low spending districts despite relatively low property wealth, had an average school tax rate of $1.60 in 1974/75, 12.5 percent below the State average, and reduced it to $1.47 in 1977/78 to about 10 percent below the State average. By contrast, the high spending districts, despite relatively high property wealth, had a school tax rate of $1.85.

All but one of the low spending districts were below the Guaranteed Tax Base (GTB) of $97,000 in 1977/78, and therefore benefitted from an increase in equalization aid. Garfield, although above the GTB, received minimum equalization aid of $165 per pupil, which it had never received before.[7] Although the low spending districts received an average increase in State aid per pupil almost three times as great as the average increase of the high spending districts, their average expenditure increase was only 56 percent of the high spending district average increase. Instead of moving their expenditure level closer to the State average, they dropped even further below the State average, and elected to reduce their already low school taxes even lower. For example, low spending Millville, which received an increase in State aid of $258 per pupil, increased its expenditures by $360 per pupil and reduced its school tax rate from $1.66 to $1.43. At the same time, high spending Leonia, which received an increase in State aid of $80 per pupil, increased its expenditures by $871 per pupil, and increased its school tax rate from $1.97 to $2.17.

It is evident from these data that the present State aid system lacks the capacity to insure minimum adequate expenditure levels or prevent huge disparities between high and low spending districts. One reason is that there is no minimum expenditure level or tax rate to push up the spending level of the low spending districts. Districts can spend as little as they wish and use increased State school aid for tax relief rather than expenditure increases. A second reason is that the expenditure cap provision, because of an inadequate formula, the easy availability of cap waivers, and the effect of declining enrollment, has failed to exert downward pressure on the high spending districts.

Fiscal Neutrality

The relationship between property wealth and per pupil expenditures is demonstrated in this section in four ways. One is the Gini Coefficient, a statistic which declines in value when there is movement towards a closer relationship between property wealth and per pupil expenditures. The second is the correlation coefficient, a statistic which measures the degree of association between two variables. The third is an analysis of expenditures per pupil of districts grouped into ten deciles of approximately equal enrollment, ranked by equalized valuation per resident pupil. The fourth is an analysis of specific districts.

Gini Coefficient. The Gini Coefficient for total expenditures per pupil increased between 1974-75 and 1977-78 from .042 to .048, indicating an increase in the extent to which expenditures are related to weatlh.

Correlation Coefficient. The correlation coefficient for total expenditures per pupil and equalized valuation per pupil increased between 1974-75 and 1977-78 from .55 to .58, indicating an increase in the degree of the relationship between expenditures and wealth.

Expenditures per pupil in districts grouped by property wealth. Table XI.3 groups districts into 10 deciles of approximately equal resident enrollment, ranked in accordance with equalized valuation per pupil. The lowest three deciles which had an average per pupil expenditures of $1,454 in 1974, increased their expenditures by $406 to $1,860 per pupil. At the same time, the highest three deciles increased their average per pupil expenditures by $536, from $1,744 to $2,280.

[7] The Chapter 212 wealth equalization formula provides a minimum of 10% of the State Support Limit for each pupil in a district, regardless of district wealth. In 1977-78, the State Support Limit was $1,648, therefore minimum equalization aid was $164.80 per pupil.

TABLE XI.3

EXPENDITURES PER PUPIL IN DISTRICTS GROUPED BY PROPERTY WEALTH, 1974/75 VS. 1977/78

	Average Equalized Value Per Pupil		Percent Change	Total Expenditures Per Enrolled Resident Pupil		Percent Change	Total State Aid Per Resident Pupil			Percent Change	School Tax Rate		Percent Change	Non-School Tax Rate		Percent Change
Decile	10/1/74	10/1/77		74/75	77/78		74/75	77/78	Diff.		74/75	77/78		1974	1977	
1	$21,956	$25,458	16.0%	$1,606	$1,859	15.8%	$1,022	$1,267	$245	14.2%	2.22%	1.62%	—27.0%	2.27%	2.25%	— 1.0%
2	31,154	36,332	16.6	1,351	1,918	42.0	674	1,141	467	69.3	2.03	1.87	— 7.9	1.50	1.84	+22.7
3	38,895	49,490	27.2	1,406	1,804	28.3	520	928	408	78.5	2.18	1.68	—23.0	1.34	1.11	—17.2
4	46,887	60,890	29.9	1,445	1,946	35.0	377	808	431	114.3	2.17	1.74	—19.8	1.12	1.13	+ 1.0
5	54,800	71,088	29.7	1,427	1,984	39.0	250	685	435	174.0	2.06	1.76	—14.6	1.01	.95	— 5.9
6	60,619	78,841	30.1	1,545	2,025	31.1	243	570	327	134.6	2.08	1.77	—14.9	1.08	1.04	— 3.7
7	67,351	87,450	29.8	1,656	2,187	32.1	238	469	231	97.1	2.04	1.90	— 6.9	1.06	1.00	— 5.7
8	73,233	96,050	31.2	1,674	2,198	31.3	236	339	103	43.6	1.90	1.88	— 1.1	1.06	1.02	— 3.8
9	85,778	112,582	31.3	1,716	2,249	31.1	234	316	82	35.0	1.68	1.66	— 1.1	.98	.89	— 9.2
10	132,906	175,591	32.1	1,842	2,392	29.9	244	331	87	35.7	1.16	1.14	— 1.7	1.12	1.03	— 8.0
State Avg.	$60,519	$79,320	31.1%	$1,564	$2,056	31.5%	$406	$687	$281	69.2%	1.83%	1.63%	—10.9%	1.16%	1.10%	— 5.2%

The lowest wealth decile received an increase in State aid of $245 per pupil which was less than the State average of $281 per pupil and the lowest proportionate increase in State aid of all the ten groups.[8] By contrast, districts in the sixth decile, which had an average equalized valuation per pupil almost three times that of the lowest decile, received an increase in State aid per pupil of $327 per pupil.

While the children in the high wealth districts, who enjoyed the highest expenditure levels in 1974/75, received the largest increases in expenditures, the children in the low wealth districts, with the lowest expenditure levels in 1974/75, received the lowest expenditure increases. At the same time, the taxpayers in the lowest wealth districts benefitted from the greatest school tax reductions. Although all the district groups, even the highest, showed at least some tax reduction, the lowest wealth districts, which had the highest school tax rate in 1974/75, had the second lowest school tax rate in 1977/78. Only the very wealthiest school districts had a lower rate.

One possible explanation of the behavior of the lowest decile districts can be seen in the non-school tax rate data. It is important to bear in mind that whereas the Chapter 212 state school aid formula provided a guaranteed tax base of $97,000 per pupil for purposes of district school budgets, each district must rely upon its own actual tax base to support its county and municipal budgets. As a result, the low wealth districts must have very high non-school tax rates to maintain comparable services. By comparison with the State average non-school tax rate of $1.16 in 1974 and $1.10 in 1977, the low wealth group had a non-school rate of $2.27 in 1974 and $2.25 in 1977. Clearly, the existence of very high non-school tax rates in low wealth districts creates a disincentive to raising school expenditures and school tax rates.

The upward pressure on non-school tax rates in low wealth districts can be explained in part by the fact that the cost of county and municipal services has risen faster than their property base.

[8] Actual State aid to the poor districts was already much higher in 1974-75 than the statewide average and it remained so in 1977-78.

Cost increases between 1974 and 1977 have been estimated at somewhere between 20% and 25%. However the property tax base of the two lowest wealth deciles increased by only 16% during this period. The result would therefore be either an increase in non-school tax rates or a reduction in services.

Analysis of Specific Districts

Table XI.4 lists the ten lowest wealth and ten highest wealth K-12 districts with enrollments exceeding 1,000. The low property wealth districts tend to be geographically diverse, urban, low socioeconomic districts with very high pupil needs and very low achievement levels. The high property wealth districts are diverse in terms of location, socioeconomic characteristics and community type, and have relatively low pupil needs and high achievement.

The average low wealth district spent $102 below the State average in 1974/75 and $108 below in 1977/78, while the average high wealth district spent $338 above the State average in 1974/75 and $546 higher in 1977/78.

For example, Camden, with average property wealth per pupil of 25% of the State average, spent $284 below the State average in 1974/75 and $128 less in 1977/78. By contrast, Ocean City, with average property wealth per pupil 4.65 times the State average, and almost 17 times Camden's wealth per pupil, spent only $13 above the State average in 1974/75, but $571 higher in 1977/78.

As a group, the low wealth districts increased their per pupil expenditure level by about the same as the State average increase of $492. Bridgeton and Salem City increased by more than $700 per pupil. By contrast, Newark which in 1974/75 was spending $298 per pupil above the State average, spent $44 per pupil below the State average in 1977/78. Similarly, East Orange moved from $34 above in 1974/75 to $212 below in 1977/78.

All but one of the high wealth districts increased their per pupil expenditures by more than the State average increase. Ocean City and Manchester went up by more than $1,000 per pupil. Despite the relatively large expenditure increases, all but two of the high wealth districts also were able to reduce their school tax rates.

While the high wealth districts increased their expenditures per pupil by more than ten times their increase in State aid per pupil, the low wealth districts had a ratio of increased expenditures to increased aid of only 1.42. As a result, the low wealth districts were able to reduce their average school tax rate by 16% from $2.13 to $1.79, while the high wealth districts reduced their already low average rate of $1.15 to $1.11.

Newark, for example, received an increase in State aid of $239 per pupil, but increased its expenditures by only $150 per pupil, and as a result was able to reduce its school tax rate from $2.54 to $1.59. At the same time, Ocean City, despite an aid increase of only $65 per pupil, and because of its very high property base, was able to increase its expenditures per pupil by $1,050 per pupil and still maintain a school tax rate of $.54 in both years.

As disscused in the analysis of Table XI.3, one possible explanation for the behavior of the low wealth districts can be seen in their very high non-school tax rates. In Newark, for example, the non-school tax rate increased from $2.96 to $4.32, an increase which exceeded the school tax reduction, causing the city's total tax rate to increase. East Orange and Paterson had similar experiences. The fact that their non-school tax rates are substantially higher than the State average, and increased during this period must have had a major effect on school budget decisions.

It is evident from the data in this section that the relationship between property wealth and expenditures has not diminished since the implementation of the new State aid formula. In fact the relationship has increased. Although there is a wealth equalization provision in the Chapter 212 State school aid formula, because there is no comparable support for county and municipal expenses, districts with low tax bases suffer high non-school tax rates, and are pressured into re-

TABLE XI.4

COMPARISON OF TEN LOWEST AND TEN HIGHEST WEALTH K-12 DISTRICTS, 1974/75 VS. 1977/78

	Comm. Type	DFG	Pupil Needs Index	% Above State Stand	Enrollment 10/1/77[1]	Wealth Per Pupil 10/1/77	Total Expenditures Per Pupil 74/75	Total Expenditures Per Pupil 77/78	Total Expenditures Per Pupil Diff.	Incr. Aid 74/77	School Tax 74/75	School Tax 77/78	School Tax Diff.	Non-School Tax 1974	Non-School Tax 1977	Non-School Tax Diff.
State Average			106	77%[2]		$79,320	$1,564	$2,056	$492	$281	1.83%	1.63%	—.20%	1.16%	1.10%	—.06%
Low Wealth Districts																
Camden (Camden)	MUC	A	116	42	19,832	21,993	1,280	1,928	648	414	1.83	1.22	—.61	3.46	3.20	—.26
Newark (Essex)	MUC	A	117	38	67,726	24,723	1,862	2,012	150	239	2.54	1.59	—.95	2.96	4.32	+1.36
Pemberton Twp. (Burl.)	SR	C	106	67	8,168	27,237	1,155	1,529	374	198	1.07	1.31	+.24	1.29	1.29	. . .
Hoboken (Hudson)	OUC	A	114	35	6,817	27,654	1,452	1,907	455	360	2.33	2.32	—.01	4.46	3.70	—.76
Bridgeton (Cumb.)	OUC	B	112	49	4,098	28,554	1,384	2,138	754	243	1.97	1.96	—.01	2.33	2.33	
Paterson (Passaic)	MUC	A	113	40	27,197	29,668	1,205	1,520	315	269	1.88	1.65	—.23	2.22	2.44	+.22
Trenton (Mercer)	MUC	A	119	43	16,661	30,623	1,461	1,985	524	375	1.88	1.84	—.04	3.81	3.64	—.17
Salem City (Salem)	RC	A	110	57	1,479	30,646	1,824	2,525	701	272	2.99	2.00	—.99	2.05	1.58	—.47
East Orange (Essex)	OUC	A	113	47	13,397	33,464	1,598	1,844	247	489	2.57	1.97	—.60	5.03	5.54	+.51
Willingboro (Burl.)	S	J	105	78	12,018	33,905	1,398	2,087	689	560	2.19	2.06	—.13	1.18	1.22	+.04
AVERAGE			113	50%	17,739	$28,847	$1,462	$1,948	$486	$342	2.13%	1.79%	—.34%	2.88%	2.93%	+.05%
High Wealth Districts																
Ocean City (Cape May)	SEA	F	105	82%	1,780	$368,896	$1,577	$2,627	$1,050	$ 65	.54%	.54%	. . .	1.45%	1.39%	—.06%
Fort Lee (Bergen)	US	G	105	88	3,213	231,483	1,994	2,593	599	86	.98	.95	—.03%	1.02	1.52	+.50
Secaucus (Hudson)	US	A	106	80	2,087	205,183	2,005	2,688	683	114	.96	1.13	+.17	1.59	1.48	—.11
Linden (Union)	OUC	C	109	72	5,807	197,979	1,793	2,418	625	102	1.12	1.02	—.10	.91	.52	—.39
Princeton (Mercer)	S	J	104	91	3,004	188,616	2,366	2,762	396	43	1.45	1.29	—.16	1.49	1.42	—.07
Manchester (Ocean)	R	A	107	64	1,560	186,990	1,549	2,561	1,012	28	1.10	1.10	. . .	.96	.78	—.18
Millburn (Essex)	S	J	103	91	3,507	184,782	2,177	2,777	600	31	1.38	1.28	—.10	1.86	1.95	+.06
Paramus (Bergen)	S	H	105	87	5,235	178,299	2,106	2,902	796	89	1.62	1.43	—.19	.84	.59	—.25
Ridgefield (Bergen)	US	E	104	85	1,555	177,211	1,834	2,503	669	60	1.18	1.19	+.01	.41	.38	—.03
Woodridge (Bergen)	US	E	105	86	1,141	159,098	1,614	2,191	576	58	1.20	1.14	—.06	.71	.82	+.11
AVERAGE			105	83%	2,889	$207,854	$1,902	$2,602	$700	$ 68	1.15%	1.11%	—.04%	1.12%	1.09%	—.03%

[1] This table includes only districts with enrollment over 1,000.
[2] Estimate.

ducing their school tax rates and expenditures below the level necessary to insure a "thorough and efficient" educational system. The fact that property wealth per pupil has increased at a far slower rate in the low wealth districts than in the rest of the State, has tended to exacerbate this problem during the review period.

Taxpayer Equity

Overview

Taxpayer equity is measured by the correlation coefficient (r) of the school tax rate and total expenditures per enrolled resident pupil. An r of +1.0 demonstrates a perfect association between these two measures. In 1974, the correlation coefficient was −.097; in 1977 −.088. This indicates that there was very little relationship between the two variables in either year. Moreover, the relation present was an inverse correlation in both years; that is, the higher the school tax rate the lower the per pupil expenditures.

Analysis of Specific Districts

Table XI.5 lists the total expenditures per pupil and school tax rate of the first of 578 districts listed in sequence by total expenditures per pupil, and every 50th district thereafter, to provide a representative sample of the expenditure/tax rate relationship. Other examples of this relationship are evident in earlier tables.

It is evident from the correlation coefficient statistic and the examples in Table XI.5 that there is little relationship between district effort or tax rate and district reward or expenditure level. In fact, it was still true in 1977-78, as it was in 1974-75, that tax rates were inversely correlated with tax revenues.

Urban Needs

Table XI.6 contains school finance data for 1974/75 and 1977/78 for districts grouped by community type. Urban districts are found in two groups: "Six major urban centers" and 27 "other urban centers". Inasmuch as urban districts are known to have above average educational needs and resource costs, progress for these districts would be evidenced by higher than average increases in expenditures per pupil. Similarly, because urban districts have higher tax rates, progress would be evidenced by reductions in tax rates higher than the State average.

TABLE XI.5

SAMPLE OF REPRESENTATIVE DISTRICTS TO DEMONSTRATE EXPENDITURE/TAX RATE RELATIONSHIP

District*	Total Expenditures Per Enrolled Resident Pupil 1977/78	School Tax Rate 1977/78
Lindenwold (Camden)	$1,078	$1.06
Gloucester Twp. (Camden)	1,632	1.32
Highlands (Monmouth)	1,734	1.36
Eatontown (Monmouth)	1,829	1.04
Greenwich (Warren)	1,920	1.56
No. Plainfield (Somerset)	1,985	1.84
Linwood (Atlantic)	2,054	1.92
Ewing (Mercer)	2,146	1.76
E. Rutherford (Bergen)	2,239	.99
Riverdale (Morris)	2,370	1.71
Ramsey (Bergen)	2,520	2.02
Moonachie (Bergen)	2,839	.77

* The districts in this table are the first and every subsequent 50th district in a list of 578 districts, listed in order of total expenditures per enrolled resident pupil, from lowest to highest.

TABLE XI.6

SCHOOL FINANCE DATA BY COMMUNITY TYPE, 1974/75 VS. 1977/78

Community Type	Number of Districts 1977	Enrollment 10/1/77*	Equalized Valuation Per Pupil 10/1/74	Equalized Valuation Per Pupil 10/1/77	Percent Change	Total Expenditures Per Pupil 74/75	Total Expenditures Per Pupil 77/78	Percent Change	Total State Aid Per Pupil 74/75	Total State Aid Per Pupil 77/78	Diff.	Percent Change	School Tax Rate 74/75	School Tax Rate 77/78	Percent Change	Non-School Tax Rate 1974	Non-School Tax Rate 1977	Percent Change
Major Urban Center	6	181,556	$27,962	$31,584	13.0%	$1,570	$1,912	21.8%	$909	$1,228	319	35.1%	2.16%	1.74%	—19.4%	2.89%	3.31%	+14.5%
Other Urban Center	27	151,419	60,915	73,819	21.2	1,554	1,989	28.0	445	774	329	73.9	1.73	1.54	—12.0	2.24	2.30	+ 2.7
Urban Suburban	117	292,803	72,289	94,925	31.3	1,538	2,087	35.7	252	467	215	85.3	1.73	1.64	— 5.2	1.36	1.34	— 1.5
Regional	57	148,369	63,408	84,431	33.2	1,747	2,259	29.3	392	669	277	70.7	2.05	1.80	—12.2	N/A	N/A	N/A
Suburban	144	282,312	68,446	94,843	38.6	1,607	2,193	36.5	295	539	244	82.7	1.85	1.68	— 9.2	1.28	1.23	— 4.9
Suburban Rural	59	186,162	54,770	72,428	32.2	1,480	1,955	31.6	329	680	351	106.7	1.99	1.68	—15.6	1.04	1.00	— 3.8
Rural	100	69,101	55,567	75,163	35.3	1,441	1,842	27.8	378	645	267	70.6	1.77	1.49	—15.8	.94	.80	—14.9
Rural Center	32	24,426	38,864	52,865	36.0	1,354	1,865	37.7	497	869	372	74.9	2.01	1.65	—17.9	1.23	1.04	—15.4
Rural Center Rural	8	12,132	42,864	57,373	33.8	1,292	1,744	35.0	433	816	383	88.5	1.92	1.53	—20.3	1.18	1.04	—11.9
Seashore Resort	22	12,487	199,819	261,333	30.8	1,539	2,066	34.2	236	318	82	34.8	0.63	0.61	— 3.2	1.20	1.11	— 7.5
STATE AVERAGE	572	1,360,765	$60,519	$79,320	31.1%	$1,564	$2,056	31.6%	$406	$687	281	69.2%	1.83%	1.63%	—10.9%	1.16%	1.10%	— 5.2%

* This table includes only districts with enrollment over 1,000.

In 1974/75 the six major urban center districts spent slightly above the State average, while the other urban center districts spent slightly below. In 1977/78, the major urban center districts spent $144 below the State average, while the other urban center districts spent $67 below. Although the three rural categories had a relatively higher proportionate increase in per pupil expenditures than the urban groups, they were still spending the least per pupil of all categories in 1977/78.

The average increase in State aid was $281 per pupil, or 69.2%. Urban districts received an increase of about $325 per pupil, but less than the average percentage increase because of a relatively higher base of state aid in 1974/75. The rural groups received the largest State aid increases, in both per capita and percentage increase terms.

The State average school tax rate declined by 10.9%, from $1.83 to $1.63. The largest school tax reduction of $0.42 took place in the "major urban center" group, while the "rural center rural" group took a $0.41 reduction. However only the two urban groups incurred an increase in their non-school tax rates. The "major urban center" districts increased their non-school tax rate from 2.49 times the State average in 1974 to 3.01 times the State average in 1977.

From the data it is evident that children in urban districts were worse off in 1977/78 than in 1974/75 relative to the State as a whole; expenditures per pupil were about equal to the State average in 1974/75 and about $100 below the State average in 1977/78.

At the same time, taxpayers in urban school districts benefitted by a relatively higher tax reduction than the State average. However, the increase in the non-school tax rate in the "major urban center" group offset all of the school tax reduction, providing no net benefit to taxpayers in this group.

One reason for the increase in non-school tax rates in the major urban centers may be found in the fact that their equalized valuation per pupil increased between 1974 and 1977 by only

TABLE XI.7

SCHOOL FINANCE DATA FOR MAJOR URBAN CENTER SCHOOL DISTRICTS, 1974/75 VS. 1977/78

District	DFG	Pupil Needs Index	% Above State Standard	Enrollment 10/1/77	Wealth Per Pupil 10/1/77	Total Expenditures Per Pupil 74/75	Total Expenditures Per Pupil 77/78	Diff.	Incr. Aid 74-77	School Tax 74/75	School Tax 77/78	Diff.	Non-School Tax 1974	Non-School Tax 1977	Diff.
STATE AVERAGE		106	77*		$79,320	$1,564	$2,056	$492	$281	1.83%	1.63%	—.20%	1.16%	1.10%	— .06%
MAJOR URBAN CENTER DISTRICTS															
Camden (Camden)	A	116	42	19,832	21,993	1,280	1,928	648	414	1.83	1.22	—.61	3.46	3.20	— .26
Newark (Essex)	A	117	39	67,726	24,723	1,862	2,012	150	239	2.54	1.59	—.95	2.96	4.32	+1.36
Paterson (Passaic)	A	113	40	27,197	29,668	1,205	1,520	315	269	1.88	1.65	—.23	2.22	2.44	+ .22
Trenton (Mercer)	A	119	43	16,661	30,623	1,461	1,985	524	375	1.88	1.84	—.04	3.81	3.64	— .17
Jersey City (Hudson)	A	114	48	35,471	35,774	1,465	1,849	385	342	1.99	1.84	—.15	3.14	4.39	+1.25
Elizabeth (Union)	B	115	56	14,670	70,740	1,586	2,229	642	457	2.19	2.12	-.07	1.78	1.86	+ .08
WEIGHTED AVERAGE					$31,584	$1,570	$1,912	$342	$319	2.16%	1.74%	—.34%	2.89%	3.31%	+. 42%

* Estimate.

12.95%, compared to a statewide increase of 31.07%. If the cost of municipal services increased by 20-25 percent during the three years, while the level of services remained constant, their non-school tax rates would have to go up in the major urban centers while they would go down in the State as a whole.

It is of further interest to compare the non-school tax rates of the State's lowest wealth districts (see Table XI.3), with the State's major urban centers. The lowest wealth decile had an average tax base of $25,485 in 1977 and a non-school tax rate of $2.25, while the major urban centers had an average tax base of $31,584 and a non-school tax rate of $3.31. This supports the contention of those who have written about the municipal overburden problem in New Jersey. In this State the urban centers not only have the typical problem of higher than average non-school costs, but also have far lower than average tax bases. The combined effect of high non-school costs and low tax base in New Jersey's major urban centers appears to have been a major cause of the decline in expenditures per pupil in these districts relative to the rest of the State.

Table XI.7 lists the State's six major urban school districts in detail, for further reference and analysis.

Pupil Needs

Overview

The effect on current expenditures per pupil of seven independent variables in 1974/75 and 1977/78 is shown in Table XI.8.

Each of the seven variables was chosen for its presumed effect on per pupil expenditures. The seven variables combined explain 50% of expenditure variance in 1974/75 and 45% in 1977/78. However the only two major determinants of expenditure variance are equalized valuation per pupil and median family income, which together explain 42% of the variance in 1974/75 and 41% in 1977/78.

The pupil needs index shows a very low correlation with expenditures in both years. In

TABLE XI.8

MULTIPLE REGRESSION OF CURRENT EXPENDITURES PER PUPIL AND SEVEN VARIABLES, 1974/75 VS. 1977/78

Independent Variables	1974/75 Correlation Coefficient(r)	R^2 Percent of Overall Variation Explained By:	1977/78 Correlation Coefficient(r)	R^2 Percent of Overall Variation Explained By:
Equalized Valuation per Pupil	.55	.31	.58	.33
Median Family Income	.49	.11	.46	.08
County Average 6th year NJEA Salary	.46	.02	.39	.01
% Enrollment to Population	—.08	.00	—.03	.00
Non-School Tax Rate	—.03	.02	—.02	.02
District Size	.03	.00	—.03	.00
Pupil Needs Index	—.06	.03	.02	.00
Cumulative R^2		.50		.45
No. of Districts	446		446	

1974/75 it shows a negative correlation of .06 and in 1977/78 a positive correlation of .02. In 1977/78 it explains none of the expenditure variance.

From these data it is evident that pupil needs have no bearing on expenditures per pupil. The major determinants were and still are property wealth and family income. This is true despite the fact that the Chapter 212 State School aid formula provides categorical aid for students enrolled in special needs, high cost programs.

Analysis of Specific Districts

Table XI.9 contains the ten K-12 districts with the greatest educational needs in the State and the ten K-12 districts with the lowest educational needs in the State. The table also includes each district's average percentage of children scoring above the statewide minimum standard in reading and mathematics in October 1976.

It is evident from the data in this table that there is no relationship between educational needs and educational expenditures.[9] The districts with the lowest educational needs and highest achievement levels spent $359 more per pupil in 1974/75 and $421 more per pupil in 1977/78 than did the districts with the greatest educational needs and lowest achievement levels.

These data support the conclusion of the previous section, that there was no relationship in the State between pupil needs and expenditures. The data also supports the earlier conclusion that the major determinant of expenditures is property wealth per pupil, which is 2.42 times higher in the ten low needs, high spending districts, compared to the ten high needs, low spending districts.

Summary and Conclusion

This study has examined the changes in New Jersey school district expenditures and tax rates which have taken place since the implementation of the Public School Education Act of 1975, to determine whether the conditions which led the State's Courts to declare the former system unconstitutional still exist. The district data were examined in the context of five criteria of concern to the courts: interdistrict disparities in per pupil expenditures; fiscal neutrality; taxpayer

[9] Educational needs is measured by the Pupil Needs Index. This index is calculated by taking the sum of children in state categorical aid programs times the state aid formula additional cost factor of each program, and dividing the sum plus resident enrollment by resident enrollment. The result is an index of relative pupil needs based on the New Jersey Legislature's definition of relative costs of categorical aid programs.

TABLE XI.9

COMPARISON OF TEN HIGHEST AND TEN LOWEST EDUCATIONAL NEEDS DISTRICTS, 1974/75 VS. 1977/78

District	Comm. Type	DFG	Pupil Needs Index	% Above State Standard	Current Expenditures Per Pupil 74/75	Current Expenditures Per Pupil 77/78	Wealth Per Pupil 10/1/77
High Needs Districts							
New Brunswick (Midd.) .	OUC	C	119	40%	$1,906	$2,317	$77,784
Trenton (Mercer)	MUC	A	119	43	1,393	1,909	30,623
Asbury Park (Mon.)	OUC	A	116	43	1,652	2,127	37,654
Newark (Essex)	MUC	A	116	39	1,728	1,909	24,723
Camden (Camden)	MUC	A	116	42	1,203	1,829	21,993
Atlantic City (Atl.)	OUC	A	116	46	1,045	1,431	55,396
Elizabeth (Union)	MUC	B	115	56	1,471	1,995	70,740
Passaic (Passaic)	OUC	A	114	42	1,196	1,621	44,592
Jersey City (Hudson) ...	MUC	A	114	48	1,336	1,741	35,774
Hoboken (Hudson)	OUC	A	114	35	1,342	1,824	27,654
Average			116	44%	$1,427	$1,870	$42,693
STATE AVERAGE			106	77%*	$1,439	$1,907	$79,320
Low Needs Districts							
Montgomery (Somerset) .	SR	H	102	87%	$1,667	$2,270	$106,257
Mt. Lakes (Morris)	S	J	102	97	1,679	2,332	70,422
Ramsey (Bergen)	S	J	102	94	1,921	2,343	103,514
Holmdel Twp. (Mon.) ..	SR	I	102	92	1,647	1,818	102,466
Tenafly (Bergen)	US	J	103	92	2,148	2,719	133,122
Millburn (Essex)	S	J	103	91	2,013	2,572	184,782
Bernardsville (Somerset).	SR	I	103	94	1,665	2,230	148,905
Ridgewood (Bergen)	S	J	103	92	1,866	2,391	96,630
Scotch Plains-Fan (Union)	S	I	103	88	1,573	2,201	86,864
No. Brunswick (Midd.) .	S	J	103	87	1,678	2,035	112,507
Average			103	91%	$1,786	$2,291	$103,326

* Estimate.

equity; urban needs; and pupil needs. Based upon the data contained in this study, it is evident that the disparities noted by the Court have actually worsened in almost all respects between 1974-75 and 1977-78.

Interdistrict per pupil expenditure disparities actually increased in absolute terms, although there was a modest decline when expressed in relative terms. The relationship between property wealth and expenditure levels has not diminished; in fact it increased. There is still an inverse correlation between tax effort and tax revenue, although the degree of that relationship has been somewhat diminished.

Despite higher concentrations of children in higher cost programs, and higher resource costs, expenditures per pupil in the urban districts were about $100 per pupil lower than in the State as a whole. At the same time, urban school tax rates were substantially reduced. However, in the State's major urban centers, increased non-school tax rates more than offset the school tax reduction.

Finally, despite a new State aid formula which reimburses districts for the extra costs of high cost programs designed to meet the educational needs of disadvantaged and low achieving children, there is still no relationship between

what districts spend on their children and the educational needs of those children.

There are several reasons for the failure of the new Act. Among them is the disproportionate share of State aid for nonequalizing elements most beneficial to high wealth districts and the absence of mandated minimum adequate expenditure levels.

Although New Jersey raised the State share of public school costs from 29% in 1975-76 to 41% in 1977-78, the State's share is still below the national average of State contributions which, in 1975-76, was 50%.[10]

Although the portion of State aid devoted to wealth equalization increased from 30% of total aid in 1974-75 to 53% in 1977-78,[11] the New Jersey proportion of wealth equalizing elements is still far below the national average in 1975-76 of 68%.[12]

A serious weakness of the current State aid formula is the absence of a mandated minimum expenditure level. Motivated by low property wealth, high county and municipal budgets, low family income, or simply a low estimate of the need for quality education, taxpayers may choose to spend as little as they wish for their schools. As a result, many districts, particularly low wealth and urban districts, have chosen to add less local resources to their State aid increases than has been true in wealthier, suburban districts, and have opted for tax relief rather than improved educational offerings.

The power of the State Commissioner of Education to require budget increases has not been exercised, although even if it were exercised in a few isolated instances it would not have significantly altered the massive expenditure disparities which now exist in the State. Nor has the law's expenditure cap acted to restrain the huge per pupil expenditure increases of the State's high spending districts.

The current State school aid system relies on the Guaranteed Tax Base (GTB) to enable school districts to function as if they were equal in fiscal capacity, so that with equal effort they would have equal expenditures per pupil. Holding aside the fact that the level of the GTB only equalizes two-thirds of the State's districts, it is necessary to question whether a GTB system has the capacity to achieve its goal at all.

In New Jersey, despite an increase in the GTB from $43,000 in 1974-75 to $97,000 in 1977-78, the correlation between equalized valuation per pupil and expenditures per pupil actually increased from .55 to .58 between the two years. It is evident that increasing the GTB has not reduced the effect of the actual wealth of a district on per pupil expenditures.

The economic theory which supports the GTB sytem holds that an increase in the GTB leads to an increase in the State share of the cost of education, and therefore a reduction in the district's share, or a reduction in the cost of education to the district. Applying this notion to a simple supply/demand theory, suggests that as cost goes down total expenditures will go up. That has clearly not been the case in New Jersey.

This leads to the conclusion that a guaranteed tax base system is not capable of achieving the goal of reducing interdistrict per pupil expenditure disparities. Some states have attempted to adjust a GTB system to correct for the non-wealth constraints on districts, by defining wealth in terms of both property wealth and income, or by making adjustments for municipal overburden. However, these indirect methods although valuable, still ultimately leave the final decision to the taxpayer, and still permit the personal values of a district's taxpayers to determine the quality of the education of the district's children. The result can only be unequal educational opportunity among school districts.

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[10] *Public School Finance Programs,* 1975-76, (Washington, D.C.: U.S. Office of Education, 1976), p. 4 & 14-15.

[11] Larry Rubin, *An Evaluation of the Fiscal Impact of New Jersey's Public School Education Act of 1975 on the State's Low Wealth and Urban Schools Districts,* (Newark: The New Jersey Education Reform Project, 1978), p. 9.

[12] *Public School Finance Programs,* p. 15.

XII
APPENDIX

STATISTICAL TABLES

TABLE 1

POPULATION AND EMPLOYMENT, NEW JERSEY, 1956-1978

Year	Resident Population	Work/Labor Force**	Total Employment	Unemployment		Insured Unemployment Rate (Percent)
	In Thousands			Number (000)	Rate (Percent)	
1956	5,516,100	2,406.6	2,263.2	138.6	5.8	4.6
1957	5,631,700	2,448.1	2,290.0	156.8	6.4	5.3
1958	5,739,800	2,472.6	2,248.1	222.5	9.0	7.6
1959	5,960,000	2,483.1	2,303.2	175.5	7.1	5.5
1960	6,070,780	2,507.4	2,337.2	168.5	6.7	5.7
1961	6,222,160	2,543.5	2,355.9	185.5	7.3	6.0
1962	6,370,650	2,575.1	2,415.0	159.0	6.2	5.2
1963	6,503,190	2,618.4	2,447.9	168.8	6.4	5.4
1964	6,614,560	2,655.5	2,489.6	162.1	6.1	4.8
1965	6,720,300	2,724.5	2,582.2	140.0	5.1	3.9
1966	6,821,050	2,790.3	2,665.3	122.6	4.4	3.2
1967	6,917,450	2,803.0	2,701.0	102.0	3.6	3.4
1968	7,012,750	2,829.0	2,730.0	99.0	3.5	3.3
1969	7,103,310	2,898.0	2,805.0	93.0	3.2	3.3
1970	(R)7,190,000	2,985.0	2,849.0	137.0	4.6	4.4
1971	(R)7,293,000	3,002.0	2,831.0	171.0	5.7	5.4
1972	(R)7,338,000	3,105.0	2,924.0	181.0	5.8	5.1
1973	(R)7,341,000	3,176.0	2,998.0	179.0	5.6	4.7
1974	(R)7,342,000	3,213.0	3,010.0	203.0	6.3	5.7
1975	(R)7,350,000	3,250.0	2,917.0	333.0	10.2	7.8
1976	(R)7,358,000	3,305.0	2,961.0	345.0	10.4	6.4
1977	(P)7,359,000	3,367.0	3,051.0	316.0	9.4	5.6
1978	(P)7,349,000	3,431.0	3,185.0	246.0	7.2	5.1

** For data prior to 1970, persons involved in labor-management disputes are included in total workforce and excluded from employment and unemployment. After 1969, 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 1976 employment benchmarks.

Labor force estimates for 1970 to 1978 are obtained directly from the Current Population Survey conducted for the U.S. Department of Labor.

All population data as of July 1; population estimates are not strictly comparable over time because of changes in estimating methodology.

Annual averages may not add due to rounding.

(R) —Revised.

(P)—Provisional.

Source: N.J. Department of Labor and Industry, Division of Planning and Research.

TABLE 2
WAGE AND SALARY WORKERS IN NONAGRICULTURAL ESTABLISHMENTS, MAJOR INDUSTRY DIVISIONS, NEW JERSEY, 1947-1978
(In thousands)

Year	Total Non-Agricultural Payroll Employment	Manufacturing	Mining	Contract Construction	Transportation and Public Utilities	Wholesale and Retail Trade	Finance, Insurance and Real Estates	Services and Miscellaneous	Government
1947	1,622.6	782.6	4.0	65.4	142.2	249.7	63.1	158.8	156.8
1948	1,657.1	786.3	4.1	74.6	141.0	260.5	67.0	163.7	159.9
1949	1,595.6	721.8	4.0	72.5	134.0	264.5	66.5	166.2	166.1
1950	1,657.1	756.4	4.3	81.2	135.4	273.7	68.3	166.8	171.0
1951	1,768.1	821.2	4.5	95.4	143.9	285.8	69.8	169.8	177.7
1952	1,804.0	832.9	4.6	91.9	146.7	295.6	70.7	174.0	187.6
1953	1,850.2	856.2	4.7	90.3	147.8	303.4	73.6	180.6	193.6
1954	1,820.8	802.1	4.3	93.6	146.1	312.4	76.1	186.0	200.2
1955	1,865.3	811.1	4.0	98.7	148.4	322.5	78.8	195.4	206.4
1956	1,933.5	834.8	4.3	100.7	153.8	336.6	81.8	208.4	213.1
1957	1,968.3	835.0	4.4	96.4	154.3	349.1	85.2	222.7	221.2
1958	1,911.8	776.0	3.7	88.9	148.2	351.0	86.4	230.5	227.0
1959	1,970.9	801.9	3.6	96.3	147.0	360.3	86.7	241.6	233.5
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	388.0
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	2,701.0	748.2	2.8	99.2	174.3	599.3	135.2	472.1	470.0
1976	2,756.3	756.7	2.7	93.9	176.0	618.5	138.0	490.6	479.8
1977	2,840.6	767.7	2.9	94.5	178.2	637.1	142.9	514.0	503.2
1978	2,968.0	789.2	2.5	106.7	188.6	665.1	148.3	545.7	521.9

Series have been adjusted to March 1978 benchmarks.
SOURCE: N.J. Department of Labor and Industry, Division of Planning and Research.

TABLE 3
WAGE AND SALARY WORKERS IN MANUFACTURING, DURABLE GOODS, NEW JERSEY, 1947-1978
(In thousands)

Year	Total Durable Goods	Lumber and Wood Products	Furniture and Fixtures	Stone, Clay and Glass Products	Primary Metal Industries	Ordnance and Fabricated Metals	Machinery, Except Electrical	Electrical Machinery	Transportation Equipment	Instruments and Related Products	Miscellaneous Manufacturing Industries
1947	403.0	6.9	7.7	31.0	45.8	45.7	56.0	108.9	47.4	18.2	35.5
1948	397.2	7.0	8.2	31.4	44.2	44.3	53.8	106.7	45.9	18.8	36.9
1949	346.1	6.5	7.6	29.0	37.6	40.7	48.8	87.3	37.5	17.9	33.2
1950	372.3	6.8	8.9	31.7	40.5	44.2	49.9	97.2	40.1	17.8	35.3
1951	427.9	7.1	9.1	35.3	46.5	48.3	60.0	115.1	47.5	22.4	36.6
1952	446.6	6.4	8.5	33.4	45.3	50.5	61.7	121.7	60.2	24.7	34.3
1953	470.4	6.3	8.6	33.8	46.2	57.2	64.0	132.5	62.7	26.5	32.6
1954	431.3	6.4	8.2	32.5	42.6	54.6	60.6	116.7	56.5	24.9	28.3
1955	435.5	6.4	8.5	34.1	43.9	55.7	59.1	117.5	57.1	25.3	27.8
1956	455.9	6.4	9.1	34.3	47.3	55.5	65.8	124.3	57.4	27.9	27.9
1957	457.3	6.3	9.2	33.9	46.9	56.7	65.5	125.6	55.9	29.4	27.9
1958	412.5	5.6	8.7	31.9	40.9	51.5	57.0	115.0	48.7	27.4	25.8
1959	431.1	5.9	9.2	33.1	41.7	54.3	57.8	121.4	50.5	30.2	27.0
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	363.3	4.6	8.9	36.0	26.1	58.1	68.4	88.3	19.3	31.2	22.4
1976	363.4	5.3	8.7	36.1	23.9	59.4	67.5	87.4	19.8	31.3	24.0
1977	370.1	5.8	8.9	35.1	23.0	61.1	71.0	88.0	20.7	32.0	24.5
1978	383.7	6.3	10.2	35.5	24.3	64.1	74.0	90.1	21.0	32.3	25.9

Series have been adjusted to March 1978 benchmarks.
SOURCE: N.J. Department of Labor and Industry, Division of Planning and Research.

TABLE 4

WAGE AND SALARY WORKERS IN MANUFACTURING, NONDURABLE GOODS, NEW JERSEY, 1947-1978

(In thousands)

Year	Total Nondurable Goods	Food and Kindred Products	Tobacco Manufactures	Textile Mill Products	Apparel and Related Products	Paper Allied Products	Printing, Publishing and Allied Industries	Chemicals and Allied Products	Petroleum Refining and Related Industries	Rubber and Miscellaneous Plastic Products	Leather and Leather Products
1947	379.6	56.9	5.5	61.1	78.9	21.7	18.6	80.1	15.6	29.5	11.7
1948	389.1	57.1	5.1	64.7	85.6	22.2	19.9	77.6	16.2	28.4	12.3
1949	375.7	55.9	4.9	57.8	88.9	21.8	21.4	71.9	16.3	24.7	12.1
1950	384.1	56.5	4.6	58.2	89.0	23.5	22.8	73.7	16.5	26.4	12.9
1951	393.3	59.8	4.4	53.7	89.8	24.8	23.4	79.1	17.3	28.4	12.6
1952	386.3	61.3	4.4	50.1	88.7	24.2	23.5	78.5	16.3	27.3	12.1
1953	385.8	60.9	4.3	48.3	85.0	26.5	24.8	79.2	16.4	28.4	12.0
1954	370.8	62.2	4.0	41.9	79.7	26.0	25.9	78.0	15.2	26.7	11.2
1955	375.6	61.7	3.4	42.7	79.6	26.3	27.1	80.8	14.5	27.5	11.9
1956	378.9	63.5	2.6	41.6	79.7	27.2	28.1	81.8	14.3	28.3	11.8
1957	377.7	62.9	2.0	38.6	79.2	28.3	30.5	83.3	13.8	27.7	11.4
1958	363.6	62.9	1.9	33.0	76.7	28.0	30.3	80.8	12.2	26.6	11.1
1959	370.8	62.3	1.8	33.2	79.2	28.3	31.5	82.4	11.8	29.3	11.1
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	393.3	52.7	.3	23.9	61.1	33.3	47.4	122.4	11.9	32.0	8.4
1977	397.6	50.2	.3	22.8	59.7	33.4	49.9	127.2	11.9	34.2	7.9
1978	405.5	50.4	.5	22.2	59.9	33.9	53.1	129.8	11.9	36.5	7.3

Series have been adjusted to March 1978 benchmarks.

SOURCE: N.J. Department of Labor and Industry, Division of Planning and Research.

TABLE 5

EMPLOYMENT, HOURS, AND EARNINGS OF PRODUCTION WORKERS ON MANUFACTURING PAYROLLS, NEW JERSEY, 1947-1978

Year	*Employment (thousands)*	*Average Weekly Hours*	*Average Weekly Earnings (dollars)*	*Average Hourly Earnings (dollars)*
1947	n.a.	40.7	52.26	1.28
1948	n.a.	40.5	56.37	1.39
1949	n.a.	39.4	56.97	1.45
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	494.8	39.9	199.68	4.99
1976	501.0	40.4	215.71	5.33
1977	513.0	41.3	239.79	5.80
1978	511.2	41.2	255.44	6.20

FOOTNOTE
n.a.—not available.

Series have been adjusted to March 1977 benchmarks.

SOURCE: N.J. Department of Labor and Industry, Division of Planning and Research.

TABLE 6

CONSUMER PRICE INDEXES*
FOR URBAN WAGE EARNERS AND CLERICAL WORKERS

(1967 = 100.0)

Year	*United States*	*New York SCA*[a]	*Philadelphia SMSA*[b]
1947	66.9	67.0	66.4
1948	72.1	71.5	71.7
1949	71.4	70.7	70.9
1950	72.1	71.2	71.3
1951	77.8	76.5	77.9
1952	79.5	77.7	79.5
1953	80.1	78.2	79.8
1954	80.5	78.7	80.7
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

FOOTNOTES

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

[b] Standard Metropolitan Statistical Area, including Camden, Burlington, and Gloucester counties.

* Annual averages.

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

TABLE 7

PERSONAL INCOME, NEW JERSEY AND UNITED STATES, 1948-1978

Year	Total Personal Income		Per Capita Personal Income			
	New Jersey	United States	New Jersey	United States	New Jersey[a]	United States[b]
	(millions of current dollars)		(current dollars)		(1967 dollars)	
1948	8,063	208,876	1,689	1,430	2,359	1,983
1949	8,131	205,793	1,663	1,384	2,349	1,938
1950	8,541	226,197	1,753	1,496	2,460	2,075
1951	10,151	253,232	2,028	1,652	2,627	2,123
1952	10,934	269,769	2,134	1,733	2,715	2,180
1953	11,750	285,456	2,247	1,804	2,844	2,252
1954	11,957	287,607	2,231	1,785	2,799	2,217
1955	12,688	308,266	2,306	1,876	2,904	2,339
1956	13,719	330,479	2,443	1,975	3,035	2,426
1957	14,550	348,460	2,536	2,045	3,052	2,426
1958 (R).	14,553	356,956	2,471	2,050	2,902	2,367
1959 (R).	15,655	380,033	2,603	2,146	3,020	2,458
1960 (R).	16,477	396,036	2,700	2,201	3,073	2,481
1961 (R).	17,250	411,301	2,753	2,248	3,102	2,509
1962 (R).	18,502	436,894	2,902	2,353	3,233	2,597
1963 (R).	19,415	459,075	2,973	2,436	3,247	2,656
1964 (R).	20,782	491,341	3,120	2,572	3,355	2,769
1965 (R).	22,400	532,022	3,310	2,750	3,503	2,910
1966 (R).	24,269	579,158	3,542	2,963	3,637	3,048
1967 (R).	26,107	620,020	3,768	3,142	3,768	3,142
1968 (R).	28,536	677,786	4,074	3,401	3,897	3,264
1969 (R).	30,930	738,233	4,359	3,667	3,941	3,340
1970 (R).	33,680	793,485	4,684	3,893	3,956	3,347
1971 (R).	36,181	851,952	4,967	4,132	3,983	3,406
1972 (R).	39,029	935,463	5,326	4,493	4,122	3,586
1973 (R).	42,527	1,045,098	5,807	4,980	4,220	3,742
1974 (R).	46,321	1,147,257	6,326	5,428	4,129	3,675
1975 (R).	49,839	1,248,631	6,797	5,861	4,109	3,636
1976 (R).	53,699	1,373,153	7,298	6,396	4,186	3,751
1977 (R).	58,561	1,519,893	7,969	7,026	4,319	3,871
1978 (P).	64,613	1,702,860	8,818	7,810	4,520	3,999

FOOTNOTES

[a] The average of the Consumer Price Indexes 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 for the United States was used to express United States per capita personal income in constant 1967 dollars.

(R) Revised estimates. Estimates of state total and per capita personal income for 1958-78 have been revised following the 1976 benchmark revision of the national income and product accounts. Estimates prior to 1958 have not been revised and are not directly comparable to those for 1958 to 1978.

(P) Preliminary estimates.

SOURCES: U.S. Department of Commerce; U.S. Department of Labor, Bureau of Labor Statistics. Prepared by N.J. Department of Labor and Industry, Division of Planning and Research.

TABLE 8
PRODUCTION AND TRADE, NEW JERSEY, 1948-1978

Year	Electric Power Sales			Value of New Dwelling Units Authorized	Construction Contracts Awarded	Retail Store Sales*	Registration of New Vehicles	
	Total	Large Industrial and Commercial Users	Small Industrial and Commercial Users	($000)	($000)	($000,000)	Passenger Cars (number)	Commercial Vehicles (number)
	(kilowatt hours in thousands)							
1948	6,887,131	3,736,931	1,359,854	n.a.	406,476	n.a.	116,847	25,504
1949	7,026,664	3,578,396	1,483,196	n.a.	408,007	n.a.	165,179	23,544
1950	8,023,122	4,161,454	1,630,075	n.a.	747,771	n.a.	210,436	27,229
1951	8,944,201	4,648,835	1,806,808	n.a.	676,458	n.a.	178,862	25,002
1952	9,578,722	4,837,880	1,969,215	n.a.	690,770	n.a.	149,168	19,335
1953	10,435,872	5,191,330	2,180,598	n.a.	793,889	n.a.	208,313	23,048
1954	10,931,039	5,214,694	2,348,391	n.a.	886,947	n.a.	207,242	20,601
1955	12,184,077	5,874,199	2,584,701	n.a.	1,010,459	n.a.	258,079	22,262
1956	13,224,653	6,323,544	2,807,035	n.a.	1,106,452	n.a.	219,297	21,903
1957	14,196,487	6,642,234	3,097,755	n.a.	1,048,449	n.a.	219,865	20,320
1958	14,949,906	6,829,115	3,322,774	n.a.	1,143,484	n.a.	183,770	17,616
1959	16,632,611	7,683,942	3,719,151	n.a.	1,303,736	n.a.	219,305	20,374
1960	17,569,054	8,125,141	3,967,306	497,534	1,256,532	n.a.	266,299	22,532
1961	19,248,349	8,730,727	4,471,379	553,029	1,307,832	n.a.	250,432	24,606
1962	20,630,556	9,506,486	4,848,024	549,825	1,392,618	n.a.	285,955	24,713
1963	22,077,818	10,108,217	5,309,982	608,660	1,534,448	8,992	318,127	26,804
1964	23,848,214	10,773,759	5,872,988	704,809	1,622,048	9,768	325,293	28,417
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	356,583	34,616
1970	38,156,144	15,394,352	10,185,005	599,034	2,740,746	14,274	348,304	36,027
1971	39,919,508	15,564,483	11,056,580	876,144	2,409,797	15,359	370,004	35,255†
1972	42,318,122	16,192,817	12,143,135	1,062,430	2,948,735	16,399	443,628	50,545
1973	45,540,943	17,018,962	13,233,603	1,030,506	2,513,229	17,874	453,334	53,735
1974	43,995,014	16,390,080	12,904,974	588,291	2,353,822	18,024	351,103	51,663
1975	43,477,908	14,927,694	13,509,510	574,101	1,950,095	19,636	298,926	31,493
1976	45,605,101	15,759,346	14,289,144	832,433	2,063,615	21,833	384,407	45,731
1977	46,398,759	15,659,679	14,774,406	998,931	4,805,407(R)	24,076	448,669	61,578
1978	48,113,001	16,386,752	15,474,339	1,262,831	4,036,519(P)	27,342	436,849	65,772

FOOTNOTES

* Data prior to 1976 are based on different sample design and are not strictly comparable with later retail sales figures.

† Years 1948-70 compiled by N.J. Auto List. Years 1972-74 are from the N.J. Division of Motor Vehicles.

(P)—Preliminary estimates. (R)—Revised. n.a.—not available.

SOURCES: Electric Power Sales: Edison Electric Institute. New Dwelling Units Authorized: N.J. Department of Labor and Industry in Cooperation with U.S. Department of Commerce. Construction Contracts Awarded: F.W. Dodge Corporation. Retail Sales: U.S. Dept. of Commerce, Registration of New Vehicles: New Jersey Auto Lists, Inc.; N. J. Division of Motor Vehicles.

Prepared by N.J. Department of Labor and Industry, Division of Planning and Research.

TABLE 9
BUSINESS ACTIVITY, NEW JERSEY, 1948-1978

Year	Business Telephones Net Gains	Business Failures (number)	Liabilities of Business Failures ($000)	New Incorporations (number)	Apparent Consumption of Distilled Spirits (000 gal.)	New Jersey Turnpike	
						Toll Revenue ($000)	Number of Vehicles (000)
1948	19,106	219	15,286	5,510	6,852	n.a.	n.a.
1949	10,014	366	16,246	5,411	6,688	n.a.	n.a.
1950	20,134	346	10,926	6,009	8,243	n.a.	n.a.
1951	29,806	307	11,961	5,581	8,216	n.a.	n.a.
1952	29,044	319	18,627	6,146	7,824	16,241	17,948
1953	26,613	360	25,856	6,651	8,443	19,193	22,005
1954	24,664	385	20,086	7,276	8,536	20,756	24,555
1955	31,659	456	29,753	8,386	9,045	21,123	25,888
1956	37,452	582	33,919	8,839	10,253	24,124	31,588
1957	29,856	565	39,604	8,097	9,331	29,025	39,270
1958	21,892	778	43,475	8,757	9,961	30,162	41,615
1959	35,051	639	27,619	10,436	10,702	33,321	46,199
1960	38,543	714	49,071	10,172	11,391	35,588	49,083
1961	28,825	717	53,282	9,650	11,743	37,197	51,738
1962	39,383	591	58,468	9,984	12,378	39,246	54,901
1963	29,716	509	256,075	9,716	12,810	40,781	56,677
1964	36,771	442	49,261	10,023	13,483	44,153	60,708
1965	47,251	512	96,334	10,439	14,383	46,128	64,958
1966	54,650	442	61,191	9,656	14,687	48,617	69,850
1967	48,620	414	64,215	10,220	15,064	51,239	73,529
1968	53,293	423	42,692	12,038	15,971	55,350	78,205
1969	73,211	343	53,141	13,168	16,572	57,646	80,618
1970	58,787	463	142,196	13,958	16,289	63,946	89,655
1971	45,401	428	102,738	15,563	16,440	70,136	98,553
1972	66,989	453	173,428	16,462	17,060	75,948	107,933
1973	87,064	491	201,463	16,312	16,690	79,000	110,422
1974	55,327	643	110,411	15,410	16,527	75,241	106,628
1975	31,164	768	243,209	16,022	16,155	84,402	105,633
1976	53,040	660	174,457	18,270	15,902	91,095	109,234
1977	76,351	535	194,995	19,366	n.a.	95,112	115,664
1978	73,114	415	198,834	20,381	n.a.	n.a.	n.a.

FOOTNOTES
n.a.—not available.

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

Prepared by N.J. Department of Labor and Industry, Division of Planning and Research.

TABLE 10

AGRICULTURE, NEW JERSEY, 1950-1978

Year	Number of Workers on Farms (thousands)	Cash Receipts from Farm Marketings (thousands of dollars) Total	From Livestock and Products	From Crops
1950	66	292,430	188,694	103,736
1951	65	348,831	229,976	118,855
1952	61	342,447	215,156	127,291
1953	58	346,187	223,750	122,437
1954	59	314,259	194,605	119,654
1955	58	307,674	200,178	107,496
1956	53	330,372	202,117	128,255
1957	51	314,627	193,991	120,636
1958	51	304,569	191,946	112,623
1959	45	288,814	170,273	118,541
1960	44	296,510	166,126	130,384
1961	42	285,007	154,547	130,460
1962	41	276,598	143,854	132,744
1963	39	267,965	134,962	133,003
1964	37	259,477	124,079	135,398
1965	33	268,493	118,031	150,462
1966	27	269,839	120,262	149,577
1967	23	250,927	102,337	148,590
1968	23	252,599	100,797	151,802
1969	21	248,982	103,694	145,288
1970	20	246,631	98,962	147,669
1971	19	244,045	90,679	153,366
1972	20	240,784	90,910	149,874
1973	19	302,035	111,204	190,831
1974	20	339,876	113,269	226,607
1975 (R)	21	325,998	102,915	223,083
1976 (R)	22	340,785	109,553	231,232
1977 (R)	23	351,066	99,012	252,054
1978 (P)	23	365,800	100,300	265,500

FOOTNOTE

(P) —Preliminary estimates. (R) —Revised.

SOURCES: U.S. Department of Agriculture; N.J. Department of Agriculture.

Prepared by N.J. Department of Agriculture.

TABLE 11
COUNTY POPULATION ESTIMATES
RESIDENT POPULATION[1]

County	CENSUS April 1, 1970	ESTIMATES July 1, 1977 (R)	ESTIMATES July 1, 1978 (P)
Atlantic	175,043	189,000	190,000
Bergen	897,148	873,000	865,200
Burlington	323,132	362,300	363,500
Camden	456,291	474,000	471,600
Cape May	59,554	75,900	77,000
Cumberland	121,374	132,000	130,200
Essex	932,526	848,000	829,900
Gloucester	172,681	195,000	200,000
Hudson	607,839	563,100	554,000
Hunterdon	69,718	82,700	84,200
Mercer	304,116	317,200	317,200
Middlesex	583,813	590,400	591,100
Monmouth	461,849	494,800	499,900
Morris	383,454	400,100	404,000
Ocean	208,470	319,800	331,500
Passaic[2]	460,782	470,900	466,800
Salem	60,346	63,100	62,400
Somerset	198,372	206,000	207,800
Sussex	77,528	105,600	109,200
Union	543,116	513,400	509,600
Warren	73,960	82,300	84,000
State Total[2]	7,171,112	7,359,000	7,349,000

(R) Revised (P) Provisional

[1] State estimates are shown to nearest thousand. County estimates to nearest hundred.

[2] The findings of a reevaluation currently underway of the City of Paterson's population estimate may affect post 1970 population estimates for Passaic County and the State total.

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