

Sensitivity of BLS economic projections to exogenous variables

The 1995 macroeconomic model has been most responsive to changes in fiscal spending and to changes in foreign economic activity; assumptions regarding energy have had little effect on the estimates

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The Bureau of Labor Statistics conducts a comprehensive program of aggregate and industry-level employment projections on a biennial basis.¹ Users of the projections should keep in mind that BLS (or others preparing similar projections) must make many assumptions regarding the behavior of factors which affect the future course of the U.S. economy. In addition, judgments are made about the response of the projections to these primary assumptions. In short, although projections preparation and the use of models in preparing the projections may appear precise and scientific, developing economic projections is very much an art filled with uncertainty.

The assumptions made by BLS cover a broad range, from those about which we may be reasonably certain to those which are not at all predictable. The role of the analyst in preparing projections is to exercise judgment with regard to reasonable expectations for the assumptions, particularly where alternate values may have significant impacts. That is, if a particular assumption is highly uncertain, yet has little impact on the outcome of the projections, it is important that the analysts make that known to the users. Conversely, if the projections are particularly sensitive to specific assumptions, more care must be taken in their preparation.

This article examines the assumptions which affect the aggregate economic projections and illustrates the degree of

sensitivity of the projections to possible errors in those assumptions.

Two types of assumptions are required to develop a set of aggregate economic projections. First, values must be assigned to all variables which are exogenous to the aggregate projections model, that is, variables that are not determined by the model but are required to generate a solution. They include such items as real defense expenditures, Social Security benefit payments, and the U.S. currency exchange rate. The second type of assumptions concern the validity of the model structure itself, as these are reflected in changes to that structure in the form of excluded variables, constant adjustments, and modifications to behavioral coefficients.

By their very nature, the first type of assumptions—exogenous variable specification—are the most visible inputs to the model and, also, the most amenable to sensitivity testing. The second type of assumptions are generally less visible, given that they (and their ultimate impact on the projections) are more a function of the projections preparation process. They include explicit assumptions such as expected structural shifts in the economy, the timing of the business cycle, and expectations for productivity growth. This type of assumption is far more difficult to assess for sensitivity purposes.

This article focuses primarily on the sensitivity of the macroeconomic projections (and, to a certain extent, industry-level employment measures) to changes in the aggregate model's exogenous inputs. First, the flow of information into and out of the macroeconomic model is outlined, fol-

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lowed by a discussion of the results of the error analysis and an examination of the effects of large, sustained errors in the growth rates of selected exogenous assumptions on the aggregate and industry projections. Finally, the constant adjustments imposed on the model's behavioral relationships are discussed.

The flow of information

The projections process begins with the constrained extrapolation of age-, sex-, and race-specific labor force participation rates.² Applying the extrapolated participation rates to the Bureau of the Census projected population levels³ yields an estimate of the civilian labor force which is used in the aggregate model.

Next, exogenous assumptions are applied to the aggregate model. These assumptions include true policy variables (for example, benefit payments under various Federal transfer programs, the response of the monetary authority to growth in the economy, and the level of the Armed Forces), and variables for which other reliable and generally accepted projections are available, such as the population projections developed by the Bureau of the Census. Exogenous variables also include items which are outside the scope of the model, such as economic growth and inflation rates in the economies of the major trading partners of the United States, the long-term behavior of the U.S. dollar's exchange value, and energy prices.

The aggregate model is then used as a framework for the preparation of the projection of total U.S. economic activity.⁴ BLS analysts review the aggregate results for reasonableness, checking for internal consistency and continuity with past trends and comparing the results with projections made by others. Their review focuses on such aggregate measures of economic activity as GNP, unemployment, and productivity, but the model's framework ensures that other important measures of economic performance are not overlooked.

As for industry and occupational projections, the level and distribution of real GNP and employment, as well as several other aggregate variables, are the controlling factors from the aggregate projections model. Following is a summary of major inputs to and outputs from the aggregate projections model:

- Variables incorporated from earlier projection stages
 - Level of the Armed Forces
 - Labor force, age 16 and over, by sex
 - Resident population, all age groups, by sex
- Variables incorporated as part of the macroeconomic stage of the projections
 - Fiscal policy assumptions
 - Monetary policy assumptions
 - Foreign economic activity assumptions
 - Energy price and availability assumptions

- Variables passed from the macroeconomic model to later stages of the projections

- Gross National Product
 - Personal Consumption Expenditures
 - Gross Private Domestic Investment
 - Exports
 - Imports
 - Government
- Employment
- Miscellaneous

The flow of information in the early stages of projection development is from the more aggregate to the more detailed. In the later stages, a less formal, but no less important, feedback occurs from the industry and occupational projections to the more aggregate level. Because of the review and feedback process, BLS projections converge to an internally consistent set of solutions at all levels of the estimation process.

Error analysis

The macroeconomic model used by BLS requires the values for 849 exogenous variables to generate a solution. Following is a breakdown by type of all variables and of the subset of those variables included in the subsequent analysis:

	<i>Total</i>	<i>Included in analysis</i>
Total	849	373
Fiscal	29	26
Income	40	40
Financial	18	18
Tax-related	161	146
Foreign activity	11	11
Demand-related	37	37
Energy	136	36
Technical input/output	170	0
Demographic	46	46
Miscellaneous	13	13
Model switches	188	0

Variables were excluded from consideration if they controlled program flow (model switches), accounted for extraordinary variability in historical data series (dummy variables), or were of a highly detailed industry-specific nature. A separate run of the model was performed for each of the 373 exogenous variables used.

The assumption was made that the underlying trend of each variable was correct for the 1985-95 period, but that the initial period estimate was in error by 10 percent. Thus, the exogenous value was increased by 10 percent in each year of the period, a model solution was generated, and the results were compared with the results of the base projection. Comparisons were made of those variables which are used at later stages of the projections—GNP and major demand components, employment, the unemployment rate,

Table 1. Difference between selected exogenous variables used to generate 1995 projections values as published and as generated by a 10-percent error
[In percent]

Exogenous variable	GNP, 1972 dollars	GNP, current dollars	Employment	Unemployment rate	Large time deposit rate
Fiscal:					
Defense purchases of goods and services, 1972 dollars	1.4	1.5	1.6	-1.4	-
Nondefense purchases, 1972 dollars	.4	.5	.5	-.5	-
Federal nondefense employment	-.1	-.1	-.1	-.1	-
Federal compensation/employee, 1972 dollars	-.2	-.2	-.6	.5	-
Transfers, food stamps, 1972 dollars	-.1	-.1	-.1	-.1	-
Transfers, military retirement, 1972 dollars	.1	.2	.2	-.2	-
Transfers, medicare, 1972 dollars	.3	.5	.5	-.4	-
Transfers, Social Security, 1972 dollars	.8	.9	.9	-.9	.1
Transfers, all other, 1972 dollars	.2	.3	.3	-.2	-
State and local:					
Education purchases, 1972 dollars	.8	.9	1.1	-1.0	.1
Health, labor and welfare, 1972 dollars	.4	.4	.6	-.5	-
Civilian safety, 1972 dollars	.2	.2	.3	-.2	-
Other purchases, 1972 dollars	.7	.8	.9	-.8	.1
Education employment	-.1	-.2	.3	-.2	-
Civilian safety employment	-.1	-.1	-.1	-	-
Other employment	-.1	-.1	-.2	-.2	-
Compensation/employee, 1972 dollars	-.2	-.1	-1.0	.9	-
Transfers to persons, 1972 dollars	.2	.3	.3	-.3	-
Foreign economic activity:					
World gross domestic product less U.S. and centrally-planned, 1972 dollars	1.4	1.1	1.4	-1.2	-.7
Major trading partner gross domestic product deflator	.1	.6	-.1	.1	.5
Major trading partner export deflator	1.5	2.0	1.6	-1.4	-.6
Major trading partner exchange rate index	1.5	2.9	1.6	-1.4	-.1
Energy-related:					
Domestic well-head price, lower 48 crude	-.1	.4	-.1	.1	-.3
Domestic well-head price, natural gas	-.1	.3	-	-	-.1
Barrel price, imported crude petroleum	-	.1	-	-	.1
Miscellaneous income:					
Depreciation rate, commercial and other	-.2	.2	.9	-1.0	.3
Depreciation rate, food and kindred products	-	-	-	-.1	.3
Depreciation rate, mining	-	-	-	-.1	-
Depreciation rate, communications	-.4	-.2	-	-	-.6
Ratio, non-OASDI contributions to personal income less transfers	-.2	-	-.2	.2	-.1
Percent of private earnings covered by Social Security	-1.0	.1	-1.2	1.2	-.2
Ratio, employee social insurance contributions to total contributions	-.1	-1.5	-.2	1.5	-.1
Business transfer payments, current dollars	-	-	-	-.1	-
Miscellaneous demand-related:					
Capacity value, new housing units	-	-.2	-	-	.2
Discard rate, residential one-unit structures	-	.1	-	-.1	.1
Ratio, purchases of new cars to total PCE	-.1	-.1	-.1	.1	-.1
Gasoline pump price, 1972 dollars/gallon	-	.2	-	-	-.2
Exports, factor income, 1972 dollars	.3	.6	.2	-.1	.1
Imports, factor income, 1972 dollars	-.3	-.5	-.1	.1	-
Demographic:					
Male labor force, age 16 and over	.9	1.1	1.2	3.8	-
Female labor force, age 16 and over	.7	.9	.9	3.2	-
Tax-related:					
Ratio, personal income of States with an income tax to total income	-.5	-.7	-.7	.6	-.1
Value of a standard deduction, average	.2	.3	.3	-.3	-
Value of an individual exemption	.2	.2	.2	-.2	-
Maximum taxable salary, OASDI	-.1	-	-.1	.1	-
Indirect business tax rate	-.3	1.2	-.3	.2	-.1
Effective corporate tax rate	-.3	-.3	-.3	.2	-.2
Effective State personal income tax rate	-.5	-.7	-.7	.6	-.1
Combined OASDI tax rate	-1.0	.1	-1.2	1.2	-.2
Personal tax alternatives:					
No indexation of rates (versus full indexing)	-8.8	-4.0	-3.5	3.3	-2.4
10-percent tax cut (across the board)	1.9	2.4	2.3	-2.1	.4
10-percent tax increase (across the board)	-1.7	-2.2	-2.2	2.0	-.1

GNP per labor hour, the inflation rate (as measured by the rate of change in the implicit price deflator for GNP), and the interest rate on large time deposits (the key interest rate in the macroeconomic model).

Table 1 shows the percent difference between the published moderate-growth projection values and those generated by the alternative solution. Also included is the absolute difference in the unemployment rate between the two

model solutions and the impact on the interest rate on large time deposits. Exogenous variables having insignificant impacts on these specific variables were not included in the table.

The macroeconomic model appears to be most sensitive to changes in fiscal policy assumptions, both revenues and expenditures, and to assumptions concerning foreign economic activity. Changes in assumptions regarding the en-

ergy sector, especially the barrel price of imported crude petroleum, have very little impact on the macroeconomic estimates passed along to later stages of the projections process.

To better analyze the effects of fiscal expenditure shifts on projections, the immediate and long-term multipliers for selected Federal and State and local government expenditure categories are shown in the following tabulation:

	<i>Immediate effect</i>	<i>11-year effect</i>
Federal:		
Defense spending	1.83	2.36
Nondefense spending	1.94	2.51
Military retirement .....	.71	1.83
Medicare benefits	1.56	1.97
Social Security benefits .....	.73	1.81
Other Federal transfers .....	.72	1.77
State and local:		
Education purchases	1.82	1.95
Health and welfare purchases	1.72	1.91
Civilian safety purchases	1.78	1.90
Other State and local purchases	1.76	1.89
Transfer payments .....	.72	1.53

Table 2 presents the absolute differences in the percent shares of GNP accounted for by the major demand components of GNP. As with the level of GNP and employment, the

significant impacts appear to be related primarily to fiscal policy and foreign economic activity assumption changes.

The macroeconomic model includes two types of monetary policy assumptions. The first includes many of the small components of the various definitions of the money supply. These assumptions affect only the determination of M1 (the narrow definition of the money supply) and M3 (the broadest definition of the money supply) and have no impact whatsoever on other sectors of the model.

The second type of monetary policy assumption is the "decision rule" used by the Federal Reserve Board to determine the optimal rate of growth of M2. In the macroeconomic model used by BLS, the decision rule is formulated as the willingness of the monetary authority to accommodate current levels of inflation and real growth in the current period. Choices range from fully accommodative (easy money) to the least accommodative (tight money).

Accommodation policies affect real and nominal GNP growth, employment and inflation growth, the interest rate on large time deposits, and the unemployment rate. The impacts are quite small, which is not particularly surprising in a model of this type. Monetary control, by its very nature, is a short-term phenomenon which depends on the dynamics of a detailed financial sector specification normally found only in the many short-term forecasting models available for the U.S. economy. Long-run determinants of potential

Table 2. Difference between the distribution of GNP in the 1995 projections values as published and as generated by alternate assumptions for exogenous variables

[In percent]

Exogenous variable	Personal Consumption Expenditures (PCE)			Investment			Foreign trade		Government	
	Durables	Nondurables	Services	Non-residential	Residential	Inventory change	Exports	Imports	Federal	State and local
Fiscal:										
Defense purchases, 1972 dollars .....	.16	-.09	-.22	.03	-.03	-.01	-.15	-.02	.47	-.14
Nondefense purchases, 1972 dollars .....	.05	-.02	-.06	-	-.01	-.01	-.04	-	.14	-.04
Medicare transfers, 1972 dollars .....	.02	-.01	.10	-	-.01	-	-.04	-	-.03	-.03
Social Security, 1972 dollars .....	.15	.09	.02	.03	-.01	-.01	-.09	-.05	-.06	-.08
State and local:										
Education, 1972 dollars .....	.10	-.07	-.14	-.02	-.02	-.01	-.09	-.01	-.06	.31
Health, 1972 dollars .....	.04	-.04	-.08	-	-.01	-.01	-.04	-	-.03	.16
Other, 1972 dollars .....	.08	-.06	-.12	-.02	-.02	-.01	-.08	-.01	-.05	.28
Compensation per employee, 1972 dollars	-.05	.01	.03	-.10	.03	.01	.01	.04	.01	.02
Foreign economic activity:										
World gross domestic product .....	.05	-.26	-.40	.14	-.05	-.01	.74	.02	-.10	-.14
Foreign export deflator .....	.06	-.27	-.39	.12	-.02	-.01	.37	.41	-.11	-.15
Exchange rate .....	.04	-.28	-.37	.07	-.02	-.01	.40	.44	-.11	-.16
Miscellaneous income:										
Social Security coverage	-.16	.07	.05	-.06	.04	.01	.04	-.02	.08	.11
Employee contribution rate	-.06	-.08	-.08	.02	-.03	-	.10	.10	.01	.01
Miscellaneous demand:										
Financial services, 1972 dollars	-.03	-.04	.07	-	-	-	-	-	-	-
Auto share of PCE .....	.29	-.11	-.09	-.03	-.01	-.01	.01	-.06	.01	.01
Gasoline pump price	-.03	.07	-.03	-	-	-.01	-.01	-.02	-	-.01
Factor income, exports	-	-.06	-.08	-.03	-.01	-.01	.22	-	-.02	-.03
Factor income, imports	-	.04	.07	.02	-	-	.03	-.21	.02	.03
Tax-related:										
State coverage ratio	-.10	-.07	-.01	-.02	-	-	.06	.04	.04	.06
Indirect business tax rate	-.03	.01	.08	-.04	.03	.01	-.03	-.07	.02	.03
Corporate tax rate	-.04	-	.03	-.10	.01	-	.03	.02	.02	.03
State tax rate	-.10	-.07	-.01	-.02	-	-	.06	.04	.04	.06
Combined OASDI rate	-.16	-.07	.05	-.06	.04	.01	.04	-.02	.08	.11

growth are generally understood to be more related to those factors which affect the trend path of demand growth, such as demographic factors and patterns in income growth. Thus, the monetary policy instruments, while useful in influencing the short-run behavior of the macroeconomic model, generally do not affect projections which focus on long-term growth.

Growth-rate shift analysis

The error analysis tests for the relative sensitivity of the macroeconomic model to sustained level shifts or errors in a specific exogenous variable. Some of the key assumptions, however, are subject to wide, relatively unpredictable fluctuations. To test the sensitivity of the model and projection results to unexpected fluctuations in the growth rates of selected exogenous variables, six exogenous variables were selected and two solutions were prepared for each, as follows:

- Defense purchases of goods and services (1972 dollars):
Variable unchanged, 1985–95 (no real growth).
Annual real growth of 5 percent.
- Federal nondefense purchases of goods and services (1972 dollars):
Variable unchanged, 1985–95 (no real growth).
Annual real growth of 5 percent.
- Federal transfer payments, Social Security benefits (1972 dollars):
Real average annual decline of 5 percent.
Real average annual increase of 5 percent.
- Gross domestic product, our major trading partners (1972 dollars):
Annual real growth of 1 percent.
Annual real growth of 5 percent.
- Average exchange rate index, our major trading partners:
No change, 1985–95 (value of the dollar remains constant over the period).
Annual growth of 8 percent (value of the dollar falls smoothly over the entire period).
- Price of imported crude petroleum:
Price declines to \$18 per barrel by 1988 and remains at that level thereafter.
Price declines to \$26 per barrel in 1986 then begins to increase again, reaching \$60 per barrel by 1995.

Table 3 shows the percent difference for each of the six exogenous variables and the associated impact on the major results of the aggregate model solutions.

The major demand components, for each of the 12 aggregate solutions, were allocated by producing sectors using the distributions implicit in the published BLS base projections. The resulting final demand bills of goods were applied to the 1995 input-output table from the same published projections to arrive at detailed estimates of industry total output necessary to produce the aggregate GNP. Finally, the industry output estimates were translated to employment

requirements using the employment/output ratios from the published base projections. The resulting percent changes in employment between the two alternative solutions for each of the selected exogenous variables are presented, at the sector level, in table 3.

The implications are that, at least for the selected variables, large errors in specification could lead to significantly altered results, at both the aggregate and industry levels of detail. In subsequent projections preparation, it would be worthwhile to develop such “single-variable” alternatives.

Add-factor analysis

For each behavioral relationship in the macroeconomic model, the analyst may specify adjustments to the constant term of the equation. These are called add-factors because they displace the result of the equation up or down by an additive amount. Constant adjustments may be applied in one or more years of the solution interval, may be constant, declining, or increasing over time, and, in short, allow for tremendous control by the analyst over the solution path and results of the model.

Normally, constant adjustments are initially specified for virtually every behavioral equation in a complex model to smooth the vagaries of individual equations and to force the model to reproduce the last few years of available historical data. These add-factors would then be tapered smoothly to a zero value at some point in the solution interval. Indeed, without this initial step, large economic models will generally be unable to converge on a solution at all.

Finally, to derive an acceptable solution, the analyst introduces modifications to exogenous values and further changes to the constant adjustment factors. In some cases, where the dynamics of the model make the effects of changes to constant adjustments unpredictable, the analyst may elect to exclude certain behavioral relationships. That is, the equation is “turned off” and exogenously specified values are supplied in place of the equation results. Once an acceptable solution has been derived, all of the add-factors are recomputed so that previously excluded variables may be included again in the solution set.

From the foregoing discussion, it is clear that an econometric model provides a convenient framework for a set of economic projections. However, the way that framework is fleshed out is, to a great extent, a reflection of the experiential judgments of the analysts preparing the projection. In fact, it has been estimated that as much as 70 percent of the content of a particular projection set is attributable to the judgments of the analyst and the remaining 30 percent to the formal structure of the econometric model.

The BLS 1995 projections process was begun with the Wharton control forecast of June 1984 as the starting point. Thus, the preliminary step of calibrating the constant adjustments had already been performed. However, to derive a reasonable trend projection of growth, BLS had to replace the Wharton exogenous variables with its own estimates, and, more importantly, to disentangle the Wharton constant ad-

justments which had been overlaid on the calibrating adjustments. One of the primary features of the Wharton forecast was that it contained a strong cyclical component, and many of the initial changes to the Wharton add-factors were necessitated by BLS' goal of a cycle-free trend projection.

A comparison of the Wharton constant adjustments was made with those of BLS for 106 behavioral relations in the model: 71 demand categories (all behaviorally determined components of real GNP), 33 employment levels (all behaviorally determined sectoral employment), and the male and female civilian labor force. Following is the number of behavioral relations where the constant adjustment as a proportion of the determined variable increased or decreased over time:

Equation	Increased	Decreased
Demand:		
BLS	37	34
Wharton	35	36
Employment:		
BLS	18	15
Wharton	10	23
Labor force:		
BLS	2	0
Wharton	2	0

The relation of the BLS constant adjustment to that in the Wharton control is shown below:

Equation	Larger	Smaller	Identical
Demand	39	21	11
Employment	24	4	5
Labor force	0	2	0

Exactly how one should interpret these comparisons is moot. Generally, the BLS add-factors are larger than those of Wharton. This may reflect a greater propensity on the part of BLS analysts to experiment with the structure of the model, or it may reflect the smoothing that BLS imposed on the macroeconomic results.

Recall that the BLS macroeconomic projections do not stand completely on their own merits. Where detailed results at lower levels of the projection process contradict the aggregate results, the aggregate projections are often modified to take into account these contradictions. This factor alone accounts for BLS' apparent tendency to more heavily add-factor the employment equations than does Wharton.

Conclusions and recommendations

The key results of the macroeconomic model are more heavily influenced by some exogenous assumptions than by others. These include Federal spending and tax policy and the assumptions relating to foreign economic activity. Perhaps far more important, but much less straightforward to quantify, are the impacts of model structure modifications, in the form of constant adjustments, on projection results.

Table 3. Effects of large changes in selected exogenous variables on major projected variables and sectoral employment as compared to those published for 1995
(In percent)

Item	Defense purchases	Nondefense purchases	Social Security benefits	Foreign gross domestic product	Exchange rate	Import oil price
Major projected variable						
Exogenous variable difference	62.9	62.9	172.1	37.8	115.9	233.3
Real GNP	6.5	2.3	5.3	5.4	12.6	- .7
1985-95 growth rate difference .....	.6	.2	.5	.5	1.1	.0
GNP deflator .....	.7	.4	.9	-.7	9.1	1.3
1985-95 growth rate difference .....	.1	.0	.1	.0	.8	.1
Employment	6.5	2.5	5.3	4.2	10.0	-.6
1985-95 growth rate difference .....	.6	.2	.5	.4	.9	.0
Unemployment rate difference	-5.6	-2.2	-4.7	-3.6	-8.5	.5
Large time deposit rate difference .....	.36	.16	.36	.06	1.99	.16
GNP per worker, 1985-95 rate difference .....	.0	.0	.0	.0	.2	.0
Sectoral employment						
Total establishment employment	6.3	2.0	6.7	5.2	12.0	-.6
Agriculture, forestry, and fisheries	2.6	1.2	4.2	8.3	18.5	-.3
Mining	5.8	1.5	4.2	9.9	42.4	-1.8
Maintenance and repair construction	5.6	1.4	3.5	3.1	8.2	-.4
Manufacturing	9.7	2.1	6.2	9.5	25.7	-.8
Transportation	7.7	1.9	6.4	7.0	15.7	-.8
Communications	5.7	1.8	6.5	5.1	11.0	-.5
Public utilities	6.8	2.2	8.6	4.8	13.6	-.1
Wholesale and retail trade	6.4	2.2	8.7	4.6	7.7	-.7
Finance, insurance, and real estate	3.8	1.5	6.0	2.8	7.1	-.3
Other services	5.1	2.1	6.0	3.2	7.8	-.3
Government enterprises	5.7	1.7	6.7	4.1	9.7	-.8
Special industries	3.9	1.8	5.2	2.5	5.9	-.8

BLS' current methodology is to prepare a base projection and several alternative projections. The purpose of the alternative projections has been primarily to put confidence intervals around the base projection. This approach should continue, with special focus on those variables most heavily add-factored in the preparation of the base projection.

What BLS methodology has been lacking, however, is the identification and exploration of alternatives around those exogenous assumptions which most heavily impact the key

macroeconomic results. Therefore, in addition to the alternative projections mentioned above, the foregoing results should be used to identify those specific exogenous assumptions for which alternative scenarios should be developed. Such "single-variable" alternatives would be relatively inexpensive to generate (relative to "whole-model" alternatives) and would add greatly to the usefulness of the BLS projections, in that they would assist users in identifying results which are most likely to be affected by unexpected developments in key assumptions. □

—FOOTNOTES—

¹ The BLS projections are initially published in the *Monthly Labor Review*. The latest series of projections articles, appearing in the November 1985 *Review*, include: Betty W. Su, "The economic outlook to 1995: new assumptions and projections," pp. 3-16; Howard N Fullerton, Jr., "The 1995 labor force: BLS' latest projections," pp. 17-25; Valerie A. Personick, "A second look at industry output and employment trends through 1995," pp. 26-41; and George T. Silvestri and John M. Lukasiewicz, "Occupational employment projections: the 1984-95 outlook," pp. 42-57.

² A comprehensive methodological description, along with reprints of the latest projection articles and more detailed projection results, appears in *Employment Projections for 1995: Data and Methods*, Bulletin 2253

(Bureau of Labor Statistics, 1986).

³ *Projections of the Population of the United States: 1983 to 2080, Current Population Reports, Series P-25, No. 952* (Bureau of the Census, 1984).

⁴ The aggregate economic model currently in use by the BLS was acquired as the result of a competitive procurement process. It is the Long-Term Model of the U.S. Economy developed by the Wharton Econometric Associates, Inc., version LTM0684S. The general structure of the model is fully outlined in *Long-Term Model Structure and Specification* (Wharton Econometrics, 1982).

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The *Monthly Labor Review* welcomes communications that supplement, challenge, or expand on research published in its pages. To be considered for publication, communications should be factual and analytical, not polemical in tone. Communications should be addressed to the Editor-in-Chief, *Monthly Labor Review*, Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C. 20212.
