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ABSTRACT

A study detailed further a model linking monetary and fiscal policy to industrial employment in metropolitan and nonmetropolitan areas of four United States regions. The model was used to simulate the impacts on area and regional employment of three events in the economy: changing real gross national product (GNP) via monetary policy, holding the real compensation index across industries constant; changing the real compensation index in one industry, holding GNP and real compensation in the other three industries constant; and comparing the employment implications of varying levels of GNP growth. The simulations suggested that changes in monetary and fiscal policy have significantly different effects in different parts of the country. The magnitude of the employment impact on nonmetropolitan areas depended on assumptions about industrial composition and worker compensation. (Four data tables are appended.) (YLB)

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A Simple Forecasting Model Linking Macroeconomic Policy to Industrial Employment Demand

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A SIMPLE FORECASTING MODEL LINKING MACROECONOMIC POLICY TO INDUSTRIAL EMPLOYMENT DEMAND. James R. Malley and Thomas F. Hady. Agriculture and Rural Economy Division, Economic Research Service, U.S. Department of Agriculture. Staff Report No. AGES880204.

ABSTRACT

Simulation through a model linking monetary and fiscal policy to industrial employment in metro and nonmetro areas of four U.S. regions suggests that changes in monetary and fiscal policy have significantly different effects in different parts of the country. The magnitude of the employment impact on nonmetro areas depends on assumptions about industrial composition and worker compensation.

KEYWORDS: Employment, Industry, Macroeconomic, Metro, Nonmetro, Regions

PREFACE

During the early part of 1987, the Economic Research Service developed a report for the Senate Appropriations Committee on "alternatives for maintaining and strengthening economic development in rural communities. . . ." As part of that effort, the authors examined the impact of changes in macroeconomic policy on employment change in metro and nonmetro areas by region and industry. This report provides the technical documentation for the results reported in the Senate report. It also provides information on two extensions of the research.

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INTRODUCTION

The relationship between the health of the general economy and that of the regional metro and nonmetro economies has been important for many years. William Jennings Bryan's "Cross of Gold" speech in 1896, for example, reflected the desire of farmers and others to expand the money supply as a way to raise prices of their products. Events in the middle of this century have made relationships between the regional nonmetro and national economies more complicated and, at the same time, closer. For example, although farming used to dominate nonmetro America, a recent study found that more nonmetro counties were predominantly manufacturing than agricultural (1).[1] Deregulation of financial markets has opened many new options for rural savings and removed many old barriers, which, it was argued, partly insulated nonmetro financial markets from Wall Street. Flexible exchange rates and the growth of other countries' economies have opened the U.S. economy to world competition and have particularly affected agriculture and manufacturing. Many studies have looked at the factors affecting the movement of industry among regions or its location in metro/nonmetro areas. Few, however, have studied the relationship between the national economy and the regional metro/nonmetro economies. This study concentrates on that relationship. In an earlier report (5), the authors analyzed the connections between changes in economic activity, as measured by U.S. gross national product (GNP), and employment in U.S. metro/nonmetro areas and four U.S. regions. This report (1) further details the model and its estimation used in that report, (2) extends the study by relaxing the assumption that industrial composition did not change among regions and by addressing the effects of changes in worker compensation on employment demand, and (3) examines the importance of varying rates of GNP growth on demand for employment.

MODEL STRUCTURE

The project's short deadline required the development of an extremely simple model in both theoretical formulation and empirical implementation. More specifically, the model was constructed to meet the following design criteria:

- Rapid construction required that the model be parsimonious in number of variables and equations. The model structure is

[1] Underscored numbers in parentheses refer to sources cited in the References section.

recursive, and the equations are estimated with ordinary least squares (OLS).

- o **Simplicity** in use required that the model be easy to simulate by other Economic Research Service (ERS) analysts. LOTUS was chosen for the simulation exercise due to its convenient table and graphics-reporting capabilities and its widespread use in ERS.

- o **Flexibility** required that the model be usable with a wide range of macroeconomic models and/or macroeconomic forecasts. The macroeconomic drivers are real GNP and real industrial compensation per job.

From an economic perspective, industrial employment is the most important dimension of the industry-by-region-by-area breakdown. Economic theory suggests that industry employment responds to changes in macroeconomic forces and not regional or area employment per se. In this analysis, areas and regions are uniquely composed of a number of different industries. The four industries [i=1..4] include manufacturing and construction, services, government, and primary goods. The four regions [j=1..4] include the Northeast, Midwest, South, and West. The two areas [k=1,2] are metro and nonmetro.[2] Each of these separate dimensions individually sum to total U.S. employment (Yus):

$$Yus = \sum_{i=1}^{4} [Y(i)], \quad Yus = \sum_{j=1}^{4} [Y(j)], \quad Yus = \sum_{k=1}^{2} [Y(k)].$$

Employment (Y(jk)) for any region [j=1..4] and area [k=1,2] is determined in the model by:

$$Y(jk) = \sum_{i=1}^{4} [(Y(ijk)/Y(i)) * Y(i)] \qquad [1]$$

The first term in the summation (Y(ijk)/Y(i)) represents the share of total industry employment in a given region and area. In the empirical model, this share is determined by a distributed lag of real GNP and a nonlinear time trend. The GNP lags are intended to capture the shares' responses to cyclical changes in the national economy. The time trend attempts to proxy changes in regional and area demographics, such as labor force participation, population changes, and labor force quality.

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[2] Refer to Appendix 1 for sources, definitions, and construction of the employment, GNP, and compensation data. Although employment and jobs are not technically the same measures, they will be used interchangeably throughout this report. The jobs series refers to a job count in which multiple job holders are counted more than once, whereas the employment series counts multiple job holders only one time.

The second term in the summation (Y(i)) refers to total industry employment. In the model, (Y(i)) is determined by a GNP term acting as the demand curve shifter for industrial employment and a real compensation per job term measuring the price of labor relative to the price of output.[3] The estimated coefficients in the industrial employment demand equations embody the following information: price and income elasticities of demand for industrial output, ease of factor substitutability, the price and income elasticities of supply of other factors of production, and the proportion of labor costs to other costs of production.

INDUSTRIAL SHARES

In this model, the factors determining employment in any region and area are the mix of industry, the price and income elasticities of industrial employment demand, and the trend and cyclical behavior of the employment shares. The mix of industries varies a good deal among regions and areas (fig. 1). For example, primary employment was relatively more important and services less important in nonmetro areas than in metro areas. In both metro and nonmetro areas, however, services employment was proportionately the most important in 1984, followed by manufacturing and construction, government, and primary goods employment.

In addition, industrial employment shares have been changing slowly. Services are growing and manufacturing and construction are shrinking in relative employment. These changes have been more pronounced in metro areas, however, and their importance has varied across the country. In our earlier analysis, we used the relative stability of employment shares to simplify the analysis and assumed that industrial shares were constant at their 1984 level. In this paper, we relax that assumption and take account of their long-term trend.[4]

The estimated longrun price and income elasticities (the percentage change in employment from a 1-percent change in GNP or real compensation per employee) of industrial employment demand show significant variation (table 1). Over the 1969-84 period, manufacturing and construction and services employment were relatively the most responsive to changes in GNP and primary goods the least responsive. Government employment, on the other hand, was relatively the most elastic with respect to changes in real compensation per employee.

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[3] Refer to Appendices 2 and 3 for the explicit functional forms and estimation results of the shares and industrial employment equations, respectively.

[4] The industry-by-region-by-area shares of total industry employment varied little from year to year over the period 1969-84. However, within small variance bands, the shares did move slowly on trend over longer periods of time. Refer to Appendix 2 for a description of the method of forecasting the shares during 1985-94.

Figure 1--Industrial shares by area and region, 1984

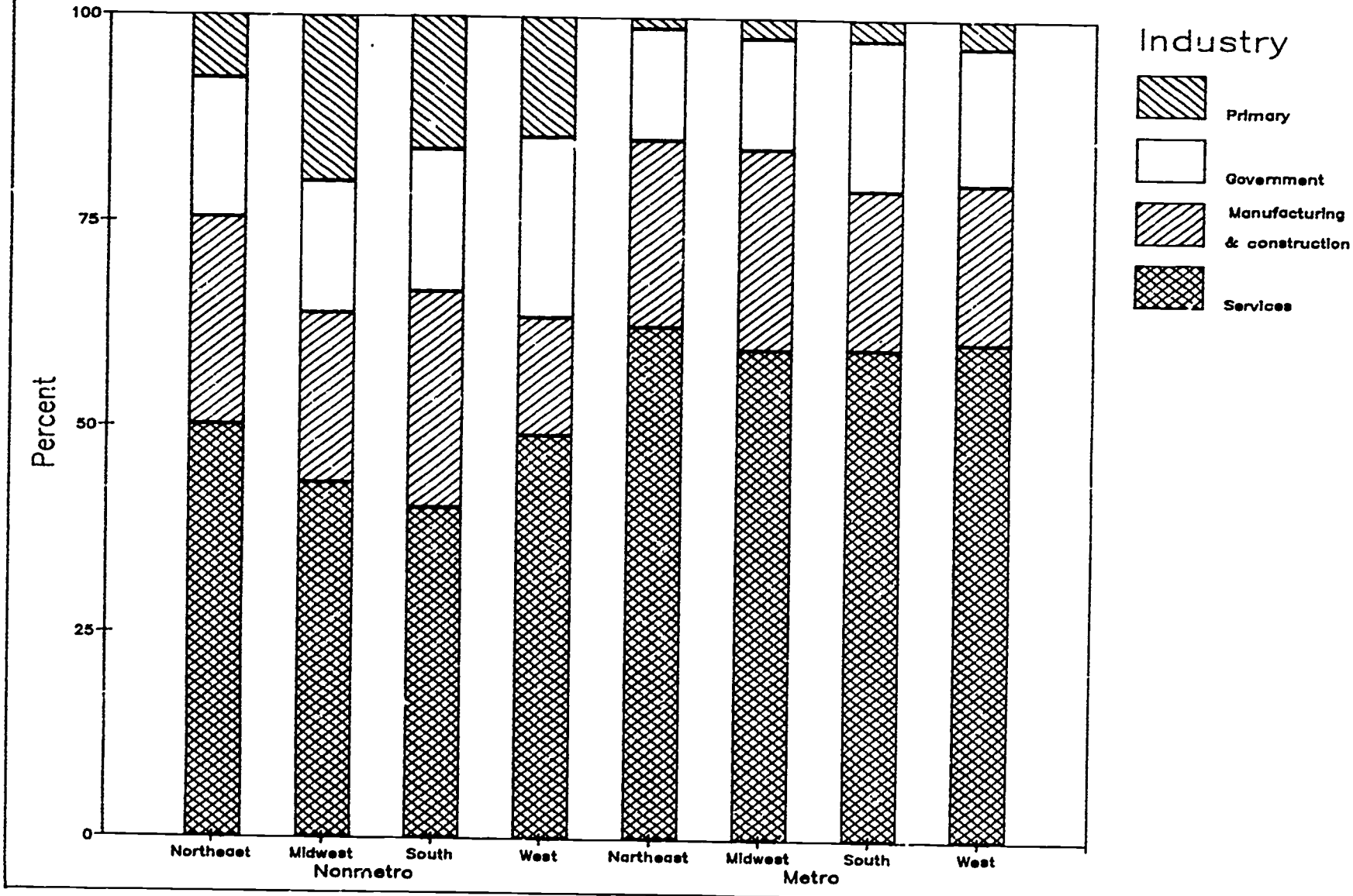

Table 1--Longrun employment elasticities by industrial sector

Industrial Sector	Elasticity	
	Income (GNP)	Compensation
Manufacturing and construction	1.72	-0.47
Services	1.27	-.52
Government	.47	-1.04
Primary goods	.24	-.12

SIMULATION RESULTS

The model can be used to simulate the impacts on area and regional employment of a variety of events in the economy. Three were simulated in this analysis:

- o Changing real GNP via monetary policy, holding the real compensation index across industries constant.
- o Changing the real compensation index in one industry, holding GNP and real compensation in the other three industries constant.
- o Comparing the employment implications of varying levels of GNP growth. We specifically compared the Congressional Budget Office (CBO) and the Council of Economic Advisors (CEA) GNP forecasts through 1992, holding the compensation index constant.

Monetary Policy Changes

The monetary policy simulation was run with the aid of an ERS macroeconomic model and results from the U.S. portion of the Federal Reserve Board's (Fed) Multi-Country Model (MCM) (3). The ERS model was used to forecast baseline real total government purchases of goods and services, the 3-month Treasury bill rate, inflation (percentage change in the implicit GNP deflator), and real GNP. Reduced-form GNP elasticities from the MCM were then combined with the ERS baseline in order to derive forecasted GNP paths given changes in monetary policy.[5]

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[5] In (3), the Fed provides the MCM's reduced-form elasticities for real GNP, the inflation rate, the short-term interest rate, the exchange rate, and the current account balance. The reduced-form elasticities are represented as either absolute or percentage deviations from their baseline values resulting from a change in macroeconomic policy. For example, the shocked value of GNP (GNPs) as a result of a change in monetary policy can be derived as:

$$GNPs=(Ej*Sj + \sum_{k=1}^{m} \sum_{i=0}^{n} [(Ej-k*Sj-i - Ej-k*Sj-(i+1)]/100+1)*GNPb$$

where, j = the number of periods of the simulation, m=j-1 and n=j-2. GNPb is baseline levels of real GNP, and E is the reduced-form elasticity of GNP with respect to the policy shock S.

The specific shock applied in the simulation is a sustained 100-basis-point increase in the 3-month Treasury bill rate for 1987-94.[6] This shock can best be characterized as providing the first round of industry-by-region-by-area employment effects of a change in aggregate demand, holding industrial real compensation and labor supply constant (tables 2 and 3). The shock is referred to as the first round since there is no mechanism by which changes in labor income feed back into the model.

In tables 2 and 3, column 2 refers to the average percentage difference of the shocked level from its baseline level, calculated over the entire simulation period (1987-94). These results can be interpreted as average employment elasticities resulting from a sustained 100-basis-point decrease in the 3-month Treasury bill rate.

For example, an average 100-basis-point drop in the short-term interest rate through 1994 leads to an average exponential GNP growth rate of 3 percent, which in turn leads to an average 2-percent increase in manufacturing and construction employment over baseline

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[6] Refer to Appendix 4 for the detailed forecast tables highlighting the region-by-area employment implications of the change in monetary policy. Appendix 4 also contains a detailed description of the methods by which the descriptive statistics in the forecast tables and the summary tables in the text are calculated.

Table 2--Industry employment changes: Monetary shock

Industry	Average difference from baseline	Average exponential growth rate	Additional jobs
	--------Percent------		Thousands
Manufacturing and construction	2.03	2.44	563.77
Services	1.31	3.84	1,517.85
Government	.46	1.40	117.22
Primary goods	.25	.72	18.99
Total United States	1.29	3.06	2,218.91

employment.[7] Column 3 refers to the average exponential growth rate of a particular variable over the shocked forecast horizon. For example, on average, services employment grew the fastest at 3.8 percent and primary goods the slowest at 0.7 percent. Column 4 refers to the additional jobs that have been created over the forecast period versus those that would have been created over the baseline forecast. For example, services have gained approximately 1.5 million jobs and primary goods approximately 19,000 jobs.

The main results to emerge from the monetary simulation are:

- o Metro areas are consistently more affected in both average elasticity and average growth rate terms than their nonmetro regional counterparts by changes in macroeconomic policy.

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[7] The bridge between changes in monetary policy and GNP is provided by the reduced-form elasticity results from the MCM. In the MCM, monetary policy works through the main channels of the effects of interest rates on consumption, investment, and the interest rate. Real long-term interest rates affect consumption and the cost of capital, which in turn, affect investment in producers' structures, durable equipment, and residential investment. Relative differences in nominal short-term interest rates between the United States and its major trading partners affect the exchange rate. The results of the sustained decrease in interest rates are higher income and prices and a decrease in the value of the dollar during the simulation. The trade balance also improves throughout the simulation period (1987-94) as a result of the lower valued dollar. GNP is 0.5 percent difference from a base of 1.5 percent by 1991.

Table 3--Area and region employment changes: Monetary shock

Industry	Average difference from baseline	Average exponential growth rate	Additional jobs
	--------Percent------		Thousands
Nonmetro Northeast	0.99	2.07	27.14
Metro Northeast	1.10	2.46	341.88
Nonmetro Midwest	.68	1.22	47.04
Metro Midwest	.85	1.67	167.71
Nonmetro South	1.13	2.35	151.65
Metro South	1.54	3.93	758.09
Nonmetro West	1.21	3.26	65.14
Metro West	1.79	4.62	660.26
Nonmetro United States	.99	2.12	290.96
Metro United States	1.36	3.28	1,927.94

- o Relative to the U.S. average, all of the nonmetro areas exhibit lower average employment elasticities and average growth rates.

- o Relative to the U.S. average, the metro West and South exhibited larger average elasticities and average growth rates.

Real Compensation Changes

Since industries differ in the proportions of various types and skill levels of workers they employ, changes in a variety of laws can affect relative compensation levels in the industries. For example, to the extent wages are lower in the service industries than in manufacturing, raising the minimum wage may affect average compensation levels differently in the two industries. Changes in immigration laws might have similar effects. The second simulation illustrates the potential impacts of such changes by showing the effects of changes in a particular industry's real compensation index, holding real compensation in the other three industries and GNP constant. As in the prior simulation, this is a first-pass, employment-generating scenario. The demand for labor is assumed to be held constant across all industries; the supply of labor is perfectly elastic; changes in labor income do not feed back into the model; and changes in real compensation in one industry do not affect compensation and the demand for labor in the other industries. In turn, the specific shock to each industry consists of a once-and-for-all increase in the real compensation index throughout the simulation period. The area-by-region employment impacts vary (tables 4-7).

The main results to emerge from the industry compensation shocks follow:

- o In response to the manufacturing and construction shock, the nonmetro Northeast and South were the only nonmetro areas to exhibit larger derived employment elasticities than their regional metro counterparts.

Table 4--Employment impacts of a 1-percent increase in the manufacturing and construction compensation index

Industry	Average difference from baseline	Average exponential growth rate	Additional jobs
	--------Percent------		Thousands
Nonmetro Northeast	-0.11	2.00	-3.06
Metro Northeast	-.09	2.35	-27.37
Nonmetro Midwest	-.08	1.19	-7.34
Metro Midwest	-.09	1.63	-22.28
Nonmetro South	-.11	2.24	-14.90
Metro South	-.08	3.76	-35.24
Nonmetro West	-.06	3.12	-2.55
Metro West	-.08	4.41	-28.59

Table 5--Employment impacts of a 1-percent increase in the services compensation index

Industry	Average difference from baseline	Average exponential growth rate	Additional jobs
	--------Percent------		Thousands
Nonmetro Northeast	-0.23	1.98	-7.93
Metro Northeast	-.29	2.33	-102.21
Nonmetro Midwest	-.21	1.17	-22.04
Metro Midwest	-.29	1.61	-89.21
Nonmetro South	-.19	2.23	-29.83
Metro South	-.28	3.73	-146.88
Nonmetro West	-.25	3.10	-14.36
Metro West	-.29	4.39	-112.19

Table 6--Employment impacts of a 1-percent increase in the government compensation index

Industry	Average difference from baseline	Average exponential growth rate	Additional jobs
	--------Percent------		Thousands
Nonmetro Northeast	-0.13	1.99	-4.20
Metro Northeast	-.10	2.35	-33.17
Nonmetro Midwest	-.13	1.18	-13.18
Metro Midwest	-.11	1.62	-32.84
Nonmetro South	-.15	2.23	-23.00
Metro South	-.14	3.75	-67.94
Nonmetro West	-.18	3.11	-9.46
Metro West	-.12	4.41	-42.42

- o In response to the services shock, all metro areas exhibited larger derived employment elasticities than their regional metro counterparts.

- o In response to the government and primary shocks, all nonmetro areas exhibited larger derived employment elasticities than their regional metro counterparts.

- o The shock to services compensation caused the greatest change in overall U.S. employment relative to base (approximately 525,000 fewer jobs through 1994). The shock to primary goods compensation caused the least change (approximately 8,000 fewer jobs through 1994).

Differing Rates of GNP Growth

The third simulation demonstrates the industry-by-region-by-area employment implications of alternative macroeconomic baseline forecasts of the general economy from 1987-92 (tables 8 and 9).[8]

To investigate these effects, we used projections of GNP growth prepared by the CEA and by CBO. The CEA projection is an average exponential growth rate of 2.88 percent over the 1987-92 period; CBO forecasts 2.34 percent.

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[8] Refer to Appendix 5 for the detailed forecast tables highlighting the region-by-area employment implications of the CEA and CBO macroeconomic baseline forecasts. Appendix 5 also contains a detailed description of the methods by which the descriptive statistics in the forecast tables and the summary tables in the text are calculated.

Table 7--Employment impacts of a 1-percent increase in the primary compensation index

Industry	Average difference from baseline	Average exponential growth rate	Additional jobs
	---------Percent------		Thousands
Nonmetro Northeast	-0.010	2.00	-0.26
Metro Northeast	-.001	2.35	-.37
Nonmetro Midwest	-.020	1.19	-2.05
Metro Midwest	-.003	1.63	-.68
Nonmetro South	-.020	2.24	-2.20
Metro South	-.002	3.76	-.97
Nonmetro West	-.010	3.12	-.63
Metro West	-.003	4.41	-.90

The interesting aspect of these results is that small differences in GNP growth can generate nontrivial employment differences at both the aggregate and region by area levels. At the U.S. level, this small difference in GNP growth rates led to approximately 5.5 million extra jobs under CEA versus CBO assumptions. Nonmetropolitan areas would gain 817,000 more jobs if the higher growth rate held for 5 years.

Table 8--Industry employment under differing GNP growth rates

Industry	Average growth rate		Additional jobs under CEA projection
	CBO projection	CEA projection	
	--------Percent------		Thousands
Manufacturing and construction	1.46	2.39	1,860.47
Services	3.05	3.61	3,297.40
Government	1.12	1.32	271.30
Primary goods	.56	.67	42.18
Total	2.32	2.69	5,473.43

Table 9--Area and regional employment under differing growth rates

Industry	Average growth rate		Additional jobs under CEA projection
	CBO projection	CEA projection	
	--------Percent------		Thousands
Nonmetro Northeast	1.55	1.99	78.84
Metro Northeast	1.84	2.32	877.73
Nonmetro Midwest	.90	1.22	186.50
Metro Midwest	1.25	1.66	677.76
Nonmetro South	1.72	2.22	404.27
Metro South	3.03	3.69	1,668.65
Nonmetro West	2.54	3.06	147.03
Metro West	3.59	4.35	1,432.63
Total Nonmetro	1.57	2.01	816.65
Total Metro	2.50	3.09	4,656 78

CONCLUSIONS AND POLICY IMPLICATIONS

A number of conclusions emerge from this analysis. The most obvious is that nonmetropolitan areas have a significant stake in national economic policy. An event like a change in the Federal deficit or changes in monetary policy is important to rural people: it affects their pocketbooks. It may easily affect their pocketbooks more than the targeted economic development programs that are commonly discussed under the heading of "rural development."

The findings also suggest that policymakers should carefully distinguish between structural employment problems in metro and nonmetro areas and cyclical problems reflecting the state of the general economy. If particular regions and areas are experiencing poor employment performance due to a general business downturn, a massive job retraining program to alleviate structural unemployment would not be efficient. On the other hand, the results do suggest that the impacts of macroeconomic policy fall unevenly on specific geographic areas and economic sectors due to differing industrial structures. Under these circumstances, policymakers may want to consider special tax and subsidy arrangements to alleviate the inequity. Extended unemployment compensation, financed from increased taxes, might be an example. Conversely, rapid employment growth in certain regions and areas may not be cause for jubilation; the growth may simply reflect general economic trends and may likely reverse itself with the next period of monetary and fiscal tightness or changes in the Federal minimum wage policy.

It is apparent from the results that discussions of the appropriate mix of fiscal and monetary policies should include consideration of the regional and area impacts. National fiscal and monetary policies and wage policy are not the appropriate tools to use for regional development policy. However, decisions on both national economic policy and regional or rural/urban economic policy ought to be made with knowledge of their interaction effects. While the results of this paper demonstrate the usefulness of modeling the connections between the macroeconomy and the regions and areas, these linkages must be expanded and refined before they can provide reliable guidelines for policy. Nonetheless, the results clearly demonstrate that regional and rural/urban problems must be analyzed in the context of the national economy.

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APPENDIX 1--DESCRIPTION OF VARIABLES

Following is a detailed explanation of the data used in the above analysis. The description contains information on sources, definitions, and methods of data series construction.

Dependent Variables

Total Employment--The employment figures are from the Regional Economic Information System (REIS), maintained by the Bureau of Economic Analysis (BEA), U.S. Department of Commerce. The wage and salary employment data in REIS are based on the establishments or payroll survey conducted by the Bureau of Labor Statistics (BLS), U.S. Department of Labor. The employment data include both full-time and part-time workers and resident military personnel. The nonfarm proprietors employment data in REIS are from the Internal Revenue Service. The farm and farm proprietor employment data is from USDA.

The BLS establishments' survey data are collected from a sample of business payroll records in cooperation with State agencies. The survey counts people who worked in a business establishment each time their names appear on a payroll. Military personnel are counted in their military capacity and each time their names appear on private payrolls. Inmates of correctional and mental institutions are counted if they are on either institutional or private payrolls. Unpaid workers on leave of absence are counted if their names are on a payroll. Nonfarm/farm self-employed and farm labor are not counted.

Do not confuse the employment data in the payroll survey inclusive of farm and nonfarm proprietors with the employment data from the household survey. The figures from the household survey are the ones most often cited since they pertain to an employment count not a job count. The familiar unemployment rate is based on the household survey numbers. Also note that the job count from the payroll data is higher than the employment count from the household survey. In 1984, for example, the total "employed" number from REIS, including farm and nonfarm proprietors, was approximately 11.5 million jobs higher than the comparable employment number from the household survey. This large difference is mainly due to methodological differences in coverage between the payroll and establishment surveys. In the household survey, there is no multiple counting of private or military employees with more than one job and inmates of correctional and mental institutions are excluded. In addition, the age of coverage in the household survey begins at 16 and unpaid workers are counted only if they worked more than 15 hours per week in the family business.

Industrial Employment--The four industry categories and their Standard Industrial Classifications (SIC) include manufacturing (SIC 20-39) and construction (SIC 15-17); government (SIC 91-99); services (SIC 40-50, 52-67, 70-89, and other services); and primary goods (farm workers, farm proprietors, and SIC 07-14). The years 1969-74 are based on the 1967 SIC and 1975-84 on the 1972 SIC.

Regional Employment--The four regions include the Northeast, Midwest, South, and West. Regional delineations follow standard Census practice. The Northeast includes ME, NH, VT, MA, RI, CT, NY, NJ, and PA. The Midwest includes OH, IN, IL, MI, WI, MN, IA, MO, ND, SD, NE, and KS. The South includes DE, MD, DC, VA, WV, NC, SC, GA, FL, KY, TN, AL, MS, AR, LA, OK, and TX. The West includes MT, ID, WY, CO, NM, AZ, UT, NV, WA, OR, CA, AK, and HI.

Area Employment--The area delineations are metro and nonmetro. Technically, "rural" and "nonmetro" have different meanings. Throughout this paper, however, they are used interchangeably to refer to counties that are outside metropolitan statistical areas, using the 1983 delineation. County-level data from each of the four industries are summed to provide annual totals for metro and nonmetro areas in each region for 1969-84. Except that for agriculture, however, the county-level data do not include sole proprietors. To maintain comparability with the national-level data used to estimate the relationships between GNP and industry employment, the number of sole proprietors of nonagricultural business each year in each industrial group is allocated to areas (metro/nonmetro) and regions according to sole proprietors' share of national wage and salary employment in the industry.

Independent Variables

Gross National Product (GNP)--Real GNP is used as a proxy for industrial product demand. The GNP figures are in billions of 1982 dollars and are from the National Income and Product Accounts (NIPA), table-1.2, BEA.

Real Compensation Bill Per Job--A real compensation bill per job for each industry was constructed by dividing compensation per employee in each industry by the price of output for that industry. Compensation includes wage and salary income, employers' contribution for social insurance, other labor income, and farm and nonfarm proprietors' income.

The industrial employment compensation figures are in millions of current dollars and are from NIPA. The NIPA tables include, table-6.4B, compensation of employees by industry; table-6.14B, nonfarm proprietors income by industry and table 1.15 national income by sector-legal form of organization and type of income (line 17, farm proprietors' income). The implicit deflators of GNP by industry are derived from NIPA table-6.1,current dollar GNP by industry, and table-6.2, constant 1982 dollars GNP by industry.

APPENDIX 2--ESTIMATION RESULTS: SHARES EQUATIONS

The form of the estimated shares equations is:

$$[Y\{ijk\}/Y\{i\}](t) = a\{ijk\} + b\{ijk\}*1/T + c\{ijk\}*1/T\hat{}2 + d\{ijk\}*\ln[L\hat{}r]GNP(t) + u(t) \quad [2]$$

[Y{ijk}/Y{i}](t) is employment in industry i, {i=1..4}; region j, {j=1..4}; area k, {k=1,2}, as a share of total U.S. employment Y{i} in industry i in time period (t). Industries 1-4 refer to manufacturing and construction, services, government, and primary goods, respectively. Regions 1-4 refer to Northeast, Midwest, South, and West, respectively. Areas 1 and 2 refer to nonmetro and metro, respectively.

L is the lag operator, and r is the order of the lag polynomial for example, for any variable X,[L^r]X(t)=X(t-r). In this specification, the order of the lag polynomial begins at 1.

ln is the natural logarithm.

^ is the power operator.

* is the multiplication operator.

a{ijk} through **d{ijk}** are the estimated coefficients for each share equation in industry i, region j, and area k.

The terms **1/T** and **1/T^2** represent a nonlinear inverse quadratic time trend, where T is a simple linear time trend and is I in 1960.

GNP(t) is real gross national product in 1982 dollars.

u(t) is the error term, assumed to be a random variable with a zero mean and constant variance.

In appendix table 1, S.E. refers to the standard error, Rbar^2 to the adjusted coefficient of determination, and r to the order of the lag polynomial on lnGNP.

The industry-by-region-by-area shares equations for any one industry [i=1..4] are specified in order to preserve the equality:

$$\sum_{j=1}^{4}\sum_{k=1}^{2} Y\{ijk\} = 1$$

This summing property is maintained by OLS estimation if the same Right-Hand-Side (R.H.S.) arguments are included in the regression. After experimenting with alternative specifications using lags of GNP and various time trends, we found that equation [2] was a "good" specification for all four industries. Besides aiming to minimize the sum of squared residuals in each of the shares equations, the "goodness" of specification was also judged in a forecasting context over the period 1985-94. Two properties were explicitly incorporated

in the forecasted shares by altering the equation specification. These were that the forecasted shares should follow their longrun trend growth and that the difference between peak and trough in the level of the forecasted shares should not exceed historical peak differences.

Appendix table 1--Share equation results
(Key at the end of table)

Item	a(ijk)	b(ijk)	c(ijk)	d(1)(ijk)	d(2)(ijk)
Y(1,1,1), r=2	0.058	-0.003	-0.001	0.003	-0.002
S.E. of Coeff.	.011	.003	.002	.002	.002
S.E. of Eq.	.0002				
Rbar^2	.92				
Y(1,1,2), r=2	.426	-.078	.050	.155	-.106
S.E. of Coeff.	.148	.037	.032	028	.022
S.E. of Eq.	.003				
Rbar^2	.97				
Y(1,2,1), r=2	.341	.006	-.040	-.048	.031
S.E. of Coeff.	.070	.017	.015	.013	.010
S.E. of Eq.	.001				
Rbar^2	.60				
Y(1,2,2), r=2	1.581	.002	-.171	-.059	.042
S.E. of Coeff.	.260	.064	.057	.049	.041
S.E. of Eq.	.005				
Rbar^2	.89				
Y(1,3,1), r=2	.113	-.010	.009	-.052	.032
S.E. of Coeff.	.059	.014	.013	.011	.009
S.E. of Eq.	.001				
Rbar^2	.95				
Y(1,3,2), r=2	-.486	.007	.081	-.005	-.0009
S.E. of Coeff.	.163	.040	.036	.030	.0248
S.E. of Eq.	.003				
Rbar^2	.92				
Y(1,4,1), r=2	.062	-.007	.002	-.025	.017
S.E. of Coeff.	.029	.007	.006	.005	.004
S.E. of Eq.	.0006				
Rbar^2	.89				
Y(1,4,2), r=2	-1.093	.085	.690	.031	-.013
S.E. of Coeff.	.108	.027	.024	.020	.161
S.E. of Eq.	.002				
Rbar^2	.98				

Continued--

Appendix table 1--Share equation results--Continued

Item	a(ijk)	b(ijk)	c(ijk)	d(1)(ijk)	d(2)(ijk)
Y(2,1,1), r=2	0.069	-0.005	-0.001	-0.005	0.003
S.E. of Coeff.	.003	.0007	.0006	.0005	.0004
S.E. of Eq.	6.19D-05				
Rbar^2	.97				
Y(2,1,2), r=2	.574	-.056	.011	.083	-.059
S.E. of Coeff.	.128	.032	.028	.024	.019
S.E. of Eq.	.003				
Rbar^2	.95				
Y(2,2,1), r=2	.284	-.013	-.016	-.024	.016
S.E. of Coeff.	.062	.015	.014	.012	.009
S.E. of Eq.	.001				
Rbar^2	.57				
Y(2,2,2), r=2	.821	-.011	-.067	-.027	.018
S.E. of Coeff.	.135	.033	.030	.025	.020
S.E. of Eq.	.003				
Rbar^2	.85				
Y(2,3,1), r=2	.180	-.010	-.005	-.010	.006
S.E. of Coeff.	.019	.005	.004	.004	.003
S.E. of Eq.	.0004				
Rbar^2	.83				
Y(2,3,2), r=2	-.332	.025	.048	-.108	.007
S.E. of Coeff.	.141	.035	.031	.026	.021
S.E. of Eq.	.003				
Rbar^2	.91				
Y(2,4,1), r=2	-.015	.003	.002	-.013	.010
S.E. of Coeff.	.027	.007	.006	.005	.004
S.E. of Eq.	.0006				
Rbar^2	.89				
Y(2,4,2), r=2	-.586	.067	.028	.008	-.002
S.E. of Coeff.	.083	.020	.018	.015	.012
S.E. of Eq.	.002				
Rbar^2	.97				
Y(3,1,1), r=2	.064	-.002	-.003	.005	-.004
S.E. of Coeff.	.013	.003	.003	.002	.002
S.E. of Eq.	.0003				
Rbar^2	.92				

Continued--

Appendix table 1--Share equation results--Continued

Item	a(ijk)	b(ijk)	c(ijk)	d(1)(ijk)	d(2)(ijk)
Y(3,1,2), r=2	0.655	-0.011	-0.049	0.019	-0.022
S.E. of Coeff.	.114	.028	.025	.021	.017
S.E. of Eq.	.002				
Rbar^2	.91				
Y(3,2,1), r=2	.207	-.018	.0002	.006	-.005
S.E. of Coeff.	.028	.007	.006	.005	.004
S.E. of Eq.	.0006				
Rbar^2	.94				
Y(3,2,2), r=2	.427	-.019	-.023	-.008	.0003
S.E. of Coeff.	.071	.017	.015	.013	.0105
S.E. of Eq.	.001				
Rbar^2	.77				
Y(3,3,1), r=2	-.093	.014	.009	-.002	.002
S.E. of Coeff.	.029	.007	.006	.005	.004
S.E. of Eq.	.0006				
Rbar^2	.96				
Y(3,3,2), r=2	-.169	.022	.034	-.026	.028
S.E. of Coeff.	.010	.025	.022	.019	.015
S.E. of Eq.	.002				
Rbar^2	.93				
Y(3,4,1), r=2	-.033	.001	.008	-.003	.0024
S.E. of Coeff.	.011	.003	.002	.002	.0016
S.E. of Eq.	.0002				
Rbar^2	.97				
Y(3,4,2), r=2	-.060	.003	.026	.010	-.003
S.E. of Coeff.	.049	.012	.011	.009	.007
S.E. of Eq.	.001				
Rbar^2	.84				
Y(4,1,1), r=2	-.025	.002	.005	-.174	1.154
S.E. of Coeff.	.031	.003	.003	.070	.367
S.E. of Eq.	.0003				
Rbar^2	.96				
Y(4,1,2), r=2	.180	-.007	-.007	-.654	3.265
S.E. of Coeff.	.088	.009	.009	.200	1.042
S.E. of Eq.	.0007				
Rbar^2	.92				

Continued--

Appendix table 1--Share equation results--Continued

Item	a(ijk)	b(ijk)	c(ijk)	d(1)(ijk)	d(2)(ijk)
Y(4,2,1), r=2	0.033	0.003	0.018	1.733	-9.867
S.E. of Coeff.	.188	.019	.019	.415	2.203
S.E. of Eq.	.002				
Rbar^2	.93				
Y(4,2,2), r=2	.159	-.010	.001	-.153	.552
S.E. of Coeff.	.059	.006	.006	.130	.691
S.E. of Eq.	.0005				
Rbar^2	.52				
Y(4,3,1), r=2	.120	.016	-.004	1.656	-6.594
S.E. of Coeff.	.208	.021	.021	.459	2.434
S.E. of Eq.	.002				
Rbar^2	.98				
Y(4,3,2), r=2	.251	.004	-.016	-1.082	7.019
S.E. of Coeff.	.157	.016	.016	.348	1.844
S.E. of Eq.	.001				
Rbar^2	.71				
Y(4,4,1), r=2	.150	-.003	-.003	-.431	1.802
S.E. of Coeff.	.072	.007	.007	.160	.848
S.E. of Eq.	.0006				
Rbar^2	.95				
Y(4,4,2), r=2	.130	-.004	.005	-.883	2.586
S.E. of Coeff.	.207	.021	.021	.457	2.426
S.E. of Eq.	.0017				
Rbar^2	.97				

Industry [i]	Region [j]	Area [k]
Manufacturing and construction = 1	Northeast = 1	Metro = 1
Service = 2	Midwest = 2	Nonmetro = 2
Government = 3	South = 3	
Primary = 4	West = 4	

APPENDIX 3--ESTIMATION RESULTS: EMPLOYMENT EQUATIONS

The explicit functional form of the theoretical employment-demand equations is:

$$[L\hat{}r]Y(i)(c)\hat{}c(i) = \exp(a(i) + b(i,*T) * [L\hat{}r]GNP(t)\hat{}d(i) * [L\hat{}r](C(i)/P(i))(t)\hat{}e(i) \quad [3]$$

The log-linear form of the estimated equations is:

$$c(i)*\ln[L\hat{}r]Y(i)(t) = a(i) + b(i)*T + d(i)*\ln[L\hat{}r]GNP(t) + e(i)*\ln[L\hat{}r](C(i)/P(i))(t) + u(t) \quad [4]$$

Y(i) is employment in industry i, (i = 1,..4). Industries 1-4 refer to manufacturing and construction, services, government, and primary goods.

L is the lag operator, and r is the order of the lag polynomial. For example, for any variable X, [L^r]X(t) = X(t-r). The order of the lag polynomial begins at zero.

exp is the mathematical constant e = 2.71....

ln is the natural logarithm.

^ is the power operator.

* is the multiplication operator.

GNP is real gross national product, 1982 dollars.

(C(i)/P(i)) is the real compensation index per employee, 1982=100.

T is a linear time trend and begins at I in 1960.

a(i) through e(i) are the estimated coefficients for each equation in industry i.

u(t) is the error term, assumed to be a normally distributed random variable with zero mean and constant variance and to include either errors of measurement and/or the effects of excluded variables,

In appendix table 2 S.E. refers to the standard error, Rbar^2 to the adjusted coefficient of determination, and r to the orders of the lag polynomial on lnY(i), ln(GNP), and ln(C(i)/P(i)), respectively.

Appendix table 2--Industrial employment results[1]

Item	ai	bi	c(1)i	d(0)i	d(1)i	e(0)i	e(1)i
Y(1), r=0,0,0	59.474	-0.031	n/a	1.721	n/a	-0.436	n/a
S.E. of Coeff.	8.073	.005	n/a	.258	n/a	.329	n/a
S.E. of Eq.	.019						
Rbar^2	.846						
Y(2), r=1,0,0	1.463	n/a	0.524	.162	n/a	-.248	n/a
S.E. of Coeff.	.355	n/a	.050	.060	n/a	.066	n/a
S.E. of Eq.	.005						
Rbar^2	.998						
Y(3), r=1,1,0	5.167	n/a	.526	n/a	.217	-.489	n/a
S.E. of Coeff.	.888	n/a	.101	n/a	.054	.107	n/a
S.E. of Eq.	.005						
Rbar^2	.992						
Y(4), r=0,1,0	7.377	n/a	n/a	n/a	.237	-.121	n/a
S.E. of Coeff	.656	n/a	n/a	n/a	.064	.034	n/a
S.E. of Eq.	.011						
Rbar^2	.950						

n/a = not applicable.

1 Examination of the residual plots with the nonparametric "exact" runs test did not indicate any systematic overprediction or underprediction in any of the above equations.

APPENDIX 4--EMPLOYMENT IMPLICATIONS OF ALTERNATIVE MACROECONOMIC ASSUMPTIONS

In the forecast tables below:[1]

%ch is the percentage change or growth rate of a variable between successive years. For example, %ch = [X(t) / X(t - 1) - 1] * 100.

% pt. diff. (shock - base) is the percentage point difference of a variable between the shocked and baseline simulations and is calculated by subtracting one growth rate from another. For example, % pt.diff. = %ch. shock X(t) - %ch. base X(t).

job ch. (shock. - base) is the extra jobs (thousands) gained or lost in the shocked simulation over a particular period compared with what would have occurred over the same period in the baseline simulation. For example, Job ch. = [shock X(t) - shock X(t-1)] - [base X(t) - base X(t-1)].

% diff. (shock - base) is the percentage difference between shocked and baseline runs of the model. For example, % diff. = [shock X(t) / base X(t) -1] * 100.

In the summary tables in the text:

Ave. Exp. %ch. is the average exponential growth rate of a variable. The rates were calculated over the period 1987-94. For example,

Ave. exp. %ch. = ln[X(1994) / X(1987)] / (1994 - 1987) + 1, where ln is the natural logarithm.

Ave. % pt. diff. (shock - base) is the mean of the % pt. diff. measure. The averages were calculated over the period 1987-94. For example:

$$\text{Ave. \% pt. diff.} = \sum_{t=1987}^{1994} [\text{\% pt. diff. } X(t)] / (1994 - 1987) + 1.$$

Additional jobs is the extra jobs gained or lost (thousands) over the entire simulation period compared with what would have occurred over the same period in the baseline simulation. It is calculated by adding together the job changes (job ch.) in each year over the 1987-94 period. For example:

$$\text{Additional jobs} = \sum_{t=1987}^{1994} [\text{job ch.}(t)].$$

[1] The detailed forecast tables below refer only to the monetary policy simulation. In the interest of conserving space, the tables pertaining to the real compensation bill shocks are not presented but are available upon request.

Appendix table 3--Employment implications of alternative macroeconomic assumptions

Item	1987	1988	1989	1990	1991	1992	1993	1994
MCM reduced-form elasticities:								
Real GNP--								
Fiscal (tot. govt. purch.)	2.00	1.70	1.20	0.80	0.50	0.10	-0.20	-0.40
Monetary (3m-tbill rate)	-.40	-1.00	-1.40	-1.50	-1.50	-1.40	-1.20	-1.00
3m-tbill rate--								
Fiscal (tot. govt. purch.)	1.70	2.00	2.00	2.20	2.40	2.60	2.80	2.90
Monetary (3m-tbill rate)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Inflation %ch. GNP deflator--								
Fiscal (tot. govt. purch.)	.20	.60	1.10	1.60	2.00	2.40	2.70	2.90
Monetary (3m-tbill rate)	-.10	-.20	-.60	-1.00	-1.50	-2.10	-2.60	-3.20
Trend forecast (baseline):								
GNP bill. 1982$	3790.70	3920.90	4040.80	4186.80	4328.70	4485.00	4632.30	4787.20
%ch	3.03	3.43	3.06	3.61	3.39	3.61	3.28	3.34
Tot. govt. purch.	762.80	779.50	796.20	812.90	829.60	846.30	863.10	879.80
%ch	2.25	2.19	2.14	2.10	2.05	2.01	1.99	1.93
3m-tbill rate %	6.00	6.50	7.10	7.20	7.20	7.10	7.10	7.00
GNP deflator %ch	3.70	4.70	4.70	4.30	4.50	4.40	4.40	4.20
Fiscal change bill. 1982$:								
Percent of real GNP	0	0	0	0	0	0	0	0
Level of fiscal change	0	0	0	0	0	0	0	0
Level of tot. govt. purch.	762.80	779.50	796.20	812.90	829.60	846.30	863.10	879.80
GNP post fiscal change	3790.70	3920.90	4040.80	4186.80	4328.70	4485.00	4632.30	4787.20
%ch	3.03	3.43	3.06	3.61	3.39	3.61	3.28	3.34
3m-tbill rate post fiscal	6.00	6.50	7.10	7.20	7.20	7.10	7.10	7.00
GNP deflator %ch	3.70	4.70	4.70	4.30	4.50	4.40	4.40	4.20
Monetary shock:								
3m-tbill %pt. change (+/-)	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
GNP post-monetary	3805.86	3960.11	4097.37	4249.60	4393.63	4547.79	4687.89	4835.07
%ch	3.44	4.05	3.47	3.72	3.39	3.51	3.08	3.14
3m-tbill rate post-monetary	5.00	5.50	6.10	6.20	6.20	6.10	6.10	6.00
Inflation post-monetary	3.80	4.90	5.30	5.30	6.00	6.50	7.00	7.40
Fiscal and monetary shocks:								
GNP post fis. & mon.	3805.86	3960.11	4097.37	4249.60	4393.63	4547.79	4687.89	4835.07
%ch	3.44	4.05	3.47	3.72	3.39	3.51	3.08	3.14
% pt. diff. (shock-base)	0.41	0.62	0.41	0.10	0.00	-0.10	-0.20	-0.20
Level diff. (shock-base)	15.16	39.21	56.57	62.80	64.93	62.79	55.59	47.87
% diff. (shock-base)	0.40	1.00	1.40	1.50	1.50	1.40	1.20	1.00
3m-tbill rate post fis.& mon.	5.00	5.50	6.10	6.20	6.20	6.10	6.10	6.00
% pt. diff. (shock-base)	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00	-1.00
Inflation post fis. & mon.	3.80	4.90	5.30	5.30	6.00	6.50	7.00	7.40
% pt. diff. (shock-base)	0.10	0.20	0.60	1.00	1.50	2.10	2.60	3.20

Continued--

Appendix table 3--Employment implications of alternative macroeconomic assumptions--Continued

Item	1987	1988	1989	1990	1991	1992	1993	1994
Industrial cost/price ratios:								
Man. & cons. (base)	108.21	108.21	108.21	108.21	108.21	108.21	108.21	108.21
Man. & cons. (shock)	108.21	108.21	108.21	108.21	108.21	108.21	108.21	108.21
% diff. (shock-base)	0	0	0	0	0	0	0	0
Services (base)	100.23	100.23	100.23	100.23	100.23	100.23	100.23	100.23
Services (shock)	100.23	100.23	100.23	100.23	100.23	100.23	100.23	100.23
% diff. (shock-base)	0	0	0	0	0	0	0	0
Government (base)	99.01	99.01	99.01	99.01	99.01	99.01	99.01	99.01
Government (shock)	99.01	99.01	99.01	99.01	99.01	99.01	99.01	99.01
% diff. (shock-base)	0	0	0	0	0	0	0	0
Primary (base)	106.39	106.39	106.39	106.39	106.39	106.39	106.39	106.39
Primary (shock)	106.39	106.39	106.39	106.39	106.39	106.39	106.39	106.39
% diff. (shock-base)	0	0	0	0	0	0	0	0
Industrial employment:								
Man. & cons. (base)	27124.18	27872.29	28461.75	29333.62	30119.86	31041.30	31817.66	32645.84
Man. & cons. (shock)	27311.14	28353.62	29150.86	30094.84	30901.47	31792.86	32477.49	33209.61
Job ch. (shock-base)	186.96	294.37	207.77	72.11	20.40	-30.06	-91.73	-96.06
Job ch. (shock-base) 1987-94	563.77							
% diff. (shock-base)	.69	1.73	2.42	2.60	2.60	2.42	2.07	1.73
Ave. % difference 1987-94	2.03							
Services (base)	76043.47	79185.23	82389.24	85968.39	89718.67	93763.94	97874.34	102136.90
Services (shock)	76229.56	79771.26	83415.35	87320.37	91283.92	95426.78	99504.51	103654.75
Job ch. (shock-base)	186.09	399.94	440.08	325.88	213.26	[illegible].60	-32.67	-112.33
Job ch. (shock-base) 1987-94	1517.85							
% diff. (shock-base)	.24	.74	1.25	1.57	1.74	1.77	1.67	1.49
Ave. % difference 1987-94	1.31							
Government (base)	20046.34	20361.86	20664.15	20985.65	21310.02	21648.32	21981.70	22317.51
Government (shock)	20063.70	20415.11	20754.98	21102.08	21441.16	21783.78	22110.98	22434.[illegible]
Job ch. (shock-base)	17.35	35.89	37.59	25.59	14.71	4.32	-6.18	-12.06
Job ch. (shock-base) 1987-94	117.22							
% diff. (shock-base)	.09	.26	.44	.55	.62	.63	.59	.53
Ave. % difference 1987-94	.46							
Primary (base)	6356.63	6401.72	6453.11	6499.30	6554.15	6606.08	6661.79	6712.96
Primary (shock)	6356.63	6407.78	6468.34	6520.73	6577.30	6629.41	6683.76	6731.94
Job ch. (shock-base)	0	6.05	9.17	6.21	1.72	.18	-1.36	-2.98
Job ch. (shock-base) 1987-94	18.99							
% diff. (shock-base)	0	.09	.24	.33	.35	.35	.33	.28
Ave. % difference 1987-94	.25							

Appendix table 3--Employment implications of alternative macroeconomic assumptions--Continued

Item	1987	1988	1989	1990	1991	1992	1993	1994
Area by region of employment:								
Nonmetro Northeast (base)	2455.10	2513.08	2564.26	2627.74	2688.11	2754.60	2815.90	2880.03
Nonmetro Northeast (shock)	2462.76	2532.61	2592.31	2659.41	2721.82	2788.15	2846.49	2907.18
Job ch. (shock-base)	7.65	11.87	8.52	3.62	2.04	-.16	-2.96	-3.45
Job ch. (shock-base) 1987-94	27.14							
% diff. (shock-base)	.31	.78	1.09	.21	1.25	1.22	1.09	0.94
Ave. % difference 1987-94	.99							
Metro Northeast (base)	24688.83	25344.97	25946.62	26702.56	27418.70	28231.07	28991.40	29805.46
Metro Northeast (shock)	24767.89	25542.76	26240.74	27054.30	27810.12	28630.85	29366.67	30147.34
Job ch. (shock-base)	79.06	118.73	96.34	57.61	39.68	8.36	-24.51	-33.38
Job ch. (shock-base) 1987-94	341.88							
% diff. (shock-base)	.32	.78	1.13	1.32	1.43	1.42	1.29	1.15
Ave. % difference 1987-94	1.10							
Nonmetro Midwest (base)	8177.48	8305.82	8408.18	8531.50	8653.42	8776.10	8887.01	8994.85
Nonmetro Midwest (shock)	8198.53	8361.67	8483.03	8606.02	8724.86	8843.21	8943.96	9041.89
Job ch. (shock-base)	21.06	34.79	19.00	-.33	-3.08	-4.33	-10.16	-9.91
Job ch. (shock-base) 1987-94	47.04							
% diff. (shock-base)	.26	.67	.89	.87	.83	.76	.64	.52
Ave. % difference 1987-94	.68							
Metro Midwest (base)	23103.78	23597.11	24003.22	24468.63	24957.57	25434.16	25888.25	26321.85
Metro Midwest (shock)	23177.64	23801.68	24278.81	24738.88	25211.86	25673.30	26091.83	26489.56
Job ch. (shock-base)	73.87	130.70	71.02	-5.33	-15.97	-15.15	-35.56	-35.87
Job ch. (shock-base) 1987-94	167.71							
% diff. (shock-base)	.32	.87	1.15	1.10	1.02	.94	.79	.64
Ave. % difference 1987-94	.85							
Nonmetro South (base)	11157.85	11438.73	11702.90	12019.85	12334.26	12679.52	13009.11	13351.36
Nonmetro South (shock)	11190.33	11528.50	11842.38	12186.69	12515.64	12862.47	13178.89	13503.01
Job ch. (shock-base)	32.47	57.30	49.71	27.37	14.53	1.57	-13.17	-18.13
Job ch. (shock-base) 1987-94	151.65							
% diff. (shock-base)	.29	.78	1.19	1.39	1.47	1.44	1.31	1.14
Ave. % difference 1987-94	1.13							
Metro South (base)	32763.60	34118.86	35504.66	37100.24	38735.34	40545.40	42353.55	44250.77
Metro South (shock)	32860.53	34412.36	36024.12	37794.33	39539.24	41390.15	43173.72	45008.87
Job ch. (shock-base)	96.94	196.77	225.75	174.64	109.80	40.85	-24.58	-62.07
Job ch. (shock-base) 1987-94	758.09							
% diff. (shock-base)	.30	.86	1.46	1.87	2.08	2.08	1.94	1.71
Ave. % difference 1987-94	1.54							
Nonmetro West (base)	3773.43	3904.49	4036.31	4185.72	4338.63	4505.29	4671.54	4844.51
Nonmetro West (shock)	3782.50	3931.66	4083.06	4246.76	4408.54	4578.41	4742.24	4909.64
Job ch. (shock-base)	9.07	18.10	19.58	14.30	8.86	3.22	-2.43	-5.56
Job ch. (shock-base) 1987-94	65.14							
% diff. (shock-base)	.24	.70	1.16	1.46	1.61	1.62	1.51	1.34
Ave. % difference 1987-94	1.21							

Continued--

Appendix table 3--Employment implications of alternative macroeconomic assumptions--Continued

Item	1987	1988	1989	1990	1991	1992	1993	1994
Metro West (base)	23455.91	24605.10	25810.82	27161.25	28589.50	30148.70	31736.65	33385.01
Metro West (shock)	23526.21	24843.64	26254.44	27763.09	29285.70	30882.66	32452.04	34045.27
Job ch. (shock-base)	70.30	158.24	205.08	158.22	94.36	37.77	-18.57	-55.14
Job ch. (shock-base) 1987-94	660.26							
% diff. (shock-base)	.30	.97	1.72	2.22	2.44	2.43	2.25	1.98
Ave. % difference 1987-94	1.79							
Total nonmetro (base)	25563.87	26162.13	26711.65	27364.81	28014.43	28715.51	29383.56	30070.75
Total nonmetro (shock)	25634.12	26354.44	27000.78	27698.89	28370.86	29072.24	29711.58	30361.72
Job ch. (shock-base)	70.26	122.06	96.81	44.95	22.36	.30	-28.71	-37.06
Job ch. (shock-base) 1987-94	290.96							
% diff. (shock-base)	.27	.74	1.08	1.22	1.27	1.24	1.12	.97
Ave. % difference 1987-94	.99							
Total metro (base)	104012.12	107665.85	111265.33	115432.67	119701.12	124359.33	128969.85	133763.10
Total metro (shock)	104332.28	108600.45	112798.12	117350.60	121846.91	126576.96	131084.25	135691.04
Job ch. (shock-base)	320.16	614.44	598.19	385.14	227.88	71.83	-103.22	-186.46
Job ch. (shock-base) 1987-94	1927.94							
% diff. (shock-base)	.31	.87	1.38	1.66	1.79	1.78	1.64	1.44
Ave. % difference 1987-94	1.36							
Total US (base)	129575.99	133827.97	137976.98	142797.49	147715.54	153074.85	158353.41	163833.85
Total US (shock)	129966.40	134954.88	139798.89	145049.49	150217.77	155649.20	160795.83	166052.76
Job ch. (shock-base)	390.41	736.50	695.00	430.08	250.23	72.13	-131.93	-223.52
Job ch. (shock-base) 1987-94	2218.91							
% diff. (shock-base)	.30	.84	1.32	1.58	1.69	1.68	1.54	1.35
Ave. % difference 1987-94	1.29							
Ind. emp. by sree & region:								
Man. & cons. (base)--								
Nonmetro Northeast	614.71	628.00	637.08	652.49	665.38	681.04	693.14	706.37
Metro Northeast	5491.34	5603.29	5679.40	5824.75	5934.05	6081.72	6190.95	6320.30
Nonmetro Midwest	1596.96	1620.33	1629.30	1647.54	1664.41	1679.81	1688.42	1694.44
Metro Midwest	5281.56	5309.54	5282.13	5279.70	5271.47	5249.41	5204.49	5146.71
Nonmetro South	2846.69	2927.25	2990.85	3086.05	3169.52	3269.24	3352.29	3442.33
Metro South	6228.06	6464.05	6676.17	6966.91	7234.39	7551.89	7834.24	8138.99
Nonmetro West	513.16	524.55	532.09	545.61	555.84	569.05	578.65	589.75
Metro West	4550.92	4794.37	5033.63	5328.96	5622.98	5956.79	6272.76	6603.59
Man. & cons. (shock)--								
Nonmetro Northeast	618.95	638.48	651.44	667.75	680.70	695.49	705.53	716.79
Metro Northeast	5529.19	5691.18	5800.03	5958.17	6073.59	6215.68	6308.27	6421.63
Nonmetro Midwest	1607.97	1649.03	1665.88	1680.83	1693.13	1704.31	1706.73	1707.52
Metro Midwest	5317.97	5401.49	5390.75	5366.34	5335.69	5296.46	5230.57	5157.36
Nonmetro South	2866.31	2976.68	3061.46	3164.75	3251.19	3348.08	3421.81	3502.13
Metro South	6270.99	6576.44	6849 15	7174.69	7459.89	7776.13	8038.78	8319.48
Nonmetro West	516.70	532.78	543.12	557.38	567.68	580.42	588.42	598.07
Metro West	4582.29	4886.74	5188.06	5523.28	5837.44	6173.69	6474.37	6782.97

Continued--

Appendix table 3--Employment implications of alternative macroeconomic assumptions--Continued

Item	1987	1988	1989	1990	1991	1992	1993	1994
Services (base)--								
Nonmetro Northeast	1255.47	1293.68	1329.67	1371.45	1412.51	1456.61	1499.79	1544.50
Metro Northeast	15699.62	16221.91	16733.83	17332.54	17925.68	18581.46	19224.00	19903.04
Nonmetro Midwest	3664.75	3757.96	3839.71	3931.57	4023.35	4115.86	4203.77	4290.80
Metro Midwest	14225.43	14656.80	15061.44	15499.64	15966.52	16435.96	16906.55	17370.60
Nonmetro South	4567.58	4725.38	4879.50	5053.94	5232.10	5423.08	5612.83	5809.08
Metro South	20031.51	21018.00	22057.23	23220.77	24443.93	25784.86	27159.28	28599.29
Nonmetro West	1979.32	2075.09	2175.03	2285.73	2402.92	2529.79	2660.05	2795.41
Metro West	14624.93	15443.15	16321.53	17283.46	18324.82	19451.81	20626.79	21845.90
Services (shock)--								
Nonmetro Northeast	1258.54	1301.64	1341.61	1385.78	1428.67	1473.76	1515.89	1559.37
Metro Northeast	15738.04	16324.17	16899.40	17546.54	18175.99	18846.73	19482.66	20145.07
Nonmetro Midwest	3673.71	3781.62	3871.51	3964.02	4056.01	4148.15	4232.63	4315.95
Metro Midwest	14260.24	14761.88	15218.03	15672.65	16146.15	16617.77	17074.82	17519.68
Nonmetro South	4578.76	4757.29	4930.65	5127.45	5304.02	5498.55	5685.66	5876.37
Metro South	20080.53	21181.36	22368.36	23657.61	24964.89	26345.47	27716.97	29124.08
Nonmetro West	1984.16	2091.41	2205.33	2327.16	2451.60	2581.92	2711.63	2843.70
Metro West	14660.72	15578.83	16589.78	17660.87	18770.93	19931.52	21104.27	22293.48
Government (base)--								
Nonmetro Northeast	398.66	401.62	403.80	406.20	408.51	410.74	412.78	414.79
Metro Northeast	3217.61	3234.55	3243.49	3251.17	3260.57	3265.70	3270.50	3272.77
Nonmetro Midwest	1250.68	1259.35	1265.46	1273.78	1279.88	1287.28	1293.15	1300.02
Metro Midwest	3059.51	3089.68	3114.52	3140.42	3166.71	3192.09	3216.59	3240.25
Nonmetro South	1932.78	1976.60	2021.42	2068.23	2116.72	2167.47	2218.50	2269.73
Metro South	5760.63	5883.72	6008.42	6140.91	6275.14	6417.60	6559.24	6702.97
Nonmetro West	797.02	814.56	832.45	851.80	871.00	891.78	912.26	933.31
Metro West	3630.14	3702.52	3775.40	3854.27	3932.68	4017.16	4100.35	4185.69
Government (shock)--								
Nonmetro Northeast	399.01	402.48	404.83	407.11	409.34	411.54	413.47	415.37
Metro Northeast	3220.39	3242.09	3251.34	3255.56	3262.37	3266.52	3270.07	3271.60
Nonmetro Midwest	1251.76	1261.19	1267.36	1275.66	1282.13	1289.62	1295.34	1302.14
Metro Midwest	3062.16	3096.95	3124.21	3150.00	3176.03	3201.22	3224.72	3247.29
Nonmetro South	1934.45	1982.93	2033.97	2085.74	2136.93	2188.52	2238.84	2288.23
Metro South	5765.62	5900.86	6042.12	6188.50	6330.86	6475.87	6615.74	6754.65
Nonmetro West	797.71	816.80	837.01	858.51	879.06	900.27	920.55	940.95
Metro West	3633.28	3712.47	3794.85	3882.11	3965.72	4051.83	4134.07	4216.69

Continued--

Appendix table 3--Employment implications of alternative macroeconomic assumptions--Continued

Item	1987	1988	1989	1990	1991	1992	1993	1994
Primary (base)--								
Nonmetro Northeast	186.26	189.78	193.71	197.60	201.71	205.91	210.19	214.37
Metro Northeast	280.27	285.22	289.90	294.10	298.39	302.19	305.95	309.35
Nonmetro Midwest	1665.09	1668.18	1673.71	1678.61	1685.78	1693.15	1701.66	1709.59
Metro Midwest	537.27	541.10	545.12	548.86	552.87	556.71	560.62	564.29
Nonmetro South	1810.81	1809.50	1811.12	1811.63	1815.92	1819.74	1825.50	1830.22
Metro South	743.40	752.90	762.85	771.65	781.89	791.05	800.79	809.53
Nonmetro West	483.93	490.29	496.74	502.58	508.86	514.66	520.59	526.03
Metro West	649.92	665.06	680.26	694.56	709.02	722.94	736.75	749.83
Primary (shock)--								
Nonmetro Northeast	186.26	190.01	194.43	198.78	203.10	207.36	211.60	215.64
Metro Northeast	280.27	285.32	289.97	294.02	298.17	301.93	305.67	309.05
Nonmetro Midwest	1665.09	1669.83	1678.29	1685.52	1693.60	1701.13	1709.27	1716.28
Metro Midwest	537.27	541.36	545.83	549.89	554.00	557.85	561.71	565.23
Nonmetro South	1810.81	1811.61	1816.30	1818.76	1823.51	1827.32	1832.58	1836.29
Metro South	743.40	753.70	764.48	773.52	783.59	792.67	802.23	810.66
Nonmetro West	483.93	490.67	497.60	503.71	510.01	515.81	521.65	526.93
Metro West	649.92	665.60	681.76	696.84	711.62	725.63	739.34	752.13

APPENDIX 5--EMPLOYMENT IMPLICATIONS OF CBO VERSUS CEA MACROECONOMIC ASSUMPTIONS

In the forecast tables below:

%ch is the percentage change or growth rate of a variable between successive years. For example, %ch = [X(t) / X(t) - 1] * 100.

% pt. diff. (shock - base) is the percentage point difference of a variable between the shocked and baseline simulations and is calculated by subtracting one growth rate from another. For example, % pt. diff = % ch. shock X(t) - %ch. base X(t).

Job ch. (CEA - CBO) is the extra jobs (thousands) that the CEA assumptions have added versus the CBO assumptions. For example, Job ch. = [CEA X(t) - CEA X(t-1)] - [CBO X(t) - CBO X(t-1)].

% diff. (CEA - CBO) is the number of jobs in percentage terms that the CEA assumptions will create versus the jobs created from CBO assumptions. For example, % diff. = [CEA X(t) / CBO X(t) - 1] * 100.

In summary tables in the text:

Ave. Exp. %ch. is the average exponential growth rate of a variable. It is calculated over the period 1987-92. For example, ave. exp. %ch. = ln[X(1992) / X(1987)] / (1992 - 1987) + 1 where, ln is the natural logarithm.

Additional jobs is the extra jobs gained or lost by using the CEA macroeconomic assumptions versus those of the CBO over the 1987-92 period. It is calculated by adding together the job changes (job ch.) in each year. For example:

$$\text{Additional jobs} = \sum_{t=1987}^{1992} [\text{job. ch.}(t)].$$

Appendix table 4--Employment implications of CBO versus CEA macroeconomic assumptions

Item	1987	1988	1989	1990	1991	1992
CBO baseline forecast:						
GNP bill. 1982$	3,780.50	3,892.40	4,009.20	4,133.50	4,245.10	4,351.20
%ch	2.75	2.96	3.00	3.10	2.70	2.50
CEA baseline forecast:						
GNP bill. 1982$	3,793.30	3,926.10	4,067.40	4,213.80	4,361.30	4,509.60
%ch	3.10	3.50	3.60	3.60	3.50	3.40
Real GNP diff. Admin. minus CBO:						
Level diff. (Admin.-CBO)	12.80	33.70	58.20	80.30	116.20	158.40
Ave. level diff. 1987-92	76.60					
% pt. diff. (Admin.-CBO)	.35	.54	.60	.50	.80	.90
% diff. (Admin.-CBO)	.34	.87	1.45	1.94	2.74	3.64
Industrial cost/price ratios:						
Man. & cons. (CBO)	109.46	109.46	109.46	109.46	109.46	109.46
Man. & cons. (Admin)	109.46	109.46	109.46	109.46	109.46	109.46
Services (CBO)	100.34	100.34	100.34	100.34	100.34	100.34
Services (Admin.)	100.34	100.34	100.34	100.34	100.34	100.34
Government (CBO)	99.21	99.21	99.21	99.21	99.21	99.21
Government (Admin.)	99.21	99.21	99.21	99.21	99.21	99.21
Primary (CBO)	106.29	106.29	106.29	106.29	106.29	106.29
Primary (Admin.)	106.29	106.29	106.29	106.29	106.29	106.29
Industrial employment:						
Man. & cons. (CBO)	26,863.28	27,386.50	27,938.97	28,550.04	28,979.76	29,317.18
Man. & cons. (Admin.)	27,019.96	27,795.77	28,640.50	29,511.08	30,358.17	31,177.64
Job ch. (Admin.-CBO)	156.70	252.58	292.26	259.50	417.37	482.06
Job ch. (Admin.-CBO) 1987-92	1,860.47					
% diff. (Admin.-CBO)	.58	1.49	2.51	3.37	4.76	6.35
Services (CBO)	75,880.96	78,722.54	81,720.41	84,909.85	88,055.89	91,118.25
Services (Admin.)	76,038.15	79,225.04	82,720.16	86,465.41	90,379.95	94,415.64
Job ch. (Admin.-CBO)	157.20	345.30	497.25	555.81	768.50	973.33
Job ch. (Admin.-CBO) 1987-92	3,297.40					
% diff. (Admin.-CBO)	.21	.64	1.22	1.83	2.64	3.62

Continued--

Appendix table 4--Employment implications of CBO versus CEA macroeconomic assumptions--Continued

Item	1987	1988	1989	1990	1991	1992
Government (CBO)	19997.67	20282.93	20565.85	20853.69	21128.23	21388.10
Government (Admin.)	20012.33	20328.69	20654.66	20988.32	21324.27	21659.40
Job ch. (Admin.-CBO)	14.66	31.11	43.04	45.83	61.41	75.26
Job ch. (Admin.-CBO) 1987-92	271.30					
% diff. (Admin.-CBO)	.07	.23	.43	.65	.93	1.27
Primary (CBO)	6357.32	6398.33	6442.68	6487.94	6535.01	6576.36
Primary (Admin.)	6357.32	6403.46	6455.84	6510.11	6564.85	6618.54
Job ch. (Admin.-CBO)	0	5.12	8.04	9.01	7.66	12.34
Job ch. (Admin.-CBO) 1987-92	42.18					
% diff. (Admin.-CBO)	0	.08	.20	.34	.46	.64
Area by region employment:						
Nonmetro Northeast (CBO)	2445.56	2494.33	2543.91	2596.14	2641.42	2683.66
Nonmetro Northeast (Admin.)	2452.00	2511.04	2572.66	2636.03	2699.41	2762.50
Job ch. (Admin.-CBO)	6.44	10.28	12.03	11.14	18.10	20.85
Job ch. (Admin.-CBO) 1987-92	78.84					
% diff. (Admin.-CBO)	.26	.67	1.13	1.54	2.20	2.94
Metro Northeast (CBO)	24594.68	25158.21	25738.57	26360.33	26918.64	27460.76
Metro Northeast (Admin.)	24661.21	25327.84	26039.53	26791.95	27560.01	28338.50
Job ch. (Admin.-CBO)	66.53	103.10	131.33	130.66	209.75	236.36
Job ch. (Admin.-CBO) 1987-92	877.73					
% diff. (Admin.-CBO)	.27	.67	1.17	1.64	2.38	3.20
Nonmetro Midwest (CBO)	8151.43	8253.08	8353.56	8455.43	8536.04	8602.11
Nonmetro Midwest (Admin.)	8169.14	8300.84	8430.71	8555.43	8674.65	8788.61
Job ch. (Admin.-CBO)	17.72	30.04	29.40	22.84	38.61	47.89
Job ch. (Admin.-CBO) 1987-92	186.50					
% diff. (Admin.-CBO)	.22	.58	.92	1.18	1.62	2.17
Metro Midwest (CBO)	23015.20	23409.47	23804.89	24205.17	24536.97	24809.33
Metro Midwest (Admin.)	23077.36	23584.31	24086.79	24569.14	25035.64	25487.09
Job ch. (Admin.-CBO)	62.16	112.68	107.06	82.08	134.69	179.09
Job ch. (Admin.-CBO) 1987-92	677.76					
% diff. (Admin.-CBO)	.27	.75	1.18	1.50	2.03	2.73
Nonmetro South (CBO)	11116.21	11353.21	11600.66	11864.49	12103.39	12325.72
Nonmetro South (Admin.)	11143.52	11429.90	11740.21	12066.26	12397.35	12729.99
Job ch. (Admin.-CBO)	27.30	49.39	62.86	62.22	92.19	110.31
Job ch. (Admin.-CBO) 1987-92	404.27					
% diff. (Admin.-CBO)	.25	.68	1.20	1.70	2.43	3.28

Continued--

Appendix table 4--Employment implications of CBO versus CEA macroeconomic assumptions--Continued

Item	1987	1988	1989	1990	1991	1992
Metro South (CBO)	32646.97	33853.03	35135.43	36515.52	37859.76	39166.10
Metro South (Admin.)	32728.57	34103.88	35641.05	37306.55	39045.68	40834.75
Job ch. (Admin.-CBO)	81.60	169.24	254.77	285.41	394.89	482.73
Job ch. (Admin.-CBO) 1987-92	1668.65					
% diff. (Admin.-CBO)	.25	.74	1.44	2.17	3.13	4.26
Nonmetro West (CBO)	3762.38	3879.69	4002.77	4133.59	4260.32	4362.87
Nonmetro West (Admin.)	3770.02	3902.93	4048.53	4204.03	4365.12	4529.91
Job ch. (Admin.-CBO)	7.64	15.60	22.52	24.68	34.36	42.24
Job ch. (Admin.-CBO) 1987-92	147.03					
% diff. (Admin.-CBO)	.20	.60	1.14	1.70	2.46	3.35
Metro West (CBO)	23372.14	24395.99	25496.38	26680.84	27854.24	28983.03
Metro West (Admin.)	23431.32	24599.15	25920.50	27356.49	28862.68	30415.67
Job ch. (Admin.-CBO)	59.18	143.98	220.96	251.53	332.79	424.20
Job ch. (Admin.-CBO) 1987-92	1432.63					
% diff. (Admin.-CBO)	.25	.83	1.66	2.53	3.62	4.94
Total Nonmetro (CBO)	25475.58	25980.31	26500.91	27049.65	27541.17	27994.36
Total Nonmetro (Admin.)	25534.68	26144.71	26792.12	27461.76	28136.52	28811.01
Job ch. (Admin.-CBO)	59.09	105.31	126.81	120.89	183.25	221.30
Job ch. (Admin.-CBO) 1987-92	816.65					
% diff. (Admin.-CBO)	.23	.63	1.10	1.52	2.16	2.92
Total Metro (CBO)	103628.99	106816.69	110175.27	113761.85	117169.61	120419.23
Total Metro (Admin.)	103898.45	107615.17	111687.86	116024.13	120504.01	125076.01
Job ch. (Admin.-CBO)	269.46	529.01	714.12	749.68	1072.12	1322.38
Job ch. (Admin.-CBO) 1987-92	4656.78					
% diff. (Admin.-CBO)	.26	.75	1.37	1.99	2.85	3.87
Total US (CBO)	129104.57	132797.00	136676.17	140811.51	144710.79	148413.59
Employment growth (CBO)	2.74	2.86	2.92	3.03	2.77	2.56
Total US (Admin.)	129433.13	133759.88	138479.98	143485.88	148640.53	153887.01
Employment growth (Admin.)	3.00	3.34	3.53	3.61	3.59	3.53
Job ch. (Admin.-CBO)	328.56	634.31	840.93	870.57	1255.37	1543.68
Job ch. (Admin.-CBO) 1987-92	5473.43					
% diff. (Admin.-CBO)	.25	.73	1.32	1.90	2.72	3.69

Continued--

Appendix table 4--Employment implications of CBO versus CEA macroeconomic assumptions--Continued

Item	1987	1988	1989	1990	1991	1992
Ind. emp. by area & region:						
Man. & cons. (CBO)--						
Nonmetro Northeast	608.80	617.29	626.11	636.01	641.64	645.47
Metro Northeast	5438.52	5511.42	5587.28	5676.25	5727.10	5769.84
Nonmetro Midwest	1581.60	1591.62	1601.13	1610.54	1608.27	1598.09
Metro Midwest	5230.76	5216.83	5197.55	5173.85	5110.08	5020.91
Nonmetro South	2819.31	2876.97	2937.25	3003.91	3051.13	3089.86
Metro South	6168.15	6350.89	6546.09	6762.49	6939.68	7098.27
Nonmetro West	508.23	515.94	523.63	532.21	537.00	540.78
Metro West	4507.14	4704.57	4918.74	5153.29	5363.05	5551.68
Man. & cons. (Admin.)--						
Nonmetro Northeast	612.35	626.22	640.93	655.77	669.80	683.06
Metro Northeast	5470.24	5586.42	5713.08	5846.78	5975.73	6100.18
Nonmetro Midwest	1590.83	1616.00	1638.98	1657.15	1670.75	1680.55
Metro Midwest	5261.27	5295.01	5312.03	5305.38	5279.49	5238.65
Nonmetro South	2835.75	2919.03	3009.44	3103.15	3194.51	3283.14
Metro South	6204.13	6446.43	6719.93	7013.52	7309.02	7602.81
Nonmetro West	511.19	522.97	535.20	547.59	559.26	570.29
Metro West	4533.44	4782.82	5069.81	5380.27	5697.71	6016.56
Services (CBO)--						
Nonmetro Northeast	1253.79	1287.19	1322.17	1358.72	1392.92	1426.26
Metro Northeast	15666.07	16138.98	16628.95	17149.78	17649.14	18144.02
Nonmetro Midwest	3656.91	3738.76	3819.74	3901.52	3974.28	4041.11
Metro Midwest	14195.03	14573.42	14960.17	15357.11	15728.62	16068.80
Nonmetro South	4557.62	4699.80	4846.70	5001.19	5149.39	5292.91
Metro South	19988.70	20889.98	21852.92	22888.64	23929.90	24957.43
Nonmetro West	1975.09	2062.33	2155.11	2254.27	2353.53	2450.60
Metro West	14593.68	15338.66	16142.89	17008.73	17890.28	18751.27
Services (Admin.)--						
Nonmetro Northeast	1255.38	1294.05	1334.38	1376.37	1419.23	1462.68
Metro Northeast	15698.52	16227.03	16795.51	17402.27	18031.65	18677.49
Nonmetro Midwest	3664.49	3759.14	3852.81	3945.12	4036.17	4125.76
Metro Midwest	14224.43	14663.59	15117.00	15575.59	16038.55	16502.27
Nonmetro South	4567.26	4727.23	4897.76	5077.15	5262.14	5450.95
Metro South	20030.11	21029.90	22151.25	23374.47	24666.93	26010.71
Nonmetro West	1979.18	2076.30	2184.22	2300.90	2423.63	2550.78
Metro West	14623.91	15454.56	16396.02	17424.67	18515.32	19651.39
Government (CBO)--						
Nonmetro Northeast	397.69	400.20	402.41	404.50	406.18	407.64
Metro Northeast	3209.80	3222.62	3232.48	3240.05	3243.97	3244.63

Continued--

Appendix table 4--Employment implications of CBO versus CEA macroeconomic assumptions--Continued

Item	1987	1988	1989	1990	1991	1992
Nonmetro Midwest	1247.64	1255.44	1262.11	1268.66	1273.76	1279.19
Metro Midwest	3052.08	3078.25	3102.50	3125.88	3146.29	3164.31
Nonmetro South	1928.08	1968.17	2009.19	2051.55	2093.34	2133.06
Metro South	5746.64	5859.74	5974.71	6083.54	6210.08	6322.07
Nonmetro West	795.08	811.34	827.87	845.06	861.95	878.42
Metro West	3621.33	3687.98	3755.50	3825.53	3893.91	3960.34
Government (Admin.)--						
Nonmetro Northesst	397.99	400.94	403.51	405.83	408.02	410.13
Metro Northeast	3212.15	3229.12	3241.00	3248.66	3254.32	3258.69
Nonmetro Midwest	1248.56	1257.05	1264.40	1271.49	1278.32	1285.07
Metro Midwest	3054.32	3084.51	3112.48	3138.80	3164.18	3188.84
Nonmetro South	1929.50	1973.58	2021.01	2070.69	2121.32	2172.12
Metro South	5750.86	5874.43	6006.73	6145.60	6287.09	6429.16
Nonmetro West	795.67	813.26	832.21	852.30	872.83	893.32
Metro West	3623.98	3696.53	3774.13	3855.95	3939.42	4023.38
Primary (CBO)--						
Nonmetro Northeest	186.28	189.65	193.21	196.90	200.68	204.28
Metro Northeest	280.30	285.18	289.86	294.25	298.43	302.27
Nonmetro Midwest	1665.27	1667.26	1670.58	1674.71	1679.73	1683.72
Metro Midwest	537.33	540.97	544.67	548.33	551.99	555.32
Nonmetro South	1811.00	1808.27	1807.53	1807.85	1809.51	1809.88
Metro South	743.48	752.43	761.71	770.85	780.09	788.33
Nonmetro West	483.99	490.09	496.16	502.04	507.84	513.07
Metro West	649.99	664.78	679.25	693.29	706.99	719.73
Primary (Admin.)--						
Nonmetro Northeast	186.28	189.84	193.83	198.06	202.35	206.62
Metro Northeast	280.30	285.27	289.93	294.24	298.31	302.14
Nonmetro Midwest	1665.27	1668.65	1674.52	1681.66	1689.40	1697.23
Metro Midwest	537.33	541.20	545.28	549.38	553.42	557.34
Nonmetro South	1811.00	1810.05	1812.00	1815.27	1819.38	1823.78
Metro South	743.48	753.12	763.13	772.96	782.65	792.06
Nonmetro West	483.99	490.41	496.91	503.24	509.40	515.32
Metro West	649.99	665.23	680.54	695.13	710.23	724.34

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