FINAL REPORT

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ANALYSIS OF INTERACTIONS BETWEEN THE MACROECONOMY AND FOOD STAMP PROGRAM CHANGES

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EXECUTIVE SUMMARY

The primary purpose of this project is to disentangle the effects of legislative changes enacted in 1981 and 1982 from the effect of separate but simultaneous changes in economic conditions. It is hypothesized that an economic recession can alter the demand for food stamps because of the accompanying change in real income and unemployment. By estimating through econometric analysis how the caseload and the cost of the food stamp program is related to economic variables, the caseload and cost of other programs (such as AFDC), and the administrative changes in the food stamp program itself, we can estimate both what would have happened to the food stamp caseload had the recession not occurred and the amount by which the administrative changes in the food stamp program held down the caseload and cost of the program.

The project is divided into three phases. The first phase consists of a descriptive analysis of the variables which may have affected the cost and caseload of the food stamp program. The second phase is the construction of an econometric model of the food stamp program which statistically disentangles the effect of economic variables from the effect of program changes on the caseload and cost of the food stamp program. The third phase is a simulation experiment in which the econometric model is used to estimate what would have happened to the cost and caseload of the food stamp program under a different economic scenario in which it is assumed that the unemployment rate did not rise and real income continued to rise throughout the 1981-83 period.

1. Descriptive Analysis

The 1974-75 period was one of rapid growth for the food stamp program. The total number of recipients in the 50 states plus the District of Columbia rose from 13.3 million persons in the first quarter of 1974 to 17.8 million persons by the second quarter of 1975--an increase of 34 percent. In contrast, during the 1981-82 recession the caseload first dropped from 20.8 million in the second quarter of 1981 to 20.0 million by the fourth quarter of 1981 and then increased to a peak of 22.2 million by the first quarter of 1983--only 6 percent higher than at the beginning of the recession.

The descriptive analysis phase of the project explores several possible causes for the difference in the growth in the caseload in the two recessions. One of the most important differences is the program environment. In July 1974 the food stamp program was expanded into a nationwide program. Thus, part of the increase in food stamp recipiency during the period 1974-75 can be attributed to changes in the program rather than to the 1974-75 recession. In contrast, in the 1981-82 recession, the eligibility rules of the food stamp program were made stricter with one important change being the introduction of a gross income eligibility limit of 130 percent of the poverty line for families without an elderly or disabled member.

However, there were also other differences between the two time periods. These differences include the following.

* Between 1974 and 1981 the female labor force participation rate rose by about 14 percent nationally, contributing to a 13 percent increase in the number of couples in which there were two earners. Other things equal, these increases should have cushioned the shock of the second recession.

* Elderly families had real incomes that were 12 percent higher in 1981 than in 1974. This may also have cushioned the impact of the second recession.

* The number of persons living in families headed by women and below the poverty line increased from around 12 million persons during the 1974-75 recession to nearly 16 million persons during the 1981-82 recession. Since these families are generally eligible for AFDC benefits, increases in their numbers could reduce the average benefit paid by the food stamp program since AFDC benefits are included in countable income for purposes of calculating food stamp benefits. Moreover, the AFDC caseload actually fell by over one million recipients between the first quarter of 1981 and the third quarter of 1982 due to the establishment of a gross income limit in determining AFDC eligibility, the lack of indexing of benefit standards, the changes in allowable deductions from countable income. The likely impact of this fall is not entirely clear. On the one hand, a family removed from the AFDC roles is likely to have a greater need for food stamp benefits than before. On the other hand, because there is a very large overlap between the two programs (in August 1982 more than 40 percent of all food stamp recipients also received AFDC), drops in AFDC might lead to drops in food stamp recipiency.

The analysis produced no evidence to support the hypothesis that the latter recession was more regionally differentiated than the earlier recession and that this somehow translated into a differential response of the food stamp program. Moreover, since the unemployment insurance program covered a smaller fraction of the unemployed during the latter recession, there is no evidence that unemployment insurance did a better job of cushioning the impact of the recession and, thus, reducing the demand for food stamps.

2. A Macroeconomic Model of the Food Stamp Caseload and Average Benefits

Taking advantage of the findings of the descriptive analysis a macroeconomic model of the food stamp program has been developed to analyze the impact of economic variables and program changes on the food stamp caseload and average benefit. The model has two basic equations--one to analyze the caseload and one to analyze the average benefit. The explanatory variables in the recipient model include the unemployment rate, the fraction of the unemployed population that has been unemployed for at least 52 weeks, the real wage rate, the poverty rate, the AFDC benefit recipient rate, and dummy variables to represent the elimination of the purchase requirement and the 1981 Omnibus Budget Reconciliation Act (OBRA81) changes.

The unemployment rate and the poverty rate were the two most powerful explanatory variables, along with the AFDC recipient variable.

The regression analysis of the food stamp caseload indicated that a one percentage point increase in the unemployment rate in each of the nine divisions of the U. S. would lead to an increase of about 375,000 food stamp recipients. Moreover, an increase of one percentage point in the fraction of the unemployed experiencing unemployment for more than 52 weeks would lead to an increase of about 82,000 recipients. Each increase of ten persons in the number of people in poverty is estimated to increase the food stamp caseload by five persons. An increase in the AFDC caseload of 10 persons would lead to an increase in the food stamp caseload of nearly 17 persons. The OBRA81 changes appear to have reduced food stamp recipiency by about 500,000 recipients compared with what the caseload would have been in the absence of the changes. The estimate of the impact of the OBRA82 changes had the wrong sign and was dropped from the analysis.

The explanatory variables in the benefit equation included the maximum allotment for a family of four, the average AFDC benefit, the difference between the mean income of families in poverty and the poverty line, the real wage, and dummy variables representing the elimination of the purchase requirement, the OBRA81 changes and the OBRA82 changes. The equations were estimated in constant dollars, and most variables were converted into percent change form to focus the model on the dynamic process of benefit adjustment. Pooled cross-section time series techniques were used with a single equation estimated for the entire U. S., pooling across the nine divisions.

The regression analysis of the average food stamp benefits indicated that a one percentage point increase in the real maximum allotment leads to a 1.7 percent increase in the average real benefit. A one percentage point decrease in real AFDC benefits leads to a 0.16 percent increase in food stamp benefits. A 1 percent increase in the mean real difference between the average income of persons in poverty and the poverty line leads to a 0.22 percent increase in the average real food stamp benefit. A one percent increase in real wage and salary disbursements leads to a 0.41 percent decrease in food stamp benefits. OBRA81 is estimated to have reduced the average quarterly increase in average food stamp benefits by about one dollar (in 1983 dollars) between its implementation and the implementation of OBRA82. However, the coefficient of the OBRA82 variable is positive and almost as large as the OBRA81 dummy. This suggests that the OBRA81 changes depressed the rate of increase in benefits only temporarily. (It should be noted that this negative effect of the OBRA81 changes is not due to delays in cost-of-living adjustments to the allotments. Instead this variable reflects the impact of other OBRA81 changes such as prorating the first month benefits, postponing increases in the standard deduction, and reducing the earnings disregard.)

Both the recipient model and the benefit model performed reasonably well in reproducing the historical pattern over the period 1976 through 1983.

3. The Impact of the Recession on the Food Stamp Program

The food stamp model was used in conjunction with the Data Resources, Inc., model of the U. S. Economy, the DRI Regional Information Service (RIS) model, and the Demographic-Economic (DECO) Model to estimate the impact of assuming that the 1981-82 recession did not take place. This then yields an estimate of what would have happened to the food stamp cost and caseload in the absence of the recession.

Whether the 1981-82 recession could have been avoided by different economic policies is, of course, problematic. The case that the recession could have been avoided rests on the assumption that a much less strict monetary policy combined with the tax cuts implemented by Congress would have provided enough stimulus to avert the recession. On the other hand, it is plausible that continuing uncertainty deriving from such factors as high inflation and the risk of further oil price shocks combined with an increase in the difference between U. S. and foreign labor costs made a recession inevitable no matter what government policies were followed. It is not the purpose of this report to address this issue. Nonetheless, it is necessary that a scenario be created in which the recession does not take place. In order for that scenario to be internally consistent, a specific set of monetary and fiscal policies must be followed which, according to the relationships built into the DRI model, will lead to continuous growth in GNP.

The scenario created is only one of many no-recession scenarios which could have been created. Moreover, each equation in the model is stochastic and is subject to forecast error. Thus, even if the policy parameters and the basic responses to these parameters are taken as given, there is significant range of uncertainty around the point estimates provided by the model. Consequently, the differences between what actually happened and what was simulated to happen in this particular scenario should be viewed as suggestive rather than definitive.

The simulation exercise was carried out by simulating a change in federal government monetary policy during the period 1981-83 to reduce unemployment and increase gross national product over this period, compared with what actually happened. Through its open-market operations, the Federal Reserve system was assumed to increase non-borrowed reserves by 11 percent in 1981 and nearly 4 percent in 1982. This led to a money stock which was five to seven percent larger during the 1981-83 period. The result was continuous growth in real GNP, a stable unemployment rate rather than a sharp increase in unemployment, significantly higher inflation, and a lower federal deficit (resulting from much higher tax revenues). Real GNP differed by as much as $123 billion (in the third quarter of 1982); the unemployment rate remained below 7.7 percent; the inflation rate peaked at nearly 10 percent; and the deficit was over $125 billion lower in late 1982. The national simulation was then used to drive both a regional simulation and a simulation of the income distribution. These simulations, in turn, were used to produce simulated values for the explanatory variables in the food stamp model. This permits estimates to be made of what the food stamp caseload and average benefit would have been had the recession not occurred.

In summary, the simulation shows that the difference in the caseload between actual history and the "No Recession" simulation grows rapidly from under 500,000 in the middle of 1981 to between 2.5 and 3.1 million during 1982 and a peak difference of 4.3 million in the first quarter of 1983. The difference begins to decline thereafter as the real-world economy begins to recover from the recession. Focusing on the peak difference of 4.3 million, over 1.6 million fewer persons are simulated to be on the caseload as a result of a difference in poverty of about 3.2 million persons. The difference in the AFDC caseload (669,000 persons) and the difference in long-term unemployment (709,000 persons) lead to a difference in food stamp recipiency of 990,000 and 500,000 persons, respectively. The difference in the unemployment rate (3.0 percentage points) accounts for the almost all the remaining difference in recipiency--nearly 1.1 million persons. The increase in the real wage has a negligible effect.

The difference in the average benefit between actual history and the "No Recession" simulation is much smaller. At its peak in the fourth quarter of 1983, the average benefit is $.61 lower (in 1967 dollars) than in history. The real average benefit is lower because of the combined effect of three variables. The real maximum allotment for a family of four is lower; the mean poverty deficit is lower; and real wage and salary disbursements are higher.

Estimates of the total cost of the food stamp program under the "No Recession" scenario can be obtained by multiplying the simulated number of recipients by the simulated average benefit. The differential betwee this scenario and actual history, driven primarily by lower recipiency, rises to $2.6 billion in the second quarter of 1983.

In contrast to these rather large differences, the regression analysis indicated that OBRA81 caused the food stamp caseload to be about 500,000 persons lower than it would have been otherwise. The OBRA81 changes were estimated to have reduced the average quarterly increase in average food stamp benefits per recipient by about one dollar (in 1983 dollars) between its implementation and the implementation of OBRA82. Hence, it is not surprising that the 1981-82 recession masked the impact of the OBRA81 changes to the food stamp program.

4. Conclusions

The most important conclusion of this study is that although the OBRA81 changes reduced food stamp recipiency by about 500,000 recipients compared with what the caseload would have been in the absence of changes, the cyclical sensitivity of the food stamp program resulted in a large increase in the caseload and costs of the program that masked the effect of the OBRA changes. Under a possible scenario in which the 1981-82 recession was assumed not to take place, food stamp recipiency would have been 4.3 million persons lower than what actually happened, and total food stamp costs would have been $2.6 billion lower (in current dollars) in the first quarter of 1983.

Regression analysis confirmed the sensitivity of the food stamp caseload to the unemployment rate, long-term unemployment, poverty, and the caseload of the AFDC program.

The relative strength of the increase in the food stamp caseload during the 1974-75 recession compared to the increase in the 1981-82 recession is at least partially explainable by the difference in the program environment of both food stamps and AFDC during the two periods. In the earlier recession, the food stamp program was expanded into a nationwide program, and the AFDC caseload was growing. In contrast, in the 1981-82 recession, the eligibility rules of both food stamps and AFDC were made stricter. Thus, in the earlier recession changes to the food stamp program and growth in the AFDC program reinforced the cyclical tendency for the food stamp caseload to increase during a recession. In the latter recession, changes to both programs restrained the cyclical reaction of the food stamp program.

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CHAPTER I. DESCRIPTIVE ANALYSIS OF THE DIFFERENCES BETWEEN THE 1974-75 AND 1981-82 RECESSIONS

INTRODUCTION

Based on Hoagland (1983), federal expenditures (in 1983 dollars) on the food stamp program (including Puerto Rico Nutrition Assistance) grew from $1.480 billion in 1970 to $12.130 billion by 1981. Thus, by 1981 the real cost of the program was over eight times the 1970 cost. In the Omnibus Budget Reconciliation Act of 1981 (OBRA), the Food Stamp and Commodity Distribution Amendments of 1981 (Farm Bill), and the Food Stamp Act Amendments of 1982 (1982 Amendments), legislation was enacted with the intent to tighten eligibility standards and reduce benefit growth. Nonetheless, the program's cost (in 1983 dollars) rose to $12.653 billion by 1983. As pointed out in the U.S. Food and Nutrition Service's Interim Report to Congress (1984), the continued growth in the cost of the food stamp program is almost certainly due to the 1981-82 recession.

To understand the impact of the legislative changes it is necessary to disentangle the effects of the legislative changes themselves from the effect of economic conditions. The general hypothesis underlying this project is that the occurrence of an economic recession can increase the demand for food stamps because of a decline in real income and the increase in unemployment accompanying the recession. If econometric analysis can be used to estimate how the cost and caseload of the food stamp program is related to economic variables, then it is possible to estimate how much of the recent changes in the cost and caseload of the program are attributable to economic change. Then the effect of the changes in the food stamp program controlling for the impact of the economy can be estimated.

This chapter begins the process of this analysis by summarizing exploratory descriptive analysis of variables which potentially may have affected the cost and caseload of the food stamp program. Since there are indications that the food stamp program may have behaved differently during the most recent recession than during the last serious recession (1974-75), the descriptive analysis focuses on variables which may have behaved differently during the two recessions in such a way that the cost and caseload of the food stamp program may have reacted differently.

The first section of the chapter traces the pattern of growth in the food stamp caseload and costs during the two recessions and sketches the differences in the program during the two periods. Special attention is given to describing the changes made in the program during 1981 and 1982.

The second section suggests several potential causes of the caseload behaving differently during the two recessions. It summarizes the findings of the descriptive analysis and then explores the implications of the descriptive analysis for building a regional model of the food stamp program. It, thus, lays the groundwork for building a model of the food stamp program linked to a comprehensive regional-level model of the U. S. economy. (This is described in Chapter II.)

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A. FOOD STAMP CASELOAD GROWTH AND PROGRAM CHANGES DURING TWO RECESSIONS

The Food Stamp program is countercyclical--that is, recipiency rises during recessions and falls during periods of recovery. This is illustrated in Charts 1 and 2, which track the paths of the civilian unemployment rate and the year-to-year percentage change in real gross national product (in 1983 dollars) respectively, against the number of food stamp recipients. This countercyclical

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Chart 1

CIVILIAN UNEMPLOYMENT RATE
VERSUS
NUMBER OF FOODSTAMP RECIPIENTS (DASH)

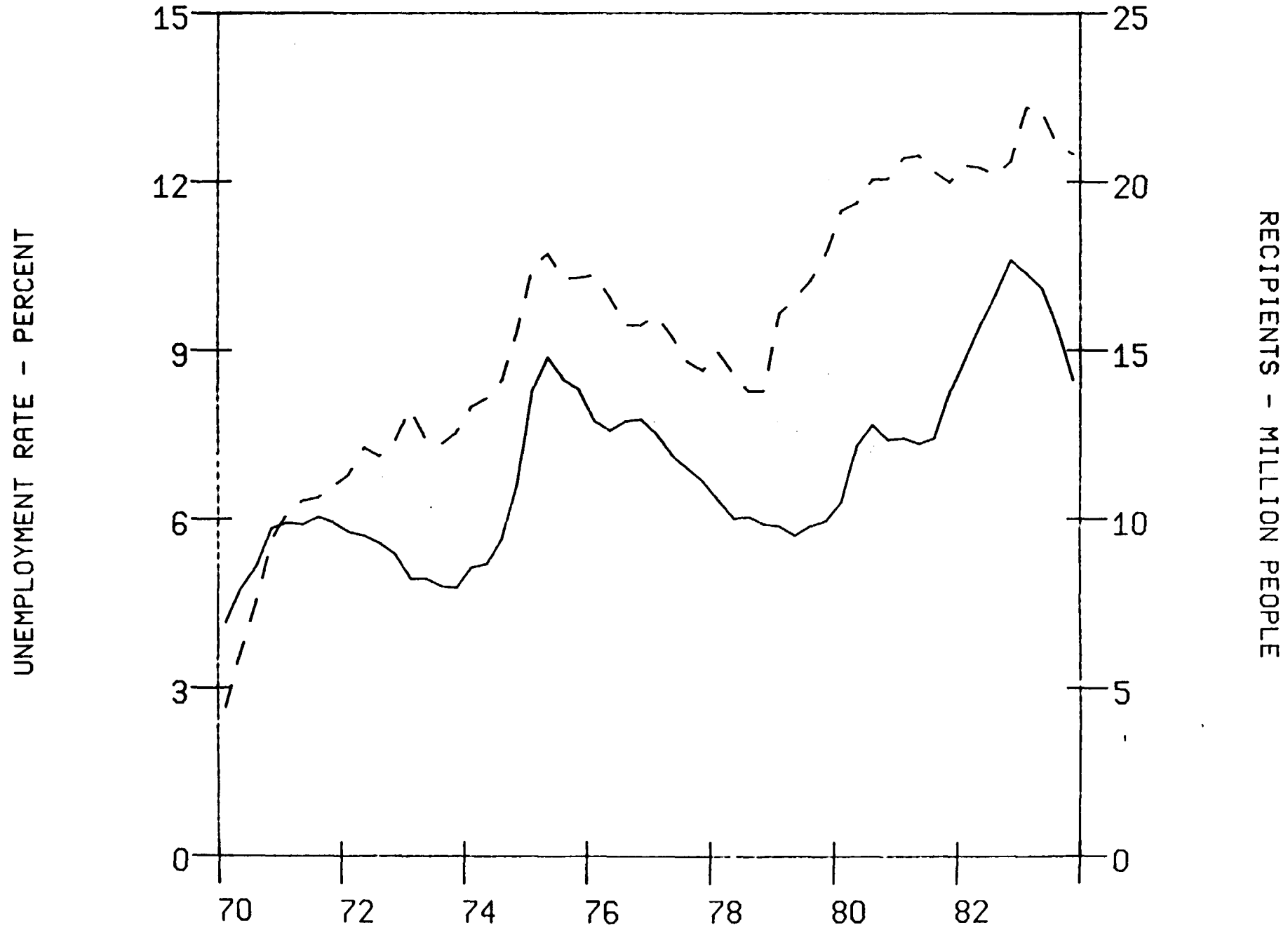

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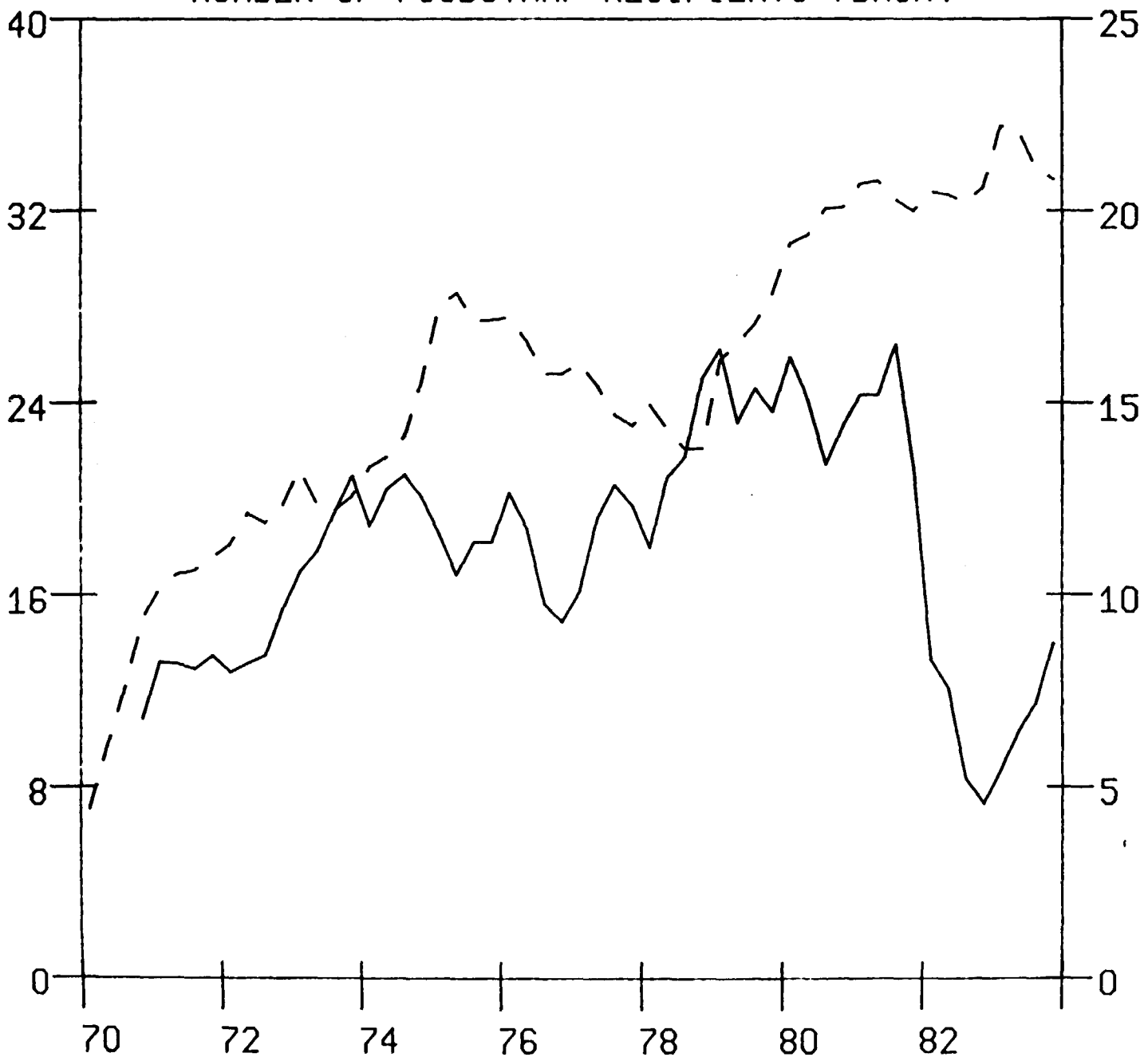
Chart 2

PERCENT CHANGE YR AGO IN GROSS NATIONAL PRODUCT
VERSUS
NUMBER OF FOODSTAMP RECIPIENTS (DASH)



PERCENT CHANGE YR AGO IN GNP (1983 DOLLARS)

RECIPIENTS - MILLION PEOPLE

The 1974-75 period was one of rapid growth for the food stamp program. The total number of recipients in the 50 states plus the District of Columbia[1] rose from about 13.3 million persons to about 17.8 million persons by mid-1975 or 34 percent. Over this same two-year period, the annual cost of the program (in 1983 dollars) rose from $6.7 billion to $8.6 billion--a 29 percent increase. This increase was associated with two factors--the 1974-75 recession and the July 1974 nationwide expansion of the food stamp program.

Charts 3 and 4 show the number of recipients and the annualized total cost (in 1983 dollars) of the program during this two-year period for the nation as a whole and the number of recipients for nine regions of the U. S.[2].

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1 Puerto Rico has been excluded from the analysis of this report because, in a later stage of this project, we will be using the Data Resources, Inc., Regional Information Service (RIS) model to provide a basic structure for the Food Stamp Model. RIS models only the 50 states.

2 The regions shown correspond for the most part to the nine divisions defined by the Census Bureau except that the Census Mountain and Pacific divisions have been combined and redivided into a Northwest Pacific and a Southwest Pacific region. This departure from Census definitions is necessary because the Data Resources, Inc., Regional Information Service (RIS) model uses these definitions, and the RIS model is expected to be used at a later stage of the project in conjunction with the econometric model of the food stamp program. The regional abbreviations showed in Chart 2 and in other charts displaying regional concepts are ENC for East North Central, ESC for East South Central, MATL for Middle Atlantic, NENG for New England, PNW for Pacific North West, PSW for Pacific South West, SATL for South Atlantic, WNC for West North Central, and WSC for West South Central.

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Chart 3

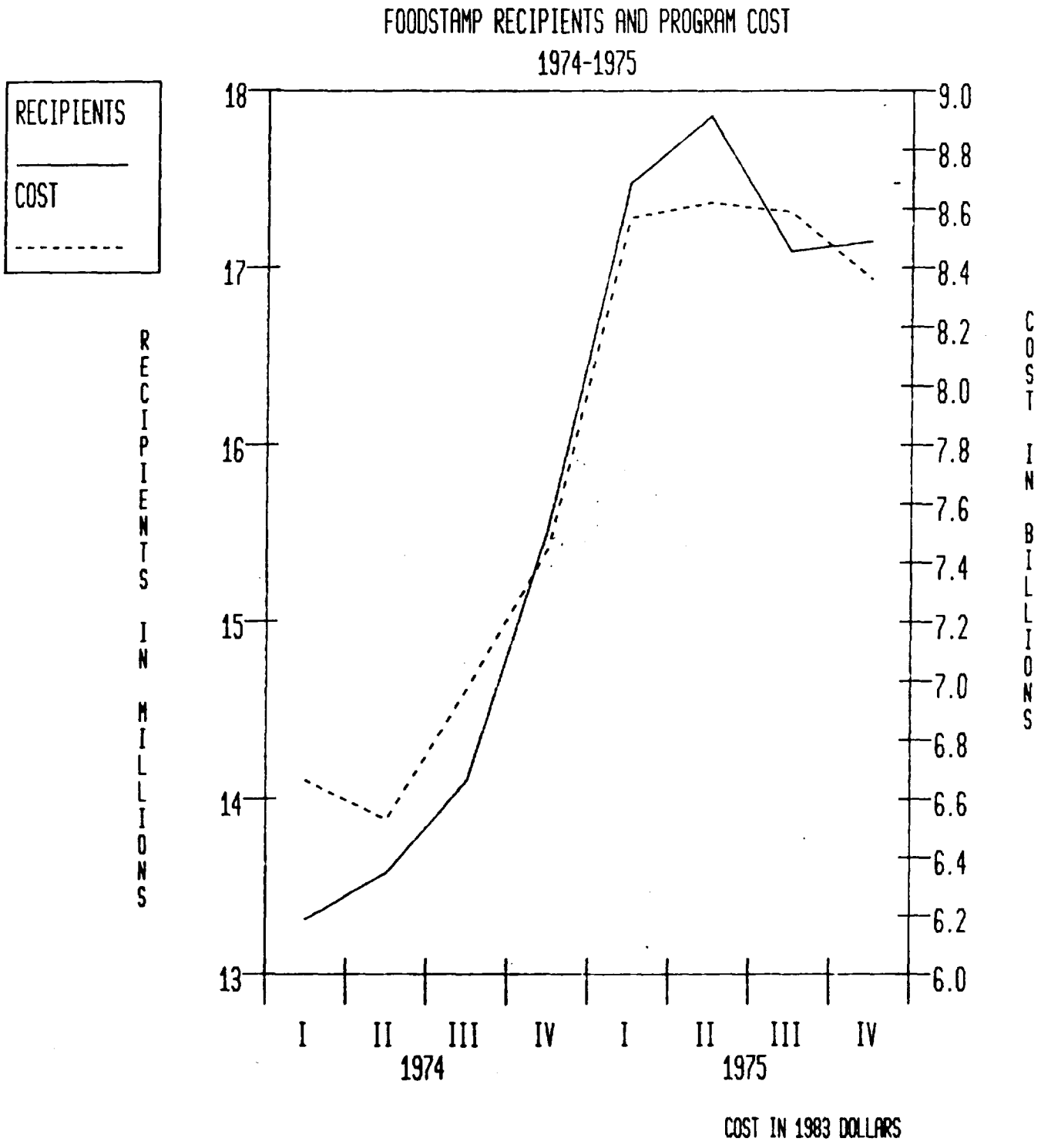

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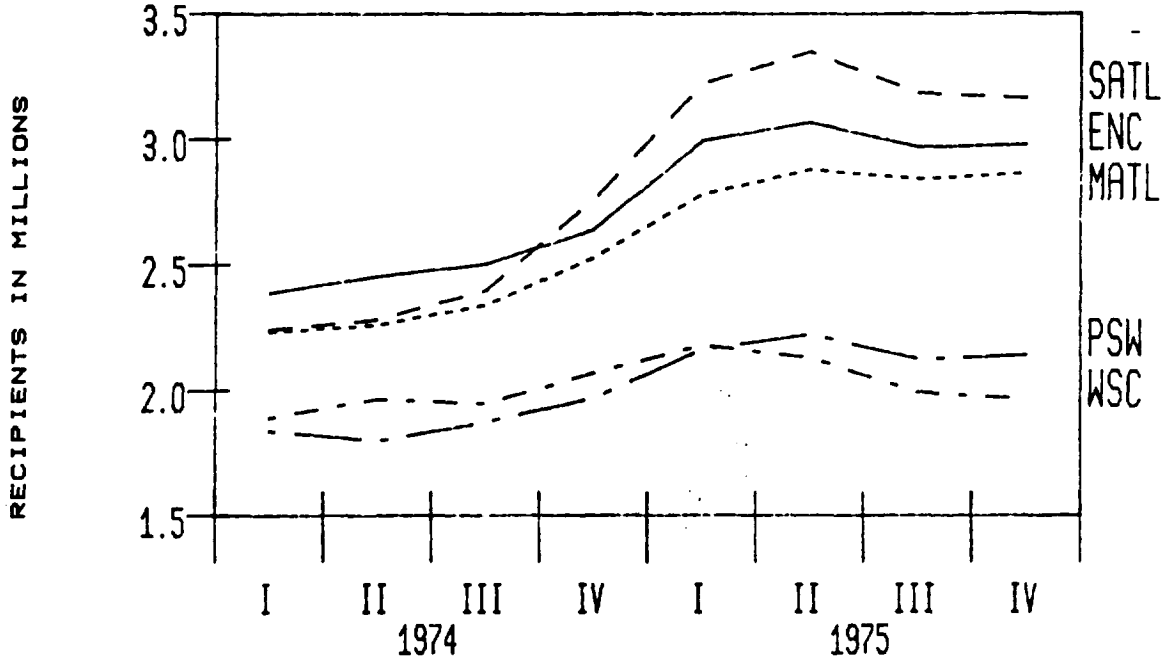
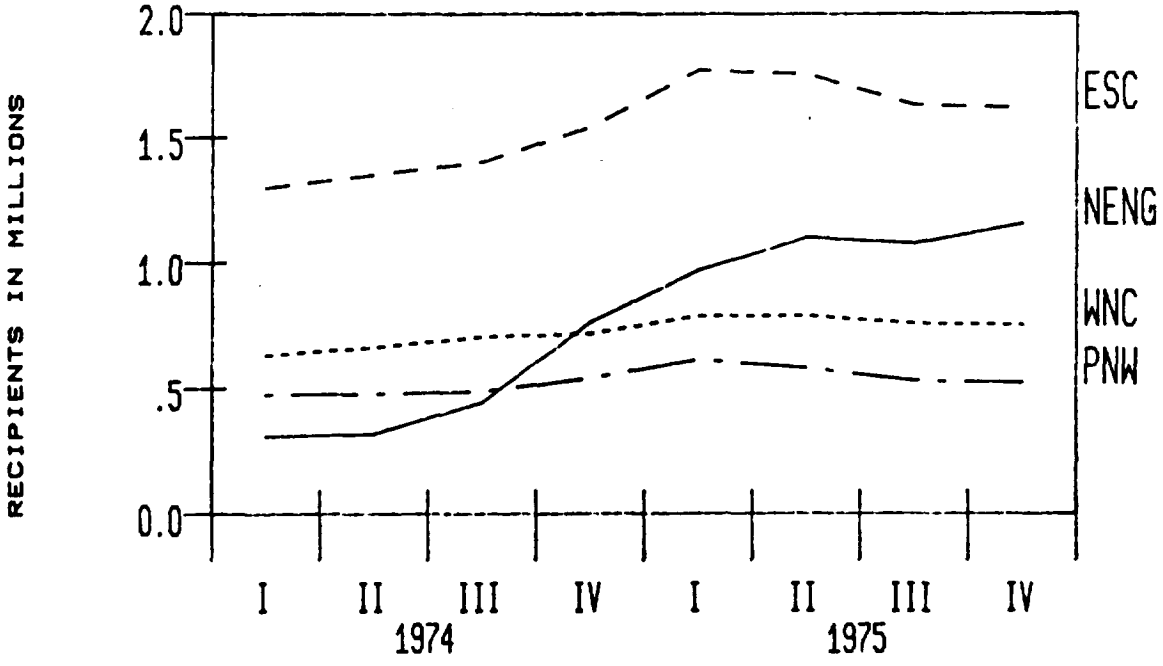
Chart 4

FOODSTAMP RECIPIENTS IN REGIONS WITH MORE THAN
1.7 MILLION RECIPIENTS IN 1974:1
1974-1975



FOODSTAMP RECIPIENTS IN REGIONS WITH LESS THAN
1.7 MILLION RECIPIENTS IN 1974:1
1974-1975



Results for the same period are shown for the number of recipients in index number form in Chart 5. This index number is calculated by dividing the number of recipients in each quarter by the number of recipients during the first quarter of 1974 and multiplying the quotient by 100.

As shown in Chart 1 from the second half of 1975 through 1977 the number of recipients in the program declined as the economy continued its recovery. However, the Food Stamp Act of 1977 made the program more accessible to low income households by eliminating the purchase requirement. In 1980 there was a brief recession. The combination of all of these factors caused a significant increase in the number of food stamp recipients. By the second quarter of 1981, the number of recipients leveled off at 20.7 million recipients in the 50 states--an increase of 16 percent over the second quarter of 1975. Over the same period, the total cost of the program (in 1983 dollars) rose from $8.6 billion (in 1983 dollars) to $11.4 billion--an increase of 33 percent.

In the 1981-82 period, a major recession coincided with legislative changes in the food stamp program. Congress enacted three pieces of legislation--OBRA, the Farm Bill, and the 1982 Amendments. The most important 1981 changes were as follows:

- A gross income eligibility limit of 130% of the poverty line was established for families without an elderly or disabled member.
- First month benefits were pro-rated to the date of application.
- The earnings disregard was reduced from 20% to 18%.

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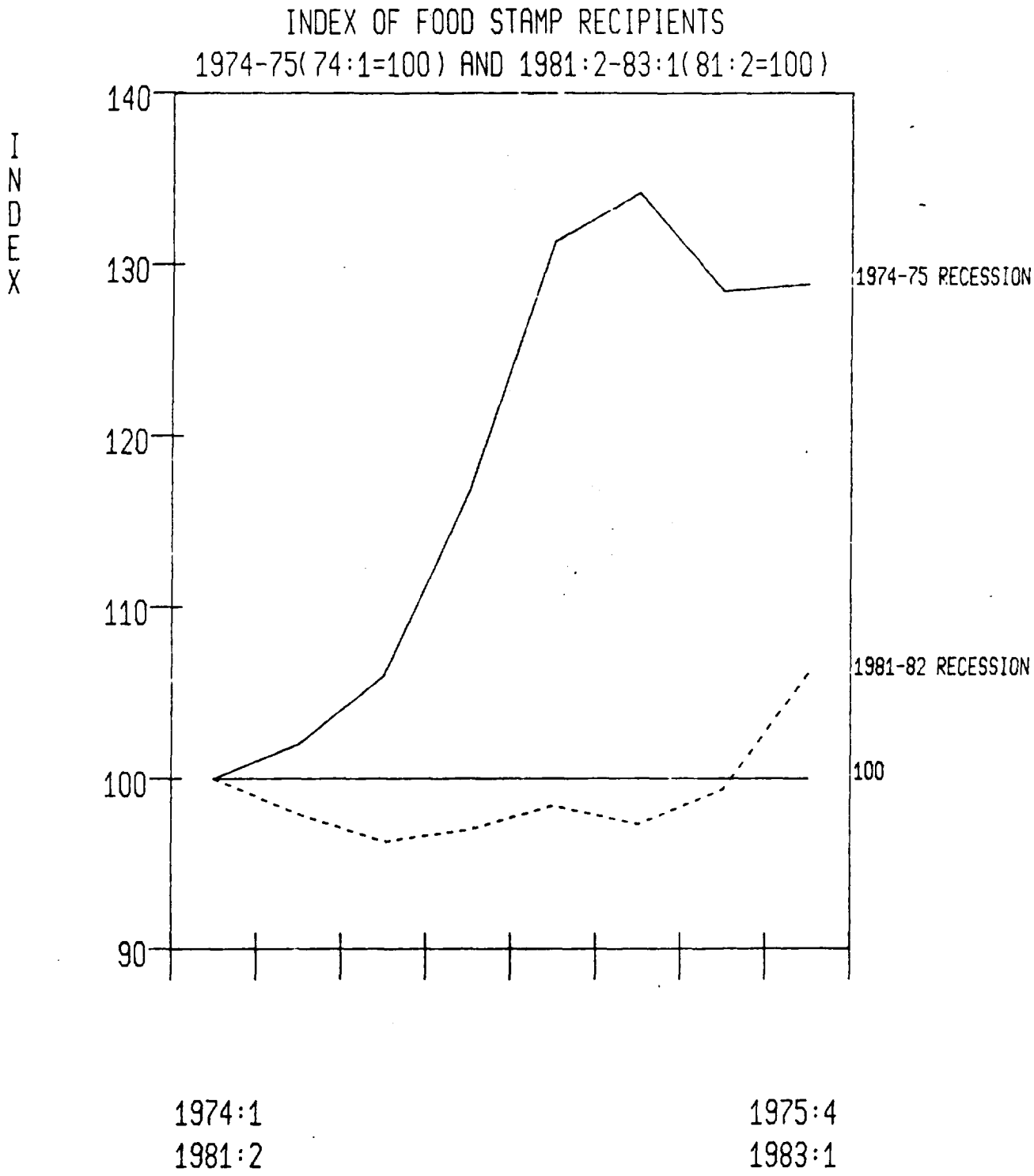
Chart 5



- Increases in the allotment per household were postponed until October 1982.
- The annual January update in the standard deduction was postponed until July 1983, October 1984 and each October thereafter.
- The annual January update in the dependent shelter deduction was delayed until July 1983.

The 1982 amendments included the following:

- A net income ceiling, combined with a gross income maximum, was established for families not containing an elderly or disabled member.
- Increases in the allotment per household were rescheduled to occur in October of each year based on 99 percent of the Thrifty Food Plan for the preceding June.
- The postponement in the standard deduction, was continued until October 1983.
- The delay in the dependent shelter update was continued until October 1983.
- Rounding in the value of the deduction was changed from the nearest five dollars to the next lower dollar, rounding in benefits and maximum allotments were changed from the nearest dollar to the next lower dollar.

According to FNS analysis of the legislative changes, the food stamp program would have cost about $1.5 billion more had the changes not been legislated[1].

[1]See U. S. Food and Nutrition Service (1984).

Charts 6 and 7 show the change in the number of recipients and the total cost (in 1983 dollars) of the program during this two-year period for the nation as a whole and the number of recipients in the regions. In spite of the legislative change, as Chart 6 shows, nationally, the total number of recipients fell by about 4 percent between the second and fourth quarters of 1981, stayed level during most of 1982, and then increased sharply at the end of 1982 and in early 1983. By the first quarter of 1983, the total number of recipients was 6 percent higher than in the second quarter of 1981. The annualized cost of the program dropped 13 percent by the second quarter of 1982 but then rose sharply to 1 percent higher than its value at the beginning of the recession.

To summarize, the 1974-75 recession was a period of rapid growth for the food stamp program with a caseload increase of 34 percent. In contrast, during the 1981-82 recession, the caseload first dropped by about 4 percent and then increased to a level 6 percent higher than at the beginning of the recession. This contrast is even clearer when the two periods are viewed together (see Chart 5) in index number form (with each period using the first quarter as its base period).

These quite different responses may be due to a number of causes. Part of the difference may lie in the changes in the program rules which took place during both recessions. However, there were other important differences between the two recessions. The next section suggests several potential hypotheses to explain the differences, summarizes preliminary analysis of these hypotheses, and explores the implications of this analysis for building a food stamp model.

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Chart 6

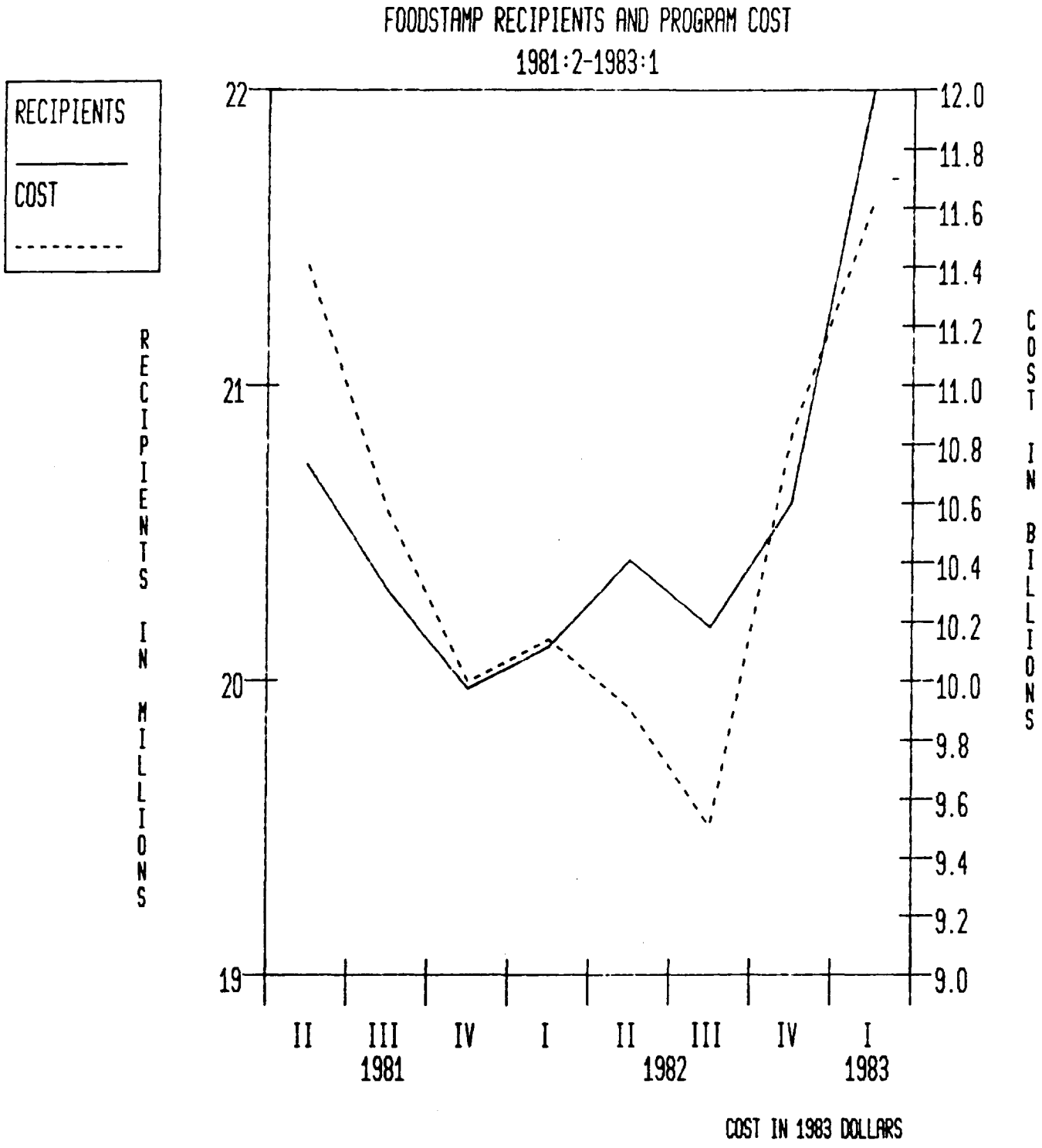

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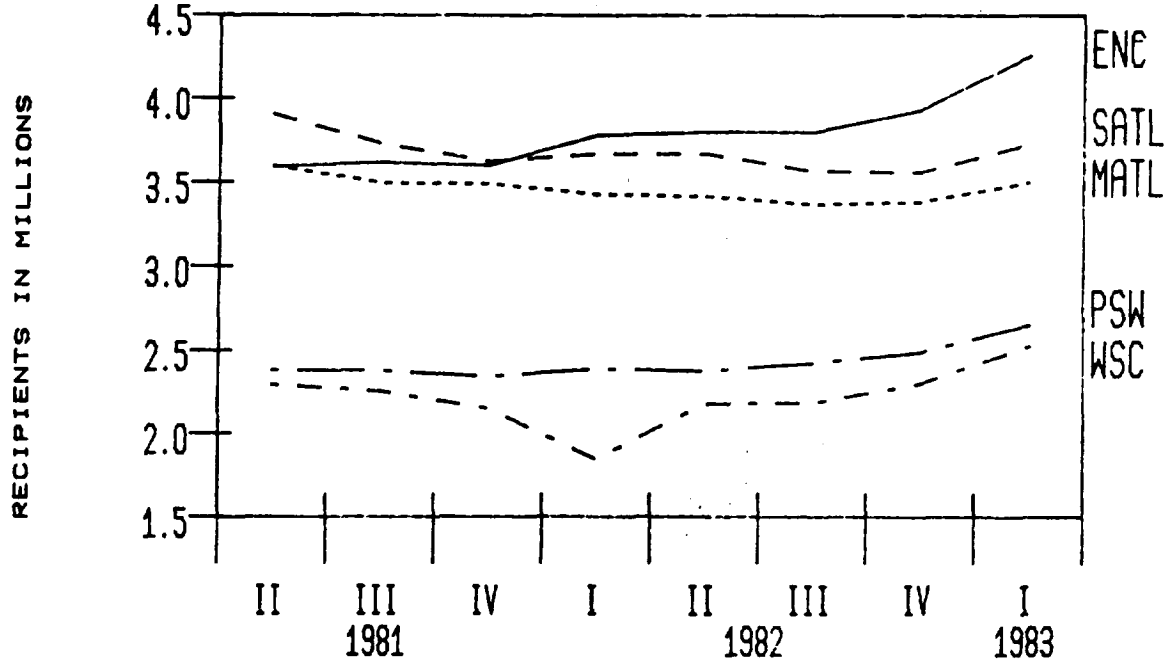
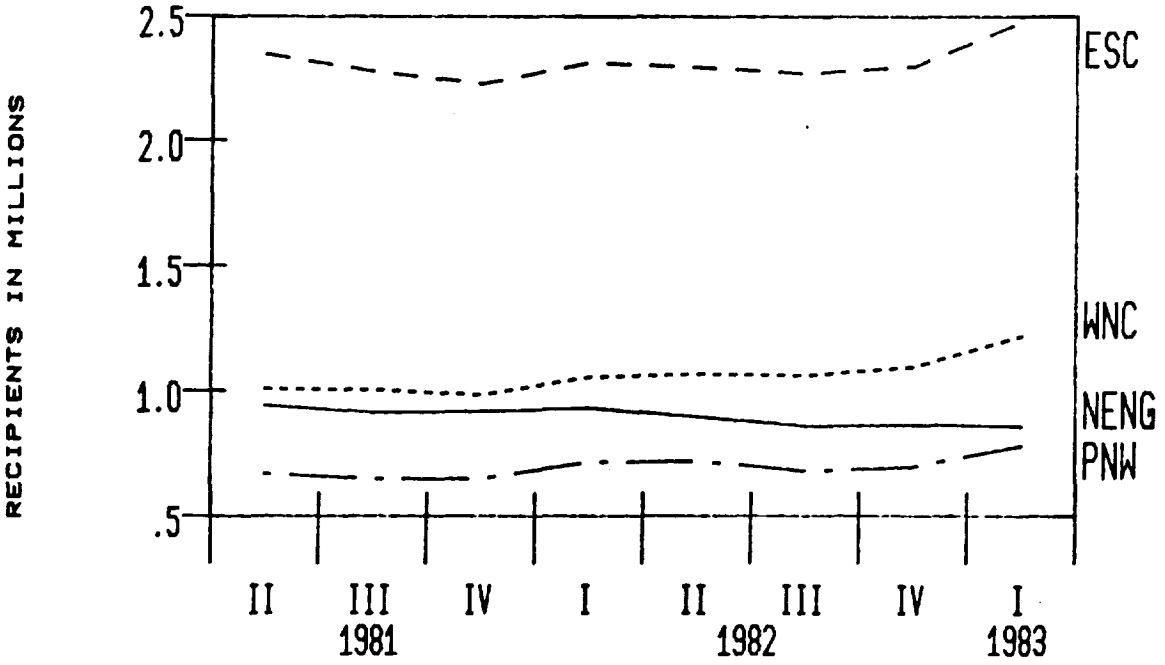
Chart 7

FOODSTAMP RECIPIENTS IN REGIONS WITH MORE THAN
1.7 MILLION RECIPIENTS IN 1974:1
1981-1983



FOODSTAMP RECIPIENTS IN REGIONS WITH LESS THAN
1.7 MILLION RECIPIENTS IN 1974:1
1981-1983



B. POTENTIAL CAUSES OF DIFFERENCES IN CASELOAD RESPONSE TO RECESSIONS

Preliminary analysis was carried out to explore the following potential causes for the differences in the behavior of the food stamp caseload and costs to the 1974-75 and 1981-82 recessions:

- Differences in the severity of the two recessions.
- Differences in the labor force participation of women and the number of two-earner couples.
- Differences in the concentration of unemployment among workers covered by unemployment insurance.
- Differences in the regional intensity of the recessions.
- Differences in the economic status of the elderly.
- Differences in the fraction of the poverty population made up of families headed by women.
- Differences in the inflation rates for food, housing, and medical expenses.

The results of the analysis can be summarized as follows.

First, the issue of the severity of the recessions is discussed. The recession in the U. S. economy that took place between the second quarter of 1981 and the last quarter of 1982 is commonly viewed as the most severe recession since World War II[1]. This is true if the unemployment rate is used to measure severity. As shown in Chart 8, the unemployment rate reached a peak of 10.5 percent in the fourth quarter of 1982--significantly higher than the 8.7 percent peak reached in the second quarter of 1975.

[1]Even though growth in real GNP rose slightly in the third quarter of 1982, the economy in reality was still considered to be in a recession.

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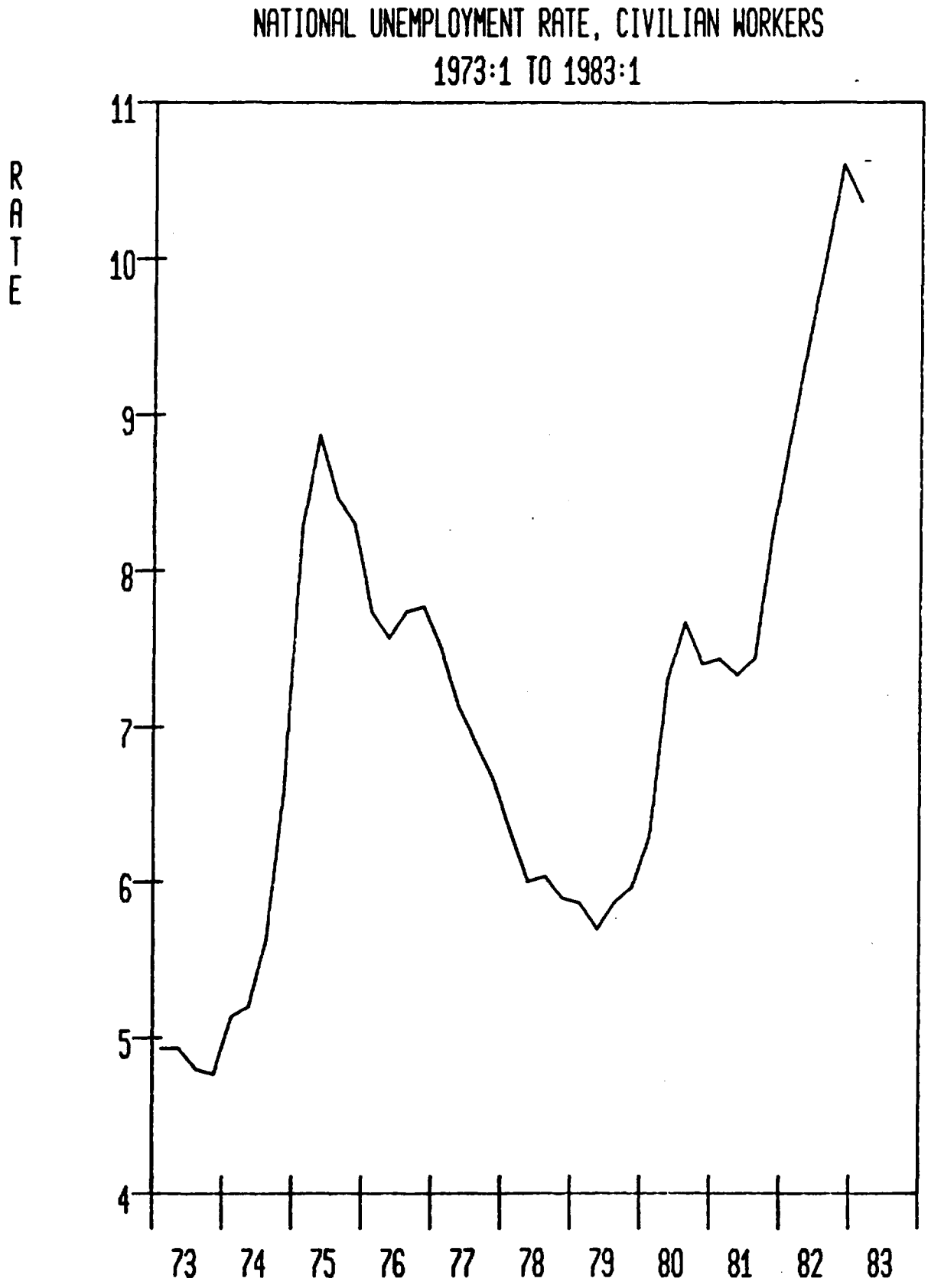
Chart 8



However, as shown in Chart 9, the 1981-82 recession was less severe than the 1974-75 recession if viewed against the backdrop of the economy prior to each recession. In the last quarter of 1973 just prior to the recession, the unemployment rate was only 4.8 percent as shown in Chart 9; in the first quarter of 1981 the unemployment rate was 7.3 percent. In percentage terms the peak-to-trough increase in the unemployment rate was 72 percent in the earlier recession and only 43 percent in the latter recession[1]. Similarly, as can be seen in Charts 10 and 11 the peak to trough decline in real GNP was 4.9 percent in the 1974-75 recession and only 2.3 percent in the 1981-82 recession.

The picture is actually somewhat more complicated than presented above. The recovery that reached its peak in the first quarter of 1981 is often viewed as an incomplete recovery precisely because unemployment did not fall below 7 percent. A year earlier, prior to a two-quarter period of stagnation, the unemployment rate stood at 6.3 percent. If this earlier peak is viewed as the real beginning of an intermittent recession that lasted for three years, the peak-to-trough increase in the unemployment rate was 68 percent--virtually the same as the earlier recession.

[1]The peak prior to the 74-75 recession occurred in 1973 fourth quarter. The trough occurred in 1975 first quarter. The peak prior to the 81-82 recession occurred in the first quarter of 1981; the trough quarter is assumed to be the fourth quarter 1982.

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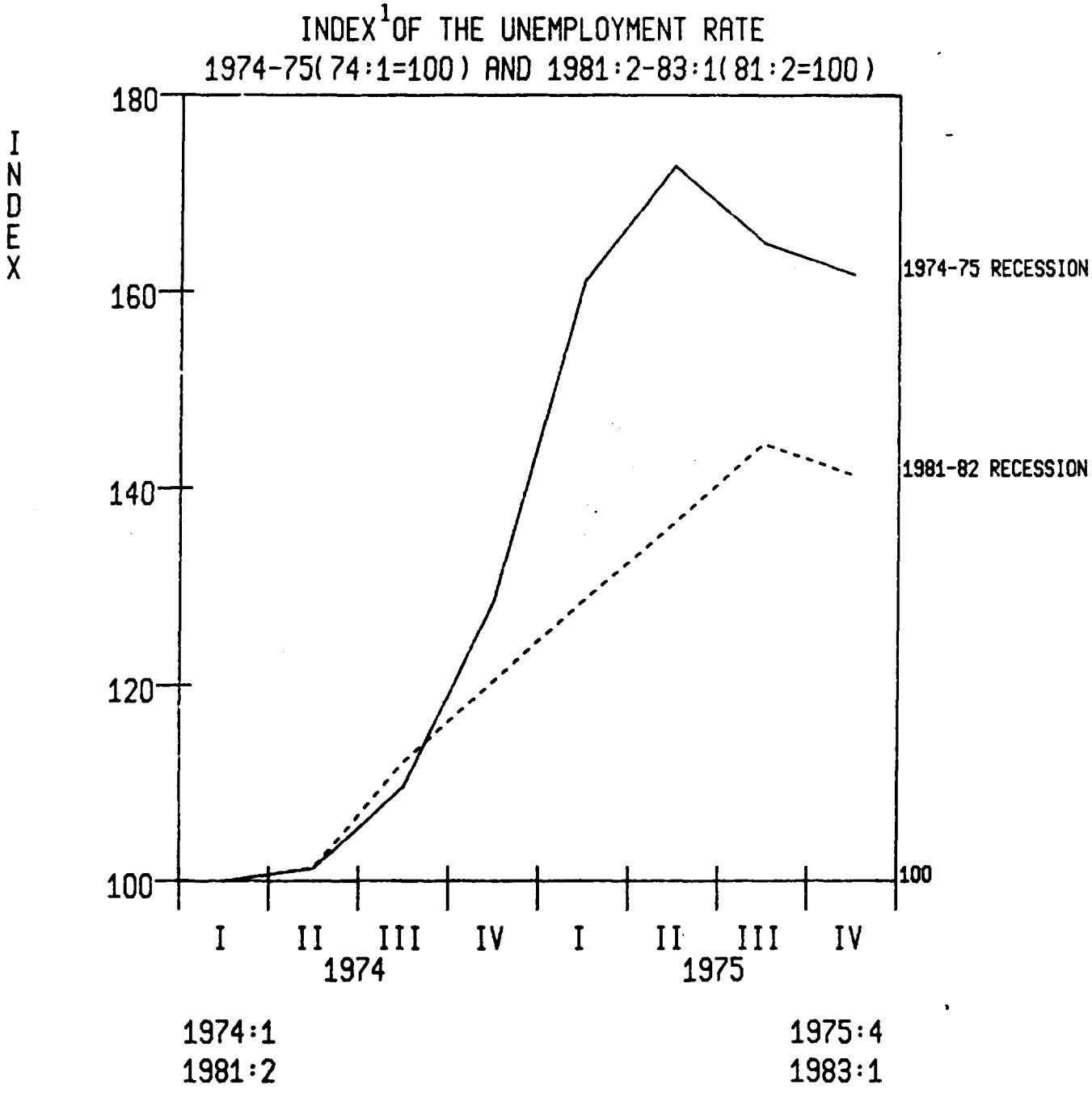
Chart 9



[1] Index numbers for the 1974-75 recession were calculated by dividing the quarterly unemployment rates by the unemployment rate for 1974, quarter 1, and multiplying the quotient by 100. Index numbers for the 1981-82 recession use 1981, quarter 2, as their base.

Chart 10

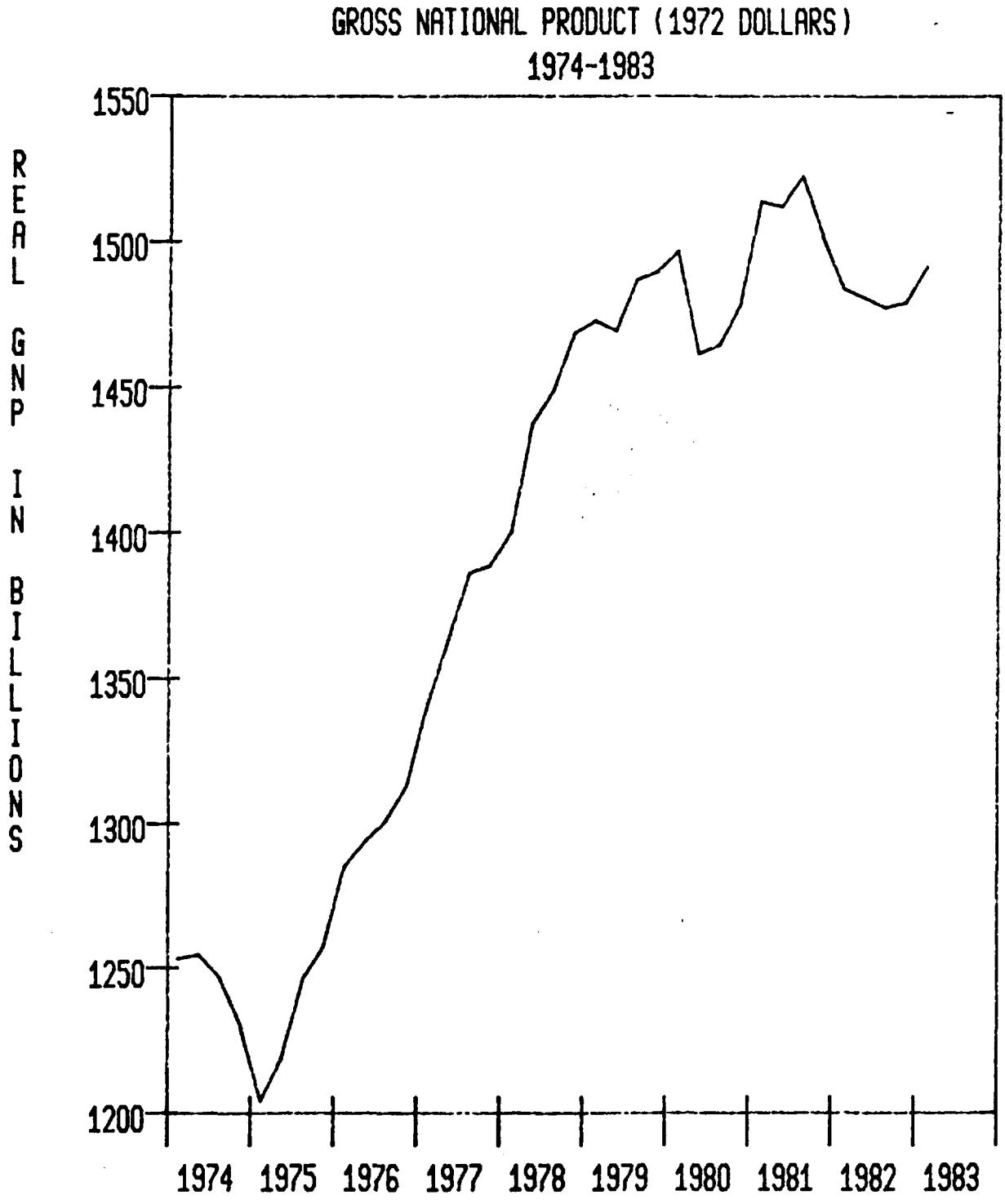

GROSS NATIONAL PRODUCT (1972 DOLLARS)
1974-1983
REAL GNP IN BILLIONS
1550
1500
1450
1400
1350
1300
1250
1200
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983

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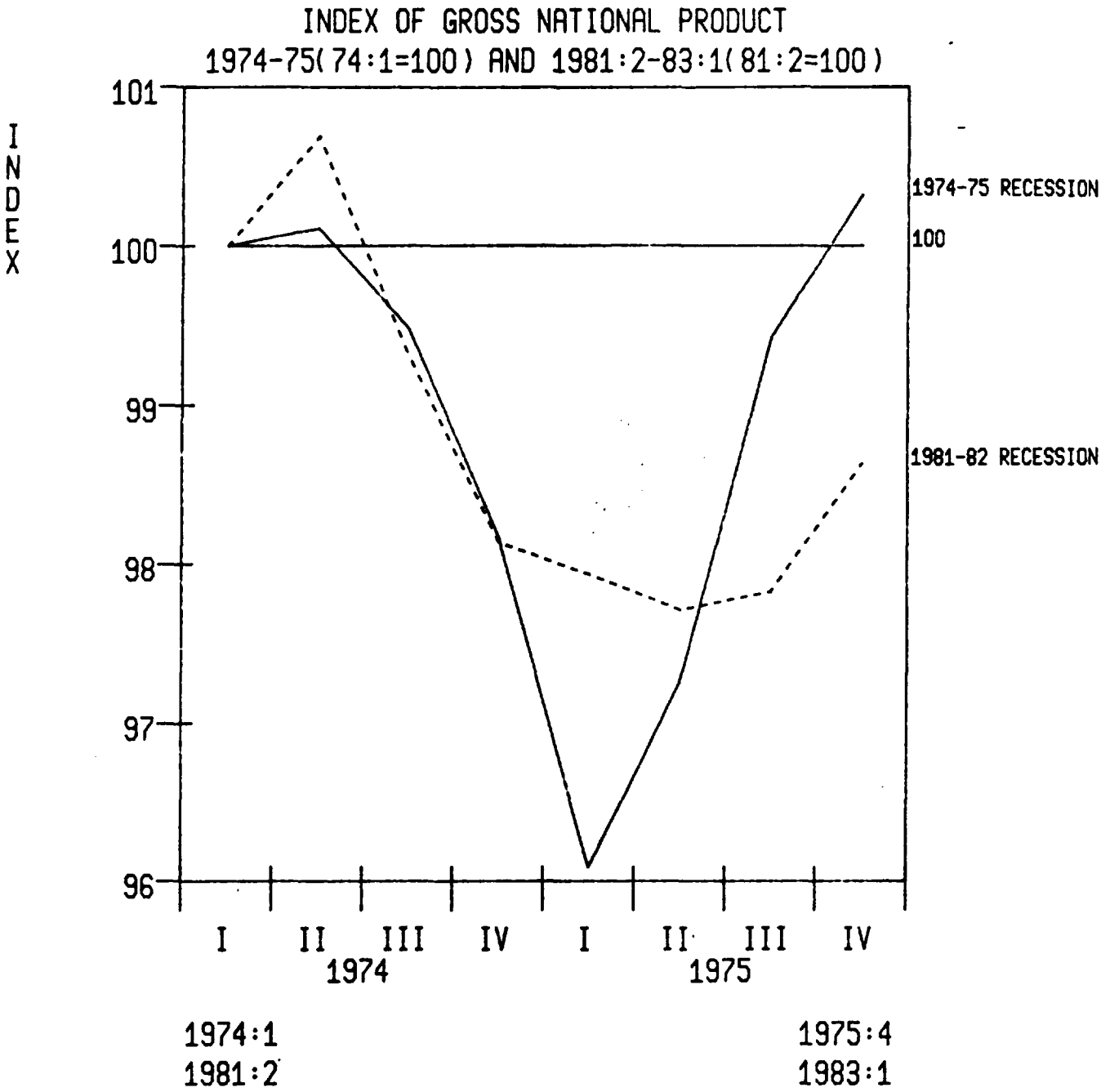
Chart 11



Second, there is significant support for the hypothesis that the increase in female labor force participation and the corresponding increase in the number of two-earner families may have contributed to the sluggishness of the response of the food stamp program. Chart 12 shows the difference in the labor force participation rate of women in the two recessions. Between 1974 and 1981 the rate rose by about 14.0 percent nationally, contributing to a 13.1 percent increase in the number of couples in which there were two earners (see Chart 13). Other things equal, the increase in the female labor force participation rate and the corresponding increase in the number of two-earner families should have cushioned the shock of the second recession.

Third, the increase in the income of the elderly between the two recessions and during the second recession may have also cushioned the impact of the recession on the food stamp program. During the 1970s the elderly improved their economic status relative to the rest of the population. This was in part due to significant increases in social security benefits (which were rising rapidly for each new retiring age cohort and fully indexed for those already retired) for the elderly compared with stagnating real earnings for the working population. In addition, income from private pensions and assets rose. Since the income of the elderly is much less dependent on earnings than is the case of the rest of the population, a drop in earnings in the economy at large would have little effect on the elderly population.

Chart 14 shows the average income in 1972 dollars of families headed by persons over age 65 plus individuals over age 65. This is in sharp contrast with the average income of other families and unrelated individuals during the two

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Chart 12

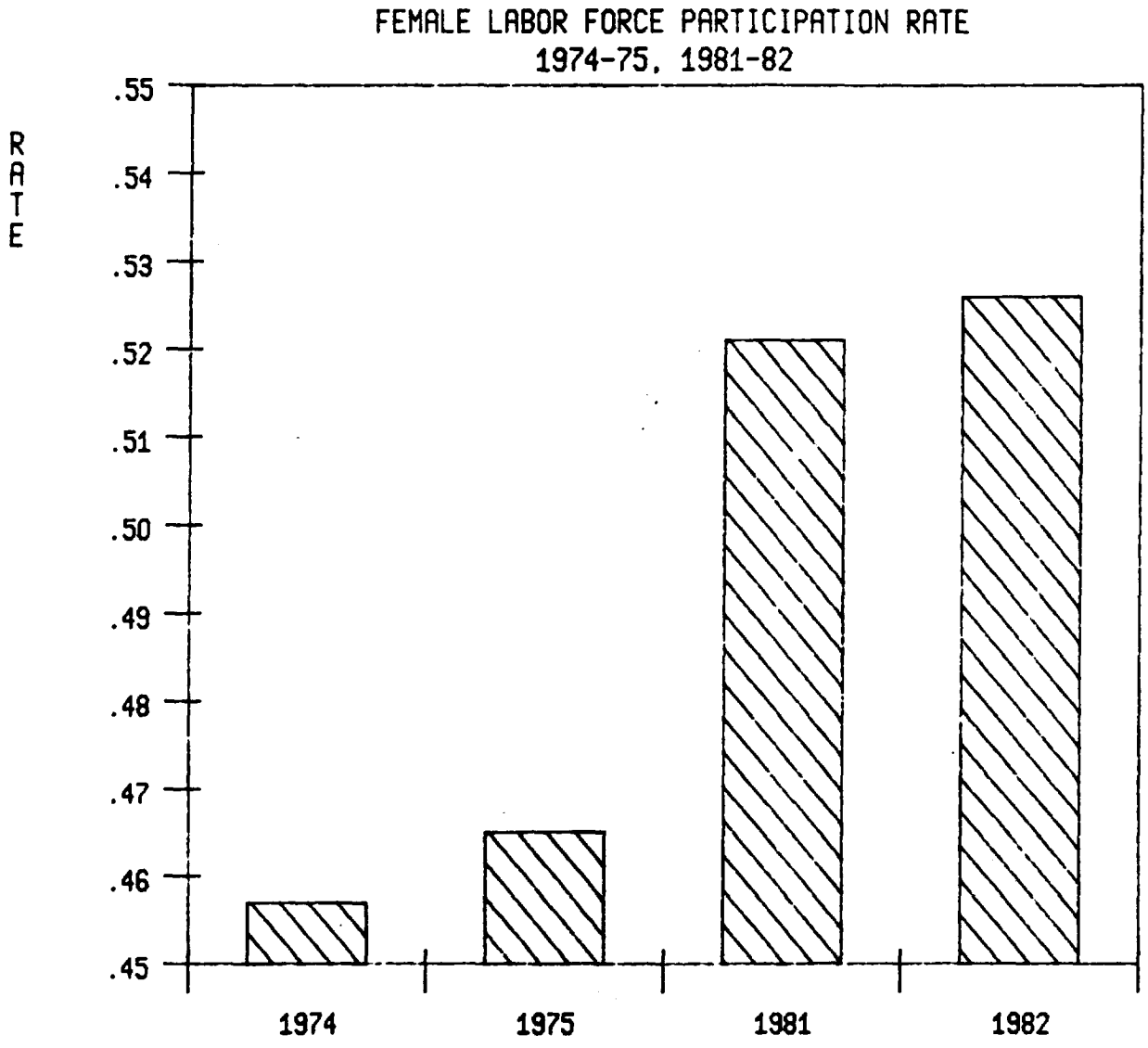

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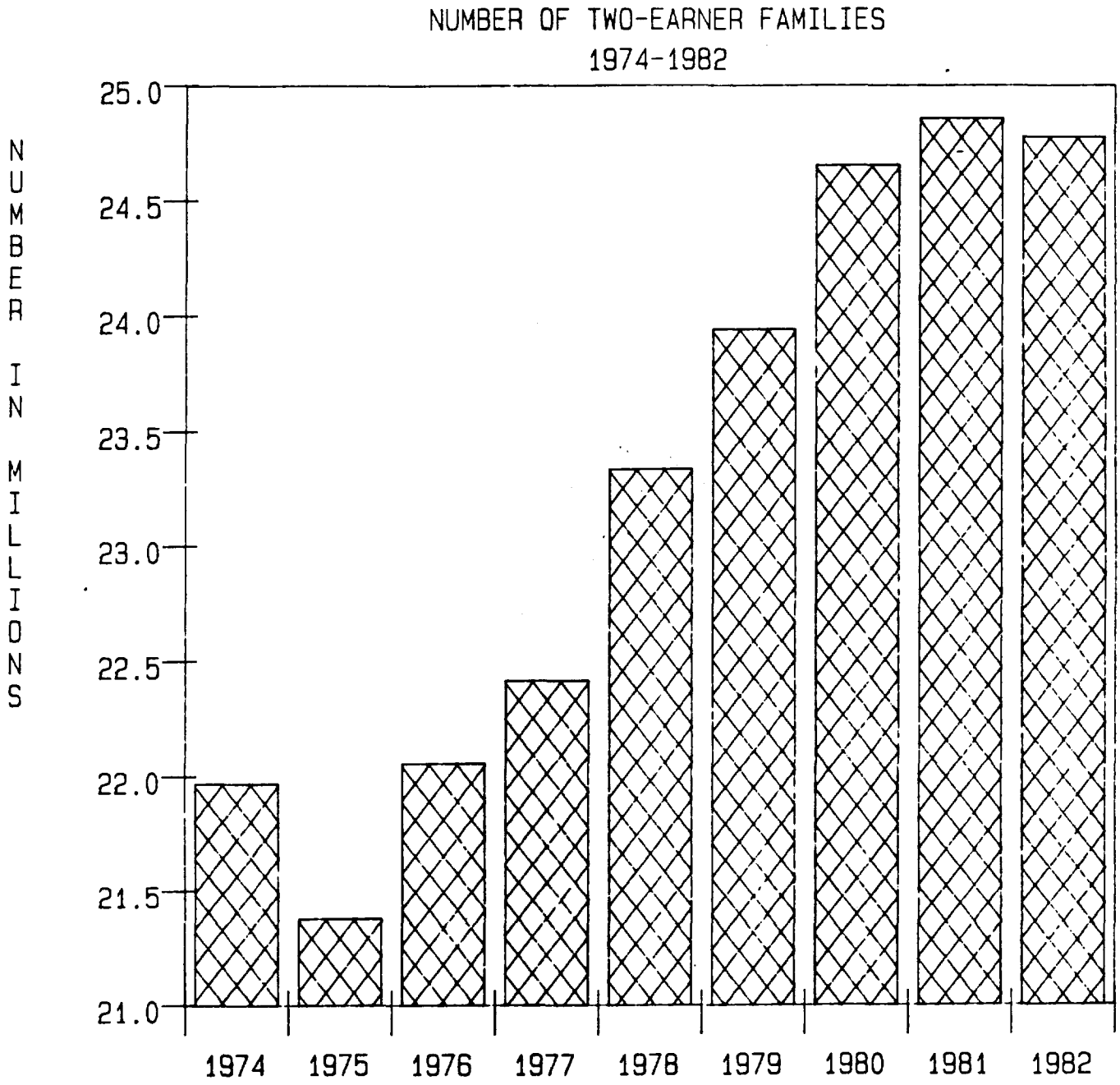
Chart 13



recessions. Using 1974 and 1981 as the comparison years, the elderly families experienced a 12 percent increase in average real income during the seven-year period, while the real income of the non-elderly population increased by less than 2 percent. (If 1975 and 1982 are used as the benchmarks, the increases are larger in both cases but the elderly enjoy a similar advantage in the income growth rate.)

It is also interesting to note that the real income of the elderly rose sharply during the 1981-82 recession in contrast with the 1974-75 recession when it fell by nearly 2 percent. In contrast, the real income gains of the non-elderly families were much smaller (although positive) in the 1981-82 recession than the gains for the elderly, and the loss slightly larger in the earlier recession.

The fact that the elderly were better protected in absolute terms and also experienced real income increases throughout the recession meant that there should have been little if any increase in the demand for food stamps from this sector of the population. In fact, according to the Interim Report to Congress, households containing at least one elderly member fell from a 24 percent to 20 percent share of the caseload between 1979 and 1982. In the earlier recession, their real incomes were lower, and they shared the real income loss of the recession with the rest of the population. Thus, part of the sluggishness of the response of the food stamp caseload may be attributable to the improved status of the elderly plus their insulation from the recession.

Fourth, the increased feminization of poverty may have shifted some of the cost burden of supporting the poverty population from food stamps to AFDC. During the 1970s there was a significant increase in the fraction of the poverty population made up of families headed by women. Families with children and

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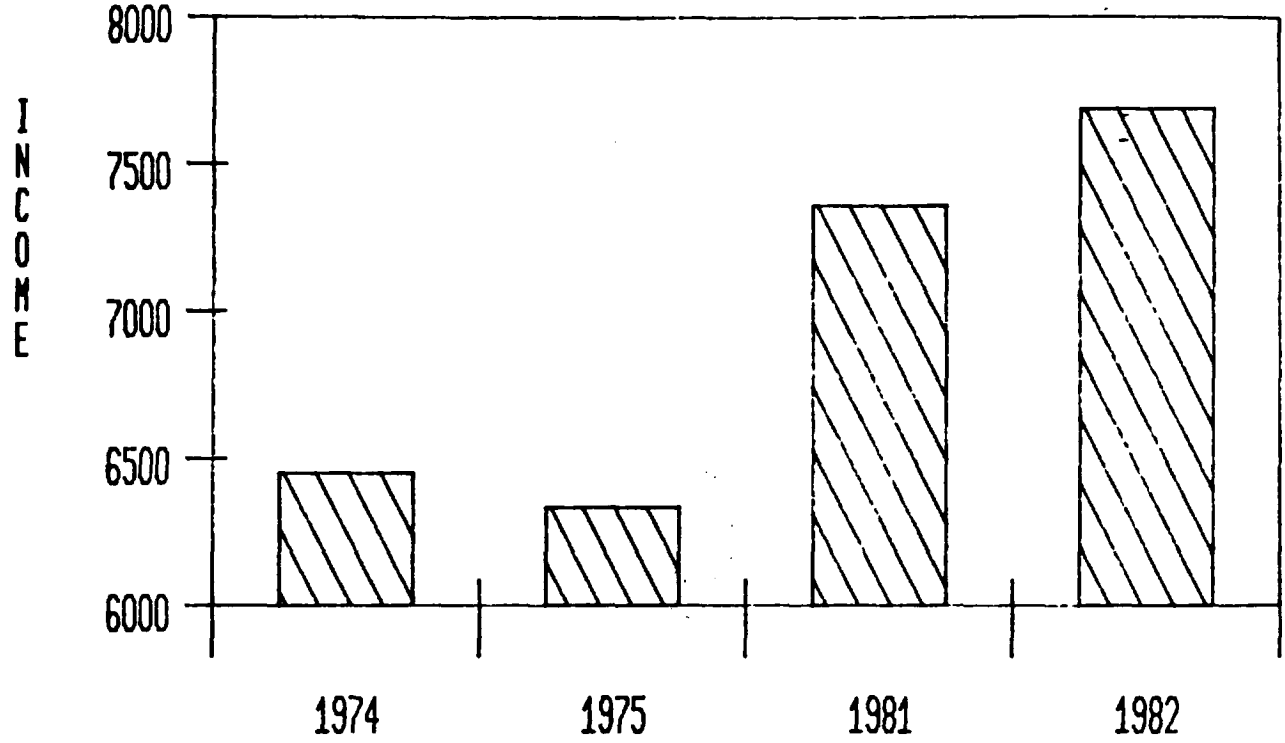
Chart 14

AVERAGE REAL INCOME OF ELDERLY FAMILIES AND UNRELATED INDIVIDUALS, 1974-75, 1981-82
(IN 1972 DOLLARS)



AVERAGE REAL INCOME OF NON-ELDERLY FAMILIES AND UNRELATED INDIVIDUALS,1974-75, 1981-82
(IN 1972 DOLLARS)

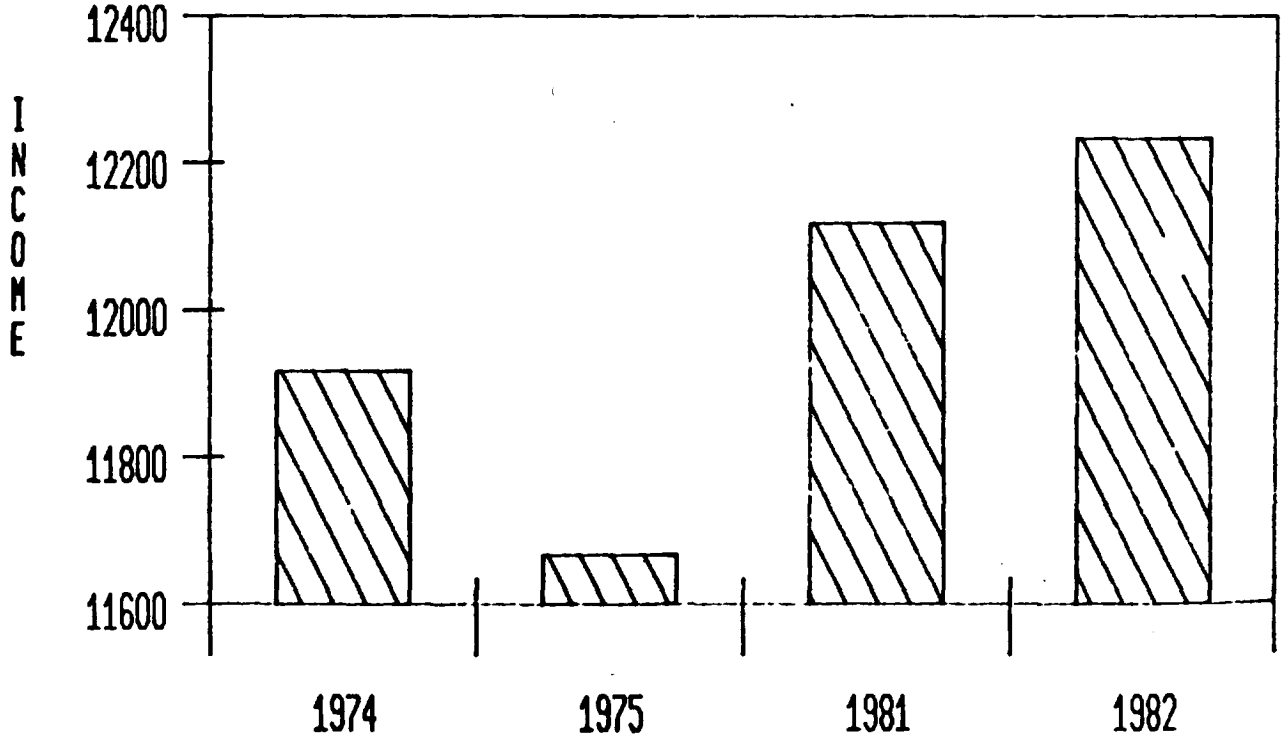


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Chart 15

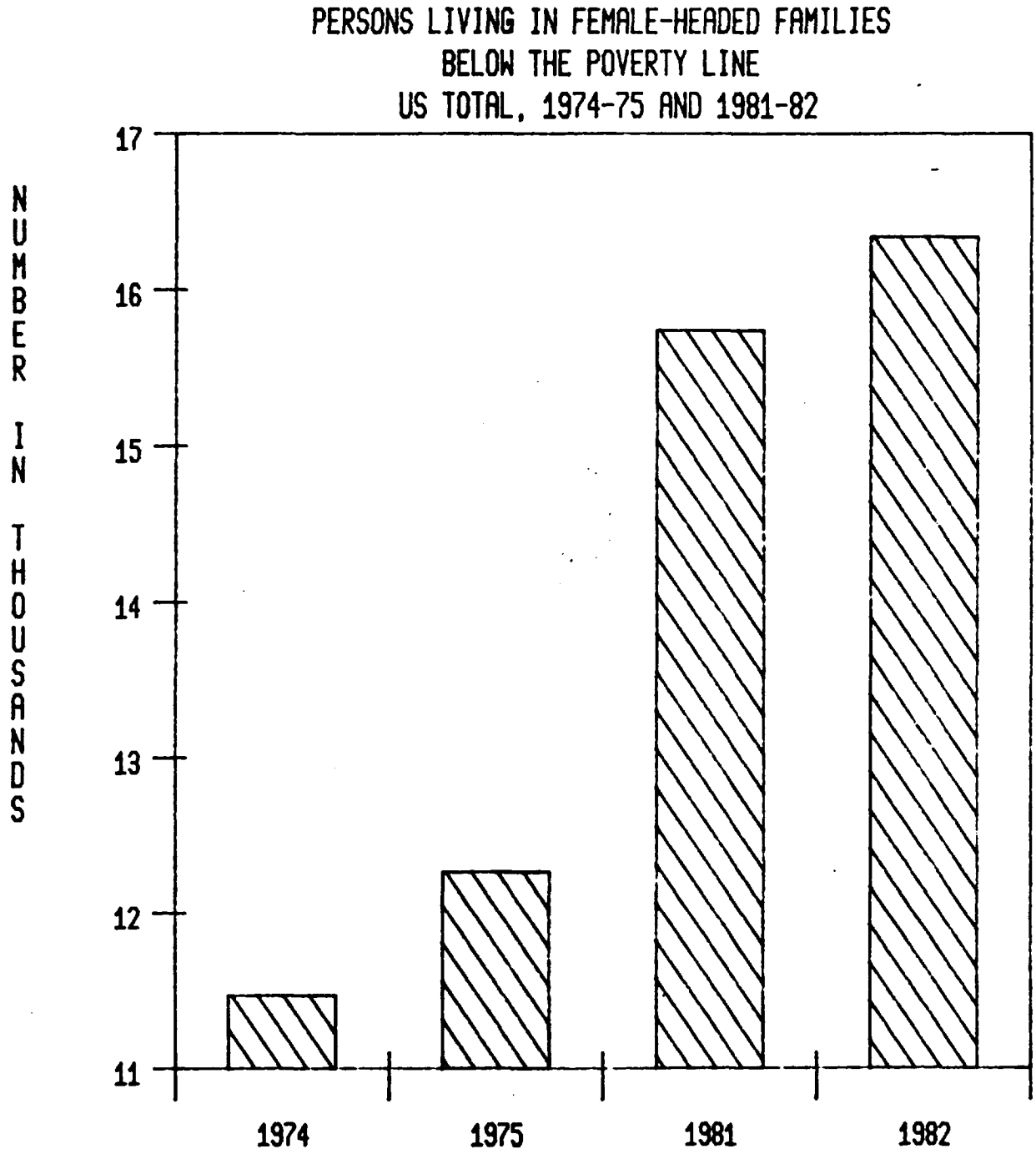
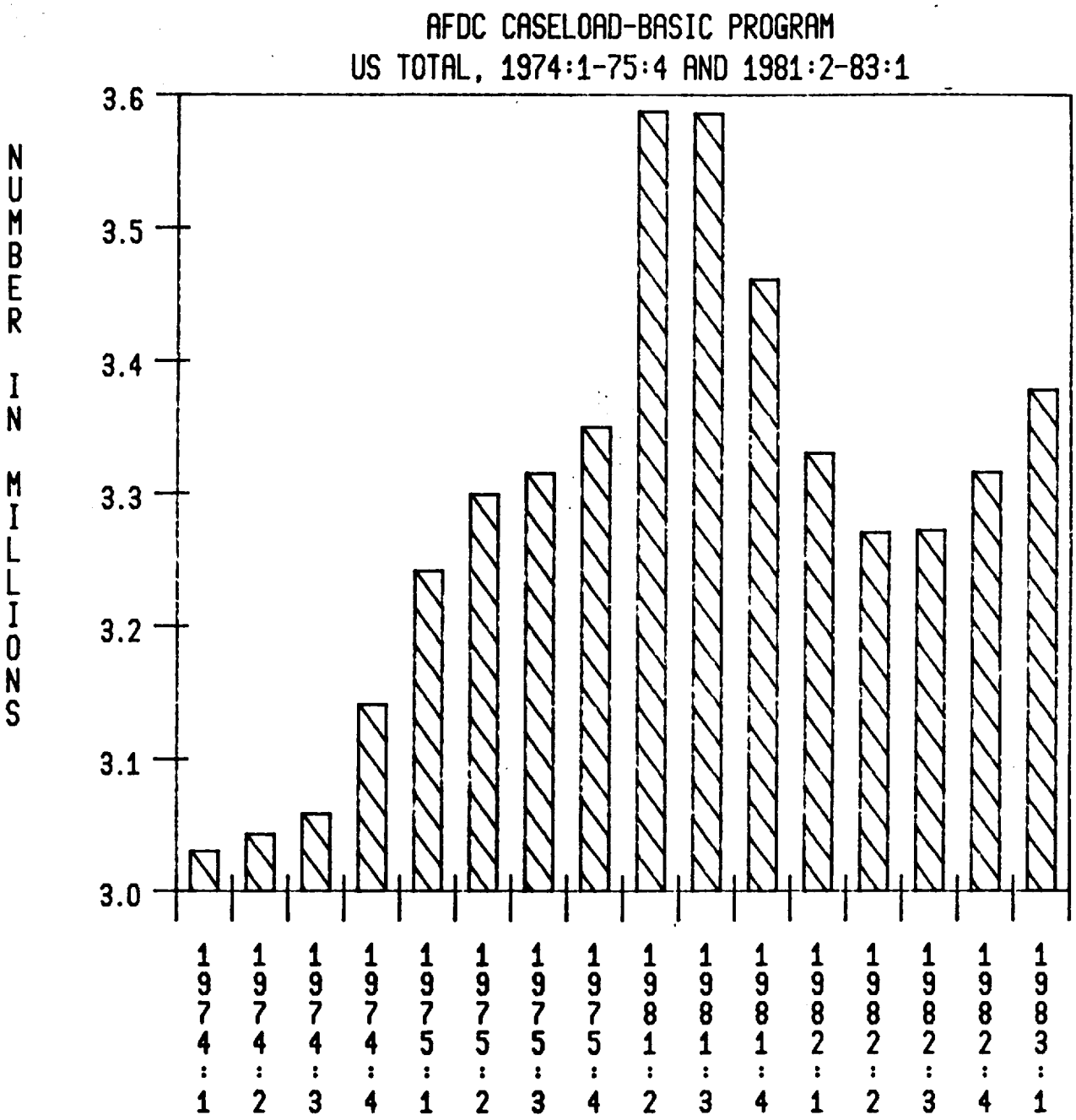


Chart 16


AFDC CASELOAD-BASIC PROGRAM
US TOTAL, 1974:1-75:4 AND 1981:2-83:1
NUMBER IN MILLIONS
3.6
3.5
3.4
3.3
3.2
3.1
3.0
1974:1
1974:2
1974:3
1974:4
1975:1
1975:2
1975:3
1975:4
1981:2
1981:3
1981:4
1982:1
1982:2
1982:3
1982:4
1983:1

The descriptive analysis also reached some negative conclusions. If the first quarter of 1981 is used as the peak benchmark, there is not much evidence that the 1981-82 recession was more regionally differentiated than the 1974-75 recession. The Mid-Atlantic and North Central regions experienced higher unemployment rates than the rest of the U. S. in both recessions.

There is evidence that manufacturing was harder hit during the latter recession especially in the regions with the highest concentration of manufacturing employment. As shown in Chart 17, total employment in the U.S. increased slightly (2 percent) during the 1974-75 recession and decreased slightly during the 1981-82 recession. However, the 1981-83 decline of 13.8% in manufacturing employment as a result of the 1981-82 recession was greater than its 1974-75 counterpart of 12.1%.[1] Thus, there is some support for the hypothesis that the 1981-82 recession was more heavily concentrated on manufacturing.

However, the next step of this argument, that the concentration in manufacturing led to a heavier concentration of unemployment among insured workers, is not supported, as is shown in Chart 18. As pointed out by Burtless (1983) and displayed in Chart 18, the difference between the total unemployment

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1 The peak and trough quarters in employment as a result of a recession are not coincident with the peak and trough quarters of the recession itself, since cyclical changes in employment lag normal business cycles.

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Chart 17

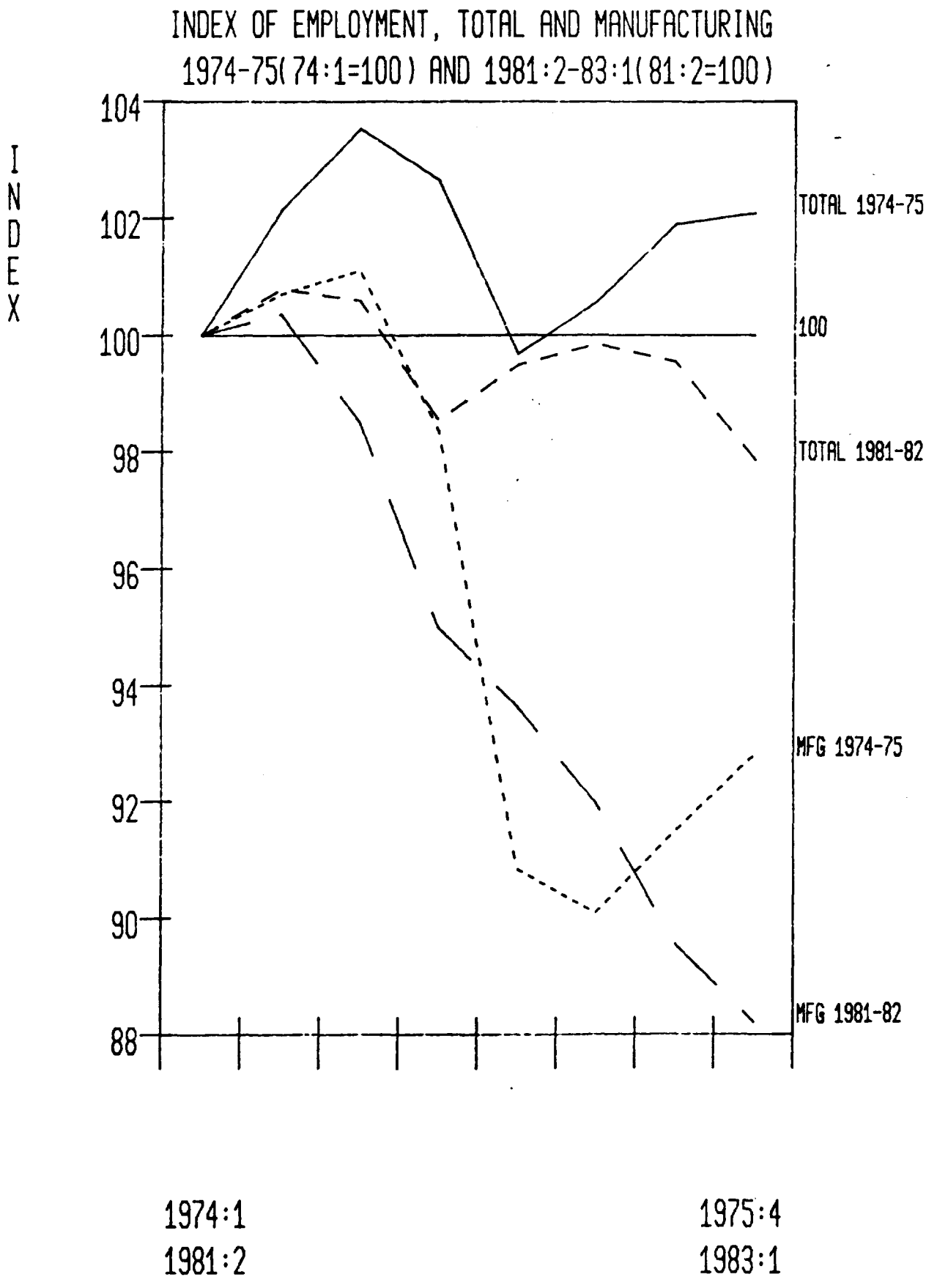
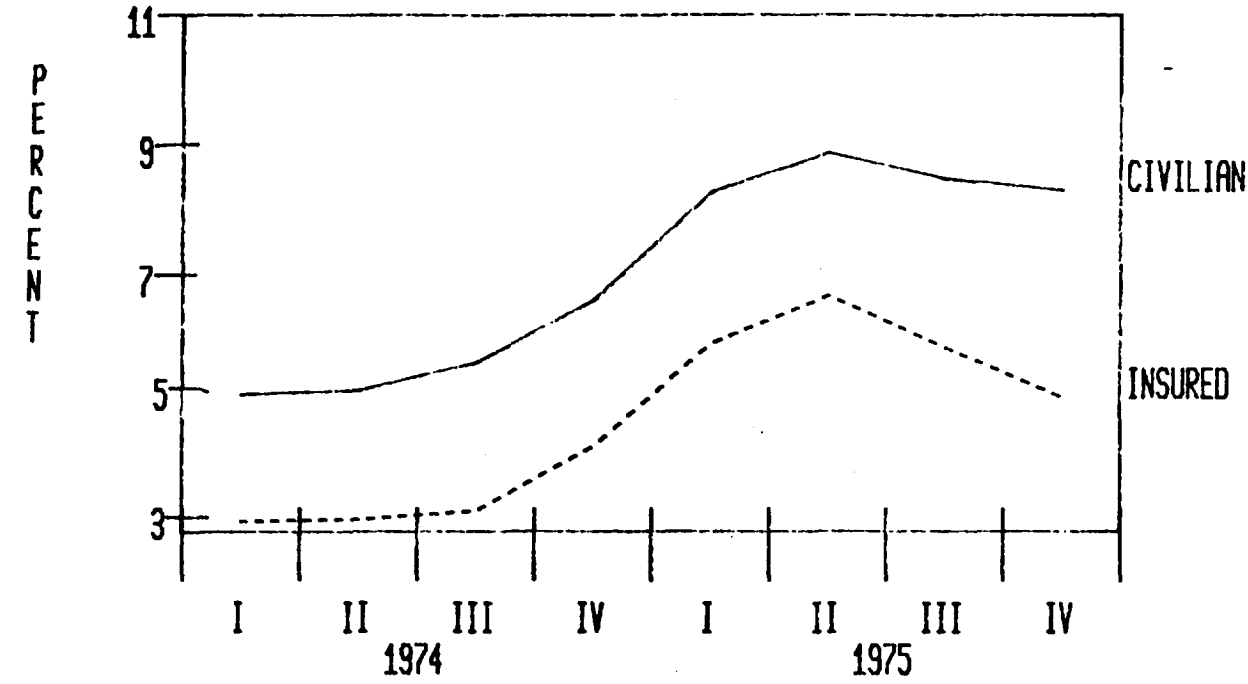
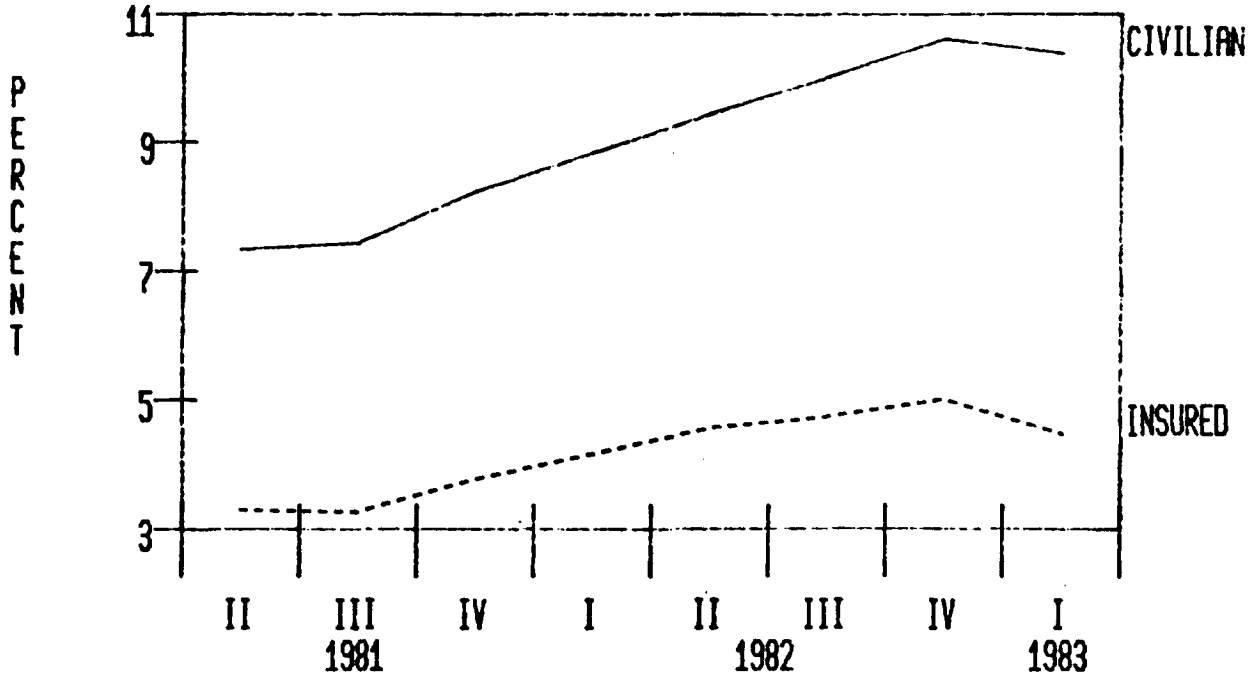


Chart 18

CIVILIAN UNEMPLOYMENT RATE AND INSURED UNEMPLOYMENT RATE, 1974-75 AND 1981-82





rate and the insured unemployment rate[1] actually widened between the two recessions. In other words, the fraction of the unemployed receiving unemployment insurance benefits in the 1981-82 recession was smaller than in the 1974-75 recession. This change was due largely to OBRA changes in the unemployment insurance program designed to limit the duration of unemployment insurance benefits - (especially changes to the national and state "trigger" provisions which provide for extended benefits to unemployed workers who have exhausted their regular benefits whenever national or state insured unemployment rates exceed specified levels) - and to the intermittent 3 year recession.

Given the wider gap between the total unemployment rate and the insured unemployment rate, it seems clear that unemployment insurance provided a less important source of support in the 1981-82 recession than in the 1974-75 recession. Consequently, the sluggishness of the response of the food stamp caseload connot be attributed to this cause.

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1 The Insured Unemployment Rate is defined as the number of insured unemployed as a percentage of average covered employment in the previous calendar year.

CHAPTER II. A MACROECONOMIC MODEL OF THE FOOD STAMP CASELOAD AND AVERAGE BENEFITS

The purpose of this chapter is to present a macroeconomic model that can produce forecasts of the caseload and average benefits of the food stamp program. Section A summarizes the specifications of the model and estimation issues. Section B presents the results of the estimation process and the final version of the model to be used for the simulations described in Chapter III. A more complete derivation of the theoretical model and discussion of the theoretical issues is provided in Appendix A.

A. Specification of Model and Estimation Issues

This section summarizes the derivation of a two-equation model of the food stamp program. The first equation models caseload. The second models the average benefits received. Together these equations can be used to analyze the total cost of the program.

Normally, in presenting the specifications of an econometric forecasting model, the theoretical specification is presented first and is followed by a discussion of the data available to estimate the model. However, in this study, an overriding data problem strongly influenced the specification of the model which was ultimately used for estimation. Consequently, this data problem is discussed first. This discussion is followed by a summarized theoretical development of the model.

The primary data problem encountered in this study is the limited number of observations available for estimating a national model or a set of regional models using time-series estimation. During 1974 the food stamp program was expanded into a truly national program. There was a very large increase in the caseload at that time. While the maximum increase occurred during 1974, the aftermath of this change lasted through 1975 as well, particularly in some regions of the United States.

Unfortunately, this period of expansion coincided with the 1974-75 recession. Ideally, one would wish to include two recessions in the estimation period to increase the likelihood that the regression can separate the effects of recession from the effects of food stamp program changes. Thus, our original plans were to include as much of the 1974-75 recession in the estimation period as possible. The dramatic increase in the food stamp caseload accompanying the national expansion of the program makes this impossible.

The maximum period for estimating this model is, in our judgment, 1974:4 through 1983:4. However, the first five quarters of this period include the lingering effects of the expansion period. Moreover, we obtained better results by restricting our sample further to 1976:1 through 1983:4. This yields 32 quarterly observations for any equation based solely on time series observations.

This small number of observations limits severely the number of variables that can be included in a single equation. While there is no hard and fast rule that specifies precisely how many variables can be included in an equation with only 32 observations, experience suggests that five or six would be a reasonable expectation.

In view of the severe restrictions placed on the number of variables imposed by the small number of time series observations, attempting to pool the time series observations across the nine regions is an attractive approach. However, there are also significant problems associated with this approach. First, it is useful to consider intuitively an important assumption that is being made when observations are pooled. In effect, we are assuming that we can infer changes over time in the dependent variable from observed differences across regions.

Econometricians commonly view cross-section variation as reflecting long-run equilibrium results while time series variation reflects incomplete reactions to changes in the explanatory variables. Thus, the time series and cross-section responses may not be the same.

Moreover, there is no guarantee that the over time relationship between the dependent variable and the explanatory variables is the same in all regions of the U. S. This problem can be reduced if we pool only within each of the four Census regions.

Our judgment is to use the pooling procedure. However, the coefficients of the pooled regressions must be carefully compared with the individual time series equations, and the forecasting error of national predictions by the alternative methods should be compared.

The use of pooling requires that the dependent variable in the caseload equation be the recipiency rate, i.e., the number of recipients divided by the population. In a time-series equation, it is immaterial whether the recipient variable is specified as the number of recipients of the number of recipients

divided by the population. However, in the pooled equations, if any of the expanatory variables is in rate rather than level form, it is necessary to use the rate form of the dependent variable. This is because a one-percentage point increase in, say, the unemployment rate in a region with a large population can be expected to produce a larger effect on the number of recipients than in a region with a smaller population. However, the effect on recipiency rate is likely to be similar.

1. Caseload Model

The food stamp caseload is determined by the interplay of two factors--eligibility and participation. To be a member of the eligible population, a household must meet the tests imposed by the rules of the program. To be a participant, a household which is eligible must choose to participate.

The caseload model, therefore, includes a set of explantory variables to represent both of these factors. Table 1 provides a list of variables, a definition for each variable, and the expected sign of its coefficient.

As shown in Table 1, the dependent variable in the caseload equation is the recipient rate, FPERSRT, which is defined as the number of food stamp recipients divided by the population. As indicated above, this form of the dependent variable was chosen over the more intuitively obvious variable, the number of food stamp recipients, because a pooled-section time-series approach was chosen for estimating the equation.

Table 1

Variables in the Caseload Model

Variable	Definition	Sign
FPERSRT	Food Stamp recipiency rate	
CONSTANT	Constant term	+or-
RUQ2	Unemployment rate	+
RD52	Fraction of unemployed who have been unemployed for at least 52 weeks	+
RWEEA	Real wage rate	-
RPOVERTY	Poverty rate	+
RAFDCBR	Recipiency rate in the AFDC basic program	+
ELIMPR	Modified dummy variable representing elimination of purchase requirement	+
OBRA81	Modified dummy variable representing OBRA81 changes in the food stamp program	-
DUMMY781	Dummy variable taking on the value 1 in 1981 and 0 otherwise representing the effect of a New England snowstorm	+
RHO	Autocorrelation coefficient	+

The unemployment rate, RUQ2, is included to measure the availability of jobs in the labor market. Jobs provide an alternative source of income to food stamp income. Thus, participation in the program is likely to decrease when the unemployment rate falls and increase when unemployment rises.

The long-term unemployment variable, RD52, is included to represent a group of households potentially eligible for food stamps. This variable may help to represent households not eligible for AFDC or SSI due to their categorical restrictions.

The real wage rate, RWEEA, is included to represent the opportunity cost of participating in the program. If the real wage rises, participation in the program is expected to fall.

The poverty rate, RPOVERTY, is included as the single closest approximation to eligibility rate for food stamps. This is because one of the most important tests for food stamp eligibility is that a household's net income be below the poverty line. However, the correspondence is not exact. Some families below the poverty line fail to qualify for food stamps because they fail to meet the asset test. Many families above the poverty line do qualify because their net income falls below the poverty line even though their gross income does not.

Overlapping with both the poverty population and the food stamp eligible population is the AFDC recipient population. Hence, we have also included RAFDCBR, the recipiency rate in the AFDC basic program. We also attempted to include the SSI recipiency rate, but the variable proved to be either insignificant or have the wrong sign, so it was omitted from the final specification.

Because major changes were made in the food stamp program in 1979 with the elimination of the purchase requirement and at the end of 1981 and 1982 with OBRA81 and OBRA82, it was decided to include dummy variables in the caseload equation to account for changes in eligibility or participation brought about by the changes. The elimination of the purchase requirement, ELIMPR, is expected to increase the participation rate, and, thus, be positively related to

the recipiency rate. OBRA81 and OBRA82 are expected to have negative effects since they restricted eligibility and/or reduced real benefits (at least temporarily). However, when the equation was estimated, OBRA82 had either insignificant results or the wrong sign and was omitted in the final specification.

2. Average Benefit Model

The variables of the benefit model are defined in Table 2.

Table 2

Variables in the Average Benefit Model

Variable	Definition	Sign
PBENEFIT	Percentage change in the average benefit per recipient	
PREALMAXALLOT4	Percentage change in the real maximum allotment for a family of four	+
PREALAVGAFDCTP	Percentage change in real average AFDC benefit	-
RWEEA	Real per capita wage and salary disbursements	-
PREALMNDIF	Percentage change in the real difference between the mean income of persons in the poverty population and the poverty line	+
ELIMPR	Dummy variable for elimination of purchase requirement	+/-
OBRA81	Dummy variable for implementation of OBRA81	+/-
OBRA82	Dummy variable for implementation of OBRA81	+/-
RH0xxxx	Autocorrelation coefficient for each of nine regions	+

There are two major issues involved in estimating the average benefit model. The first is whether to estimate the model in real or nominal terms. The second is whether to estimate the model in level or percent-change form. These issues are discussed in turn.

Estimation of the benefit model in nominal terms has a clear appeal. First, in the real world the actual administrative process of determining eligibility for the program and then determining a benefit takes place in current dollars. Current dollar incomes are compared with current-dollar standards to determine eligibility. Then the current-dollar value of food stamp benefits is computed based upon a current-dollar allotment and a current dollar net income. However, in such a model the driving force is the increase in food prices since it is the increase in food prices that determines the value of the allotment. However, the fact that the allotments go up as food prices go up is not as interesting as the variations that takes place after the effect of food prices has been controlled. One way of controlling for the effect of food prices is to carry out the analysis in real terms. This purges the model of the secular upward trend in nominal food prices and would appear to allow attention to be focused on the other variables which may effect the average benefit. For this reason it was decided to conduct the analysis in real terms by dividing the maximum allotment variable and the average benefit variable by the CPI for food at home.

However, conducting the analysis in real terms complicates the model considerably. First, deflating the average cost and the allotment variables by the CPI food does not eliminate the influence of the food price variable from the model. This is because the adjustment process takes place only twice a year throughout most of the estimation interval and less frequently towards the end. During periods in which food prices are rising rapidly, there will be a "horizontal ratchet" effect in which the maximum allotment falls for one (or more) quarters and then recovers following the adjustment.

When the maximum allotment is adjusted (by applying the change in the food price index to the old maximum allotment), this generates a fixed dollar increase for each household size, which is then given to each household regardless of its current net income. Consequently, only those families with zero net incomes get the same percentage increase in benefits as the percentage increase in the food index. For everyone else, the percentage change is greater (since the fixed increase is divided by a smaller allotment). The result is that the average percentage increase in benefits is significantly larger than the percentage change in the maximum allotment. However, during the quarters in which no adjustment is made in the maximum allotment, real benefits will fall. For families with no net income the percentage decline in benefits will equal the percentage increase in food prices. But, for families with positive net income the same inflation which is causing food prices to rise will also tend to make net incomes rise. Thus, for families with smaller allotments, real benefits will fall both due to the rise in food prices and the rise in nominal net incomes. The result is that, on average, during quarters in which there is no adjustment the

percentage decline in real benefits will exceed the percentage decline in the real maximum allotment. Thus, the average benefit will fluctuate in the same horizontal ratchet pattern but with greater amplitude. This can be seen in Chart 19, in which the percentage change in the maximum allotment and the real average benefit are plotted. The greater amplitude of the swings in average benefits can be seen clearly.

In economics the ratio of the percentage change in one variable to the percentage change in another variable is termed the elasticity of one variable with respect to the other. If a percentage change in one variable leads to a larger percentage change in the other variable, the elasticity is said to be greater than one. This seems to be the case with the average benefit and the maximum allotment. Estimating the real benefit equation in percentage change form (in which the dependent variable in defined as the percentage change in the average benefit and the chief explanatory variable is the percentage change in the maximum allotment) permits direct estimation of this elasticity. Since Chart 19 suggests that this elasticity seems stable over time, it was decided to estimate the model in this form. (An alternative form was also tried in which the level of the real benefit and the level of the maximum allotment were used. However, this specification was much less successful--leading to serious problems of autocorrelation which could not be successfully corrected using standard correction procedures and requiring an elaborate pooling procedure which was unnecessary when the percentage change specification was used.)

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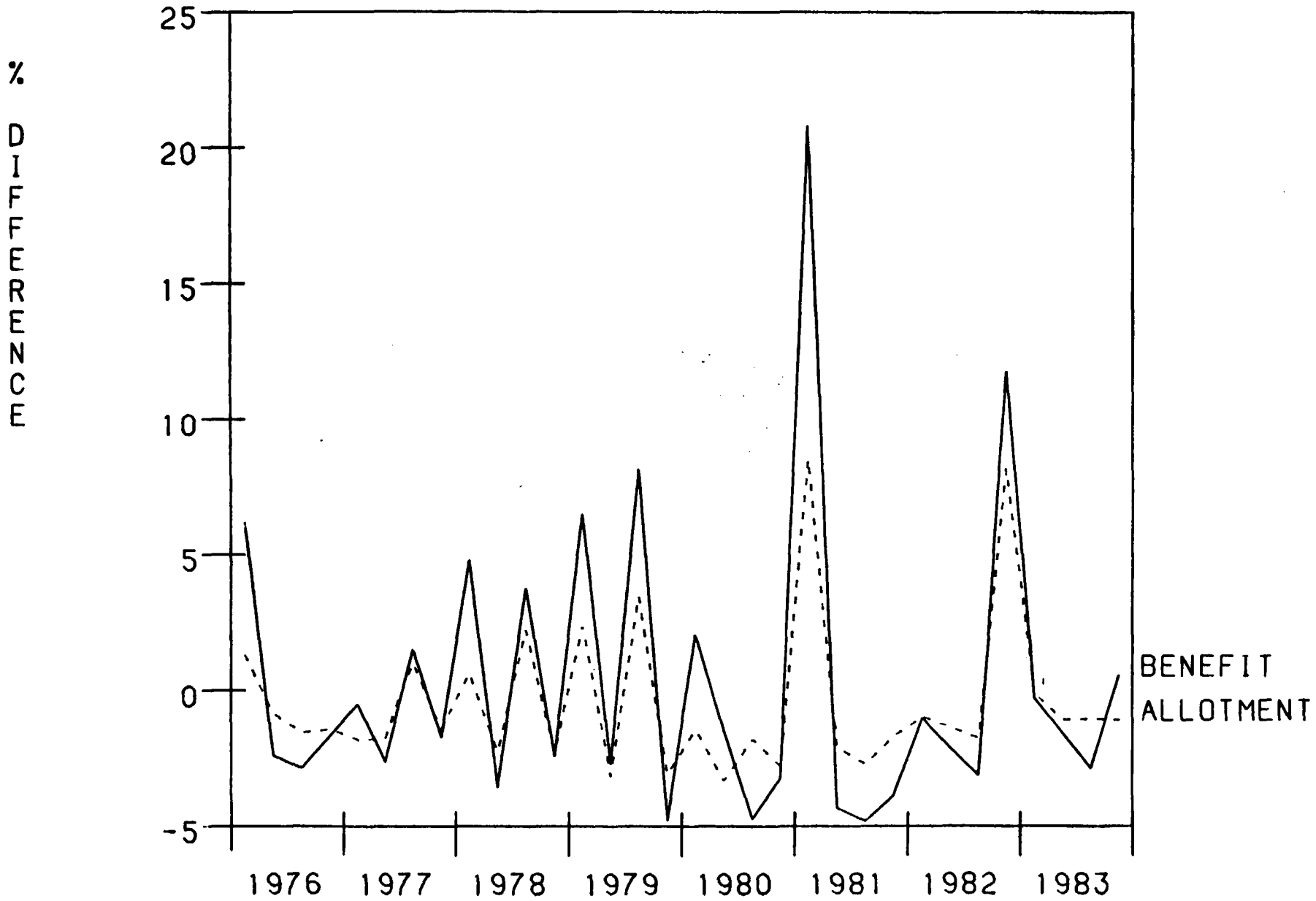
Chart 19

PERCENTAGE CHANGE IN REAL AVERAGE MAXIMUM FOOD STAMP ALLOTMENT AND REAL AVERAGE FOOD STAMP BENEFIT PER RECIPIENT 1976-1983



Average food stamp benefits are the result of the interaction of the food stamp benefit formula (and adjustments made to this formula over time) and the distribution of net income of the recipient population. Since food stamp benefits are reduced as a client household's income increases, the greater the concentration of the client population in the zero income or very low income brackets, the higher the average food stamp benefit. As benefit levels in the program are adjusted for changes in the cost of the Thrifty Food Plan there will be corresponding changes in average nominal benefits.

One of these two factors, the adjustments in food stamp allotments is easily measured. The percentage change in the real maximum allotment for a family of four, PREALMAXALLOT4, serves as a proxy for the benefit families of different sizes may receive. The other factor, the distribution of income of the recipient population, cannot be directly observed on a regular, quarterly basis. Thus, it is necessary to use proxies. These variables include the percentage change in the mean difference between the income of families in poverty and the poverty line--the poverty deficit (PREALMNDIF)--the real wage rate, RWEEA, and the percentage change in the average AFDC benefit, PREALAVGAFDCTR. The poverty deficit is intended to be an indicator of the income levels of the poor (who are the primary targets for food stamp). The real wage is intended to capture the effect of rising wages on net incomes. This variable is closer to measuring the type of income which food stamp recipients might potentially receive than more general per capita income measures. The average AFDC benefit is intended to capture the impact of reductions in real AFDC benefits (due both to OBRA changes and the lack of formal indexing of benefits) on food stamp benefits (which were indexed). This variable is intended

to capture the resulting shift of costs from AFDC to food stamps and is, thus, expected to have a negative sign.

As with recipiency, changes in the program rules must also be taken into account in constructing a benefit equation. The maximum allotment variable captures the most important impact of the OBRA changes--namely the delay in the cost-of-living adjustments. However, dummy variables are included to represent other OBRA81 and OBRA82 effects-largely freezing of deductible amounts. In addition, a dummy variable is included to account for any impacts upon average benefits brought about by the elimination of the purchase requirement.

The dummy variable for elimination of the purchase requirement, ELIMPR could have either a positive or negative sign depending on the income distribution of the new persons joining the program. If the new recipients were poorer than the old recipients, the expected sign would be positive. The OBRA81 dummy variable could also have either a positive or negative sign. By freezing deductions, OBRA81 may have reduced benefits for the existing recipients. However, by making ineligible the recipients with the highest incomes, OBRA81 might have sufficiently changed the composition of the recipient population to cause an increase in average benefits. OBRA81, a dummy variable for the OBRA82 changes, is expected to have smaller effects than OBRA81 because the program changes were not as great.

B. Results

1. Caseload Model

a. Regression Results

As explained above, the recipient equation uses as its dependent variable the number of recipients divided by the population. Thus, as estimated the equation predicts the rate of recipiency of a region. However, by multiplying through by any year's population statistics, the equation can be transformed into an equation which predicts the number of recipients.[1]

A pooled cross-section time-series estimation strategy was followed. This resulted in a single-equation for each of three Census regions--the South, the North Central, and the West. Within each of these regions statistical tests were performed for equality of regression coefficients for the Census divisions contained within each region. (For the South, the divisions are: South Atlantic, East South Central, and West South Central; for the North Central, the divisions are East North Central and West North Central; for the West they are Pacific Northwest and Pacific Southwest.) This strategy was also attempted in the [redacted]

was more one of a secular downward trend, broken only temporarily by the elimination of the purchase requirement.[1] An additional complicating factor was the absence of an unemployment effect in the Mid-Atlantic division. Because New England and the Mid-Atlantic were different from each other and also from the rest of the country, we decided to rely on separate time series estimates for these two divisions. Because of the small number of observations, it was necessary to limit the number of explanatory variables to the AFDC recipiency rate, the unemployment rate, and the dummies for changes in the food stamp program. (A dummy variable was also included to account for a major New England snow storm which caused a brief but dramatic increase in recipiency.)

Table 3 show the results for all nine divisions derived from the three regional pooled models of recipiency and the time series models for New England and the Mid-Atlantic. In the actual pooled regression equations most of the variables were constrained to have the same effect on the dependent variable for all divisions within a single region. However, if a statistical test indicated that the difference in the coefficient values was significantly different from zero, "interaction" terms were introduced into the equation to allow the coefficients to take on different values. Thus, in Table 3, for some of the variables, the coefficients within a region are exactly the same for all divisions, while for other variables they are different.

[1]Actually, Massachusetts is almost totally responsible for this pattern. The rest of New England is similar to the rest of the country.

Because the statistics in this table are all in rate form, there is no problem of scale in making comparisons across the nine divisions. However, discussions of this table must be in terms of rates of recipiency rather than the size of the caseload.

Table 4 shows these same equations translated into level form using 1983 population totals. This makes it possible to interpret the coefficients in caseload form. However, it introduces a scale problem since the more populous divisions will tend to have larger statistics for most of the coefficients simply due to their larger populations. Most questions of interest can be addressed by using one or the other of the two tables.

As shown in Table 3, the unemployment rate variable performs as expected in all parts of the country. An increase in the unemployment rate leads to an increase in the food stamp recipiency rate. However, the strength of the effect varies. It is strongest in the East South Central division, where a one percentage point increase in the unemployment rates leads to a 0.46 percentage point increase in the food stamp recipiency rate. It is weakest in the Mid-Atlantic, where the effect is not statistically significant and is less than one-hundredth of a percentage point. As shown in Table 4, when looked at in level form, the picture is slightly different. In the West South Central division, a one percentage point increase in the unemployment rate leads to an increase in food stamp recipiency of nearly 70,000 persons--somewhat larger than in the East South Central. This larger effect on the level of recipiency is due to the West

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Table 3

Primary Recipient Model

	NENG	MATL	SATL	ESC	WSC
Constant	-2.506	-11.481*	-8.542*	-8.544*	-8.536*
RUQ2	0.288*	0.010	0.158	0.459*	0.303*
RD52	---	---	0.046	0.046	0.046
RWEEA	---	---	-0.050	-0.050	-0.051
RPOVERTY	0.064	0.730*	0.384*	0.384*	0.384*
RAFDCBR	1.549*	1.971*	2.515*	2.120*	2.751*
ELIMPR	0.010	1.369*	1.873*	3.854*	2.391*
OBRA81	0.290	-0.378	-0.080	-0.080	-0.080
RHO	0.193	0.111	0.436*	0.388*	0.510*
RBARSQ	0.912	0.946	0.937	0.965	0.946
DW	1.781	1.943	1.610	1.600	1.549
DUMMY781	0.802*	---	---	---	---

	ENC	EWC	PNW	PSW
Constant	-2.156*	-2.140*	-5.302*	-5.323*
RUQ2	0.086*	0.108*	0.258*	0.110*
RD52	0.050*	0.050*	0.032*	0.032*
RWEEA	-0.031	-0.031	-0.159*	-0.159*
RPOVERTY	0.486*	0.486*	0.506*	0.506*
RAFDCBR	0.662*	0.230	1.601*	1.456*
ELIMPR	0.682*	0.682*	1.414*	1.414*
OBRA81	-0.147	-0.147	-0.526*	-0.526*
RHO	0.223	0.352*	0.102	-0.162
RBARSQ	0.990	0.980	0.927	0.939
DW	1.666	1.363	1.628	2.334

* = t statistic of coefficient is significant at .05 level.

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Table 4

Recipient Rate Equation Transformed Into Level Form[1]

	DIVISION				
	NENG	MATL	SATL	ESC	WSC
CONSTANT	-313,700	-4,253,300	-3,342,700	-1,290,300	-2,235,200
RUQ2	36,200	3,700	62,600	69,400	81,100
RD52	---	---	18,500	6,900	12,000
RWEEA	---	---	-20,000	-7,700	-13,300
POVERTY	0.064	0.730	0.3842	0.3842	0.3842
AFDCBR	1.549	1.971	2.5147	2.1201	2.7512
ELIMPR	1,000	507,600	732,000	581,000	625,500
OBRA81	36,240	-140,800	-31,300	-12,100	-20,900
DUMMY781	100,300	---	---	---	---
RHO	0.193	0.111	0.435	.387	.509
POPULATION (thousands)	12,497	37,050	39,142	15,091	26,173

[1]Transformation carried out by multiplying both sides of regression equation by the ratio and $POP_r/100$, where POP_r is the population of region r in 1983. Since the variables RAFDCBR and RPOVERTY were converted into rate form in Table 1 by multiplying AFDCBR and POVERTY, respectively by $100/POP_r$, multiplying them by $POP_r/100$ simply converts them back into level form--AFDCBR and POVERTY, and the coefficients do not change.

Table 4 (Continued)

	DIVISION				
	ENC	WNC	PNW	PSW	U.S.[1]
CONSTANT	-901,500	-373,400	-525,100	-1,945,300	-15,180,500
RUQ2	37,600	18,800	25,500	39,800	374,700
RD52	20,900	8,700	3,100	11,600	81,700
RWEEA	-12,500	-5,500	-15,700	-58,100	-132,800
POVERTY	0.4863	0.4863	0.5061	0.5061	0.4715
AFDCBR	0.6615	0.2291	1.6011	1.4550	1.6788
ELIMPR	283,800	119,000	140,000	516,900	3,506,800
OBRA81	-58,400	-25,600	-52,100	-192,200	-497,200
RHO	.222	.352	.102	.161	
POPULATION (thousands)	41,735	17,449	9,903	36,548	235,588

[1]For all variables except POVERTY and AFDCBR, this column has been calculated as the sum of the coefficients. For RUQ2, RD52, the statistic should be interpreted as the national effect of a one percentage point increase in each of the explanatory variables in each of the regions. For ELIMPR and OBRA81, the statistic should be interpreted as the total national effect of the program changes. For POVERTY and AFDCBR, the statistic has been calculated as the weighted average of the coefficients using the population shares of the regions as weights. These should be interpreted as the increase in the national food stamp caseload as the result of one additional person added to the poverty or AFDC populations, respectively.

South Central's larger population since the effect of unemployment on the recipiency rate is only two-thirds as large in the West South Central compared with the East South Central region. Overall, if each division experienced a one percentage point increase in its unemployment rate, the total increase in U. S. food stamp recipiency would be about 375,000 persons, other things being equal.

Although the duration of unemployment variable performs as expected, it is statistically significant in only the Central region and the West. In the Central region, where it is strongest, a one percentage point increase in the fraction of the unemployed experiencing unemployment for over 52 weeks leads to a 0.05 percentage point increase in the food stamp recipiency rate. The effect is even smaller elsewhere. In the single equations estimated for New England and the Mid-Atlantic divisions, the variable was excluded altogether due to problems of multicollinearity. Looking at the effect of this variable in terms of the national caseload, a one-percentage point increase within each of the divisions would lead to an increase in the food stamp caseload of about 82,000 persons.

The real wage variable is statistically significant only in the West. However, the sign is consistently negative as expected. This indicates that there is some behavioral response of potential food stamp recipients to income-earning opportunities. Once again this variable had to be excluded from the New England and Mid-Atlantic equations.

As shown in Table 3, the poverty rate variable is one of the strongest variables in the equation. This is not surprising in view of the large overlap between the food stamp eligible population and the poverty population. In the three regions for which pooled regressions were estimated a one percentage point increase in the poverty rate leads to an increase in the recipiency rate of 0.38 percentage points in the South, 0.49 percentage points in the Central region, and 0.51 percentage points in the South. The poverty rate variable is even stronger in the Mid-Atlantic equation--0.73 percent. (However, it should be noted that the unemployment rate is insignificant in the Mid-Atlantic, and multicollinearity may have made it impossible to separate successfully the effect of unemployment from the effect of poverty.) In New England the poverty rate is statistically insignificant. In Table 4, the same set of statistics appear for the poverty variable. However, note that the variable is no longer the poverty rate. It is the poverty level. In this table the coefficient should be interpreted as the increase in the level of food stamp recipiency resulting from an increase in the level of poverty of one person. Taking the weighted average for all nine divisions, an increase in the level of poverty of ten persons leads to an increase in food stamp recipiency of just under five persons.

As shown in Table 3, the AFDC recipiency rate is statistically significant in eight of the nine divisions. The effect is largest in the West South Central region where an increase in the AFDC recipiency rate of one percentage point leads to an increase of 2.75 percentage points in the food stamp recipiency rate. This extremely strong effect cannot be attributed solely to the overlap of the two caseloads since 100 percent overlap would lead to a coefficient of 1.0. Instead, the AFDC recipiency rate must be proxying other factors which are

influencing food stamp recipiency. As with the poverty rate, when AFDC appears in Table 4, it has been translated into the level of AFDC recipiency, so the coefficients remain the same. Taking the weighted average for all nine divisions, an increase in the AFDC caseload of ten persons leads to an increase in food stamp recipiency of nearly 17 persons.

An attempt was made to include an analogous SSI recipiency rate variable in the equations, but the coefficients were not consistently positive, so the variable was dropped. This attempt along with others is presented in Appendix B.

The elimination of the purchase requirement is shown to have had a strong positive effect on food stamp recipiency. As displayed in Table 3, the effect ranged from a neglible 0.01 percentage point increase in the recipiency rate in New England to a nearly 4 percentage point increase in the East South Central region. As shown in Table 4, the total effect for the U. S. is estimated at over 3.5 million recipients. This compares with an estimate of 3.5-4.5 million recipients presented in the U. S. Food and Nutrition Service (1981) report on the elimination of the purchase requirement.

The OBRA81 changes in the program are shown in Table 3 to have had a negative effect on the recipiency rate in all division except New England. However, the effect is much smaller than the effect of the elimination of the purchase requirement. The largest effect is in the West where the recipiency rate is estimated to have decreased by nearly 1.5 percentage points. As shown in Table 4, the total effect for the U. S. is estimated at about 500,000 persons beginning in the first quarter of 1982 and continuing through the end of 1983 (the end of the period for which data were available).

A dummy variable representing the OBRA82 changes was also included in alternative versions of these equations. (See Appendix B.) However, the variable tended to be insignificant and often had the wrong sign. Consequently, it was excluded from the final version of the equations.

The one additional substantive explanatory variable included in the model is a dummy variable for the first quarter of 1981 for New England only. This is intended to adjust the equation for the impact of a major snowstorm, which apparently caused officials to loosen the eligibility requirements briefly with a resulting temporary increase in the caseload.

Because statistical tests of the residuals of the ordinary least squares versions of these regressions indicated that the error terms of the equation were correlated positively, an autocorrelation correction term was introduced into each of the equations. The resulting coefficient, RHO, ranges as high as .51 in the West South Central division. The presence of significant autocorrelation suggests that there is stability in the caseload that is not accounted for by the explanatory variables.[1]

[1]Autocorrelation of the error term means that the residual of the regression equation (the difference between the actual and predicted values of the dependent variable) is correlated with itself over time. In other words, if the residual is positive, it is likely to be positive in the next time period; if it is negative, it is likely to be negative in the next time period. Often, autocorrelation means that an explanatory variable that is reratively stable over time has been left out of the specification of the equation. The ideal solution is to include the omitted variable in the equation. If this is not possible, the alternative is to correct for the autocorrelation by explicitly estimations RHO, the autocorrelation coefficient. This correction eliminates the bias caused by the omission of the variable.

The degree of explanatory power of the equations, as indicated by the RBARSQ statistics displayed in Table 3, is high. All of the equations have RBARSQs of at least 0.91, and the East North Central division has an RBARSQ of 0.99.

b. Validation of Forecasting Capability

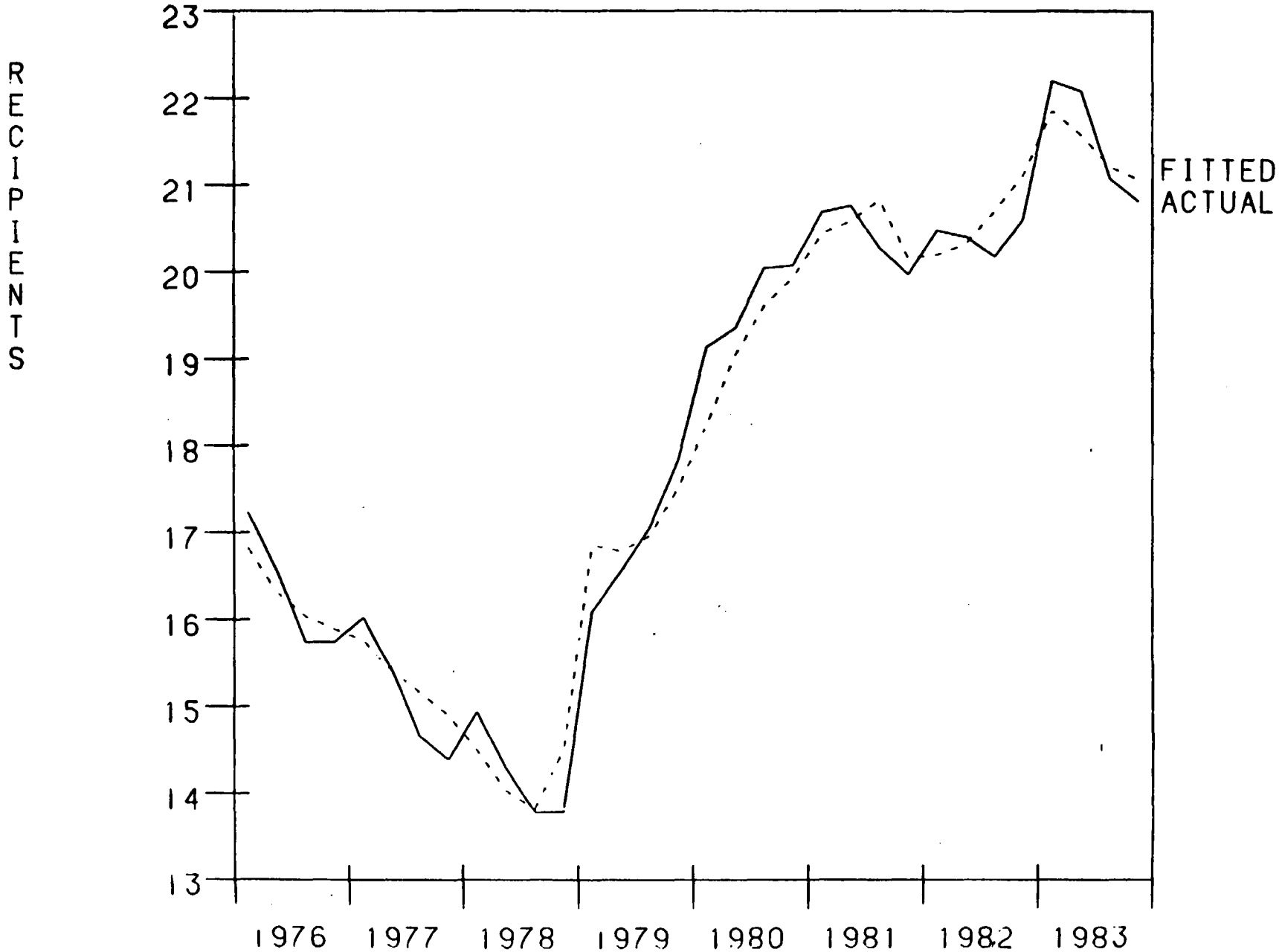
The plots of the predicted values of the number of recipients in each division presented in Appendix E indicate the models' capability of tracking history within each division accurately. In general, the performance of each of these regressions is quite good.

For purposes of evaluating the model's performance at the national level, it is necessary to aggregate the recipient forecasts across the nine divisions and compare the results with national recipient data. This is done in Chart 20. The correspondence between history and the forecast is close.

While this evaluation is useful, it is helpful to carry out a somewhat more rigorous evaluation as well. This was done as follows. First, we computed two measures of model performance for two periods of time. The two measures are the average percent error of the forecast (which is simply the average of the quarterly percentage discrepancies) for both the entire 1976-1983 period and for 1983 alone and the root mean squared percentage error (which is the square root of the sum of squared percentage discrepancies) for the same two periods. The first of the two measures shows whether there is any tendency towards positive or negative bias in the forecast. However, positive and negative errors are allowed to cancel one another out over time. The second measure, by squaring

Ch t 20

HISTORIC AND PREDICTED FOODSTAMP RECIPIENTS
NATIONAL PRIMARY RECIPIENT MODEL
(IN MILLIONS)



the discrepancies, "adds up" both positive and negative discrepancies and, thus gives a better measure of how close, on average, the model comes to reproducing history. Evaluating performance over the entire 1976-1983 period gives the best measure of how well the model would perform over a varying set of economic conditions; evaluating performance over just 1983 provides the best measure of how well the model would perform in the near future (assuming no drastic change in economic conditions). These statistics are displayed in Table 5.

To give a better idea of how well this model performs compared with alternative forecasting models, we also estimated two additional models and evaluated their performance. The first approach was to estimate a national model in which the national recipient rate was regressed on a set of national-level explanatory variables. (This model is presented in Appendix C.) The second approach was to estimate time-series equations for each of the nine divisions. These models were basically the same as the New England and Mid-Atlantic models used in the Primary Model. (These models are also presented in Appendix C.) We then calculated the same performance statistics for these models. They are also displayed in Table 5.

There is little difference in the performance of the three models. When the whole 1976-83 period is considered, none of the three models tends to overpredict or underpredict consistently, as evidenced by the mean percent error being virtually zero in all three approaches. The root mean square percent error is slightly over two percent in all three cases. This indicates a good overall performance for all three models. When the period of evaluation is limited to 1983, there is a noticeable tendency for the primary model and the national model to perform better than the regional models, although all three models

Table 5

SUMMARY OF RECIPIENT MODEL PERFORMANCE

	Primary Model	Regional Time Series	National Time Series
1976-83[1]			
Mean Percent Error	0.000	0.000	0.001
Root Mean Sq. Percent Error	0.023	0.022	0.024
1983:1-1983:4[1]			
Mean Percent Error	0.005	0.013	0.006
Root Mean Sq. Percent Error	0.016	0.020	0.017

[1] Based on forecast of national recipiency levels using entire sample (1976:1-1983:4).

have a slight tendency to overpredict recipiency during 1983. The root mean square percent error is even lower in 1983 than it is over the entire 1976-83 period. Overall, these results suggest that all three models can be useful tools for analysis and forecasting. The primary model, which is richest in explanatory variables, is probably the best model for policy analysis and for testing the sensitivity of the food stamp program to changes in economic conditions. Both the primary model and the national time series model would appear to be good choices for straightforward forecasting. However, the national model is simpler to use since it consists of only one equation and requires only national data for its explanatory variables. The regional time series models would appear to be good choices for obtaining regional forecasts. For obtaining the most accurate forecast for a particular region, they may be more accurate than the primary model since the latter model uses pooling, which, by necessity, introduces some compromises across the divisions within each region.

2. Average Benefit Model

a. Regression Results

As noted earlier, the benefit per recipient equation was estimated in percentage change form. (An alternate form in which the level of the average benefit was used as the dependent variable produced unsatisfactory results.) Since it was expected that adjustments to benefits would be made uniformly throughout the nation, it was decided to estimate one pooled equation for the entire country pooling all nine divisions. In order to test whether it was sufficient to estimate only one benefit equation for all nine divisions, statistical tests were performed on the equality of the coefficients of the equation across

all nine divisions. These tests failed to reject the hypothesis that the coefficients were the same. Consequently, we used a single equation. (This is in contrast to the recipient equation where there were many instances of significant differences across divisions.) Explanatory variables were defined previously in Table 2.

As expected, as shown in Table 6 the maximum allotment variable dominated the equation with a coefficient of about 1.7. This indicates that a ten percent increase in the real maximum allotment leads to a 17 percent increase in the average real benefit per recipient. This high degree of sensitivity is expected in view of the method used in translating changes in the maximum allotment into changes in benefits and the results displayed in Chart 19. One of the OBRA81 changes--the delays in the cost-of-living adjustments--is directly reflected in the maximum allotment variable. Thus, the effects of the OBRA81 dummy variable described below are above and beyond the effect of the COLA delays.

The AFDC benefit variable also works as expected. A 10 percent decrease in real average AFDC benefits is shown to be associated with a 1.6 percent real average increase in food stamp benefits. As noted earlier, real AFDC benefits were reduced during most of the period due both to OBRA changes in the late 1981 and the lack of formal indexing of benefits throughout the period.

The poverty deficit variable also works as expected. A 10 percent increase in the mean real poverty deficit is associated with a 2.2 percent increase in average food stamp benefits. This shows that shifts in the income distribution of the poverty population do affect food stamp payments.

A 10 percent increase in real wage and salary disbursements variable is shown to be associated with a 4.1 percent decrease in food stamp benefits. It, thus, captures the effect that rising real incomes lead to falling average food stamp benefits.

Table 6

Average Benefit Model

PREALMAXALLOT4	1.691*
PREALAVGATP	-0.156*
RWEEA	-0.409*
PREALMNBEF	0.222*
ELIMPR	0.365
OBRA81	-2.532*
OBRA82	2.021*
RHONENG	-0.345*
RHOMATL	0.457*
RHOSATL	-0.313
RHOESC	-0.181
RHOWSC	-0.125
RHOENC	-0.173
RHOWNC	-0.387*
RHOPNW	-0.190
RHOPSW	-0.202
RBARSQ	0.820

* = t statistic of coefficient is significant at .05 level.

The elimination of the purchase requirement appears to have a positive but insignificant effect on average benefits. This is not surprising since, as indicated earlier, the sign of this variable depends upon the income distribution of the new persons joining the program. If the new recipients were poorer than the old recipients, the expected sign would be positive. If the new recipients had higher incomes than the old recipients, the expected sign would be negative. OBRA81 is estimated to have reduced the average quarterly increase in average food stamp benefits per recipient by about one dollar (in 1983 dollars) between its implementation and the implementation of OBRA82. However, the coefficient of the OBRA82 variable is negative and almost as large as the OBRA dummy. This suggests that OBRA81 depressed the rate of increase in benefits only temporarily. As noted above, the negative effect of the OBRA81 dummy variable is not due to delays in cost-of-living adjustments to the allotments. These delays are accounted for by the maximum allotment variable. Instead this dummy variable reflects the impact of other OBRA81 changes such as pro-rating the first month benefits reducing the earnings disregard, and postponing increases in the standard deduction and the maximum dependent/excess shelter deduction. The positive sign of the OBRA82 dummy variable probably reflects the fact that all of the OBRA81 changes cited above could be expected to have only a temporary effect on the rate of increase in benefits. For example, although pro-rating benefits for new enrollees permanently reduces average benefits (since some fraction of the caseload will always consist of new enrollees), this reduction cannot be expected to grow over time and thus, permanently retard the rate of increase in benefits.

Other variables which were tried and not included in the final version of the equation include SSI benefits, per capita income, and the relative price of food. They were either insignificant or had the wrong sign.

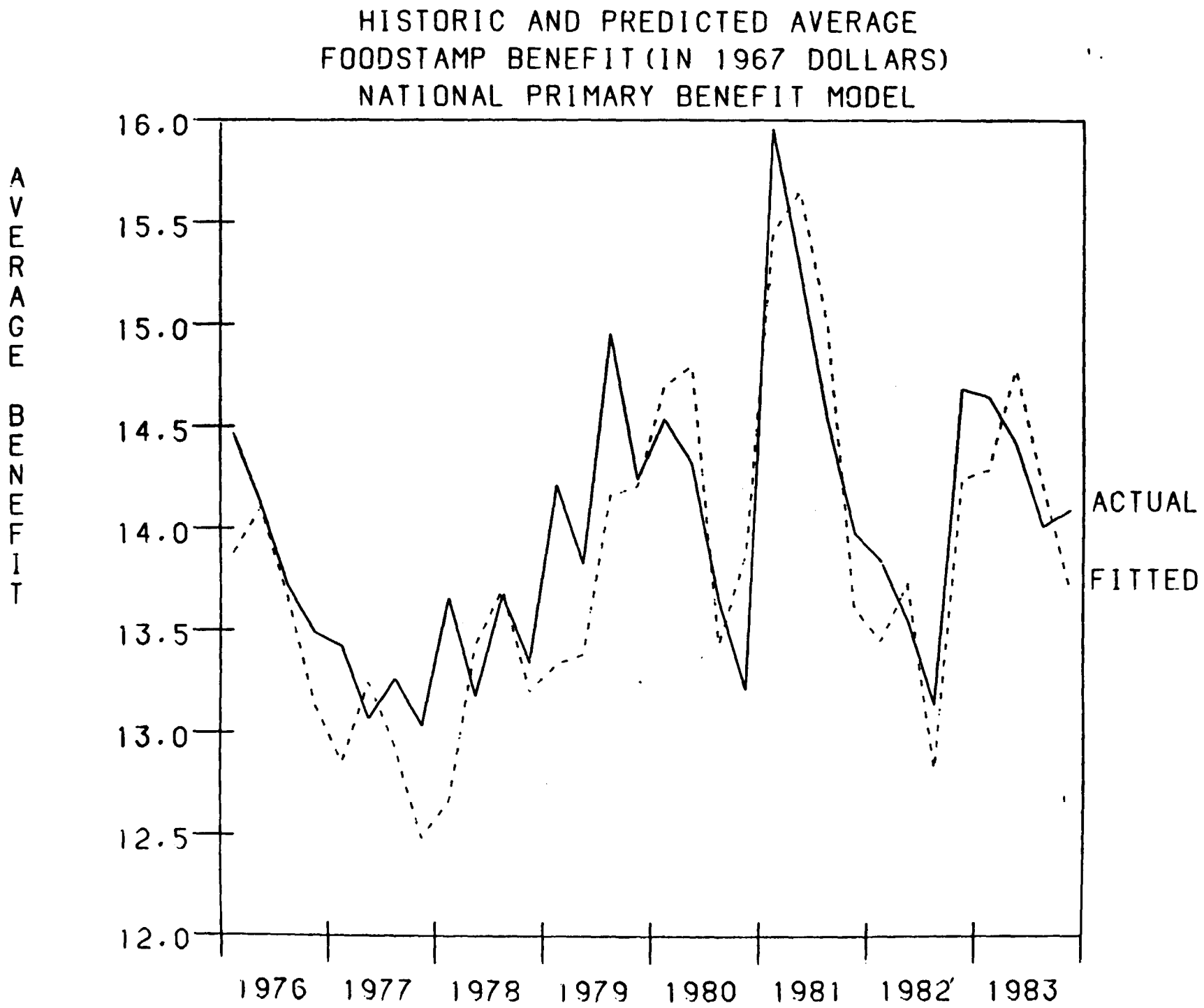
Autocorrelation of the error terms was of moderate significance in some of the divisions, and an autocorrelation term was estimated separately for each division. The overall R-square statistic was .8197--a good fit for a variable estimated in essentially a first-difference form.

Plots of the average benefit model's performance by division are shown in Appendix E. The correspondence between the predicted and actual values are reasonably close, although they are not quite as good as the results for the recipient model. A plot of the model's performance in predicting the national average benefit is shown in Chart 21.

b. Validation of Forecasting Capability

A validation of the average benefit model analogous to that performed for the recipient model was carried out. This included computation of the average

Chart 21


HISTORIC AND PREDICTED AVERAGE
FOODSTAMP BENEFIT (IN 1967 DOLLARS)
NATIONAL PRIMARY BENEFIT MODEL
AVERAGE BENEFIT
16.0
15.5
15.0
14.5
14.0
13.5
13.0
12.5
12.0
1976
1977
1978
1979
1980
1981
1982
1983
ACTUAL
FITTED

benefit forecasts at the division level--using the predicted number of recipients as the weights. Since the predicted number of recipients is also forecast with some error (as shown in the analysis of the recipient model), the forecast error of the average benefit includes error from both the average benefit- and the recipient equations. However, this is the appropriate test to employ, since when the model is actually being used, recipient forecasts at the divisional level will be necessary to obtain a national forecast of the average benefit.)

Results are shown in Table 7. In spite of the lower R-square statistic for the average benefit equation compared with teh recipient equation, the performance of the average benefit equation is quite good. The mean percent error for the entire 1976-83 period does not exceed one percent in any of the three approaches, and the root mean square percent errors are at most 2.7 percent. There is a noticeable difference in the performance of the models with the national time series model performing best. This tendency carries over to the 1983 comparisons. The national model has both the lowest mean percent error and root mean square percent error. However, the results for the pooled model are still quite good.

As with the recipient model, because of the richness of its explanatory variables, the pooled model is probably best used for policy analysis and for testing sensitivity of the average benefit to alternative economic forecasts, while the regional models and the national models are probably best for straightforward forecasting of the regional and national average benefits, respectively.

Table 7

SUMMARY OF AVERAGE BENEFIT MODEL PERFORMANCE

	Pooled Model[2]	Regional Time Series[2]	National Time Series
1976-83[1]			
Mean Percent Error	-0.010	-0.004	-0.003
Root Mean Sq. Percent Error	0.027	0.025	0.016
1983:1-1983:4[1]			
Mean Percent Error	0.007	-0.011	0.002
Root Mean Sq. Percent Error	0.024	0.027	0.009

[1] Based on forecast of national average benefit using entire sample (1976:1-1983:4).

[2] National average benefit computed by multiplying predicted regional benefit by predicted regional recipients, summing across regions to obtain a predicted total cost, and dividing by the sum of predicted recipients to obtain average national benefit.

CHAPTER III. THE IMPACT OF A "NO RECESSION" SCENARIO ON FOOD STAMP CASELOAD AND COSTS

INTRODUCTION

This chapter describes simulation analysis which was performed to estimate the impact of assuming that the 1981-82 recession did not take place. Estimates are made of the foodstamp caseload, average benefits, and resulting total program costs under the assumption that the recession was avoided.

The purpose of the exercise is to disentangle the effects of the recession (which caused the food stamp program to expand) from the effects of the changes in the rules of the food stamp program (which presumably, in the absence of a recession, would have caused the program to contract). By imposing a continuously growing economy during the period, the effects of the legislative changes can be observed in a non-recessionary environment.

Section A describes the methodology employed to carry out the simulation. Section B describes the results.

A. Simulation Methodology

The DRI Model of the U. S. Economy was used as the primary tool for creating a "No Recession" scenario. This model enables the user to manipulate policy instruments such as the money supply, government spending, and government tax policy to estimate their impacts on GNP, unemployment, inflation, and many other important aspects of the U. S. economy. Normally,

the DRI model is used for forecasting the likely course of the economy in the future under current and alternative combinations of monetary and fiscal policy. In this case, the model was used to simulate alternative government policies to avoid the 1981-82 recession. The first step was to produce a scenario in which the DRI model tracked what actually happened during the 1981-83 period. The next step was to modify the government policy "levers" which, in the model, affect what happens in the rest of the economy.

Since the fiscal policy adopted in the early 1980's was expansive (due to the large tax cuts which went into effect in successive years), it seemed unreasonable to make fiscal policy even more expansive through either increases in government spending or even larger tax cuts. The other major policy lever is monetary policy. The Board of Governors of the Federal Reserve has a significant impact on the total quantity of money in circulation in the economy through its activities in buying and selling U. S. government securities. By buying large quantities of these bonds, it pumps money into the economy. By selling, it siphons money out of the economy. Since 1979 the Federal Reserve has had the explicit policy goal of reducing the inflation rate. Its method for doing so was to restrict the growth of the stock of money.

Consequently, the obvious choice for a policy lever to eliminate the recession was to assume that the Federal Reserve pursued an easier monetary policy and allow the money stock to grow more rapidly. To develop the "No Recession" simulation, the model was run repeatedly with more and more liberal monetary policy until the economy was simulated to avert two consecutive quarters of decline in real GNP. Through its open-market

operations, the Federal Reserve system was assumed to increase non-borrowed reserves by 11 percent in 1981 and nearly 4 percent in 1982. This led to a money stock which was five to seven percent larger during the 1981-83 period. The result as shown in Table 8, was continuous growth in real GNP, a stable unemployment rate rather than a sharp increase in unemployment, significantly higher inflation, and a lower federal deficit (resulting from much higher tax revenues). Real GNP differed by as much as $123 billion (in the third quarter of 1982); the unemployment rate remained below 7.7 percent; the inflation rate peaked at nearly 10 percent; and the deficit was over $125 billion lower in late 1982.

Whether the 1981-82 recession could have been avoided by different economic policies is, of course, problematic. The case that the recession could have been avoided rests on the assumption that a much less strict monetary policy combined with the tax cuts implemented by Congress would have provided enough stimulus to avert the recession. On the other hand, it is plausible that continuing uncertainty deriving from such factors as high inflation and the risk of further oil price shocks combined with an increase in the difference between U. S. and foreign labor costs made a recession inevitable no matter what government policies were followed. It is not the purpose of this report to address this issue. Nonetheless, it is necessary that a scenario be created in which the recession does not take place. In order for that scenario to be internally consistent, a specific set of monetary and fiscal policies must be followed which, according to the relationships built into the DRI model, will lead to continuous growth in GNP.

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Tab1

Comparison of Macro Variables Exogenous to Foodstamp Model

MONEY STOCK - MNY1

	1981:1	1981:2	1981:3	1981:4	1982:1	1982:2	1982:3	1982:4	1983:1	1983:2	1983:3	1983:4
NO RECESSION	426.59	442.67	452.20	461.23	478.22	485.95	495.17	510.80	521.98	531.16	540.02	547.95
ACTUAL	420.87	429.27	432.60	437.53	448.77	451.30	458.20	475.73	490.90	505.20	517.17	523.40
DIFFERENCE	5.73	13.48	19.60	23.70	29.45	34.65	36.97	35.07	31.08	25.96	22.85	24.55

MONEY STOCK - MNY2

NO RECESSION	1,679.31	1,757.17	1,839.78	1,923.17	2,004.19	2,072.59	2,150.45	2,207.74	2,300.91	2,336.00	2,356.60	2,407.86
ACTUAL	1,654.50	1,697.67	1,731.73	1,777.20	1,819.80	1,853.20	1,896.57	1,946.67	2,046.33	2,100.40	2,136.63	2,181.93
DIFFERENCE	24.81	59.50	108.04	145.97	184.39	219.39	253.88	261.07	254.57	235.60	219.97	225.93

REAL GROSS NATIONAL PRODUCT

NO RECESSION	1,517.21	1,532.91	1,560.64	1,558.69	1,560.19	1,587.72	1,600.18	1,599.37	1,606.46	1,629.83	1,638.93	1,640.65
ACTUAL	1,513.50	1,511.70	1,522.10	1,501.30	1,483.50	1,480.50	1,477.10	1,478.80	1,491.00	1,524.80	1,550.20	1,572.70
DIFFERENCE	3.71	21.21	38.54	57.39	76.69	107.22	123.08	120.57	115.46	105.03	88.73	67.95

CIVILIAN UNEMPLOYMENT RATE

NO RECESSION	7.33	6.98	6.77	7.17	7.22	7.25	7.34	7.66	7.38	7.34	7.08	6.81
ACTUAL	7.43	7.33	7.43	8.23	8.83	9.43	10.00	10.60	10.37	10.10	9.40	8.47
DIFFERENCE	-0.11	-0.35	-0.66	-1.06	-1.61	-2.18	-2.66	-2.94	-2.98	-2.76	-2.32	-1.66

INFLATION RATE

NO RECESSION	10.80	9.02	12.89	8.33	4.40	7.05	9.63	3.79	1.43	5.86	6.19	6.05
ACTUAL	11.38	8.73	11.47	6.78	3.76	5.47	7.20	1.56	0.32	4.34	4.15	4.43
DIFFERENCE	-0.58	0.29	1.42	1.55	0.64	1.58	2.43	2.23	1.11	1.53	2.04	1.62

DEFICIT

NO RECESSION	-37.07	-24.60	-29.07	-40.34	-20.34	-12.18	-41.04	-82.41	-58.36	-60.69	-93.09	-96.34
ACTUAL	-46.50	-50.60	-63.10	-97.00	-106.30	-112.00	-163.70	-210.60	-185.70	-167.30	-180.90	-180.50
DIFFERENCE	9.43	26.00	34.03	56.66	85.96	99.82	122.66	128.19	127.34	106.61	87.81	84.16

The scenario created is only one of many no-recession scenarios which could have been created. Moreover, each equation in the model is stochastic and is subject to forecast error. Thus, even if the policy parameters and the basic responses to these parameters are taken as given, there is a significant range of uncertainty around the point estimates provided by the model. Consequently, the differences between what actually happened and what was simulated to happen in this particular scenario should be viewed as suggestive rather than definitive.

Once the "No Recession" macroeconomic simulation was carried out, the next step was to carry out simulations of the distribution of income and simulations of the regional economies consistent with this new scenario.[1]

The simulation of the distribution of income was carried out by DRI's Demographic-Economic (DECO) model. This model simulates both demographic shifts in the U. S. population and changes in the distribution of income. In this particular scenario it was assumed that there were no changes in demographic behavior. Consequently, attention was focused solely on the income distribution. DECO approximates the distribution of income by estimating the parameters of a modified log-normal distribution for each of several demographic groups, using the micro data from the March Current Population Surveys. These parameters, in turn, are then related to income and unemployment variables which are forecast by the DRI Model of the U. S. Economy. Thus, when the national unemployment rate and the level of various

[1] In addition, the national time series food stamp model described in Appendix C was also used to produce a "No Recession" estimate of food stamp recipiency and benefits. The purpose of this exercise was to serve as a check on the primary model. Results are reported in Appendix C.

sources of income change, the parameters of these distributions are changed by the DECO model--yielding a new set of income distributions. These new simulated income distributions are then used to calculate both the number of persons and families in poverty and the real mean poverty deficit--both of which are explanatory variables in the food stamp model.

Next, a simulation of the DRI Regional Information Service (RIS) model was carried out using the results of the macroeconomic simulation. RIS simulates the unemployment rate and the real wage rate for each of the nine divisions of the U. S. used in the food stamp model. The RIS model's results are all constrained to be consistent with the national totals for the same concepts.

Next, a simulation was carried out of the caseload and cost of the AFDC regular and UP program. The model upon which this simulation was based forecasts AFDC recipiency as a function of the unemployment rate, poverty, inflation, and the demographic structure of the U. S. population. The average benefit is forecast based on inflation and the AFDC standard of need.

Finally, several variables required by the food stamp model were either not forecast by any of the models or were forecast at the national level but needed at the division level. To obtain these forecasts, a set of auxiliary or "bridge" equations were estimated to relate the required variables to variables which were, in fact, forecast by the DRI models. Bridge equations were necessary to forecast such variables as the CPI for food at home (as a function of the CPI for food); poverty rates at the region level (as a function of poverty

at the national level); and the fraction of the unemployed whose duration of unemployment exceed 52 weeks (forecast as a function of lagged unemployment rates at both the national and division level).

Details of the DECO simulation, the RIS simulation, and the bridge equations are all provided in Appendix D.

The final step in the simulation process was to use the values forecast by the various models and equations in the food stamp model itself and to produce the "No Recession" simulation of the food stamp program. To summarize, the alternative monetary policies were used to produce an alternative macroeconomic scenario in which the recession was assumed not to take place. Based on this macroeconomic simulation, a simulation was carried out for each of the nine divisions and for the distribution of income. Forecasts of the explanatory variables in the food stamp model were then taken directly from the regional or income distribution simulations or derived from them using auxilliary equations. Finally, the food stamp model was simulated using the forecasts of the explanatory variables as inputs.

At each stage of simulation, point estimates of the outputs from one simulation are used as inputs to the next simulation. In some cases variables that are not statistically significant are nonetheless employed as explanatory variables because the regression coefficient is still the best estimate of their effect. Consequently, forecasting errors made at any stage of the process are carried through the entire process. Thus, as mentioned above, the results should be viewed as suggestive rather than definitive. The results of all of these simulations are summarized in the next section.

B. Results

The results of the "No Recession" macroeconomic scenario are contrasted with historical statistics in Table 8. The macroeconomic results were summarized above.

These results, after being used in the DECO, RIS, and AFDC models and the bridge equations, yield the following outcomes for the explanatory variables in the food stamp primary recipient model, as reported in Table 9 in both rate and level form.[1] Nationwide, the difference in the unemployment rate reaches a peak of about 2.5 percentage points. In the East North Central division, the difference reaches 3 percentage points in the first quarter of 1983 due to the increases in actual unemployment which took place during that period. This dramatic difference in unemployment, as we shall see below, implies a dramatic reduction in food stamp recipiency since, nationwide, unemployment is one of the two most important variables in explaining recipiency.

The difference in the fraction of the unemployed who have remained unemployed for more than 52 weeks reaches a peak in 1983--rising abruptly from about 1 percentage point in the fourth quarter of 1982 to over 6 percentage points in the first quarter of 1983. The abruptness of this increase is partially a statistical artifact caused by the fact that the historical data on long-term unemployment is recorded annually rather than quarterly. For each

[1] Results of the national time series model simulating are reported in Appendix C. Differences in the national level forecast between the primary model and the national time series model are minor. Results at the division level are reported in Appendix F.

Table ?

COMPARISON OF VARIABLES IN FOODSTAMP

PRIMARY MODEL FOR UNITED STATES

CIVILIAN UNEMPLOYMENT RATE

	1981:1	1981:2	1981:3	1981:4	1982:1	1982:2	1982:3	1982:4	1983:1	1983:2	1983:3	1983:4
NO RECESSION	7.33	6.98	6.77	7.17	7.22	7.25	7.34	7.66	7.38	7.34	7.08	6.81
ACTUAL	7.43	7.33	7.43	8.23	8.83	9.43	10.00	10.60	10.37	10.10	9.40	8.47
DIFFERENCE	-0.11	-0.35	-0.66	-1.06	-1.61	-2.18	-2.66	-2.94	-2.98	-2.76	-2.32	-1.66

POVERTY RATE

NO RECESSION	14.092	13.742	13.563	13.556	13.716	13.713	13.714	13.720	13.741	13.749	13.749	13.743
ACTUAL	13.635	13.878	14.126	14.379	14.733	14.988	15.144	15.202	15.107	15.072	15.036	15.001
DIFFERENCE	0.457	-0.136	-0.563	-0.823	-1.016	-1.274	-1.430	-1.482	-1.367	-1.323	-1.288	-1.258

PERCENT OF UNEMPLOYED WHO HAVE BEEN UNEMPLOYED 52 WEEKS OR MORE

NO RECESSION	5.984	6.607	6.938	6.982	6.994	6.987	6.989	7.007	7.316	7.606	7.723	7.614
ACTUAL	7.102	6.937	6.943	7.083	8.074	8.132	8.099	8.182	13.605	14.021	13.983	13.668
DIFFERENCE	-1.198	-0.330	-0.005	-0.101	-1.080	-1.145	-1.110	-1.095	-6.289	-6.414	-6.261	-6.053

REAL AVERAGE ANNUAL WAGE (1967 dollars)

NO RECESSION	6.022	6.002	5,969	6.015	6.087	6.143	6.161	6.197	6.302	6.314	6.283	6.258
ACTUAL	6.031	5.988	5.942	5.944	6.002	6.012	5.992	6.041	6.167	6.170	6.182	6.188
DIFFERENCE	-0.010	0.013	0.027	0.072	0.086	0.131	0.170	0.156	0.136	0.144	0.100	0.070

TOTAL NUMBER OF PEOPLE (000) IN POVERTY

	1981:1	1981:2	1981:3	1981:4	1982:1	1982:2	1982:3	1982:4	1983:1	1983:2	1983:3	1983:4
NO RECESSION	32,239	31,539	31,206	31,266	31,715	31,785	31,862	31,951	32,075	32,170	32,245	32,308
ACTUAL	31,193	31,851	32,501	33,165	34,065	34,739	35,184	35,402	35,265	35,265	35,265	35,265
DIFFERENCE	1,045	-312	-1,295	-1,899	-2,350	-2,954	-3,322	-3,451	-3,190	-3,095	-3,020	-2,957

TOTAL NUMBER OF PEOPLE (000) WHO HAVE BEEN UNEMPLOYED FOR 52 WEEKS OR MORE

NO RECESSION	483	527	537	562	579	579	591	618	653	651	645	616
ACTUAL	585	588	592	637	799	847	897	940	1,661	1,568	1,467	1,353
DIFFERENCE	-103	-60	-55	-76	-221	-269	-306	-322	-1,008	-917	-823	-737

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Table 9 (Continued)

PERCENT OF POPULATION ON AFDC: BASIC PROGRAM

NO RECESSION	4.40	4.34	4.31	4.10	3.88	3.74	3.71	3.71	3.71	3.69	3.64	3.64
ACTUAL	4.40	4.36	4.34	4.17	4.00	3.91	3.90	3.94	4.00	4.01	3.98	4.01
DIFFERENCE	0.00	-0.01	-0.03	-0.07	-0.13	-0.17	-0.19	-0.23	-0.29	-0.32	-0.34	-0.37

TOTAL NUMBER OF PEOPLE PARTICIPATING IN AFDC BASIC PROGRAM

NO RECESSION	10,067,590	9,969,240	9,907,153	9,447,486	8,959,797	8,679,304	8,619,117	8,639,194
ACTUAL	10,057,694	9,995,498	9,985,533	9,610,888	9,251,950	9,066,687	9,055,372	9,173,380
DIFFERENCE	9,896	-26,259	-78,380	-163,402	-292,153	-387,383	-436,256	-534,186

region, therefore, the statistic for each quarter of the year is exactly the same. Thus, there is an abrupt increase in measured long-term unemployment in the first quarter of 1983. In reality, the rate of long-term unemployment was probably increasing throughout 1982, and the increase between the fourth quarter of 1982 and the first quarter of 1983 was much smaller. In the "No Recession" scenario, the long-term unemployment rate remains almost unchanged. Consequently, the difference in the long-term unemployment rates between the two scenarios increases abruptly in the first quarter of 1983. This difference in long-term unemployment implies a somewhat smaller number of persons eligible for food stamps in the "No Recession" scenario.

Real wages are consistently higher in the "No Recession" scenario. However, the difference is relatively small--peaking at about $500 (in 1983 dollars) in the third quarter of 1982. This implies a modestly higher opportunity cost for food stamp participation in the "No Recession" scenario.

The poverty rate is significantly lower in the "No Recession" scenario. By the fourth quarter of 1982, it is almost 1.5 percentage points lower than the actual rate in that quarter. This translates into a difference of about 3.5 million persons in poverty. The difference drops to 3.2 million persons by the first quarter of 1983 and continues to drop thereafter. It is important to note that the difference in poverty is attributable to increases in the actual level of poverty rather than simulated decreases in the "No Recession" scenario. This lower level of poverty implies a smaller population eligible for food stamps.[1]

[1]In the first quarter of 1981 the poverty rate is slightly higher in the "No Recession" scenario than historically. This is due to the DECO tracking simulation not aligning perfectly to historic data. The DECO simulation was slightly too high, and this carried over into the beginning of the "No Recession" scenario until the effect of rising incomes is fully felt. Thus, this result is a simulation artifact rather than a likely outcome of the scenario.

The percentage of the population participating in AFDC falls throughout the 1981-1983 period both historically and in the "No Recession" scenario. However, the percentage drops faster in the "No Recession" scenario, and consequently the difference in the participation rates widens throughout the period. By the end of 1982 the difference in the participation rates is 0.23 percentage points--equivalent to a 6.1 percent decline in the AFDC caseload. Given the overlap beteween AFDC and food stamps, we can expect this difference to lead to a difference in food stamp recipiency as well.

Since the variables representing the effect of the elimination of the purchase requirement and the OBRA changes take on the same values in both scenarios, they are assumed to have the same effect on the recipiency rate in both scenarios. Thus, none of the difference in the number of recipients in the two scenarios can be attributed to the administrative changes in the program.

We now turn to the impact of all these changes in the explanatory variables on the number of food stamp recipients. The impact on the total number of recipients in the entire U. S. is shown in Table 10 and displayed in Chart 22.

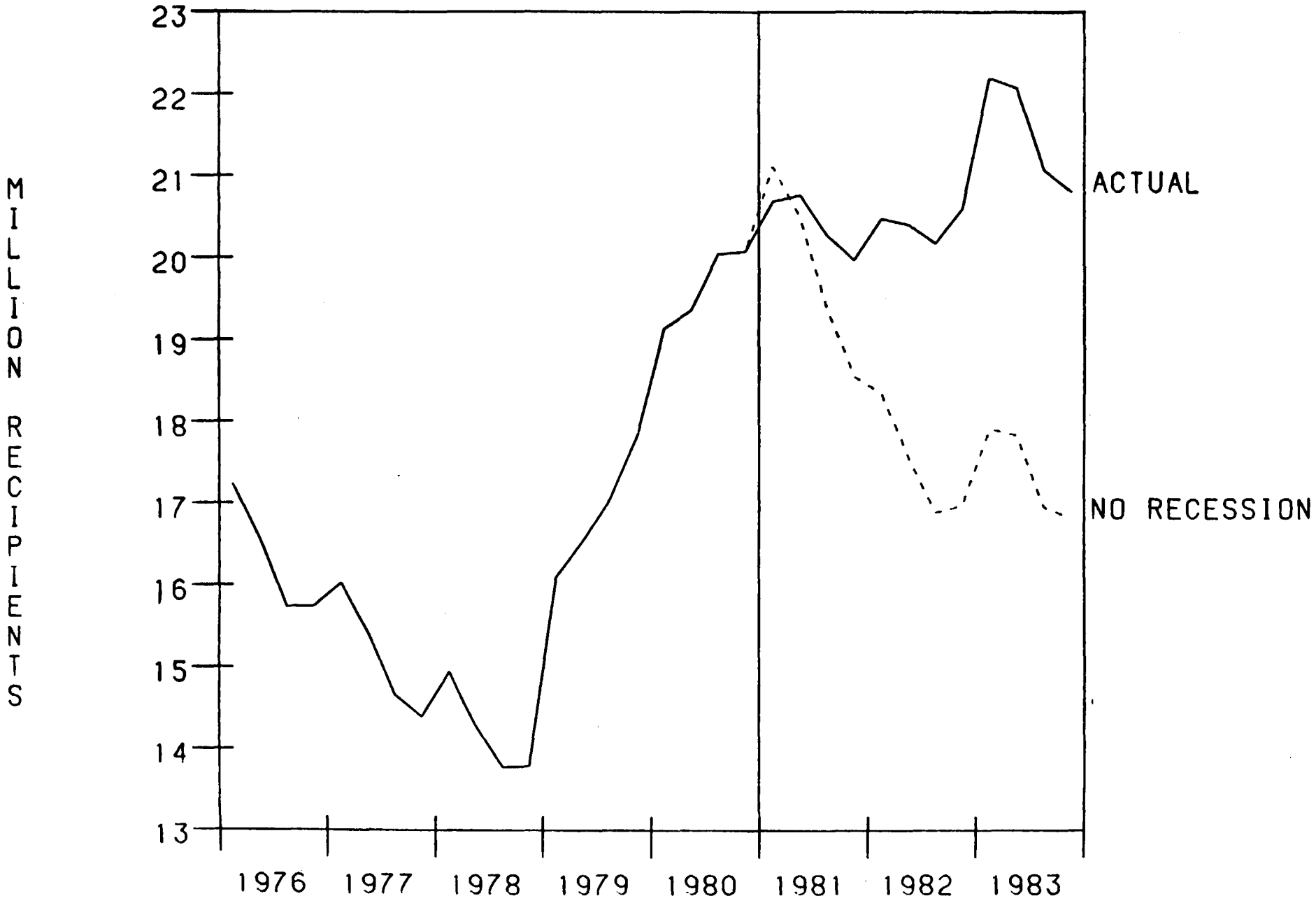
TABLE 10

COMPARISON OF FOOD STAMP RECIPIENCY
ACTUAL AND NON-RECESSION SCENARIO

	1981:1	1981:2	1981:3	1982:4
NO RECESSION	21,111,000	20,497,000	19,377,000	18,551,000
ACTUAL	20,686,000	20,765,000	20,279,000	19,971,000
DIFFERENCE	425,000	-268,000	-902,000	-1,420,000
	1982:1	1982:2	1982:3	1982:4
NO RECESSION	18,342,000	17,563,000	16,888,000	16,969,000
ACTUAL	20,478,000	20,405,000	20,179,000	20,600,000
DIFFERENCE	-2,136,000	-2,842,000	-3,291,000	-3,631,000
	1983:1	1983:2	1983:3	1983:4
NO RECESSION	17,907,000	17,835,000	16,952,000	16,819,000
ACTUAL	22,192,000	22,077,000	21,074,000	20,814,000
DIFFERENCE	-4,285,000	-4,243,000	-4,122,000	-3,995,000

Chart 22

PRIMARY MODEL
FOODSTAMP RECIPIENTS IN U.S.
ACTUAL VS. NORECESSION SCENARIO



These results can be examined from two different perspectives. The first approach is to focus on the difference in the caseload between actual history and the "No Recession" scenario. The second approach is to look at the change in the food stamp caseload between the first quarter of 1981 and the first quarter of 1983 under each scenario. In particular, what explains the large drop in food stamp recipiency in the "No Recession" scenario? These two related issues will be addressed in turn.

For the nation as a whole the difference in the caseload between the two scenarios grows rapidly from under 500,000 in the middle of 1981 to between 2.5 and 3.1 million during 1982 and a peak difference of 4.3 million in 1983:1.[1] The difference begins to decline thereafter as the real-world economy begins to recover from the recession. By the fourth quarter of 1983 the difference is reduced to 4.0 million recipients.

How this rather large impact comes about is explained in Table 11. This table shows the effect of each of the explanatory variables on the difference in the number of food stamp recipients when the recession is assumed not to occur. Most variables have been converted to level form for ease of interpretation.

The last row in the table summarizes the effect of each of the variables on the difference in recipiency between actual history and the "No Recession" scenario. Clearly, the most important variable is poverty. Over 1.6 million fewer persons are predicted to be on the caseload as a result of a difference in poverty of about 3.2 million persons. The difference in the AFDC caseload and

[1]The slightly higher poverty rate in the first quarter of the "No Recession" scenario leads to a slightly higher rate of food stamp recipiency. See the

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TABLE 11

Causes of the Difference in the Number of Food Stamp Recipients (thousands), By Division, 1983:1, Actual vs. No-recession Scenario

Division	Poverty Level (1,000)	Unemploy. Rate (%)	Longterm Unempl. (1,000)	AFDC (1,000)	Real Wage (1,000)	Total Recipient Effect	Percentage of Total U.S. Effect	Percentage of Total U.S. Food Stamp Recipients
New England								
Change in exp. variable	-183	-2.5	NA	-13	NA			
Effect on recipiency	-12	-89	NA	-20	NA	-121	2.9%	0.5%
Percentage of Effect	10%	74%	NA	17%	NA			
Mid-Atlantic								
Change in exp. variable	-542	-2.2	NA	-40	NA			
Effect on recipiency	-396	-7	NA	-79	NA	-482	11.4%	2.2%
Percentage of Effect	82%	1%	NA	16%	NA			
South Atlantic								
Change in exp. variable	-69	-2.7	143	-114	+0.122			
Effect on recipiency	-27	-322	-122	-312	-7	-790	18.7%	3.6%
Percentage of Effect	3%	41%	15%	39%	1%			
East South Central								
Change in exp. variable	-27	-3.6	69	-48	+0.183			
Effect on recipiency	-10	-165	-38	-132	-3	-349	8.3%	1.6%
Percentage of Effect	3%	47%	11%	38%	1%			
West South Central								
Change in exp. variable	-46	-1.7	49	-77	+0.162			
Effect on recipiency	-18	-135	-43	-211	-6	-415	9.8%	1.9%
Percentage of Effect	4%	33%	11%	51%	1%			
East North Central								
Change in exp. variable	-964	-3.8	328	-204	+0.160			
Effect on recipiency	-469	-172	-182	-47	-5	-875	20.7%	3.9%
Percentage of Effect	54%	20%	21%	5%	1%			
West North Central								
Change in exp. variable	-404	-2.2	52	-53	+0.029			
Effect on recipiency	-196	-41	-46	-12	-5	-296	7.0%	1.3%
Percentage of Effect	66%	14%	16%	4%	2%			
Pacific Northwest								
Change in exp. variable	-203	-2.5	37	-18	+0.168			
Effect on recipiency	-103	-27	-15	-20	-8	-173	4.1%	0.8%
Percentage of Effect	60%	16%	9%	12%	5%			
Pacific Southwest								
Change in exp. variable	-732	-2.6	118	-105	+0.133			
Effect on recipiency	-381	-101	-38	-133	-23	-716	17.0%	3.2%
Percentage of Effect	53%	14%	8%	21%	3%			
Total USA								
Change in exp. variable	-3,190	-3.0	-1,007	-669	+0.136			
Effect on recipiency	-1,612	-1,039	-506	-986	-57	-4,217	100%	19.0%
Percentage of Effect	38%	25%	12%	23%	1%			

*Excluding effect of autocorrelated error term.

the difference in long-term unemployment lead to a difference of 990,000 and 500,000 recipients, respectively. Together, the three variables which are intended to proxy the eligible population account for a difference of 3.1 million persons. The unemployment rate, which was intended to proxy the participation rate, accounts for almost all the remaining difference in recipiency--nearly 1.1 million persons. The increase in the real wage has a negligible effect.

Two points should be kept in mind in interpreting these results. First, the potential recipient population includes persons above the poverty line. Thus, the fact that the difference in recipiency is greater than the difference in poverty is not necessarily wrong. Moreover, as indicated by the strong impact of unemployment, some of the difference is probably due to a drop in the participation rate of persons who are eligible. Second, the fact that the change in food stamp recipiency attributed to the change in AFDC recipiency is greater than the change in AFDC recipiency itself can be attributed to the fact that the AFDC coefficient was greater than one in several of the divisions (as discussed in Chapter II). This is probably due to the AFDC population serving as a proxy for a larger population consisting of those people most likely to be eligible for and receive food stamps.

There are significant differences in the importance of the variables across the nine divisions. These generally reflect the difference in the importance of the regression coefficients. Thus, in New England unemployment is by far the most important factor--accounting for about 75 percent of the decline in recipiency. In the Mid-Atlantic division the poverty level is by far the most

important factor--accounting for over 80 percent of the change in recipiency. In the South the reduction in unemployment and AFDC recipiency dominate the results--together explaining about 80 percent of the drop. In the North Central region, the decline in poverty explains over half of the drop in recipiency while the two unemployment measures account for most of the rest. In the Pacific Northwest about 60 percent of the drop is accounted for by poverty. In the Pacific Southwest poverty is also the dominant factor, but the drop in the AFDC caseload plays an important role as well.

Although explaining the reasons for the difference in the caseload is of primary importance, it is also interesting to examine briefly what happended to the caseload over the two-year period between the first quarter of 1981 and the first quarter of 1983 under the two scenarios. The actual history is that the caseload rose from 20.7 million recipients to 22.2 million recipients over the period. In view of the increase in unemployment and poverty during the recession, this result is not surprising--even though the OBRA81 changes were put into effect during this period. The path of the "No Recession" scenario is a drop in recipiency from 21.1 million to 17.9 million during the same period. This drop may appear puzzling at first glance because the unemployment rate was simulated to remain virtually constant over the period, and the number of people in poverty dropped by only 2.5 percent. However, the AFDC recipient population is simulated to drop by 16 percent over the period--a drop of about 1.4 million recipients. As we have seen, the food stamp recipient population is very sensitive to AFDC recipiency with a drop in AFDC recipiency leading to an even greater drop in food stamp recipiency. Thus, according to the model, the drop in

AFDC is largely responsible for the simulated drop in food stamp recipiency in the "No Recession" scenario and presumably played a large role in holding down the increase in the actual food stamp caseload.

The simulation of average benefits is somewhat more complicated than the simulation of the recipiency rate. This is because the equation was estimated in percentage change form. This means that the model predicts the percent change in average benefits from the previous year. Consequently, in order to calculate the level of benefits in a quarter, it is necessary to multiply the predicted percent change for the current quarter by the level of benefits in the previous quarter. Thus, to simulate over the entire period, it is necessary to start with the level of benefits for the quarter preceding the simulation and then successively apply the predicted percent changes to that level.

The simulation results for the variables explaining average benefits are displayed in Table 12 along with the results for average benefits. Although the regression itself was estimated in percentage change form, as described in Chapter II, the variables are displayed in level form for greater ease of interpretation. The pattern followed by the maximum allotment for a family of four is as expected. In the historic data, its value falls each quarter through 1982:3--reaching a minimum of $79.59 (in 1967 dollars). This reflects the inflation of the period. There is a sharp increase in 1982:4, reflecting the cost-of-living adjustment delayed by OBRA, and then a steady decline sets in again through 1983:4. Overall, the real value of the maximum allotment falls by about 6 percent over the three-year period. In the "No Recession" scenario the legislated adjustment pattern stays the same. The only difference is the pattern

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Table 12

COMPARISON OF VARIABLES IN FOODSTAMP

PRIMARY MODEL FOR UNITED STATES

REAL AVERAGE COST PER RECIPIENT

	1981:1	1981:2	1981:3	1981:4	1982:1	1982:2	1982:3	1982:4	1983:1	1983:2	1983:3	1983:4
NO RECESSION	15.95	15.16	14.69	13.63	13.20	12.88	12.71	14.56	13.97	13.45	13.47	13.48
ACTUAL	15.96	15.27	14.54	13.98	13.84	13.56	13.14	14.69	14.65	14.42	14.01	14.09
DIFFERENCE	-0.01	-0.11	0.15	-0.35	-0.65	-0.68	-0.43	-0.12	-0.68	-0.98	-0.55	-0.61
REAL MAXIMUM ALLOTMENT FOR A FAMILY OF 4												
NO RECESSION	88.47	86.58	84.00	82.33	81.45	80.08	78.26	86.29	85.99	84.77	83.51	82.29
ACTUAL	88.62	86.61	84.20	83.01	82.33	81.09	79.59	86.24	86.35	85.30	84.28	83.25
DIFFERENCE	-0.15	-0.03	-0.20	-0.67	-0.88	-1.01	-1.33	0.05	-0.36	-0.53	-0.77	-0.96
REAL AVERAGE AFDC PAYMENT PER RECIPIENT												
NO RECESSION	37.40	36.69	36.33	36.83	36.86	36.52	36.54	36.33	35.90	35.65	36.20	35.82
ACTUAL	37.32	36.13	36.38	37.11	37.12	36.50	36.26	36.47	36.81	36.01	36.62	36.25
DIFFERENCE	0.08	0.56	-0.05	-0.27	-0.26	0.01	0.28	-0.14	-0.92	-0.36	-0.42	-0.43
REAL PER-CAPITA WAGE AND SALARY DISBURSEMENTS												
NO RECESSION	2,302.76	2,345.18	2,424.84	2,450.87	2,340.21	2,393.21	2,416.99	2,441.31	2,360.89	2,429.05	2,473.69	2,528.55
ACTUAL	2,399.98	2,385.26	2,369.32	2,351.90	2,343.62	2,339.06	2,317.19	2,311.87	2,340.67	2,364.73	2,383.08	2,401.14
DIFFERENCE	-97.22	-40.08	55.53	98.97	-3.40	54.15	99.81	129.44	20.22	64.31	90.61	127.41
REAL MEAN INCOME DEFICIT												
NO RECESSION	1,296.48	1,273.71	1,242.55	1,222.49	1,290.96	1,273.04	1,249.35	1,239.91	1,261.46	1,246.87	1,231.70	1,217.10
ACTUAL	1,333.46	1,305.85	1,270.87	1,250.21	1,374.57	1,356.39	1,333.03	1,327.88	1,369.05	1,354.60	1,340.89	1,326.44
DIFFERENCE	-36.98	-32.15	-28.33	-27.72	-83.61	-83.35	-83.68	-87.97	-107.60	-107.73	-109.19	-109.34

of prices. Since inflation is more rapid in this scenario, the real value of the maximum allotment falls faster. However, the 1982:4 adjustment makes up for much of the 1981:1-1982:3 decline--just as in the historical data. After the adjustment the decline again proceeds faster in the "No Recession" scenario, reaching a 1983:4 level of $82.29--one dollar lower (in 1967 dollars) than in history. We can expect this to cause average food stamp benefits to fall more rapidly in the "No Recession" scenario during the 1981:1-1982:3 and 1982:4-1983:4 periods with benefits slightly lower at the end of the period than in history.

Two other variables included in the benefit model are changed noticeably by the "No Recession" scenario. They are the real mean poverty deficit and real wage and salary disbursements. According to historical statistics, the real mean poverty deficit remained roughly constant over the three year period. However, in the "No Recession" scenario, the deficit drops by about 6 percent. This drop in the poverty deficit should be associated with somewhat slower growth in average benefits over the entire two-year period since the smaller poverty deficit implies higher incomes within the population most likely to be eligible for food stamps.

Real wage and salary disbursements rise over the two-year period in the "No Recession" scenario but stagnate in history. This leads to a widening gap which reaches $125 (in 1967 dollars) by the fourth quarter of 1984--a percentage difference of about five percent. A rise in real wages should be associated with lower average benefits, other things equal, since wages are countable income for those food stamp recipients who work.

The final variable in the equation that is permitted to vary between the two recessions, the average AFDC payment, shows only a slight difference between history and the "No Recession" scenario. Hence, this variable cannot be expected to have an impact on food stamp benefits.

Each of the first three variable changes in the direction that should cause average food stamp benefits to be lower in the "No Recession" scenario, and Table 12 and Chart 23 reveal this to be the case. By the fourth quarter of 1983, the average benefit in the "No Recession" scenario is $.61 lower (in 1967 dollars) than in history. The decrease in average benefits from the first quarter of 1981 through the third quarter of 1982 and from the fourth quarter of 1982 through the third quarter of 1983 in both scenarios reflects the pattern of the maximum allotment and is caused by the inflation throughout both periods. The sharp increase in the fourth quarter of 1982 reflects the cost-of-living adjustment in the allotment. The real average benefit drops faster in the "No Recession" scenario primarily because the maximum allotment drops faster in the "No Recession" scenario. This, in turn, is due to the higher inflation in the "No Recession" scenario. The real average benefit is lower in the "No Recession" scenario especially at the end of the period because of the combined effect of three variables. The real maximum allotment is lower; the mean poverty deficit is lower; and real wage and salary disbursements are higher.

Because inflation is more rapid in the "No Recession" scenario than in history, there is little difference between average benefits measured in current dollars, as shown in Chart 24. In both the "No Recession" scenario and in history, the average benefit is about $42 in the first quarter of 1981 and is $.50 to $.75 higher by the end of 1983. The drops in nominal benefits prior to the cost-of-

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Chart 23

PRIMARY MODEL

AVERAGE FOODSTAMP BENEFIT IN U.S. (1967$)

ACTUAL VS. NORECESSION SCENARIO

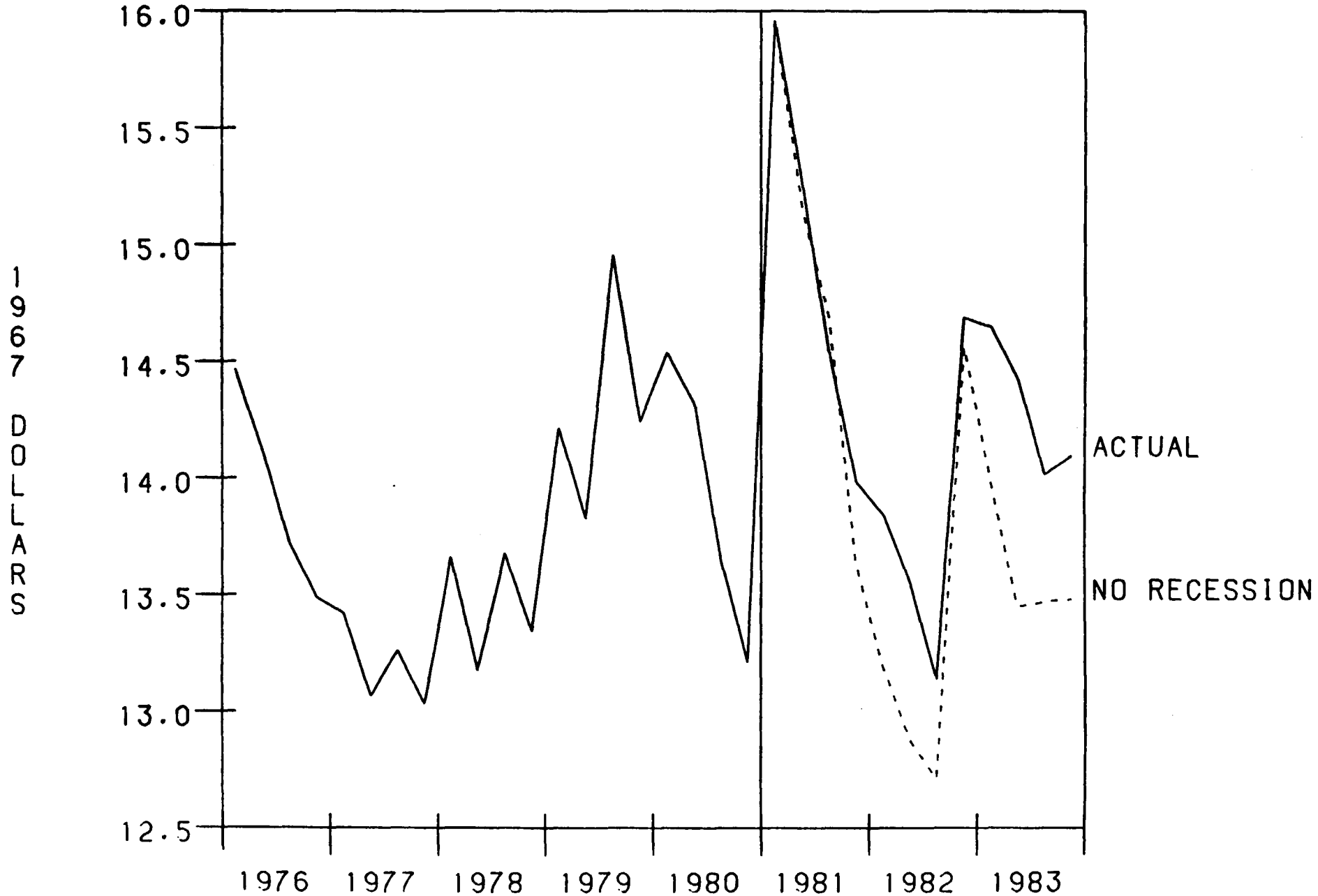

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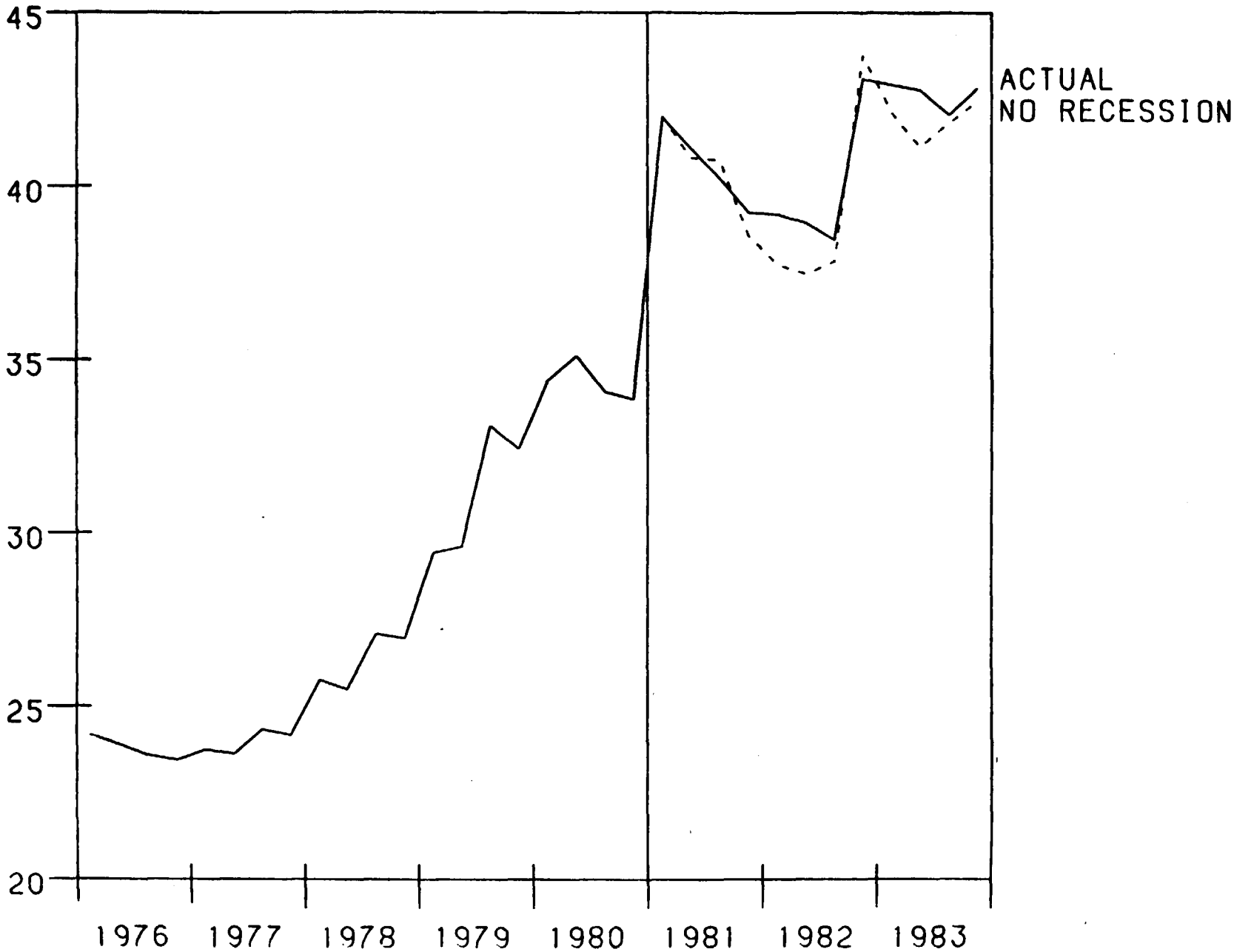
Chart 24

PRIMARY MODEL

AVERAGE FOODSTAMP BENEFIT IN U.S. (CURR$)

ACTUAL VS. NORECESSION SCENARIO



living adjustment in both scenarios reflect the phenomenon that for all families with positive countable income, nominal income is increasing due to inflation while the maximum allotment is frozen. Because there is more inflation in the "No Recession" scenario, the phenomenon is stronger than in actual history, and consequently the nominal average benefit falls more rapidly. Moreover, the increases in real wage and salary disbursements and the decline in the mean poverty deficit would also tend to hold down food stamp benefits in the "No Recession" scenario.

The changes in benefits brought about by OBRA81 and OBRA82 are assumed to be the same in both scenarios. Thus, part of the 1982 decline in average benefits in both history and in the "No Recession" scenario may have been brought about by the pro-rating of first month benefits.

The process by which the model adjusts benefits from one quarter to the next can be seen better in Table 13. This table shows, division by division, the causes of the difference between the "No Recession" scenario and history in the adjustment to real benefits occurring between the first and second quarters of 1983.

The results displayed in this table are sensitive to the particular period chosen for analysis. As can be seen in the fourth column of the table, there was no difference between the two scenarios in the quarter-to-quarter change in the mean poverty deficit. Consequently, the mean poverty deficit played no role in determining the difference in the change in benefits in the second quarter of 1983. This would not have been true if we had chosen the change between 1981:4

TABLE 13

Causes of the Difference in the Change in the Average Benefit
Per Recipient 1983:1 - 1983:2
Actual vs. No-Recession Scenarios

Division	Change in Maximum Allotment (1967 dollars)	Change in Average AFDC Payment (1967 dollars)	Change in Wage & Salary Disbursements (1967 dollars)	Change in Mean Poverty Deficit (1967 dollars)	Change in Effect (1967 dollars)
Difference in exp. var.	-.17	.59	56	0	
Effect on benefit change	-.05	-.03	-.12	0	-.20
% of effect	25%	15%	60%	0%	
Mid Atlantic					
Difference in exp. var.	-.17	.29	34	0	
Effect on benefit change	-.05	-.02	-.08	0	-.15
% of effect	33%	13%	53%	0%	
South Atlantic					
Difference in exp. var.	-.17	.07	57	0	
Effect on benefit change	-.05	-.01	-.13	0	-.19
% of effect	26%	5%	68%	0%	
East South Central					
Difference in exp. var.	-.17	.13	35	0	
Effect on benefit change	-.05	-.02	-.11	0	-.18
% of effect	28%	11%	61%	0%	
West South Central					
Difference in exp. var.	-.17	-.05	24	0	
Effect on benefit change	-.05	.01	-.06	0	-.10
% of effect	50%	-10%	50%	0%	
East North Central					
Difference in exp. var.	-.17	1.39	45	0	
Effect on benefit change	-.05	-.10	-.12	0	-.27
% of effect	4%	37%	44%	0%	
West North Central					
Difference in exp. var.	-.17	.37	41	0	
Effect on benefit change	-.05	-.02	-.10	0	-.17
% of effect	29%	12%	59%	0%	
Pacific Northwest					
Difference in exp. var.	-.17	.19	29	0	
Effect of benefit change	-.05	-.01	-.08	0	-.14
% of effect	36%	7%	57%	0%	
Pacific Southwest					
Difference in exp. var.	-.17	.51	59	0	
Effect of benefit change	-.05	-.02	-.11	0	-.18
% of effect	28%	11%	61%	9%	

and 1982:1 when the change in the poverty deficit differed by $56. Thus, the results should be viewed as illustrative of the adjustment process rather than as giving a representative view of the importance of the variables across the entire period of simulation.

Moreover, the change in the average benefit at the national level depends not only on the change in the average benefit in each region but also on the change in the regional distribution of the food stamp population. For example, if the caseload falls disproportionately in divisions with relatively high average benefits, the national average benefit will fall even if average benefits within each division remain unchanged. Consequently, it is not possible to take the weighted average of the divisional results to obtain the change in the national average benefit.

Bearing in mind these caveats, we see that in New England there was a $.20 difference between the two scenarios in the change in average benefits for the period 1983:1-1983:2. Of this $.20 difference, 25 percent can be explained by the $.17 difference in the change in the maximum allotment between the two scenarios. Only 15 percent can be explained by the difference in the change in the average AFDC benefit, and 60 percent by the $56 difference in the change in wage and salary disbursements. Since there was no difference in the change in the mean poverty deficit between the two scenarios, that variable played no role in this particular quarter's difference.

Estimates of the total cost of the food stamp program in the "No Recession" scenario can be obtained by multiplying the predicted number of

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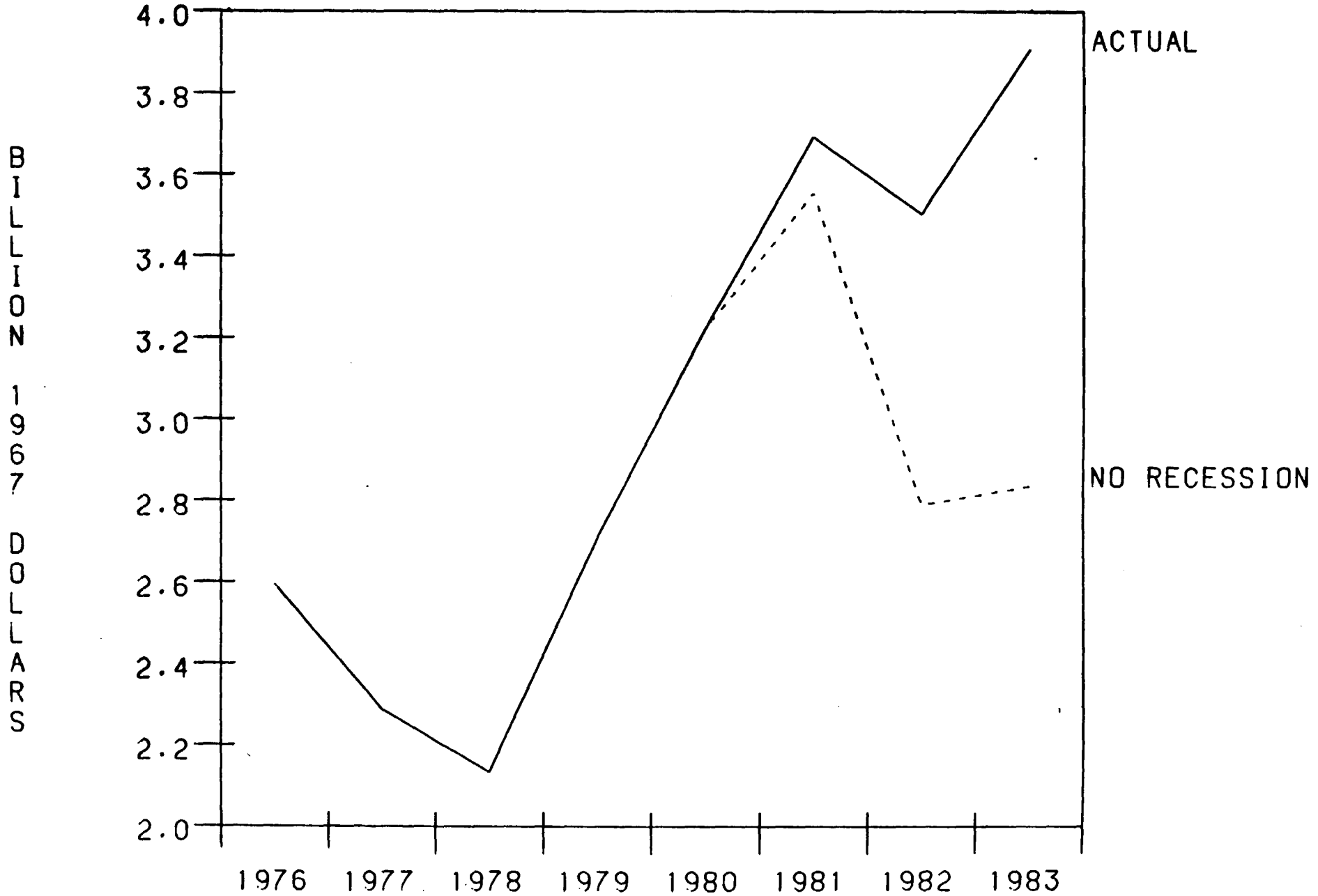
Chart 25

PRIMARY MODEL

TOTAL ANNUAL FOODSTAMP COST IN U.S. (1967$)

ACTUAL VS. NORECESSION SCENARIO



recipients by the predicted average real benefit. This predicted real total cost is contrasted with the actual historical figures in Chart 25. The differential, driven primarily by lower recipiency, rises to a maximum of 943 million dollars (in 1967 dollars) in the second quarter of 1983. This is a reduction of about 25 percent. In current dollars the pattern is similar, as shown in Chart 26. The reduction reaches a peak of $2.5 billion dollars about a 22 percent reduction.

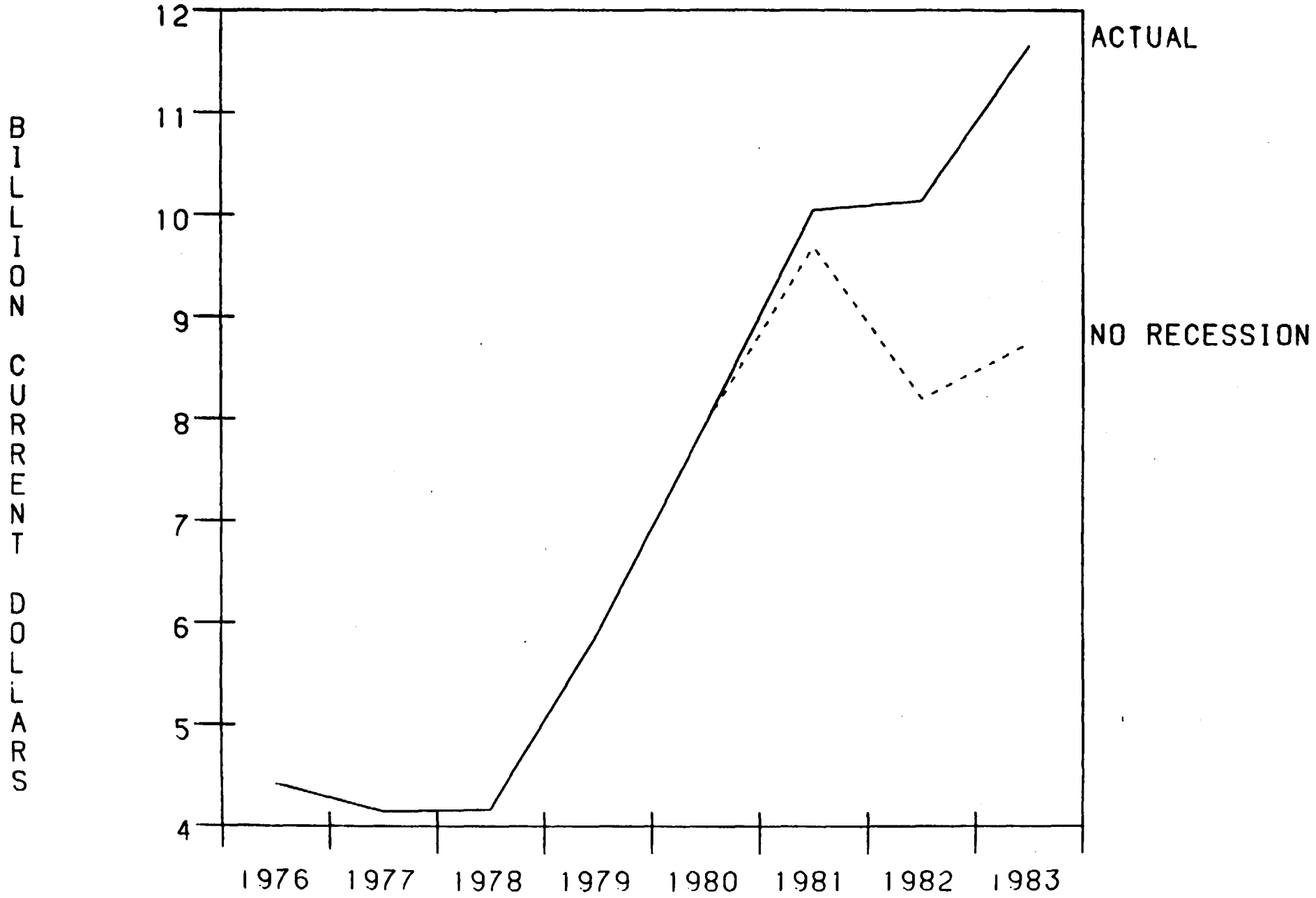
In summary, the simulation shows that under a possible "No Recession" scenario the food stamp caseload could have been 4.3 million recipients lower than, in fact, it was in the first quarter of 1983--a reduction of over 19 percent. According to this same simulation, average benefits per recipient in the first quarter of 1983 could have been about $.68 lower--a reduction of about 5 percent. Together the reduction in recipiency combined with the reduction in average benefits could have led to a reduction (in 1967 dollars) in the total real cost of the program of about $900 million--a reduction of 24 percent.

Chart 26

PRIMARY MODEL

TOTAL ANNUAL FOODSTAMP COST IN U.S. (CURR$)

ACTUAL VS. NORECESSION SCENARIO



CHAPTER IV. CONCLUSIONS

The purpose of this project was to disentangle the impacts of the 1981-82 recession from the impact of the changes made in the food stamp program during the early 1980's. The project began with a descriptive analysis which contrasted the 1974-75 and 1981-82 recessions and tentatively explored some possible hypotheses to explain why the food stamp caseload appeared to respond differently to the two recessions. This was followed by the construction of a two-equation model of the food stamp program to analyze the relationship between the caseload and average benefits of the food stamp program to changes in the macroeconomy and administrative changes in the food stamp program. The project concluded with the construction of a "No Recession" scenario which permits estimation of what would have happened to the caseload and average benefits of the food stamp program if the 1981-82 recession had not taken place.

The conclusions of the project are as follows.

1. Major changes were implemented in the food stamp program as the result of the OBRA81 legislation. They included changes in eligibility standards and changes in benefits. Most of these changes could have been expected either to reduce the food stamp caseload, reduce average benefits, or both. However, these changes were implemented just as the U. S. economy was moving into one of the two most severe recessions since World War II. Instead of falling, the food stamp caseload rose from 20.7 million recipients in the first quarter of 1981 to 22.2 million recipients by the first quarter of 1983. Average benefits

rose from $42.02 to $43.02 over the same period (although real average benefits fell).

The most important conclusion of this study is that the OBRA81 changes reduced food stamp recipiency by about 500,000 recipients compared with what the caseload would have been in the absence of the changes. However, the cyclical sensitivity of the food stamp program resulted in a large increase in the caseload and costs of the program that masked the effect of the OBRA changes. Under a possible scenario in which the recession was assumed not to take place, food stamp recipiency would have been 4.3 million persons lower than what actually happened, and total food stamp costs would have been $2.6 billion lower (in current dollars) in the first quarter of 1983.

2. There is strong support for the hypothesis that the food stamp program is highly sensitive to key features of the economy--especially the unemployment rate and the poverty rate. Regression analysis of the food stamp caseload indicated that a one percentage point increase in the unemployment rate in each of the nine divisions of the U. S. would lead to an increase of about 375,000 food stamps recipients. Moreover, an increase of one percentage point in the fraction of the unemployed experiencing unemployment for more than 52 weeks would lead to an increase of about 82,000 recipients. Each increase of ten persons in the number of people in poverty is estimated to increase the food stamp caseload by five persons.

3. There is a strong correlation between the food stamp and AFDC caseloads. Regression analysis indicates that an increase in the AFDC caseload

of 10 persons would lead to an increase in the food stamp caseload of nearly 17 persons.

4. During the 1974-75 recession, the caseload of the food stamp program grew by 34 percent. In contrast, during the 1981-82 recession, the caseload first dropped by about 4 percent and increased to a level of 6 percent higher than at the beginning of the recession. The strong cyclical nature of the food stamp caseload implies a tendency for the food stamp caseload to rise sharply in both recessions. The relative strength of the increase in the earlier recession compared with the recent recession is a least partially explainable by the difference in the program environment of both food stamps and AFDC during the two periods. In July 1974 the food stamp program was expanded into a nationwide program. Thus, part of the increase in food stamp recipiency during the period 1974-76 can be attributed to changes in the program rather than to the 1974-75 recession. Moreover, the AFDC caseload rose by about 10 percent during the 1974-75 recession. In contrast, in the 1981-82 recession, the eligibility rules of the food stamp program were made stricter with one important change being the introduction of a gross income eligibility limit of 130 percent of the poverty line for families without an elderly or disabled member. As noted above, regression analysis indicates that the OBRA81 changes reduced the food stamp caseload by about 500,000 persons compared to what the caseload would have been in the absence of rule changes. Thus, in the 1981-82 recession, changes in the program environment held down the increase in food stamp recipiency.

5. The primary model estimated in this project yields predictions which, when tested over history, closely approximate what actually happened. However, there was evidence that parameter estimates are sensitive to the number of observations included in the regression. This suggests that the model should be re-estimated as additional historic data become available. This is especially important in the near future since the number of observations on the program after the OBRA changes is quite limited.

6. For purposes of forecasting the future caseload and costs of the food stamp program, there is some evidence that time-series models estimated with regional data may produce more accurate regional forecasts and that a time series model estimated with national data may produce more accurate national estimates. However, for analysis of the impact of alternative economic scenarios on the food stamp program, the primary model (which is for the most part estimated by pooled cross-section time series techniques) is probably the best choice.

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