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Kentucky Annual Economic Report 2000

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Kentucky Annual Economic Report

2000

Center for Business and Economic Research

Department of Economics

Gatton College of Business and Economics

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From the Director . . .

The Center for Business and Economic Research (CBER) is pleased to publish the 28th *Kentucky Annual Economic Report*. The *Report* is one of the important ways in which the Center fulfills its mission to monitor and analyze the Kentucky economy. The 2000 Report contains seven articles that provide state and national economic forecasts and address many of the major economic policy issues facing the Commonwealth.

In publishing this report, we draw on expertise from the Gatton College of Business and Economics at the University of Kentucky and continue the practice of inviting members of Kentucky state government to provide their insights on economic issues facing the state. Our authors include five faculty members and one graduate student from the Department of Economics, one research associate from the Center for Business and Economic Research, and one economist from the Kentucky Governor's Office for Economic Analysis.

The first article looks at an issue that has received widespread attention in Kentucky in recent years. Glenn Blomquist and I examine per capita income in Kentucky and show how Kentucky's lower cost of living and higher quality of life can provide a different interpretation of per capita income. In response to Governor Paul Patton's goal that Kentucky reach 100 percent of the U.S. per capita income by 2015, we conclude that Kentucky need only reach 92 percent of the U.S. average after adjusting for cost of living and quality of life.

In the second article, Steven N. Allen, a research associate at CBER, proposes a methodology for estimating the number of participants and costs for expansions of state health insurance programs in Kentucky. Many states have recently initiated programs to provide health insurance to uninsured or underinsured individuals, and Allen points out that providing accurate estimates of participants and costs is critical in the planning stages of these programs.

Dr. William H. Hoyt, an associate professor of economics at the University of Kentucky, examines Kentucky's tax structure in the third article. He finds that Kentucky actually has a more "progressive" tax system than in many other states, in part because of its reliance on the income tax for much of its revenue. But because incomes in Kentucky are lower than in most states, he still finds that Kentuckians pay relatively high taxes as a percentage of their incomes.

Jonathan Fisher, a graduate student in economics at the University of Kentucky, provides an update to our popular article on computer and Internet usage at Kentucky businesses that appeared in last year's *Report*. This year's article looks specifically at the explosive growth of electronic commerce through a survey of businesses in Kentucky. He finds that about 14 percent of Kentucky businesses in the survey currently sell online and that many more businesses plan to do so in the future.

The fifth article provides CBER's annual forecasts for the Kentucky economy for the next three years. Dr. Eric C. Thompson, CBER's Associate Director, maintains and updates the University of Kentucky State Econometric Model, which produces these forecasts. Dr. Thompson forecasts that gross state product will average 2.5 percent in 2000 and that Kentucky will add about 24,000 jobs in 2000, many of them in the services sector.

Greg Harkenrider, an economist with the Kentucky Governor's Office for Economic Analysis (GOEA), discusses the Kentucky Composite Economic Indicators in the sixth article. He describes the methodology that developed a model of leading and coincident economic indicators and discusses some individual indicators that are used in Kentucky.

Finally, Dr. Christopher J. Waller, the Gatton Chair of Macroeconomics and Monetary Theory, looks back at the U.S. economy during 1999, noting that the year saw a continuation of the tremendous expansion of the U.S. economy despite rising oil prices and fears of a stock market "bubble." He sees 2000 as continuing this expansion, as the Federal Reserve seeks to take a low profile during a presidential election year.

The past year was again very successful for the Center for Business and Economic Research. Perhaps our most significant accomplishment was the release of our two-year study entitled *Long-Term Trends in the Kentucky Economy*. This collaboration with the Kentucky Governor's Office for Economic Analysis looked at important factors in the Kentucky economy over the past 30 years and provides information on Kentucky's population, education, employment, earnings, and other measures during this time period. We also look ahead to the future and provide some scenarios for the future that Kentucky could encounter. This publication received wide coverage in the press and we were pleased when it was selected as the Best Publication of the Year by the Association of University Business and Economic Research (AUBER).

In addition to our coverage of the past, present, and future Kentucky economy, we also conducted several research projects for various clients. We examined different options for providing health insurance benefits to some uninsured and low-income populations in Kentucky for the Kentucky Cabinet for Health Services and looked at the economic effects of coal mining on Kentucky's Black Mountain. We also conducted a survey of small business owners in Kentucky for the Kentucky Small Business Development Center and released a study of the economic impacts of the proposed container deposit legislation in Kentucky.

Mark C. Berger

Center for Business and Economic Research

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The Center for Business and Economic Research (CBER) is the applied economic research branch of the Carol Martin Gatton College of Business and Economics at the University of Kentucky. Its purpose is to disseminate economic information and provide economic and policy analysis to assist decision makers in Kentucky's public and private sectors. In addition, CBER performs research projects for federal, state, and local government agencies, as well as for private-sector clients nationwide. The primary motivation behind CBER's research agenda is the belief that systematic and scientific inquiries into economic phenomena yield knowledge which is indispensable to the formulation of informed public policy.

CBER's research includes a variety of interests. Recent projects have been conducted on manpower, labor, and human resources; transportation economics; health economics; regulatory reform; public finance; and economic growth and development. In addition to the *Kentucky Annual Economic Report*, CBER publishes a quarterly newsletter, *Kentucky Business and Economic Outlook,* which contains quarterly forecasts for the Kentucky economy as well as other business and economic issues. CBER also publishes the *Carol Martin Gatton College of Business and Economics Working Papers*, which report the results of current research by college

faculty, and *Growth and Change*, a scholarly, refereed journal of urban and regional policy with international distribution.

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Steven N. Allen is a research associate at the Center for Business and Economic Research at the University of Kentucky. Mr. Allen received a M.A. in economics in 1998 and a B.A. in history in 1996, both from the University of Kentucky. Since coming to the Center in 1995, he has worked on a variety of applied economic projects in Kentucky, including studies of the proposed Interstate 66 project, the economic impact of the arts in Kentucky, the deregulation of the electric utility industry, and many other projects. For the past three years, he also has served as managing editor of the *Kentucky Annual Economic Report*.

Dr. Mark C. Berger

Dr. Mark C. Berger is the Director of CBER and William B. Sturgill Professor of Economics at the University of Kentucky. Dr. Berger received a Ph.D. in economics from The Ohio State University in 1981. He has conducted applied economic research studies on a variety of subjects including higher education, health issues, human capital, the earnings and employment of workers, and the estimation of the demand for electricity. He has received research funding from a variety of public and private sources, including the U.S. Small Business Administration, the National Science Foundation, the National Institutes of Health, the U.S. Department of Labor, and several Kentucky state government agencies. Dr. Berger's research has been published in some of the leading journals in economics and public policy, including *American Economic Review*, *Journal of Political Economy*, *Review of Economics and Statistics*, *Industrial and Labor Relations Review*, and the *Journal of Human Resources*.

Dr. Glenn C. Blomquist

Glenn C. Blomquist is the Carl F. Pollard Professor of Health Economics, Professor of Economics and Public Policy, and Chairman of the Department of Economics at the University of Kentucky. He is a graduate of Ohio Wesleyan University, B.A., Ohio State University, M.A., and the University of Chicago, Ph.D. His areas of interest are health economics, environmental economics, urban economics, and public policy. He has published in journals such as: *Journal of Political Economy, American Economic Review, Journal of Risk and Uncertainty, Journal of Health Economics, Journal of Environmental Economics and Management, and Journal of Urban Economics*. His work has been published by the Brookings Institution and National Academy of Sciences, and he has received grants from the National Science Foundation, U.S. Environmental Protection Agency, Urban Institute and Kentucky Cabinet for Natural Resources and Environmental Protection. He has been a visiting professor at the Centre for Health Economics at the Stockholm School of Economics, visiting Fulbright Scholar at the Swedish Road and Traffic Research Institute and visiting scholar at the University of Chicago.

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Jonathan Fisher is a doctoral student in the Department of Economics at the University of Kentucky. Mr. Fisher received his M.S. in economics from the University of Kentucky in 1999 and his B.A. in economics from Alma College in 1997.

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Greg Harkenrider

Greg Harkenrider is an economist with the Governor's Office of Economic Analysis (formerly OFMEA) in Frankfort. His principal responsibilities include revenue estimation and forecasting. Mr. Harkenrider received his M.A. in economics at the University of Tennessee in 1992 and is completing work on his doctoral dissertation. After working as a research associate at the University of Tennessee's Center for Business and Economic Research for five years, he joined the revenue estimating staff of OFMEA in 1997. His primary interests are in the areas of public finance, industrial organization, econometrics, and impact analysis.

Dr. William H. Hoyt

Dr. William H. Hoyt is Associate Professor of Economics at the University of Kentucky. He also has previously served on the faculty at Georgetown University. Dr. Hoyt received his Ph.D. in economics from the University of Wisconsin in 1986. His areas of research interest include tax policy and public finance. His research has been published in the *American Economic Review*, the *Journal of Urban Economics*, and the *Journal of Public Economics*. His work has also appeared in previous editions of the *Kentucky Annual Economic Report*, focusing on Kentucky's tax system in 1995 and welfare reform in 1997.

Dr. Eric C. Thompson

Dr. Eric C. Thompson is Associate Director of CBER and a Research Assistant Professor in the Department of Economics and CBER at the University of Kentucky. Dr. Thompson received his Ph.D. in agricultural economics from the University of Wisconsin in 1992. Previously, he was a Research Assistant Professor at the Center for Economic Research at West Virginia University and in the Community Economic Development Division of the West Virginia University Extension Service before coming to Kentucky in 1995. Dr. Thompson's expertise lies in the fields of economic forecasting and regional economics. He has conducted many studies on local and state economic development and currently maintains and updates the University of Kentucky State Econometric Model.

Dr. Christopher J. Waller

Dr. Christopher J. Waller is the Carol Martin Gatton Chair of Macroeconomics and Monetary Theory at the University of Kentucky and a Research Fellow of the Center for European Integration Studies at the University of Bonn. He received his B.S. from Bemidji State University (Minnesota) in 1981 and his Ph.D. from Washington State University in 1985. From 1985-1998 he was a faculty member at Indiana University. Dr. Waller has been a Visiting Professor at Washington University, the University of Mannheim, and the National University of Ukraine-Kiev. He has also served as a Visiting Scholar at the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of St. Louis. He has also served as a consultant to the Federal Reserve Bank of Cleveland. His research interests include monetary search models, the political economy of central banking, bargaining theory, and intranational banking integration.

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products or services online. While online sales still represent a small portion of these businesses' total sales, the overall view of online sales has been positive. Kentucky businesses also use the Internet for advertising, which should increase online and offline sales since many customers research products online but purchase goods offline. Also, the future of online sales in Kentucky looks promising. Growth of online sales should occur within firms as security and other concerns dissipate. Also, growth should occur as more Kentucky businesses begin online sales. Of those firms not currently selling online, almost one-quarter plan to sell online and over 40 percent may sell online in the future.

Eric C. Thompson

The Kentucky economy is forecast to see moderate to strong growth from 2000 through 2002. The rate of economic growth, however, is expected to slow relative to the past few years in both Kentucky and the nation. Real gross state product in Kentucky is forecast to grow at a 2.5 percent rate in 2000, while real total personal income is forecast to grow by 2.3 percent, total employment by 1.5 percent, and total population by 0.8 percent. For the entire 2000 to 2002 period, real gross state product is forecast to average 2.5 percent growth each year, compared to 2.1 percent annual growth for real total personal income. This strong rate of income growth will be fueled by strong gains in wage and salary earnings. Annual employment growth over the three-year period is forecast to average 1.3 percent, or 24,300 jobs each year. The services industry, forecast to add 11,600 jobs each year, is expected by itself to account for nearly half of this employment gain. The retail trade sector is forecast to add 5,100 jobs per year, while the manufacturing sector is forecast to lose 200 jobs per year on average from 2000 through 2002. The manufacturing industry, however, is forecast to account for roughly one-third of all growth in real gross state product.

Greg Harkenrider

Most states are constitutionally bound to submit and maintain a balanced budget. Since the state revenue bloodline flows from the pulse of the real economy, it becomes vitally important to properly measure the current and immediately pending short term state economy. This paper will illustrate the methodology employed in the development of a state model of leading and coincident economic indicators. The novel aspect of the Kentucky model lies in the link between the real and fiscal economies. Many state agencies have an interest in real economic variables only insomuch as these factors are used as exogenous inputs into state revenue forecasts. The job of translating an economic forecast (employment, personal income, etc) into a revenue forecast constitutes a second level of modeling, often done casually with rough elasticities. By including fiscal variables directly into the composite reference series, forecasters can preempt the classical problem of translating changes in the real economy into revenue impacts. Thus, the interpretation of the leading and coincident indices has an embedded revenue component that will provide direct, timely information about likely short-term revenue flows. These projections can then complement more extensive quarterly econometric models to give states a short and long view of the fiscal economy.

Christopher J. Waller

The U.S. economy continued its long growth march during 1999 despite a stumble in mid-year. Volatile gas prices, rising interest rates, and a negative savings rate were the headline makers. The Federal Reserve reversed its interest rate cuts in 1998 by raising the federal funds rate three times in 1999. The Fed also spent a lot of time worrying about an asset bubble in financial markets and whether or not they should prick it to avoid a larger collapse in the future. Internationally, Asia appears to have recovered from its financial crisis but the U.S. trade deficit continued along its explosive path. In this article, I review each of these events in detail, discuss why a bubble probably does not exist in the financial markets, and discuss why the Federal Reserve will take a low profile in the coming year.

Kentucky's Per Capita Income: What Should be the Goal?

Mark C. Berger and Glenn C. Blomquist

We investigate the effects of cost of living and quality of life differences across states on per capita income rankings. We recalculate Kentucky's per capita income relative to the U.S. average after adjusting for cost of living and quality of life differences across states. This analysis allows us to adjust Governor Patton's long-term goal for Kentucky's per capita income relative to U.S. per capita income. We find that after taking into account Kentucky's cost of living and quality of life, the state needs only to reach 92 percent of the U.S. per capita income to be equivalent in real terms. This occurs because Kentucky has a combination of lower cost of living and higher quality of life than the typical U.S. This revised goal is more likely to be accomplished over the 20-year period originally set by Governor Patton than the original goal of 100 percent of U.S. per capita income.

Introduction

Kentucky Governor Paul E. Patton has put the goal of reaching the national average per capita income at the center of his economic agenda. Where does Kentucky stand now? In 1998, the U.S. average per capita income was $26,482, while Kentucky's per capita income was $21,551, or 81.4 percent of the U.S. average. Figure 1 shows the trends in the ratio of Kentucky's per capita income to the U.S. average since 1970. After gaining ground in the 1970s and losing it all back in the early 1980s, Kentucky's per capita income started converging toward the national average in the late 1980s and early 1990s. Over the middle-to late-1990s, Kentucky's per capita income has remained relatively stable relative to the U.S. average.

Berger (1997) provides evidence that per capita incomes across states have been converging over the long term, consistent with the convergence theory of Barro and Sala-I-Martin (1992). Convergence of incomes could take place due to high returns to capital in areas with low income levels or simply due to the migration of businesses to low-wage and low-income states and the migration of workers to high-wage and high-income states. But there are at least two reasons to believe that full convergence of incomes across states would never take place. First, there are likely to be cost-of-living differences across states that would leave incomes unequal even in the long run. Second, there may be differences in quality of life as measured by variables such as air and water quality, crime, schools, and the like. These location-specific quality of life differences may also prevent a full convergence of incomes across states.

In this paper, we investigate the effects of cost of living and quality of life differences across states on per capita income rankings. We recalculate Kentucky's per capita income relative to the U.S. average after adjusting for cost of living and quality of life differences across states. This analysis allows us to adjust Governor Patton's long-term goal for Kentucky's per capita income relative to U.S. per capita income. We find that after taking into account Kentucky's cost of living and quality of life, the state needs only to reach 92 percent of the U.S. per capita income to be equivalent in real terms. This occurs because Kentucky has a combination of lower cost of living and higher quality of life than the typical U.S. state. Our analysis provides a more accurate yardstick by which to measure progress toward Governor Patton's goal than has been available previously.

Which National Average?

Cost of living differences across states could potentially be important in evaluating per capita income differences if the prices of goods and services vary widely from place to place. For example, if

FIGURE 1

Per Capita Income in Kentucky Relative to the U.S. Average, 1969-1998

Source: Regional Economic Information System (REIS).

be just as well off as they would be with higher incomes in colder areas. If high crime rates are a disamenity, then individuals will need higher incomes to locate in areas with more criminal activity. These quality of life differences illustrate why per capita incomes may never fully converge, even if the well-being of individuals were identical across states after accounting for quality of life differences.

Empirical estimates of quality of life across geographic areas come from the theoretical models of compensating differentials of Rosen (1979), Roback (1982), Blomquist, Berger, and Hoehn (1988), and Gyourko and Tracy (1991). Rosen (1979) and Roback (1982) consider quality of life differences across only a limited number of cities, making state-by-state comparisons impossible. Gyourko and Tracy (1991) rank 130 cities, again not enough for state-by-state comparisons.

Blomquist, Berger, and Hoehn (1988) estimate dollar values of quality of life across 253 U.S. counties. These counties can be aggregated up to the state level to investigate state-by-state differences in quality of life. Greenwood, Hunt, Rickman, and Treyz (1991) aggregate the Blomquist, Berger, and Hoehn (1988) estimates to the state level. Their own state rankings indicate that Kentucky's income would be 92.89 percent of the national average in equilibrium, indicating that its residents would be willing to accept 7.11 percent lower earnings or pay higher prices to consume the amenities in Kentucky. Kentucky was 23rd out of the 50 states and District of Columbia in the overall quality of life ranking. While not reporting dollar or relative income quality of life income estimates, Gabriel, Mattey, and Wascher (1996) do report rankings of states by quality of life in 1981 and 1990.

food, clothing, and transportation are more expensive in one area than in another, it will take a lower income to be just as well off in the less expensive area.

In general, cost of living differences appear to exist across states in the United States. McMahon (1991) examines cost of living differences across states from 1981 to 1990. In 1981, cost of living across states varied from 90.51 percent of the national average (Wyoming) to 121.66 percent of the national average (Alaska). McMahon also found that Kentucky's cost of living in 1981 was 95.03 percent of the national average. By 1990, cost of living varied from 88.21 percent (Utah) to 136.17 percent (Hawaii) of the national average, with Kentucky's cost of living at 91.63 percent of the national average. McMahon's study illustrates that it may be very important to adjust per capita income levels by cost of living before making state-by-state comparisons or comparing Kentucky's per capita income to the national average.

Similarly, quality of life differences across states could be important because per capita income does not reflect location-specific amenities and disamenities that are not traded explicitly in the market. Thus, for example, if warm weather is an amenity, then in places like Florida, individuals will accept lower incomes to live in warmer weather, and

In one set of estimates, Kentucky ranked 23rd out of the 50 states in 1981 and 24th in 1990, while in the other set, Kentucky ranked 24th in 1981 and 22nd in 1990.

Berger (et. al.) (1999) also aggregate the Blomquist, Berger, and Hoehn (1988) quality of life estimates for Kentucky, the states contiguous to Kentucky, the southeast states, and the overall U.S. average. They find that Kentucky's quality of life exceeds the contiguous states, slightly exceeds the national average, and is below that of the southeast states. In addition, important components of quality of life indexes have been improving in Kentucky relative to the contiguous states, the southeast states, and the rest of the country. Kentucky's crime rate, school quality, and environmental quality have all improved relative to other states, suggesting that Kentucky's quality of life ranking has improved since 1980, the year on which the Blomquist, Berger, and Hoehn (1988) estimates are based. This evidence, combined with the evidence of other studies, suggests that quality of life in Kentucky may be somewhat higher than the U.S. average, and thus raw per capita income figures may understate the well-being of Kentucky residents relative to the typical U.S. resident.

The results of earlier studies, along with simple economic reasoning, suggest that after adjusting for cost of living and quality of life, Kentucky's per capita income might be much closer to the national average per capita income than the published figures indicate. In the next section, we describe the data and methodology that we will use to adjust the published per capita income statistics for cost of living and quality of life differences across states.

Adjusting Per Capita Income

Data

The three basic ingredients to complete the analysis in this study are data on per capita incomes by state, cost of living by state, and quality of life by state. We describe the sources for each type of data in this section. Per capita income data by state from the Bureau of Economic Analysis for 1998 are the latest available and are used as the raw income measures in this study.

Obtaining data on cost of living and quality of life by state is not as straightforward. The Bureau of Labor Statistics stopped estimating cost of living across metropolitan areas in 1981, and its Consumer Price Index (CPI) for various geographic areas measures price changes over time for given areas but not cross-sectional price differences (McMahon, 1991). The most widely used source of data for cross-sectional price differences is the American Chamber of Commerce Research Association (ACCRA) Cost of Living Index for selected cities and rural areas.

The ACCRA Cost of Living Index provides quarterly relative price information for over 300 urban areas and some non-metropolitan areas. Along with an overall index, there are separate indexes for six components: housing, utilities, groceries, transportation, health care, and miscellaneous goods and services. The index is cross-sectional in nature; the overall U.S. average is indexed to 100, and the individual area prices are expressed relative to the U.S. average. The data are reported quarterly. In order to obtain an annual index for 1998, we average the indices across the quarters that are reported for a particular area. We obtain state price indices from the city and county indices by taking a population-weighted average of all of the individual indices in a state. Our state price index is constructed omitting housing costs because prices for housing vary across regions in part because of quality of life differences across regions. Some states are not represented in the ACCRA Index in 1998. For these states, we estimate the cost of living using the index value for a neighboring state.

Blomquist, Berger, and Hoehn (1988) contain the most comprehensive set of data available for the construction of state quality of life income adjustments. Other studies contain too few geographic areas or publish only state rankings and not dollar quality of life values. The drawbacks to the Blomquist, Berger, and Hoehn (1988) estimates are that they are based on 1980 data while the income and cost of living data are for 1998 and not all states have counties included in the analysis. We address the first problem by inflating the 1980 values to 1998 dollars using the CPI.

The Blomquist, Berger, and Hoehn (1988) index is based on climate, environmental quality, and local conditions variables. Climate is not likely to have changed very much over time. If the other

components change only slowly, the 1980 data may be a good approximation for current quality of life differences across states. We estimate the quality of life values for the few states not included in the analysis by using the index values for the closest state for which we have data, or using an average of the index values in surrounding states. Like Greenwood, Hunt, Rickman, and Treyz (1991), we construct our state quality of life values using population-weighted averages.

Methodology

We use a method to reestimate per capita income by state and to reevaluate Kentucky's per capita income relative to the national average per capita income that takes into account both cost of living and quality of life differences across states. Correcting for cost of living differences is relatively straightforward. We would simply adjust the raw per capita income figures for each state in 1998 by our estimated cost of living index for each state in 1998:

(1) $PCPI^*_{1998,j} = PCPI_{1998,j} / COLI_{1998,j}$ $j=1,...,51$,

where $PCPI^*_{1998,j}$ is the per capita income in state j in 1998 adjusted for cost of living.

Taking into account both cost of living and quality of life differences is somewhat more complicated. We adjust the raw per capita income figures for each state in 1998 by cost of living and quality of life using the following equation:

(2) $PCPI^{**}_{1998,j} = (PCPI_{1998,j} / COLI_{1998,j}) +$
    $((QOLI_{1980,j} / N_{1980,j})(CPI_{1998}/CPI_{1980}) / COLI_{1998,j})$ $j=1,...,51$,

where $PCPI^{**}_{1998,j}$ is the per capita income in state j in 1998 adjusted for both cost of living and quality of life. $COLI_{1998,j}$ is the state cost of living index for 1998 based on the ACCRA data without the housing cost component. $QOLI_{1980,j}$ is the measure of quality of life estimated by state using Blomquist, Berger, and Hoehn (1988). It is expressed in 1980 dollars per household. Thus, we must divide by average household size ($N_{1980,j}$) in 1980 to obtain an estimate of quality of life per person in the state. Because the quality of life estimates are expressed in 1980 dollars, we adjust them using the growth in the national

Consumer Price Index between 1980 and 1998 (CPI_{1998}/CPI_{1980}).

We use the cost of living index without housing costs (COLI) because the models of Roback (1982) and Blomquist, Berger, and Hoehn (1988) assume that quality of life differences across areas in part show up in housing prices. Thus, we take housing cost differences out of the cost of living index and let them show up as quality of life differences. In other words, one of the main reasons that housing prices might be higher in one area for a house with the same features is due to differences in the amenities that one may consume in the higher-priced area. Thus, quality of life differences are reflected in the prices of locally traded goods, of which housing is likely the most important.

Using equation (2) we can also solve for the raw per capita income Kentucky would have to reach to obtain parity with the rest of the nation, given our estimated cost of living and quality of life differences across states. This simply involves setting the lefthand side of each equation equal to the national average per capita income and solving for the raw per capita income in Kentucky that is consistent with an adjusted per capita income equal to the national average.

Results

Table 1 shows the 1998 Kentucky and United States unadjusted and adjusted per capita personal incomes. As reported in the Introduction, Kentucky's unadjusted per capita personal income stands at 81.4 percent of the U.S. average. After adjusting for cost of living and quality of living using

TABLE 1

Per Capita Income in Kentucky and the United States, 1998

	Unadjusted	Adjusted for Cost of Living and Quality of Life
Kentucky	$21,551	$23,369
United States	$26,482	$26,482
Ky./U.S. Ratio	0.814	0.882

Source: Bureau of Economic Analysis, U.S. Department of Commerce and authors' estimates.

TABLE 2

State Per Capita Income Rankings Relative to the U.S. Average: Unadjusted and Adjusted for Cost of Living and Quality of Life, 1998

Rank	State	Unadjusted Ratio	Rank	State	Adjusted Ratio
1	Connecticut	1.424	1	District of Columbia	1.320
2	District of Columbia	1.409	2	Connecticut	1.312
3	New Jersey	1.282	3	Maryland	1.200
4	Massachusetts	1.242	4	Colorado	1.184
5	New York	1.196	5	Massachusetts	1.157
6	Maryland	1.134	6	Illinois	1.131
7	Delaware	1.130	7	Washington	1.112
8	New Hampshire	1.103	8	Delaware	1.107
9	Illinois	1.094	9	Virginia	1.098
10	Colorado	1.088	10	New Hampshire	1.068
11	Washington	1.060	11	Minnesota	1.047
12	Minnesota	1.045	12	Nebraska	1.045
13	California	1.041	13	Nevada	1.037
14	Virginia	1.038	14	Kansas	1.033
15	Nevada	1.033	15	Florida	1.023
16	Rhode Island	1.017	16	New Jersey	1.020
17	Pennsylvania	1.015	17	Georgia	1.015
18	Hawaii	0.990	18	California	1.012
19	Michigan	0.981	19	Texas	1.000
20	Florida	0.979	20	Wisconsin	0.998
21	Alaska	0.973	21	Indiana	0.996
22	Ohio	0.953	22	Tennessee	0.987
23	Wisconsin	0.951	23	North Carolina	0.983
24	Georgia	0.948	24	Ohio	0.975
25	Kansas	0.946	25	Iowa	0.975
26	Texas	0.945	26	Pennsylvania	0.974
27	Nebraska	0.936	27	Michigan	0.974
28	Oregon	0.936	28	Oregon	0.962
29	Missouri	0.923	29	New York	0.955
30	Indiana	0.918	30	Missouri	0.955
31	Vermont	0.914	31	Rhode Island	0.949
32	North Carolina	0.911	32	Wyoming	0.944
33	Iowa	0.907	33	Arizona	0.917
34	Tennessee	0.892	34	South Dakota	0.911
35	Wyoming	0.877	35	Vermont	0.899
36	Arizona	0.874	**36**	**Kentucky**	**0.882**
37	Maine	0.869	37	Arkansas	0.876
38	South Dakota	0.838	38	Oklahoma	0.871
39	North Dakota	0.820	39	South Carolina	0.865
40	**Kentucky**	**0.814**	40	North Dakota	0.863
41	Alabama	0.812	41	Hawaii	0.862
42	South Carolina	0.808	42	Alabama	0.859
43	Louisiana	0.808	43	Louisiana	0.858
44	Utah	0.797	44	Idaho	0.857
45	Idaho	0.796	45	Maine	0.844
46	Oklahoma	0.795	46	Utah	0.839
47	Arkansas	0.770	47	Alaska	0.836
48	Montana	0.765	48	Mississippi	0.809
49	New Mexico	0.756	49	New Mexico	0.789
50	West Virginia	0.732	50	West Virginia	0.786
51	Mississippi	0.717	51	Montana	0.765

Note: Each state's per capita income is expressed as a ratio of the U.S. average per capita income.
1.00 indicates that the state's per capita income is equal to the U.S. average per capita income in 1998.

equation (2), however, Kentucky's per capita income increases to 88.2 percent of the U.S. average. Note that the U.S. average does not change after adjusting for cost of living and quality of life. This is true by definition. The state-by-state cost of living and quality of life adjustments have been rescaled so that the average person in the United States has a cost of living index of 100 and a quality of life index of zero dollars.

Table 2 provides state rankings of unadjusted and adjusted per capita personal incomes relative to the national average. In the unadjusted ranking, Connecticut has the highest per capita income relative to the national average (1.424) while Mississippi has the lowest (0.717). Kentucky's relative per capita income of 0.814 places it 40th among the states and the District of Columbia. After adjusting for cost of living and quality of life, the District of Columbia has the highest per capita income relative to the U.S. average (1.320) and Montana has the lowest (0.765). The spread in relative incomes between the highest and lowest ranked states shrinks after adjusting for cost of living and quality of life. Thus, the highest-ranked states using unadjusted

per capita income have some combination of higher cost of living and lower quality of life than other states. The reverse is true at the bottom. These states have lower cost of living or higher quality of life than other states.

After adjusting for cost of living and quality of life, Kentucky's ranking improves from 40th to 36th. Most of the improvement is due to the fact that Kentucky's cost of living is lower than the national average. Its quality of life index, while above that of surrounding states, is only slightly different from the national average. Thus, the quality of life adjustment has only a small effect and the cost of living adjustment has a relatively large effect.

There are many states that move more places in the overall ranking than does Kentucky after the adjustments have been made. For example, New Jersey falls from 3rd to 16th and New York falls from 5th to 29th, primarily due to high cost of living. Other states that fall in the ranking because of high cost of living include California (13th to 18th), Rhode Island (16th to 31st), Pennsylvania (17th to 26th), Hawaii (18th to 41st), Alaska (21st to 47th), and Maine (37th to 45th). Some states like Michigan (19th to 27th) fall in the ranking primarily because of low quality of life. On the other hand, some states improved their ranking because of relatively high quality of life. These include Colorado (10th to 4th), Virginia (14th to 9th), Florida (20th to 15th), Georgia (24th to 17th), and North Carolina (32nd to 23rd). Finally, several states improved their ranking due to relatively low cost of living, much like Kentucky. Among these are Kansas (25th to 14th), Texas (26th to 19th), Nebraska (27th to 12th), Indiana (30th to 21st), Iowa (33rd to 25th), Tennessee (34th to 22nd), Oklahoma (46th to 38th), and Arkansas (47th to 37th).

TABLE 3

Alternative Goals for Kentucky's Per Capita Income in 2015

	Percent of National Average Per Capita Income
Governor Patton's Original Goal	100 %
Governor Patton's Original Goal Adjusted for Cost of Living and Quality of Life	92%

Using equation (2), we can also recalculate Kentucky's per capita income goal relative to the U.S. average after adjusting for cost of living and quality of life. This new goal tells us how high Kentucky's unadjusted per capita income must increase in order to be equivalent to the national average after taking into account cost of living and quality of life. This revised goal assumes that Kentucky's cost of living and quality of life relative to the U.S. average remains unchanged.

Table 3 shows Governor Patton's original goal and the revised goal adjusting for quality of life and cost of living. Governor Patton's original goal was that Kentucky's per capita income reach 100 percent of the U.S. average by 2015. The adjusted goal is 92 percent of the U.S. average by 2015. If Kentucky were to reach that level, its per capita income would be equal to the national average, after taking into account cost of living and quality of life.

Conclusion

This paper provides evidence that Kentucky has a combination of lower cost of living and higher quality of life than the national average. When cost of living and quality of life are taken into account, Kentucky's per capita income is closer to the national average than was originally thought. Put another way, Governor Patton could revise his goal from Kentucky's reaching 100 percent of the national average per capita income to 92 percent of the national average. Our analysis suggests that if Kentucky were to reach 92 percent of the national average its income would be equivalent in real terms, i.e., after taking into account differences in cost of living and quality of life. If Kentucky were to reach 100 percent of U.S. per capita income, its real income would actually be above, not equal to, the national average.

This gives us new perspective on what Kentucky must do to make its citizens as well off as residents in other states. In 1998, Kentucky's per capita income stood at 81.4 percent of the national average. If Kentucky wanted to reach the national average by the year 2015 (20 years after Governor Patton took office), it would require that the gap close by 1.094 percent per year. As Berger (1997) points out, a convergence rate of 0.45 to 0.60 percent per year is more in line with data during past periods

of convergence. If we use 92 percent as the goal for parity with the national economy, then Kentucky needs to close the gap by 0.62 percent per year. While this will still be a difficult task, it is more in line with historical data than a scenario in which Kentucky would have to reach 100 percent of the U.S. per capita income by 2015.

Our analysis suggests that while Kentucky has a long way to go to reach national income parity, it does not have as far to go as was originally thought. The revised goal is more reasonable and more likely to be accomplished over the 20-year period originally set out by Governor Patton than the original goal of 100 percent of U.S. per capita income.

References

Barro, Robert J. and Xavier Sala-I-Martin,"Convergence," *Journal of Political Economy* 100:2 (April 1992): 223-251.

Berger, Mark C., "Kentucky's Per-Capita Income: Catching Up to the Rest of the Country," *Kentucky Annual Economic Report, 1997,* 1-8.

Berger, Mark C. (et. al.), *Long-Term Trends in the Kentucky Economy,* Center for Business and Economic Research, University of Kentucky, 1999.

Blomquist, Glenn C., Mark C. Berger, John P. Hoehn, "New Estimates of Quality of Life in Urban Areas," *American Economic Review* 78:1 (March 1988): 89-107.

Gabriel, Stuart A., Joe P. Mattey, and William L. Wascher, "Compensating Differentials and Evolution of the Quality of Life Among U.S. States," University of Southern California, June 1996.

Greenwood, Michael J., Gary L. Hunt, Dan S. Rickman, and George I. Treyz, "Migration, Regional Equilibrium, and the Estimation of Compensating Differentials," *American Economic Review* 81:5 (December 1991):1382-1390.

Gyourko, Joseph and Joseph Tracy, "The Structure of Local Public Finance and the Quality of Life," *Journal of Political Economy* 99:4 (August 1991): 774-806.

McMahon, Walter W., "Geographical Cost of Living Differences: An Update," *AREUEA Journal* 19:3 (1991): 426-450.

Roback, Jennifer, "Wages, Rents and the Quality of Life," *Journal of Political Economy* 90:6 (December 1982): 1257-1278.

Rosen, Sherwin, "Wage-Based Indexes of Urban Quality of Life," in P. Mieszkowski and M. Strazheim (eds.) *Current Issues in Urban Economics,* Baltimore, MD, Johns Hopkins University Press, 1979, 74-104.

Expanding Health Insurance to the Uninsured in Kentucky: Estimating Participants and Costs

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Many states have recently offered health insurance benefits to low-income populations who have previously been uninsured or underinsured. This article describes a methodology that can be used to estimate the potential number of participants and costs for expanding health insurance to low-income populations in Kentucky. This process involves three main steps: 1) estimating the eligible population based upon specific eligibility criteria, 2) applying a participation, or "takeup," rate to the eligible population to determine how many eligible persons actually participate in the program, and 3) applying per person cost estimates to obtain an overall estimate of the total program cost. I use a combination of national and Kentucky-specific data on the number of uninsured, takeup rates, and health benefit costs to provide estimates for expanding health insurance to certain low-income populations in Kentucky. I also discuss other factors that must be considered, such as the "crowding out"of private insurance, varying costs over time, and consideration of federal matching dollars if programs are implemented as Medicaid expansions.

Introduction

During the 1990s, many states in the U.S. have initiated or have studied programs that would offer some health care benefits to individuals who previously did not have health insurance coverage. The rising costs of health insurance have prevented some people from purchasing health insurance, and many of these programs have emerged at the state level to provide coverage to low-income individuals. Indeed, about 20 percent of the adult (ages 19 to 64) population in the United States had no health insurance in 1998. In Kentucky, this percentage was slightly lower, with about 17.6 percent of the adult population having no health insurance.[1]

Providing health care benefits to even a small portion of this uninsured population can be very costly. Costs for medical care in general have risen dramatically during the 1990s. In the U.S., costs for medical care on average have risen by about 63 percent since 1990 while the overall increase in inflation during the same period has been only about 32 percent.[2] In addition, individuals who have been without health insurance for an extended period of time may be less healthy on average than those with health insurance. As a result, they may require more health care services when they do enroll in a state

program and incur greater costs than if they had prior health insurance coverage.

The following analysis will describe a methodology that can be used to estimate the number of participants and associated costs for a general program that would expand health care benefits to previously uninsured individuals. The focus here is not so much on the specific nature or details of any hypothetical program, but more on the different steps required to estimate the number of participants and costs. Although the analysis here will use some information and data that are specific to Kentucky, many of the issues addressed would be applicable to other states as well.

Estimating the number of participants and costs is important for several reasons. First, policymakers often need information on how many individuals a program will cover and how much that program will cost. How many people are without health insurance in Kentucky and how many would be affected by expanded health insurance programs? How much would it cost to cover these persons? Second, many programs of this type are implemented in steps, usually based on income levels. For example, there may be sufficient funds to cover only individuals whose income places them below the Federal Poverty Level (FPL). Policymakers, then, will need to know how many

people are eligible under these criteria. In addition, making accurate estimates of participants and costs will also lessen the possibility that these programs may run short of funds, potentially resulting in enrollment limits or other types of restrictions.

Overview of Procedure

Determining the number of participants and their costs proceeds in three main steps: 1) Estimating the *eligible* population, or those individuals who could potentially participate in the program, 2) Applying a participation or "takeup" rate to the eligible population to estimate the *participating* population, or those eligible individuals who actually enroll in a program, and 3) Applying per person health care costs to the participating population to estimate the total costs for providing coverage to these individuals. Each of these steps is explored in more detail below.

Determining the Eligible Population

Estimating the number of individuals who would be eligible for a health care benefits expansion is the first and often the most difficult task. Depending on how a program is structured, data might be needed on the population's insurance status, income, assets, health status, or labor market information. Finding a consistent and current data source that provides even some of this information presents a substantial challenge. There are several data sources that ask about one or more of these types of information but relatively few that have data on all.

Using the
Current Population Survey (CPS)

Most estimates of the uninsured population in the United States come from the Current Population Survey (CPS). The CPS is a monthly, nationwide survey of about 50,000 households conducted by the Census Bureau and the Bureau of Labor Statistics that asks respondents a variety of questions on employment, income, and other topics. During

March of each year, respondents are also asked about their health insurance coverage during the previous year. These questions, combined with demographic and income data, provide a current description of the population's health insurance status broken down by a number of factors, such as age, gender, and income.

There are several advantages in using the CPS for estimates of the uninsured population. First, the CPS is a large national survey that is conducted each year. Data collected in March are released the following October, so the CPS provides a timely description of health insurance coverage. Second, data on some health insurance information are available back to 1980 so it is possible to look at how the health insurance status of the population has changed over time. And finally, since the CPS is a representative nationwide survey, it is possible to perform comparisons across different states.

At the same time, the CPS, like any data source, has some limitations. Even though approximately 50,000 households are surveyed, sample sizes become small at the state level, especially when looking at different demographic characteristics of the population. Furthermore, there is considerable debate as to how respondents answer the questions on health insurance. The CPS asks whether respondents had health insurance coverage *at any time* during the previous year. Respondents are not asked if they do not have health insurance; rather, the uninsured population is simply those respondents who do not indicate any type of health insurance coverage. Some researchers believe that many respondents do not correctly interpret these questions and instead provide their *current* health insurance coverage, which may or may not be the same as their coverage last year. Since individuals are more likely to be covered at any one time during a year, as opposed to a specific point in time, many analysts believe the estimates of health insurance coverage are lower than the real values. Since the uninsured are calculated as a residual of those who do have insurance, then this would produce a higher uninsured population than is actually the case.[3]

Differences in Health Insurance Status by Income Level

The CPS, unlike many surveys, provides data on the family incomes of the population. The importance of data on the population's income is crucial to an analysis of the uninsured population. Typically, estimates of the uninsured population are provided at a certain percentage of the Federal Poverty Level (FPL), a measure which accounts for how much income is needed to support a family of a certain size (including parent(s) and any children). Table 1 shows the most current annual income amounts for Federal Poverty Levels of 50 percent, 100 percent, 150 percent, and 200 percent, and for family sizes of one to five persons. As can be seen, a family of three needs to earn $13,880 in annual income to stay above the Federal Poverty Level. Even a single person with no dependents who is at 200 percent of the FPL only earns $16,480 per year.

TABLE 1

Federal Poverty Levels (FPL) by Family Size

	1 Person	2 Persons	3 Persons	4 Persons	5 Persons
50%	$4,120	$5,530	$6,940	$8,350	$9,760
100%	8,240	11,060	13,880	16,700	19,520
150%	12,360	16,590	20,820	25,050	29,280
200%	16,480	22,120	27,760	33,400	39,040

Source: *Federal Register*, Volume 64, No. 53, March 18, 1999, Notices.

Individuals at lower income levels are much more likely to be uninsured than those at higher income levels, as shown in Tables 2-4. These tables use the CPS to show the health insurance status of individuals age 19 to 64 in Kentucky, the United States as a whole, states contiguous to Kentucky, and states in the southeast U.S.[4] Table 2 shows the insurance status for persons at all income levels, Table 3 shows the insurance status for persons with family incomes less than 200 percent of the Federal Poverty Level, and Table 4 shows the insurance status for persons with family incomes less than 100 percent of the Federal Poverty Level.

As Table 2 shows, employers provide the majority of health insurance to persons of working age. About 62.0 percent of health insurance in

TABLE 2

Health Insurance Status for Persons Ages 19 – 64 in Kentucky and Comparison Regions, 1996 - 1998

	Employer	Individually Purchased	Government	Uninsured
Kentucky	62.0%	3.9%	16.5%	17.6%
United States	63.4	5.7	11.6	19.3
Southeast states [1]	61.8	5.2	14.2	18.9
Contiguous states [2]	67.9	5.2	11.5	15.4

1. Alabama, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee.
2. Illinois, Indiana, Missouri, Ohio, Tennessee, Virginia, and West Virginia.

Source: Author's calculation from the pooled 1997 - 1999 March Current Population Survey (CPS).

Kentucky is employer-provided compared to 63.4 percent in the U.S., 67.9 percent in the contiguous states, and 61.8 percent in the southeast states. About 3.9 percent of Kentucky residents have individually purchased insurance, with the other regions averaging about five percent. Kentucky has a higher percentage of persons with government insurance (including Medicaid and military health insurance), 16.5 percent, compared to only 11.6 percent in the U.S. as a whole. Finally, about 17.6 percent of Kentucky's population has no health insurance, which is lower than the U.S. (19.3 percent) and southeast states (18.9 percent) but higher than the contiguous states (15.4 percent).

When the analysis is restricted to persons with family incomes of less than 200 percent of the Federal Poverty Level, the percentage of the population with no health insurance doubles. Table 3 shows that 34.7 percent of persons with family income less than 200 percent of the FPL have no insurance, compared to 38.4 percent in the U.S., 37.0 percent in the southeast states, and 32.4 percent in the contiguous states. In addition, the percentage of this population with government insurance more than doubles in some cases, with 34.6 percent of Kentuckians in this group with government insurance, the highest of the four comparison groups. The percentage of this population with individually purchased insurance remains about the same, approximately five to seven percent, but the percentage of the population with employer-provided insurance drops dramatically. Compared to persons at all income levels, a lower percentage of individuals at the 200 percent and lower income levels will be employed and many of those who are employed do not have employer-provided

TABLE 3

Health Insurance Status for Persons Ages 19 – 64 in Kentucky and Comparison Regions, 1996 - 1998: Family Incomes Less than 200% of the Federal Poverty Level

	Employer	Individually Purchased	Government	Uninsured
Kentucky	25.0%	5.7%	34.6%	34.7%
United States	28.3	7.3	26.0	38.4
Southeast states [1]	29.2	6.4	27.4	37.0
Contiguous states [2]	31.5	7.4	28.7	32.4

1. Alabama, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee.
2. Illinois, Indiana, Missouri, Ohio, Tennessee, Virginia, and West Virginia.

Source: Author's calculation from the pooled 1997 - 1999 March Current Population Survey (CPS).

TABLE 4

Health Insurance Status for Persons Ages 19 – 64 in Kentucky and Comparison Regions, 1996 - 1998: Family Incomes Less than 100% of the Federal Poverty Level

	Employer	Individually Purchased	Government	Uninsured
Kentucky	9.6%	5.2%	47.4%	37.8%
United States	12.9	7.4	38.7	41.0
Southeast states [1]	13.8	7.1	43.2	35.8
Contiguous states [2]	12.9	7.4	37.0	42.7

1. Alabama, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee.
2. Illinois, Indiana, Missouri, Ohio, Tennessee, Virginia, and West Virginia.

Source: Author's calculation from the pooled 1997 - 1999 March Current Population Survey (CPS).

insurance. As can be seen, one-fourth of this population in Kentucky has employer-provided insurance, the lowest of any of the four groupings. About 28.3 percent of the U.S. as a whole in this population has employer-provided insurance, compared to 29.2 percent for the southeast states, and 31.5 percent for the contiguous states.

Finally, Table 4 restricts the analysis further by looking only at individuals with family incomes of less than 100 percent of the Federal Poverty Level. For this population, very few individuals have employer-provided insurance, while those with no insurance has remained about the same (as a percent of the population) compared to persons with incomes of less than 200 percent of the FPL. The difference is accounted for by the higher rate of government insurance. As also can be seen for Kentucky, about 37.8 percent of this population has no health insurance, compared to 41.0 percent for

the U.S., 35.8 percent for the southeast states, and 42.7 percent for the contiguous states. Almost one-half of this population in Kentucky has government insurance, the highest of the four groupings.

As these three tables illustrate, the rate of uninsurance is much higher at lower income levels. Many persons at these lower income levels are either unemployed and perhaps cannot afford insurance, while many who are employed are not in jobs that offer employer-provided insurance or perhaps are working part-time with no health care benefits.

Finally, Figure 1 provides a glimpse of how the percentage of the population with no health insurance has changed over time. This figure shows the percentage of the total adult population (ages 19 to 64) in Kentucky and the U.S. at all income levels with no health insurance from 1991 to 1999. Throughout this period, the rate of uninsurance is lower in Kentucky than in the U.S. as a whole, ranging from about 16 to 18 percent of the adult population, compared to about 17 to almost 20 percent for the adult population in the U.S. It is interesting to note that while the rate of uninsurance in the U.S. has remained steady and even risen in the past three years, it has actually declined slightly in Kentucky.

Other Potential Data Sources

Other sources of data exist, but none provide the timeliness and scope of the CPS. The Survey of Income and Program Participation (SIPP) is also a large, national survey that asks very detailed questions about health insurance and health conditions, providing a much richer source of information on the population's complete health status. In addition, the SIPP follows the same

<div style="color:white; background:#7a1f2b">**FIGURE 1**</div>

Percentage of Population Ages 19 – 64 without Health Insurance in Kentucky and the United States, 1990 - 1998

Source: Author's calculation from 1991 - 1999 March Current Population Survey (CPS).

Health Insurance Survey (KHIS) to provide estimates of the uninsured population in Kentucky, or the eligible population. Combining these two data sources will allow us to increase the sample size from which the uninsured estimates are drawn. Because the KHIS surveys residents only by telephone, I adjust for the fact that some people without telephones were not included in that survey. Because the CPS is conducted by in-person surveyers and has information on whether a household has a telephone, I adjusted the KHIS data using information from the CPS on households without tele-phones and without health insurance.

Tables 5 and 6 provide estimates of two groups of the Kentucky population and their health insurance status using the combined CPS / KHIS data. Table 5 shows estimates of the total number of individuals ages 19 to 64 with no health insurance while Table 6 shows estimates of the total number of individuals with individually purchased health insurance.[5] Each of these tables presents the information for five age groups: 19 - 29, 30 - 39, 40 - 49, 50 - 59, and 60 - 64, and for four different income levels: less than 100 percent of the FPL, 100 to 149 percent of the FPL, 150 to 199 percent of the FPL, and 200 percent and higher of the FPL.

As shown in Table 5, about 396,800 individuals ages 19 to 64 in Kentucky have no health insurance. About 132,000 of these persons, or about one-third of the total, have family incomes of less than 100 percent of the FPL while about another one-third have family incomes of 100 percent to 199 percent of the FPL. Many of these individuals come from younger age groups. About 139,000 people in this uninsured population are ages 19 to 29, with another 109,000 who are ages 30 to 39. Compared to persons in older age groups, persons in these younger age groups are less likely to be employed in jobs that provide health insurance and may be less likely to believe that they actually need health insurance. As

individuals over time for a given period, which provides a description of how their health insurance status may have changed. But the SIPP has a smaller sample size than the CPS and its following of people over time means that there is an approximately three-year delay in the collection and release of the data, making a current description impractical.

Many individual states have conducted surveys that focus on health insurance or that have questions on health insurance as part of a larger survey. The Robert Wood Johnson Foundation conducted its Family Health Insurance Survey in 1993 in 10 states. In Kentucky, the Legislative Research Commission (LRC) has conducted the Kentucky Health Insurance Survey (KHIS) since 1996. This survey covers approximately 2,000 individuals, asks about health insurance coverage, and oversamples the uninsured population to boost sample sizes. These data will be described and used in more detail below.

Combining Multiple Data Sources to Produce the Eligible Population

For this analysis, I will use a combination of the Current Population Survey (CPS) and Kentucky

TABLE 5

Persons Ages 19 – 64 with No Health Insurance in Kentucky: Combined Current Population Survey (CPS) / Kentucky Health Insurance Survey (KHIS)

			Age Group			
Federal Poverty Level[1]	19–29	30–39	40–49	50–59	60–64	Total
Less than 100%	37,504	45,056	31,206	13,313	4,794	131,873
100% – 149%	26,875	25,207	15,756	9,961	1,548	79,347
150% – 199%	16,920	13,301	10,618	4,120	1,933	46,893
200% and Above	57,553	25,661	30,881	19,674	4,917	138,686
Total	138,852	109,226	88,461	47,069	13,192	396,800

1. See Table 1 for a definition of the income ranges for each Federal Poverty Level.
Source: Kentucky Consensus Uninsured Working Group (Mark Berger and Steve Allen (CBER); Ginny Wilson and Mike Clark (Legislative Research Commission), November 1999, (actual estimates generated by Mike Clark of the Legislative Research Commission).

TABLE 6

Persons Ages 19 – 64 with Individually Purchased Insurance in Kentucky: Combined Current Population Survey (CPS) / Kentucky Health Insurance Survey (KHIS)

			Age Group			
Federal Poverty Level[1]	19–29	30–39	40–49	50–59	60–64	Total
Less than 100%	3,263	822	135	1,399	2,085	7,704
100% – 149%	5,419	1,694	1,930	1,976	1,067	12,085
150% – 199%	1,745	2,222	953	832	1,094	6,846
200% and Above	11,016	11,803	13,610	10,280	6,259	52,968
Total	21,443	16,540	16,628	14,487	10,505	79,603

1. See Table 1 for a definition of the income ranges for each Federal Poverty Level.
Source: Kentucky Consensus Uninsured Working Group (Mark Berger and Steve Allen (CBER); Ginny Wilson and Mike Clark (Legislative Research Commission), November 1999, (actual estimates generated by Mike Clark of the Legislative Research Commission).

200 percent or more of the FPL. Indeed, only about 26,600 persons have this type of insurance and have family incomes less than 200 percent of the FPL, with only about 7,700 persons having this type of insurance and a family income of less than 100 percent of the FPL.

Determining the Participating Population

Determining the eligible population is the first step in estimating the potential number of participants and costs for a health insurance expansion. For several reasons, many of those individuals who are eligible to participate in the program will not actually make use of the services. This requires the application of a participation, or "takeup," rate to the eligible population to determine the participating population, or those who are expected to receive benefits through the insurance program.

Individuals who are eligible for an insurance program may not

individuals age, they are more likely to develop health problems and may see a greater need to have health insurance, which is reflected in the lower number of uninsured persons in older age groups. Indeed, only 47,000 of uninsured individuals are ages 50 to 59 and only about 13,000 are ages 60 to 64.

Table 6 shows that substantially fewer people have health insurance that is purchased individually from private insurers. We look at this group in addition to those without health insurance because, since they pay all of their health insurance costs, they too might be the most likely to enroll in a state health insurance expansion. As shown in Table 6, about 79,600 individuals in Kentucky are estimated to have individually purchased health insurance, with the majority of these persons having family incomes of

participate for several reasons. First, the program may not be fully subsidized, so that participants must pay some kind of monthly premium or copayments for services, or some combination of the two. Some persons will pay the premium or copayments to receive coverage, but some persons, especially those at lower income levels, will not. Second, many people may not be aware that they are eligible for a certain program. They may not know about or understand the eligibility requirements for participation and hence do not participate. And finally, many individuals may elect not to participate because of a perceived "stigma" of public health insurance programs.

Applying an appropriate takeup rate is crucial to estimating appropriate costs. Indeed, substantially underestimating the expected

TABLE 7

Medicaid Participation Rates for Persons Ages 19 - 64 in Kentucky, the U.S., and Selected States, 1994 - 1995

State	Participation Rate
Kentucky	81.5%
United States	78.2%
Mississippi	88.9%
West Virginia	88.8
North Carolina	83.6
Georgia	79.7
Florida	75.8
Tennessee	74.6
South Carolina	71.0
Virginia	68.8
Maryland	65.8

Source: Urban Institute State-Level Databook, 1998.

TABLE 8

Estimated Participation Rates of Other State-Subsidized Health Insurance Programs (as of 1996)

State/Program	Estimated Participation Rate
Oregon Health Plan	64%
MinnesotaCare	50
New York Child Health Plus	48
Hawaii Health QUEST	41
Massachusetts Children's MSP	34
Delaware, Diamond State Health Plan	34
Pennsylvania CHIP	33
Tennessee, TennCare	26
Vermont Health Access Plan	22
California AIM	20
Washington Basic Health Plan	19
Florida Healthy Kids	11
Massachusetts MSP	10
Colorado Child Health Plan	10
New Jersey Health Access	3

Source: Debra J. Lipson and Stephen P. Schrodel, "State-Subsidized Insurance Programs for Low-Income People," Alpha Center, November 1996, p. 29.

participation rate could dramatically underestimate the potential costs. For example, a simple scenario is one in which the participation rate is expected to be about 40 percent of the eligible population. If it turns out that instead 80 percent of the eligible population participated in the program, then actual costs would be twice the costs that had been estimated.

Takeup Rates from the Medicaid Program

Unfortunately, there is very little empirical information on participation rates for health insurance programs. For reasons that have been discussed above, estimating the number of people who are eligible for a given program can be as difficult as estimating the number of uninsured persons (and in many cases, they may be the same estimate). Some estimates of participation rates do exist in the literature, however. The Urban Institute State-Level Databook for 1998 provides estimates of participation rates in Medicaid programs for persons ages 19 to 64 from 1994-1995. Participation rates for Kentucky, the U.S., and some additional states are shown in Table 7. Even though most Medicaid participants receive entirely free health

care benefits, in no state is the participation rate 100 percent or even above 90 percent. In Kentucky, it is estimated that about 81.5 percent of the eligible population participates in Medicaid compared to the national average of 78.2 percent. In Mississippi and West Virginia, almost 89 percent of the eligible population participates in Medicaid while in Virginia and Maryland, less than 70 percent of the eligible population participates in the program.

Takeup Rates from Other State Programs

Table 8 provides some additional participation rates, as of 1996, for several health insurance expansion programs in other states, including some programs for adult individuals and some programs under the Children Health Insurance Program (CHIP), which many states had implemented by 1996. The estimated participation rates for these programs are much lower than those for the Medicaid program, in part because many programs require some form of participant contribution, such as a premium or copayment for services. Moreover, some of these programs have only recently been implemented, while the Medicaid program has a long history of over 30 years. As Table 8 shows, the

participation rates vary widely, from about 64 percent of the eligible population in the Oregon Health Plan down to only three percent for New Jersey Health Access. Most programs, however, have participation rates somewhere in the middle, ranging from about 20 percent to 40 percent of the eligible population.

Finally, even the use of existing takeup rates must be done cautiously. It is likely that a takeup rate from another program will come from a population that is different in some ways from the population that is eligible for a proposed program. These differences—in age, gender, income level, health status, or other factors—could have significant implications in determining how many people participate in the program. Moreover, the financial structures of programs must be examined closely when applying takeup rates to other programs. A program that provides essentially free service will likely have a higher takeup rate than a program that requires premiums and/or copayments from participants. All of these factors must be considered when applying existing takeup rates to proposed programs.

Determining Per Person Costs

Once the participating population has been determined, the next step is to apply a per-person cost estimate. These costs will depend a great deal on the type of program that is implemented. For instance, a program that offers almost complete coverage for health care, such as with Medicaid, will cost more than a program that only offers limited benefits, such as basic hospitalization insurance. Several sources of potential costs are available, such as using current Medicaid costs or premiums charged in the private insurance market, but these costs must be used very carefully. As a whole, uninsured persons may have substantially different characteristics than persons who are currently receiving health care benefits, either through a government program or through a private insurer.

Costs from the Medicaid Program

One of the most attractive sources of cost data is costs for Medicaid services. Medicaid provides health care benefits to a largely low-income population, and most state health insurance expansions would also cover primarily low-income persons. A potential drawback is that a state health insurance expansion to uninsured persons may not provide the same level of coverage provided by Medicaid, so that costs estimated using these costs may overstate the actual costs. Table 9 provides some information on average Medicaid costs in Kentucky. This table shows the per member per month (PMPM) costs for Medicaid recipients in various categories for fiscal years 1995 and 1996. We have updated the costs to July 1999 using the U.S. Health Care Consumer Price Index. These average costs are calculated from the database of charges incurred by Kentucky Medicaid recipients for various health care services, including inpatient and outpatient hospital services, primary care clinics, dental care, and pharmacy costs.

The table provides average monthly costs for five Medicaid categories. These include persons in the Aid to Families with Dependent Children (now Temporary Assistance to Needy Families) program, foster children, medically needy coverage limited to pregnant women and children, and persons receiving Supplemental Security Income (both with and without Medicare). Average costs for the AFDC/TANF category were about $117 in both

TABLE 9

Per Member Per Month Costs for Medicaid Recipients in Kentucky, FY 1995, FY 1996, and July 1999 (estimated)

Medicaid Category	FY 1995	FY 1996	July 1999 (estimated) [1]
AFDC / TANF [2]	$117.09	$116.53	$130.18
Foster children	145.67	146.19	162.63
SOBRA [3]	145.59	146.44	162.73
Supplemental Security Income (SSI) with Medicare	116.53	111.42	127.02
Supplemental Security Income (SSI) without Medicare	387.26	395.28	436.06

1. Projected from FY 1996 to July 1999 using the U.S. Health Care Consumer Price Index.
2. Aid to Families with Dependent Children (AFDC), now Temporary Assistance to Needy Families (TANF).
3. Populations included under the Sixth Omnibus Budget Reconciliation Act (SOBRA) [AFDC-related Medically Needy limited to pregnant women and to children].

Source: Kentucky Cabinet for Health Services.

fiscal year (FY) 1995 and fiscal year 1996 and were estimated to increase to about $130 by 1999. Both foster children and medically needy pregnant women and children average about $146 per month in FY 1995 and FY 1996, and about $163 in 1999. Finally, persons receiving Supplemental Security Income (SSI) assistance had much higher Medicaid costs, due in part to their disabilities and the fact that persons in this group are usually older than persons in the other groups. For SSI recipients who also received Medicare health care benefits, the PMPM costs were about $117 in FY 1995, $111 in FY 1996, and estimated to be $127 in 1999. SSI recipients who do not receive Medicare health benefits had substantially higher average monthly costs of about $387 in FY 1995, $395 in FY 1996, and estimated to be $436 in 1999.

Costs from the Private Insurance Market

A different potential source of cost information is the monthly premiums charged by private insurers in the Kentucky market. These data differ from the Medicaid data in that they represent premiums and not actual costs that have been incurred. Moreover, plans from private insurers typically offer fewer benefits than Medicaid and usually charge some copayments for various services. Nonetheless, these premiums represent what private insurers expect health care benefits to cost for various portions of the population, including both males and females and different age groups.

Table 10 shows monthly premiums charged in Kentucky by Humana, Inc., for its HMO coverage in the individual market. This is a market where individuals purchase health insurance directly from an insurer and are not part of any group coverage. This premium information is taken from a January 1999 insurance rate filing by Humana from the Kentucky Department of Insurance. Different premiums are provided for both males and females for the following age groups: less than 30, 30 to 39, 40 to 54, and 55 to 64. As seen in Table 10, young males have the lowest expected premium among the different groups. Males who are less than 30 years old would pay a monthly premium of about $112 while males who are ages 30 to 39 would pay about $125 per month. In contrast, females in these

TABLE 10

Monthly Premiums for Humana Individual HMO Insurance in Kentucky

Gender/Age Group	Monthly Premium
Male	
Ages less than 30	$112.29
Ages 30 – 39	125.30
Ages 40 – 54	172.25
Ages 55 – 64	313.47
Female	
Ages less than 30	$168.43
Ages 30 – 39	187.95
Ages 40 – 54	218.81
Ages 55 – 64	278.55

Source: January 1999 Humana Individual rate filing with the Kentucky Department of Insurance.

age groups have higher monthly premiums, primarily reflecting the fact that pregnancy services are covered by this insurance plan. Females who are less than 30 years old would pay about $168 per month while females ages 30 to 39 would pay about $188 per month. Premiums rise substantially for older age groups. Males who are ages 55 to 64 pay about $313 per month while females in this age group pay about $279 per month.

Problems with Using Current Cost Information

Obviously, using health insurance premiums in the private market has some drawbacks as well. The type of health care benefits offered in a state insurance expansion may not match the types of services offered by a private insurer, and it may be very difficult to adjust the premiums for the different benefits. Furthermore, individuals who have been without health insurance for a long period of time may have substantially different costs (and hence, need different premiums) than persons who have had health insurance for a long period of time. In short, uninsured individuals may be less healthy on average than insured individuals because they have not received any kind of regular, preventive care. Finally, the small number of individuals who are usually enrolled in a private insurer's individual plan may not accurately reflect the expected costs, or premiums, of a much larger group of uninsured

persons, who may have quite different demographic characteristics. As we saw in Table 2, only 3.9 percent of adult Kentuckians had individually purchased insurance.

One final note about potential costs deserves special attention. If a health insurance expansion takes the form of an expansion to a state's Medicaid program, then the state can receive a large portion of the total costs of the program in federal matching dollars. As a federal program that is administered by the states, Medicaid is funded by both levels of government. In general, lower-income states, such as Kentucky, receive a greater portion of federal matching dollars as a percentage of the total cost. For fiscal year 2000 (October 1999 - September 2000), Kentucky's federal matching rate is 70.55 percent, meaning that federal funds account for 70.55 percent of total Medicaid program costs, while state funds account for the remaining 29.45 percent.[6] Such a high matching rate obviously means that expansions related to the Medicaid program can be achieved at a much lower cost to the state than if they were not related to the Medicaid program.

Additional Issues to Consider

"Crowd-Out" of Private Insurance

One important consideration when estimating participants and costs for an insurance expansion is what effects a program may have on individuals with existing health insurance. While most insurance expansions are targeted to people who have no health insurance, the various eligibility requirements may actually allow other people with existing insurance to qualify for the program. These additional persons may find the newly offered health care coverage more attractive than their existing coverage, especially if they are paying for much of their insurance out of their own pockets.

This concept is known as "crowd-out," where new or expanded public health insurance programs cause some people to drop their existing private insurance coverage in favor of free or heavily subsidized coverage from a public program. In addition, many employers may decide to drop coverage for their employers if a program is offered

to include many persons at lower income levels. Perhaps the portion of the insured population that is most likely to drop current coverage in favor of public insurance are those who purchase individual coverage from a private insurer. Since these people pay for their entire coverage, including premiums and copayments, they would benefit the most from a free or subsidized public program. One might also expect some persons with employer-provided insurance to drop their coverage, especially if they are required to contribute some premium amount or pay high copayments for services.

How substantial a problem is crowd-out of private insurance? As we saw in Tables 3 and 4, a relatively small percentage of the population at lower income levels has private insurance. Indeed, only 14.8 percent of Kentucky's adult population with incomes less than 100 percent of the Federal Poverty Level has private (employer-provided or individual) insurance, with the remainder of the population already possessing government insurance or having no insurance at all. At family incomes of less than 200 percent of the FPL, however, about 31 percent of the adult population has private insurance, so the problem certainly increases at higher poverty levels.

Some researchers have tried to estimate the extent of crowding out of private insurance. Cutler and Gruber looked at Medicaid expansions to pregnant women and to children from 1987 to 1992 and estimated that approximately 50 percent of the increase in total Medicaid coverage was due to a reduction in private insurance coverage.[7] Dubay and Kennedy looked at the same period and concluded that crowd-out, while still existent, is not as severe a problem. They estimate that about 14 percent of the increase in Medicaid coverage for pregnant women between 1988 and 1991 is due to crowding out of employer-provided health insurance.[8]

Several things could be implemented in an insurance expansion to minimize the crowding out of private insurance. First, a waiting period could be imposed that requires an individual to be without health insurance (say, six months) before he or she is eligible for coverage under the new insurance program. Of course, some persons may choose to be without insurance for six months and then enroll in the new program, but many would likely not drop current coverage. Second, one method to reduce

the substitution from employer-provided insurance is to make ineligible for an expansion those people who are offered coverage but do not accept it. And finally, an insurance expansion could be modified dramatically so that instead of directly offering health care benefits, subsidies are provided to uninsured persons who can then purchase insurance in the private market. These subsidies would be offered to anyone who meets the eligibility requirements, including persons with existing coverage.

Other Issues

In addition to crowd-out, there are other issues that should be considered when preparing estimates for state health insurance expansion. This analysis presents a simplified methodology and does not incorporate all of these adjustments, but they should be considered when making formal estimates. One issue that must be considered is individuals' changing their behavior in order to qualify for a program. For example, a person whose income or assets places him above the eligibility level may reduce his income or assets to qualify for health care services. These factors are mitigated somewhat by two factors. First, it is somewhat difficult to lower one's income without additional adverse effects, such as not having a job at all. In addition, most individuals at these lower income levels that are near the eligibility levels for these programs do not have sufficient assets to make them ineligible to receive health care services.

Some other issues must be considered that could affect how the number of participants and costs could change over time. The analysis conducted above is only for a single point in time and does not account for any changes occurring over time that might affect program participation and costs. For example, changes in population or demographic trends in the state could affect the estimates. In addition, as more uninsured persons receive health care benefits and receive some preventive care, the overall health of the population could improve, which would tend to lower overall health care costs for state health insurance expansions. All of these issues must be considered when providing estimates for these expansions, especially if these programs are proposed to continue for many years in the future.

Cost Estimates for a Hypothetical Health Insurance Expansion

Where does this path lead us? As I have stated, estimating the number of participants and costs for a state health insurance program can be separated into three main tasks: 1) determining the eligible population, 2) applying a takeup rate to determine the participating population, and 3) applying per person cost estimates to obtain total program costs. The results of such a hypothetical health insurance expansion for Kentucky can be seen in Table 11. This table shows the estimated number of participants and costs for a hypothetical health insurance program that provides health care benefits to persons with family incomes less than 100 percent of the Federal Poverty Level.

Several simplifying assumptions are made for these hypothetical estimates. First, I assume an 80 percent takeup rate, which is approximately the takeup rate estimated for Kentucky's Medicaid program by a recent study. Second, I use the monthly premium information from Humana's individual HMO January 1999 rate filing with the Kentucky Department of Insurance. These represent more current data than the average Medicaid costs, may more accurately reflect the kind of limited benefit program that might be offered, and can be separated into different age groups, whereas the average Medicaid costs apply to all age groups. Third, I assume that all persons with incomes less than 100 percent of the FPL and who have individually purchased health insurance would drop their existing coverage to enroll in this program. Finally, I assume that this program will be some kind of Medicaid expansion so that Federal matching dollars can be used at a matching rate of 70.55 percent.

Panel A of Table 11 shows the estimated number of participants for this hypothetical program. As shown, about 112,000 persons are estimated to participate in the program, with about 105,000 of those being previously uninsured. The total costs to provide health care benefits to these individuals are shown in Panel B of Table 11. Total costs are estimated to be approximately $223 million, with about $222 million going to cover the previously uninsured. If the program is part of a Medicaid expansion and Federal matching dollars are used,

TABLE 11

Hypothetical Cost Estimates for Providing Health Care Benefits for Individuals Ages 19 – 64 at 100% of the Federal Poverty Level or Below without Health Insurance in Kentucky

Assumptions:

Takeup Rate:	80%
Costs per Person:	Individual HMO rate filing with Kentucky Department of Insurance
Federal matching rate:	70.55%

Panel A: Number of Participants

	Age Group						
	19 – 29	30 – 39	40 – 49	50 – 59	60 – 64	Total	
Uninsured	30,003	36,045	24,965	10,650	3,835	105,498	
Individually Purchased	2,610	658	108	1,119	1,668	6,163	
Total	32,614	36,702	25,073	11,770	5,503	111,662	

Panel B: Total Costs

	Age Group						
	19 – 29	30 – 39	40 – 49	50 – 59	60 – 64	Total	State Share
Uninsured	$52,556,245	$70,456,050	$59,971,241	$25,584,732	$13,462,380	$222,030,649	$65,610,057
Individually Purchased	$381,051	$107,116	$21,620	$224,048	$487,920	$1,221,755	$361,029
Total	$52,937,296	$70,563,166	$59,992,862	$25,808,780	$13,950,300	$223,252,404	$65,971,085

the cost to Kentucky (the State Share column) would only be about $66 million per year.[9]

Conclusion

This analysis has provided a concise overview of how to estimate the number of participants and the costs for state health insurance expansions to previously uninsured individuals. This process involves determining the eligible population, applying a "takeup" rate to determine the participating population, and applying per person cost estimates to obtain total program costs. Certainly, this analysis has some drawbacks, including limited information on takeup rates and health care costs that may not accurately reflect the new individuals who are covered in the program. But with careful analysis, these estimates can provide policymakers with needed information on the potential number of people that would be covered and the costs associated with covering them.

Moreover, this analysis has shown that states can use existing data sources, such as the Current Population Survey (CPS), in combination with other state-specific data sources to improve estimates of the population's health insurance status. The analysis here used the CPS with estimates from the Kentucky Health Insurance Survey (KHIS) to improve the precision of the estimates of uninsured individuals in Kentucky. Additional research is needed on potential takeup rates for uninsured populations and on the potential for crowding out of private insurance, but a methodology exists that allows policymakers to obtain estimates of the potential number of participants and costs.

Endnotes

1. Author's calculation from the 1999 March Current Population Survey.

2. Author's calculation from Consumer Price Index (All Items and Medical Care), Bureau of Labor Statistics, U.S. Department of Labor.

3. See Kimball Lewis, Marilyn Ellwood, and John L. Czajka, "Counting the Uninsured: A Review of the Literature," Urban Institute Occasional Paper Number 8, July 1998, pp. 6-11, for a detailed discussion of the literature on the preciseness of the CPS health insurance questions.

4. This analysis uses the pooled 1997-1999 March CPS to reduce variability in the estimates for smaller geographic areas. States contiguous to Kentucky include Illinois, Indiana, Missouri, Ohio, Tennessee, Virginia, and West Virginia. States in the southeast include Alabama, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee.

5. We present estimates of individuals with individually purchased health insurance as well because, besides the uninsured, they are the group mostly likely to take advantage of new insurance programs by dropping their current coverage.

6. Federal medical assistance percentage (MAP) from Health Care Financing Administration, U.S. Department of Health and Human Services, http://aspe.os.dhhs.gov/health/fmap00.htm.

7. David M. Cutler and Jonathan Gruber, "Does Public Insurance Crowd Out Private Insurance?" *The Quarterly Journal of Economics*, May 1996, pp. 391-430.

8. Lisa Dubay and Genevieve Kennedy, "Did Medicaid Expansions for Pregnant Women Crowd Out Private Coverage?" *Health Affairs*, Vol. 16, No. 1, January/February 1997, pp. 185-193.

9. These estimates only include costs for health care benefits and do not include estimates of administrative or other costs that might be required as part of such a program.

Taxes and Income: Where Does Kentucky Stand?

William H. Hoyt

Much recent debate has focused on the substantial tax "burden" on lower-income households in Kentucky relative to other states and relative to higher-income households in Kentucky. I address these issues by focusing on the "regressivity" of the Kentucky tax system relative to other states and regions in the United States. Two distinct issues are addressed: How much taxes do lower-income households pay within a state relative to higher-income households? And how much taxes do lower-income households pay in absolute terms, that is, what is the average payments in taxes? I analyze these issues by looking at sales, income, and property taxes separately and in total. I find that the Kentucky tax system, while regressive, is less regressive than those of most states, particularly among those in the Southeast. In part this occurs because Kentucky relies more on the most progressive of the taxes, the income tax, and less on the more regressive sales and property taxes than many states. Lower-income households do bear a lighter tax burden relative to higher-income households in Kentucky and compared to most states. But because incomes in Kentucky are lower than in most states, these households still pay relatively high taxes as a percentage of their incomes.

Introduction

Following the re-election of Paul Patton as governor of the Commonwealth of Kentucky, the *Lexington Herald-Leader* interviewed a number of activists and politicians in the state, asking them what issues they hoped that Governor Patton would consider in his second term.[1] Not surprisingly, several issues related to taxation were brought to the attention of the Governor. One issue that might be of concern, according to University of Kentucky economist Charles Haywood, related to the state's revenue structure, specifically at how the service sector might be undertaxed. This concern has to do with the efficiency and stability of the tax system.[2]

The same article, however, mentioned another concern related to taxation: that the poor in Kentucky are penalized, not aided, by the Kentucky tax system. This criticism of the Kentucky tax system is not new and seems to be supported by several recent studies comparing taxes across the states.[3]

Kentucky is by no means alone in the heavy taxation of lower-income households relative to higher-income households. Most state tax systems are *regressive,* with lower-income households paying a higher percentage of their income in taxes than higher income households. In fact, the Center for Tax Justice (1996) estimates that the state and local tax burden on the highest quintile of income is 29 percent lower, as a percentage of income, than the tax burden on the lowest quintile of income when examined across all states. This *regressivity* in state and local taxes is a sharp contrast to the significant *progressivity* of the federal tax system. Despite numerous deductions and income shifting available to higher income households, higher-income households generally pay a substantially higher share of their income in federal taxes than do lower-income households.

That state and local taxes are regressive may not be surprising for two reasons. First, the demand for state and local public services appears to be relatively income inelastic, that is, the amount of spending on state and local services desired by individuals does not increase proportionately with individual income (Craig and Inman (1985) and Gramlich and Rubinfeld (1982)). Second, state and particularly local governments are likely to face a tax base that is much more responsive to higher tax rates. Attempts at increasing the progressivity of

taxes may only result in higher-income persons leaving the state or the locality.

In this study, I briefly discuss some evidence regarding the structure of the Kentucky tax system, focusing on how the tax burden varies with income. To address the question of whether Kentucky has a regressive or progressive tax system, it is necessary to have a focus or comparison. Here I compare the taxes paid by Kentucky residents to those for the average for states across the U.S., the states contiguous to Kentucky, and the southeast states. By comparing Kentucky to these other states, we can get a better idea of how low-income households in Kentucky fare and how the tax system might be better designed to assist them.

Tax Structure and Tax Burden

An evaluation of the Kentucky tax system, particularly regarding how tax burden differs with income, only makes sense in reference to the tax systems of other states. How regressive or progressive we are, or could be, may depend on what neighboring states are doing. With this in mind, I compare the Kentucky system to four alternative tax systems: The "average" tax structure

in the United States, the tax structure of the contiguous states[4], the tax structure of the southeast states[5,] and the tax structure of California. California is chosen as an example of a state having an extremely progressive state and local tax system.

Before examining how tax burden varies with income class, I first document how the source of taxes and the amount of taxes differ among the four different regions. In Table 1, we see that the largest source of tax revenue in the United States for combined state and local taxes are sales and excise taxes, the source of 36 percent of tax revenue. This is followed by property taxes with 30 percent of tax revenue and income taxes providing 26 percent of tax revenue.[6] Kentucky differs from most states in that the income tax is a significantly larger share of its revenues, and the share of tax revenue collected from the property tax is extremely low.

Why might the source of revenue matter for the regressivity of the tax system? Generally, it is argued that sales taxes are the most regressive and the income tax the most progressive of taxes. Income taxes, because of their design and implementation, allow for different rates to be applied to different levels of income. That is, the tax structure is designed to have increasing marginal tax rates. Those with the lowest income levels have the lowest

TABLE 1

Tax Structure and Average Tax Burden in Kentucky and Comparison Regions

State and Local Revenues	Kentucky	U.S.	Contiguous[1]	Southeast[2]	California
Percentage of Total Taxes					
Income Taxes	34%	26%	28%	26%	31%
Sales and Excise Taxes	38	36	36	44	36
Property Taxes	17	30	31	23	26
Average Tax Burden as a Percentage of Income					
Total Taxes	11.6%	11.3%	10.5%	10.4%	11.3%
Income Taxes	3.9	2.9	2.9	2.7	3.5
Sales and Excise Taxes	4.4	4.1	3.7	4.6	4.1
Property Taxes	1.9	3.4	3.2	2.4	3.0
Average Per Capita Tax Burden					
Total Taxes	$2,166	$2,597	$2,384	$2,082	$2,705
Income Taxes	730	674	657	533	834
Sales and Excise Taxes	827	939	847	922	968
Property Taxes	363	789	728	478	715
Per Capita Income	$18,734	$22,987	$22,722	$20,054	$23,854

1. Contiguous states include Illinois, Indiana, Missouri, Ohio, Tennessee, Virginia, and West Virginia.
2. Southeast states include Alabama, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee.
Source: "Who Pays: A Distributional Analysis of the Tax System in All 50 States," Citizens for Tax Justice, June 1996.

tax rates and are possibly exempt from paying taxes at all. Increasing marginal tax rates, at least in some states, means that higher income households will pay a greater share of their income in taxes.

The sales tax, in contrast to the income tax, is a flat tax assessed on all taxable goods and services. Each dollar of spending on an item or service subject to the state sales tax is taxed at the same rate. Lower-income households, then, will pay the same share of taxes on their spending as high-income households. Despite the exemption of food from the base of most state sales taxes, lower-income households spend a much greater share of their income on goods and services subject to state sales taxes than do higher-income household, and so sales taxes tend to be more regressive.

The property tax falls between the income and sales tax in terms of progressivity. Housing consumption (property value for owners or monthly rent for renters) is the base for this tax. Unlike the goods and services subject to sales taxes, the share of income spent on housing remains relatively constant as income rises.[7] In addition, numerous states, beginning in the 1960s, offered means-based homestead credits and circuit breakers to reduce the property tax burden on the poor.

Chernick (1997) examines how the share of income, sales, and property taxes in state and local

tax revenues affects the regressivity of the tax system. The measure of regressivity he uses is the ratio of tax burden (as a percentage of income) for the highest income class to that of the lowest income class. He finds that increasing the share of the income tax in tax collections by 10 percent will, on average, increase this ratio by approximately 10 percent. An increase in sales tax collection by 10 percent would reduce this ratio by 5 percent.

In Table 1 two measures of tax burden are also included for total taxes and the three major taxes. One measure of burden I use is taxes as a percentage of income. Comparing Kentucky to the other regions using this measure, we see that Kentucky has a rate (11.6 percent) that is higher than the national average (11.3 percent) and much higher than the contiguous states (10.5 percent) and the southeast states (10.4 percent).

The second measure I use is per capita tax burden. Here we have a different view of tax burden. While Kentucky's burden ($2,166) is still higher than that of the southeast states ($2,082), its burden is much lower than the average for the United States ($2,597) and even that of the contiguous states ($2,384).

The explanation for the apparent discrepancies in the two measures is easily reconciled. The last row of Table 1 gives per capita income for the four

FIGURE 1

Property Taxes as a Percentage of Income in Kentucky and Comparison Regions

Source: "Who Pays: A Distributional Analysis of the Tax System in All 50 States," Citizens for Tax Justice, June 1996.

FIGURE 2

Sales and Excise Taxes as a Percentage of Income in Kentucky and Comparison Regions

Source: "Who Pays: A Distributional Analysis of the Tax System in All 50 States," Citizens for Tax Justice, June 1996.

household in each state based on that state's tax system. The personal income taxes were based on federal tax return information. Ettlinger (1996) gives the distribution of tax burden by income quintile. In addition, he segments the top quintile into three separate income groups.

I first consider the property tax burden. In Figure 1 for each of the five regions I give the property tax burden, as a percentage of income, for the income classes. As Figure 1 suggests, the property tax is not a heavy burden on any segment of the 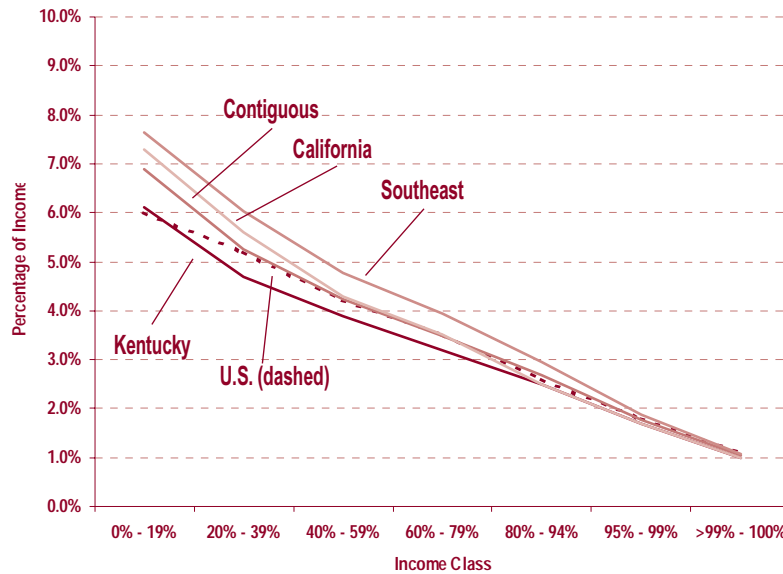Kentucky population and is much less regressive in Kentucky than it is in across the United States. Both the tax burden and the distribution of tax burden in Kentucky look very similar to those of the southeast states.

Figure 2 examines the distribution of tax burden for sales and excise taxes. This figure confirms the regressivity of the sales tax discussed earlier. For Kentucky, the U.S., and the three other regions, the tax burden is substantially higher for households in the lowest income classes than it is for those in the very highest income classes. As Table 1 had suggested, sales taxes are less of a burden for all income classes in Kentucky than in the rest of the U.S. and particularly when compared to the southeast states.

The income tax burden for each of these regions is reported in Figure 3. Here we see that Kentucky is quite different, having a substantially higher burden than the rest of regions with the exception of California at the very highest income levels. Note that in all state regions, the income tax, in contrast to the sales tax, is at least moderately progressive. While Kentucky taxpayers pay more in income taxes than other states, it also appears that they pay more regardless of their income class.

This can be seen more clearly in Figure 4, which gives the ratio of the burden for each income class to the burden for middle income classes (3rd quintile). For example, in Kentucky, tax payments as a percentage of income for the lowest income quintile are 41 percent of what they are for those in

regions. Since the per capita income in Kentucky ($18,734) is lower than the average in the U.S. ($22,987) or the southeast states ($20,054) the same spending per capita requires a higher tax burden as a share of income. This, I argue later, may be what is really driving the heavy tax burden on lower-income persons in Kentucky.

Comparing Tax Burden Across Income Classes

I now compare the tax burden for households of different income levels for each of the five regions. Data for the calculations here are from Ettlinger (1996). Ettlinger (1996) is an exhaustive and detailed study of determining tax burdens using data on the consumption and spending habits of a large sample of non-elderly married couples. With this large sample of households, he was able to determine how the spending patterns on taxable goods and services and property purchases and rents varied with income. After making assumptions regarding the incidence of the sales and property taxes, he could then estimate taxes paid by the representative

FIGURE 3

Income Taxes as a Percentage of Income in Kentucky and Comparison Regions
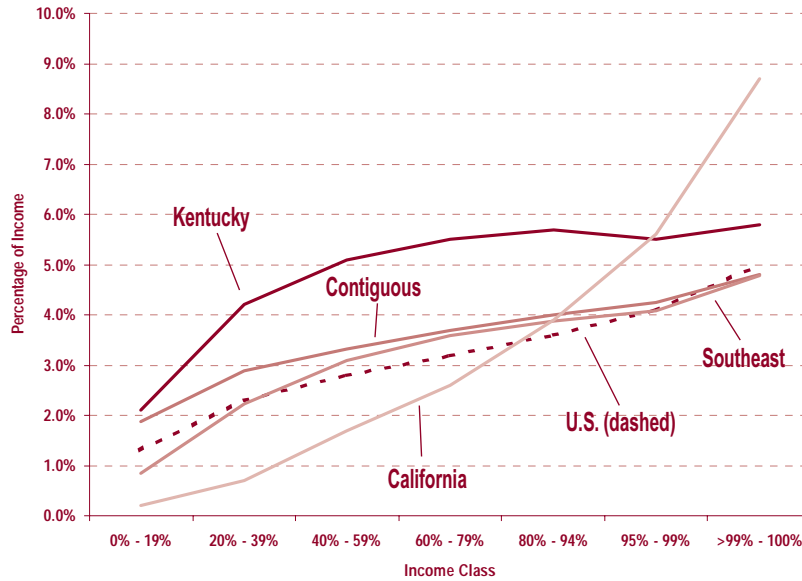
Source: "Who Pays: A Distributional Analysis of the Tax System in All 50 States," Citizens for Tax Justice, June 1996.

levels of income, Kentucky is very similar to the U.S. average but at upper income levels the average income tax structure in U.S. states becomes more progressive. Given that the maximum marginal tax rate is reached in Kentucky at $8,000 of taxable income, the lack of progressivity at higher income levels is not surprising.

Figure 5 gives the tax burden for all state and local taxes. Here we see that Kentucky has a higher burden at all but the lowest and very highest income brackets. In fact, Kentucky has the lowest burden, as a percentage of income, of any of the five regions for the lowest-income classes. For the 20 percent of households with the lowest incomes, the average tax burden in Kentucky is 10.4 percent in contrast to 12.4 percent for the U.S., and 11.7 percent for the contiguous states.

the middle quintile. Figure 4 again suggests that with the exception of California, the states have moderately progressive tax systems that are relatively similar in terms of relative burden. At low

Figure 6 gives a clearer picture of how burden varies with income classes. As with the income taxes and Figure 4, here I give the burden for each income class relative to the burden for the middle income

FIGURE 4

Relative Burden of Income Taxes in Kentucky and Comparison Regions
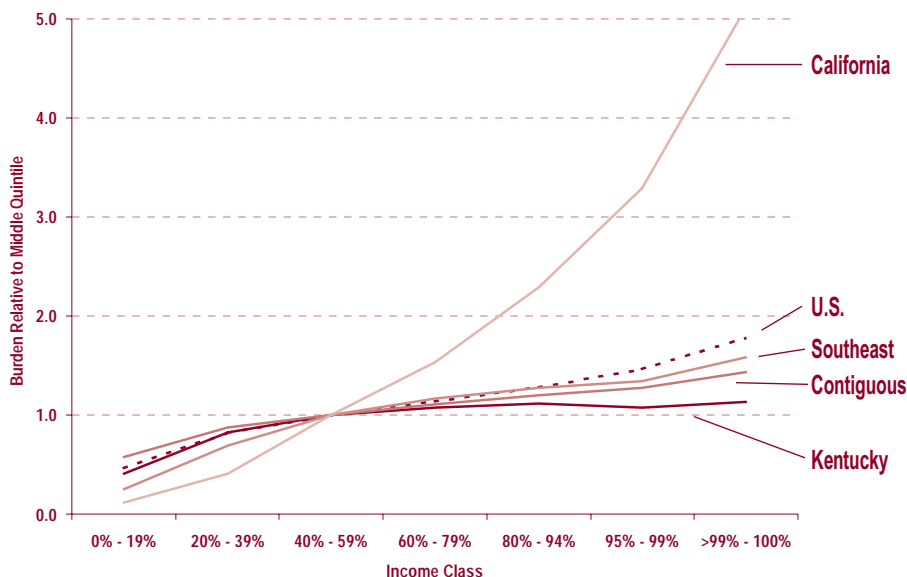
Source: "Who Pays: A Distributional Analysis of the Tax System in All 50 States," Citizens for Tax Justice, June 1996.

FIGURE 5

Total Taxes as a Percentage of Income in Kentucky and Comparison Regions
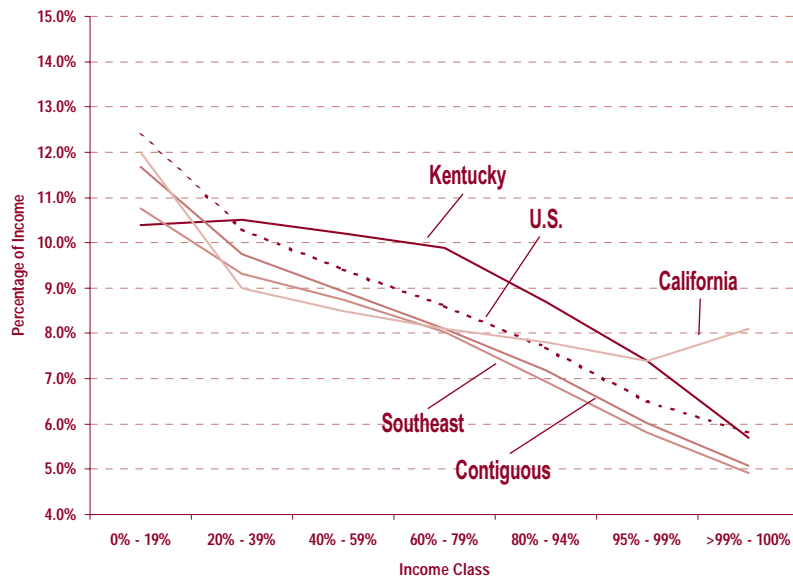
Source: "Who Pays: A Distributional Analysis of the Tax System in All 50 States," Citizens for Tax Justice, June 1996.

class. Figure 6 suggests that up to the middle income level, Kentucky has a proportional income system with the lowest and second quintiles paying the same share of their income in taxes as the middle quintile. This is in contrast to the regressive tax structure of the other regions at these low income levels. Only when comparing the incomes of the middle quantile to higher income groups does Kentucky display the same regressive nature of total taxes.

Figures 1-3 and 5 displayed both the level of tax burden (in terms of percentage of income paid in taxes) and the relative burden. In Table 2, I focus

TABLE 2

Relative Tax Burden in Kentucky and Comparison Regions

| | Ratio of Lowest Income Class to Highest Income Class | | | | |
	Kentucky	U.S.	Contiguous[1]	Southeast[2]	California
Total	1.80	2.10	2.30	2.20	1.50
Income	0.36	0.26	0.39	0.18	0.02
Sales	6.10	5.50	6.60	7.10	7.30
Property Tax	1.70	2.40	2.00	1.70	2.40

1. Contiguous states include Illinois, Indiana, Missouri, Ohio, Tennessee, Virginia, and West Virginia.
2. Southeast states include Alabama, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee.

Source: "Who Pays: A Distributional Analysis of the Tax System in All 50 States," Citizens for Tax Justice, June 1996.

only on relative burden. In Table 2, I calculate for total as well as the three major component taxes the ratio of the tax burden of the lowest quintile to that of households with incomes in the 80 percent - 95 percent range. For the U.S., households in the lowest quintile pay over twice in much in taxes (as a percentage of income) as those in the 80 percent to 95 percent range. The southeast states and contiguous states have higher ratios of tax burden than the U.S. Kentucky, in contrast to its neighbors, has a lower ratio of tax burden (1.8). While still regressive, this is almost 15 percent lower than the U.S. average.

Further inspection of Table 2 and reference back to Table 1 gives some insights into why Kentucky has a relatively progressive tax structure. Note that the income tax in Kentucky is similar to that of the contiguous states in terms of regressivity, slightly more regressive than that of the U.S., and quite a bit more regressive than that of the southeast states. That Kentucky has more regressive income taxes is due to the fact that a number of counties in Kentucky use payroll taxes, which are only on earned income with no earnings deducted.

Kentucky has a more progressive property tax than the U.S. average that is similar to that of the southeast states and contiguous states. The sales tax is more regressive in Kentucky than the U.S. average but less regressive than the sales taxes operating in the contiguous states and the southeast states.

What is more striking than differences in regressivity across the regions for a single tax is the tremendous differences in the regressivity of the three tax systems. The ratio of tax burdens under the income tax between the lowest income quintile and the highest is 0.26 for U.S. while the same ratio for the sales tax is 5.5. Less technically, the lowest-income households pay

FIGURE 6

**Relative Burden of Total Taxes
in Kentucky and Comparison Regions**

Source: "Who Pays: A Distributional Analysis of the Tax System in
All 50 States," Citizens for Tax Justice, June 1996.

should not) be answered by a professional economists. Here I have suggested that the tax burden on the poor *relative* to the tax burden on higher-income households is probably slightly lower than in most U.S. states and certainly less than Kentucky's neighbors and the southeast states.

Why, then, this concern about the poor and taxes in Kentucky? One answer is that taxes for Kentucky's poor are too high regardless of how other states are taxing their poor. Another possible explanation for this concern is that the poor in Kentucky pay higher absolute taxes than do the poor in other states. As was shown in Table 1, Kentucky residents pay a higher percentage of their income in taxes than the averages of the U.S., the contiguous states, the southeast states, and even California. We find the same when examining Figure 5 as well. Kentucky residents pay a higher percentage of their income in taxes not because spending is higher per capita but because incomes are substantially lower. Thus all taxpayers in Kentucky, poor and rich, pay a greater share of their income in taxes.

There may be reasons to consider modifying the Kentucky tax structure to make it less regressive. Possible modifications might include expanding the sales tax base to include services disproportionately consumed by higher-income classes and increasing the number of tax brackets for the individual income taxes. However, the higher taxes paid by lower-income households in Kentucky appear to have less to do with a regressive tax structure and more to do with a tax base, personal income, that is significantly lower than in other states.

only one-fourth as much of their income in state and local income taxes as the highest-income households do while they pay 5.5 times as much of their income in sales taxes as do high-income households.

Then, how is it that Kentucky, which appears to have more regressive income and sales taxes than the U.S. average, has a more progressive overall system? The key to this is found in Table 1, the mix of taxes used in Kentucky compared to the U.S. and the other regions. Kentucky is much more reliant on income taxes than most states and, as suggested by Table 2, regardless of how regressive a state income tax system is relative to other state's income tax systems, it is far less regressive than a sales tax system. Thus Kentucky's heavy reliance on the income tax system, typical reliance on sales taxes, and light reliance on property taxes have given it a relatively progressive tax structure.

Conclusion: Are the Poor Paying Too Much in Taxes?

The question of whether the poor are paying too much in taxes is beyond the scope of both this study and is probably a question that could not (and

Endnotes

1. Baniak, Peter and Jack Brammer. "Political Observers Await Agenda Patton will Push Using New Clout," *Lexington Herald-Leader,* Wednesday, November 3, 1999, A1.
2. For a discussion of these concerns of stability and efficiency and the taxation of services, see William H. Hoyt, "The Kentucky Tax System: Problems and Options," *Kentucky Annual Economic Report 1995,* Center for Business and Economic Research, University of Kentucky.
3. See *Lexington Herald-Leader*, "Taxing to the Max" (editorial), Wednesday, April 17, 1996.
4. Contiguous states are Indiana, Illinois, Missouri, Ohio, Tennessee, Virginia, and West Virginia.
5. The southeast states used here do not match with the Census definition of the Southeast. Here the southeast states are Alabama, Georgia, Mississippi, North Carolina, South Carolina, and Tennessee.
6. From files provided by the *Bureau of Census, Department of Commerce.* The totals do not add to 100% because of the omitted categories of taxes on motor vehicles and other taxes.
7. See William H. Hoyt and Stuart S. Rosenthal, "Capital Gains Taxation and the Demand for Owner-Occupied Housing," *Review of Economics and Statistics* 72 (February 1990): 45-54, for an estimate of the income elasticity of housing.

References

Chernick, Howard. (1997) "On the Determinants of Sub-National Tax Progressivity in the U.S.," Working Paper, Hunter Coolege, CUNY, New York, New York.

Craig, Steven G. and Robert P. Inman. (1985). "Education, Welfare, and the "New" Federalism: State Budgeting in a Federalist Public Economy," Harvey S. Rosen, ed., *Studies in State and Local Public Finance*, NBER Project Report, Chicago: University of Chicago.

Ettlinger, et. al. (1996). "Who Pays? A Distributional Analysis of the Tax Systems in All 50 States?," Citizens for Tax Justice and the Institute on Taxation and Economic Policy, Washington, D.C.

Gramlich, Edward J. and Daniel L. Rubinfeld. (1982) "Microestimates of Public Spending Demand Functions and Tests of the Tiebout Hypothesis and Median-Voter Hypotheses," *Journal of Political Economy*, 90:536-60.

Hoyt, William H. and Stuart S. Rosenthal. (1990) "Capital Gains Taxation and the Demand for Owner-Occupied Housing," *Review of Economics and Statistics* 72: 45-54.

Electronic Commerce at Businesses in Kentucky

Jonathan D. Fisher

Electronic commerce in the United States has expanded in recent years. Estimates show online sales surpassing $2 billion annually and growing quickly. State-level statistics are difficult to find, however. This article helps to fill this void by reporting the results of a recent survey of Kentucky businesses. About 14 percent of responding firms in Kentucky sell their products or services online. While online sales still represent a small portion of these businesses' total sales, the overall view of online sales has been positive. Kentucky businesses also use the Internet for advertising, which should increase online and offline sales since many customers research products online but purchase goods offline. Also, the future of online sales in Kentucky looks promising. Growth of online sales should occur within firms as security and other concerns dissipate. Also, growth should occur as more Kentucky businesses begin online sales. Of those firms not currently selling online, almost one-quarter plan to sell online and over 40 percent may sell online in the future.

Introduction

Computer usage by individuals in the United States increased twelve-fold between 1993 and 1997, from 5 million users to 62 million users. As impressive as that increase is the approximate 233 percent yearly increase in online sales predicted to occur between 1998 and 2000.[1] In 1997, estimates of online retail sales range from $2.4 billion to $9 billion. While online sales to consumers represent less than one percent of total consumer purchases in the United States, online sales still represent a significant amount of sales for a technology in its infancy.

Predictions about online sales change monthly. Forrester Research, Inc., predicted online retail sales would reach $7 billion by 2000 in a June 8, 1998, article in *The Wall Street Journal*. In a July 20, 1998, *Time* article, Forrester Research predicted online retail sales would reach $200 billion by 2000. Other estimates have online sales exceeding $1 trillion by 2000.[2]

Looking solely at sales figures actually underestimates the effect of a web site on a business's revenue. Approximately 31 percent of online consumers use the Internet to research goods they plan to buy offline.[3] Since some consumers may use the Internet for product research while never making a purchase online, this too underestimates the impact of a web site since the figure refers solely to current online consumers. Nationwide statistics regarding online commerce are difficult to find.

Since online commerce is a relatively new phenomenon, the federal government has not systematically collected these data. Independent research focuses mainly on consumers' purchases, which understates the effect of online commerce on a business's sales.

To help fill this gap for Kentucky, the University of Kentucky Center for Business and Economic Research has conducted two recent surveys of Kentucky businesses, one in 1998 and one in 1999. In the 1999 edition of the *Kentucky Annual Economic Report*, Steven Allen reported the findings from the 1998 survey.[4] This survey focused on computer and Internet usage at businesses in Kentucky. Allen found that all responding firms used computers and almost 80 percent used the Internet for at least one purpose. Over 40 percent of the firms marketed or promoted their products online, 10 percent advertised on web sites other than their own, and at least 10 percent sold their products or services online.

The 1999 survey and this article focus on online commerce at Kentucky businesses and provide a follow-up to Allen's article. The first section provides an overview of the survey and data used for this article. The results of the survey for all Kentucky businesses are presented in several sections. The first three sections discuss the experience of those Kentucky businesses currently selling online. The fourth section describes some aspects of Kentucky businesses not selling online.

The final section provides a summary and some concluding remarks.

Description of Survey Data

The data used in this article come from a mail survey of businesses in Kentucky conducted by the University of Kentucky Center for Business and Economic Research during May and June of 1999. In previous years, this Business Confidence Survey primarily focused on businesses with at least 100 employees. In 1999, a large business survey focused on 1,019 Kentucky businesses with more than 100 employees. An additional sample included 2,038 Kentucky businesses of all employee sizes.

A total of 164 responses were received from the large business survey and 234 responses from the all sizes survey. Firms were asked a series of questions including information on online sales at their business. In addition, these businesses were asked about general conditions and expectations for their business. These responses are reported in a separate Center for Business and Economic Research publication.[5]

We found that the two data sets are very similar in the relevant characteristics for this article. For example, the same percentage of firms in both data sets sell their products online. Of course, there are a few differences between the combined sample and the overall Kentucky population of businesses. For example, businesses employing fewer than four employees are underrepresented in the combined sample. Broken down by industry, the service sector is overrepresented in the combined sample while retail businesses are underrepresented. In general, however, the characteristics of businesses in the combined sample resemble those of businesses in the entire population. Therefore, we rely on the combined sample for our analysis, which yields a sample of 396 Kentucky businesses.

Online Sales at Kentucky Businesses

First, businesses in the survey were asked if they sell their products or services directly online. In

1999, 57 of the 392 (14 percent) responding firms stated that they did sell their products or services online, while four firms did not respond to this question. Interestingly, 14 percent of the firms in the large business sample sell online and 14 percent of the firms in the all business sample also sell online (Table 1). In the 1998 Business Confidence Survey, at least 10 percent of these large firms conducted online sales.[6]

Another comparison between 1998 and 1999 can be made. In both surveys, businesses were asked if they advertise on other web sites or any search engines. In 1998, approximately 12 percent of these large firms advertised elsewhere on the Internet (Table 1). In the 1999 combined sample, almost 10 percent of the firms that sell online also advertise elsewhere on the Internet.

TABLE 1

Online Sales and Advertising at Kentucky Businesses

Sample	Businesses Selling Online		Advertised Business on Internet	
	1998	1999	1998	1999
Large businesses	10.1%	14.7%	11.5%	10.4%
All businesses	—	14.4	—	9.1
Combined sample	—	14.5%	—	9.6%

Next, the businesses were asked how long they have been selling online; 18 percent have been doing so for less than a year. Another 47 percent had been selling online for one to two years and the remaining 35 percent had been doing so for at least two years. The percentage of firms in each industry selling their products online is not evenly distributed. Table 2 shows the breakdown of businesses by industry. Wholesale trade; finance, insurance, and real estate (FIRE); and transportation, communications, and public utilities (TCPU) have the highest percentage of firms selling their products online. No agricultural firms and only six percent of manufacturers in the sample sell online.

There appears to be little relationship between those firms that have been on selling online for at least one year and industry type (Table 2). Five of the 12 firms that began selling online are from the service industry, but this only represents 31 percent

TABLE 2

Online Sales by Industry in Kentucky

	% in Industry Selling Online	% Selling Online for at least One Year
Agriculture	0.0%	0.0%
Mining	12.5	12.5
Construction	17.6	17.6
Manufacturing	6.4	5.1
TCPU	23.8	19.0
Wholesale trade	30.7	23.1
Retail trade	18.7	14.3
FIRE	24.3	21.6
Services	12.0	8.9

TCPU = Transportation, Communications, and Public Utilities
FIRE = Finance, Insurance, and Real Estate

of all service industry firms currently selling online. Three of the remaining seven that began selling online in the last year are from the retail industry, again representing just 21 percent of retail industry firms currently selling online.

Kentucky Businesses' Experience with Electronic Commerce

Several questions were asked of the businesses currently selling online to gauge their experience in this area. These questions serve two important purposes. First, we obtain an idea of the current state of online commerce at Kentucky businesses. Secondly, these data can be useful to other businesses not selling online but who are considering using this technology in the future.

One important thing to know is the firm's motivation for undertaking online sales. Of the businesses currently selling online, 70 percent responded that they hoped to reach new customers. Almost 12 percent of businesses saw lower marketing, sales, or overhead costs as a reason. Another 12 percent stated that their existing customers wanted online transactions.

When describing their online customers, almost 19 percent of Kentucky businesses sell their products online to previous offline customers. Over 45 percent of businesses have reached new customers with their online sales. The remaining 36 percent of businesses are unsure whether their online customers are previous offline customers or new

customers. Interestingly, these firms underestimated the number of offline customers that would use this new method. However, fewer firms have been able to reach new customers than had hoped. Seventy percent stated that they hoped to reach new customers but only 45 percent of the businesses currently sell their products to new customers. In part, this may be a result of the short amount of time some firms have been selling online. More new customers are likely to find their web site as they sell their products online for a longer period of time. Similarly, increasing numbers of offline customers may find it more convenient to purchase the goods online as more time passes.

As discussed in the Introduction, online commerce does not take place solely between consumers and businesses. One estimate has business-to-business online commerce surpassing $300 billion within three to five years in the United States.[7] In this data set, one-fourth of Kentucky businesses online customers are other businesses, with another seven percent of customers representing government agencies. Individual consumers compose the remaining 68 percent of online customers. While the percentage of individual consumers is larger, this may not mean Kentucky businesses do not receive a larger percentage of total sales receipts from other businesses or government agencies. The total receipts from online business-to-business commerce may represent a higher percentage of total receipts if these other businesses are purchasing larger amounts or if the goods or services are more expensive.

FIGURE 1

Kentucky Businesses' Overall Experience with Electronic Commerce

Better than expected 28%

Worse than expected 13%

As expected 59%
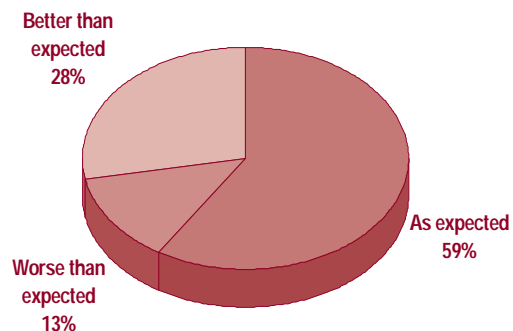
Businesses were also asked about the relative frequency of purchases made by online customers compared to offline customers. Only one of the 52 firms (1.9 percent) answering this question stated that its online customers purchase with greater frequency. Another 27 percent responded that online customers purchase with less frequency and 23 percent with the same frequency as offline customers. Almost 50 percent of the businesses were unsure of the relative frequency.

To gauge the overall feeling, businesses were asked to rate their experience selling online. Almost 59 percent of the responding firms stated that their experience has been as expected (Figure 1). While 13 percent stated that their experience has been worse than expected, 28 percent stated that their experience has been better than expected.

Sales from Online Purchases

Another important aspect of online commerce to consider is the percent of total sales for a business from online sales. Almost 50 percent of the responding firms report that less than four percent of their total sales are from online purchases (Table 3).

Twenty-eight percent of firms report that 5 percent of their total sales result from the online purchases, with another 20 percent of the firms reporting 10 percent. The one remaining firm reported that 15 percent of its total sales come from online purchases. It is important to remember that these sales figures may actually understate the impact of a web site on total sales because some

buyers research the product online but purchase the product offline. It appears that there has been an increase over time in the percentage of sales coming from online commerce. In the 1998 data set, over 60 percent of the firms reported that less than 4 percent of their total sales come from online sales (Table 3).

One might expect that those businesses that have been selling their products online for a longer period of time would have a larger percentage of their total sales from online sales. There is very little correlation between the percent of total sales from online sales and length of time selling online, however.

Other patterns are also difficult to find. Of those firms that reported their online experience has been better than expected, 60 percent have less than three percent of their total sales from online commerce. Again, predictable relationships between online sales and other variables are not evident in this sample.

Kentucky Businesses Not Currently Selling Online

Those Kentucky businesses not currently selling their products online were also asked two questions. First, they were asked why they do not currently sell online. Only five percent of the businesses that responded are unsure how to initiate online sales. Another four percent believed that initiating online commerce requires too large an investment. The largest response given was the perceived difficulty of selling their products or services online, with 63 percent giving this reason. Finally, another seven percent stated security concerns as a reason for not currently conducting online sales.

Interestingly, security issues present the biggest challenge for 36 percent of *current* online sellers. Another 13 percent stated that a lack of financial resources presents the greatest challenge. For 22 percent, a lack of properly trained employees presents the largest challenge, with the remaining firms citing other reasons as their greatest challenge.

Finally, about 22 percent of the businesses not currently selling online state that they plan to sell online in the future. Another 43 percent stated that they might sell online in the future, with the remaining 35 percent stating they do not plan to do so in the future (Figure 2).

TABLE 3

Sales from Electronic Commerce by Businesses in Kentucky

Percent of Total Sales	Percent of Total Businesses	
	1999	1998
0.5%	0.0%	10.8%
1.0	30.8	32.4
2.0	15.4	21.6
3.0	2.6	10.8
5.0	28.2	16.2
10.0	20.5	8.1
15.0	2.6	0.0

FIGURE 2

Plans of Kentucky Businesses Not Currently Selling Online

No plans to sell online 35%

Plan to sell online 22%

May sell online 43%
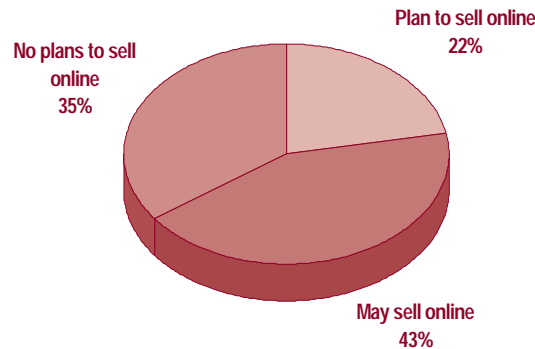
Conclusion

Currently, approximately 14 percent of Kentucky businesses sell their products online, according the survey described in this article. Unfortunately, a lack of nationwide data prevents a comparison of Kentucky businesses to businesses in the rest of the United States. The growth of online sales appears promising for the U.S. and for Kentucky. The predicted U.S. yearly growth rate for online sales surpasses 200 percent. Between the 1998 and 1999 data sets, there was also an increase in the percentage of firms in Kentucky selling online.

Growth in sales may also occur within firms rather than just in the total number of firms. This is also seen in Kentucky when comparing the 1998 to 1999 data sets. As the security of online sales improves and the perception of security improves, additional offline customers will become more comfortable with purchasing goods online. Also, security concerns are important to the businesses as well. Of the firms currently selling online, security issues presented the greatest concern for 36 percent of the sample. Of the firms not selling online, seven percent stated security reasons as a main reason they had not yet begun to sell their product or service online. As more businesses and consumers experience online commerce, the security concerns may dissipate. This should fuel even more growth in online sales.

Another concern for Kentucky businesses regarding online sales is having the properly trained employees to implement and maintain online sales. Almost one-quarter of the Kentucky businesses selling online stated that a lack of properly trained employees presented the biggest challenge to selling online. Five percent of the firms not selling online did not know how to initiate online commerce, which is an indicator of a lack of properly trained employees. Allen highlighted this point in his article in the 1999 version of this report as well. As more Kentucky businesses want to sell online, the need for employees with more advanced computer skills increases. The current situation and prospect for online sales at Kentucky businesses is promising, but the businesses will need more high-skill employees.

Endnotes

1. Krantz, Michael, "Click Till You Drop," *Time* (20 July 1998).
2. Goolsbee, Austan, "In a World Without Borders: The Impact of Taxes on Internet Commerce," National Bureau of Economic Research Working Paper #6883, 1998: 2. This last estimate may not be directly comparable to the first two estimates since it most likely includes business-to-business commerce, which represents a larger proportion of online commerce than business-to-consumer sales.
3. Morrissette, Shelley, Kenneth Clemmer, and William Bluestein, "The Retail Power Shift," *The Forrester Report*, (April 1998): www.forrester.com (Forrester Research, Inc.).
4. Allen, Steven (1999), "Computer and Internet Usage at Businesses in Kentucky," *1999 Kentucky Annual Economic Report*.
5. *Kentucky Business and Economic Outlook*, Center for Business and Economic Research, University of Kentucky, Fall 1999.
6. In 1998, a similar but not identical question was asked. In the 1998 survey, 10 percent (37 out of 367) of the firms indicated that a portion of their total sales came from online sales. Seventeen additional firms indicated that they conducted online commerce or sales in 1998. Five of the 17 reported none of their total sales came from online purchases. The other 12 firms failed to respond to this question. These 12 other firms may have been selling their product online but did not report a sales figure. Since some of these 12 firms may have been selling online, I report that at least 10 percent of the firms sold online in 1998.
7. Wysocki, Bernard Jr., "Internet is Opening Up a New Era of Pricing," *The Wall Street Journal*, 8 June 1998: A1.

Quarterly Forecasts for the Kentucky Economy, 2000 - 2002

Eric C. Thompson

The Kentucky economy is forecast to see moderate to strong growth from 2000 through 2002. The rate of economic growth, however, is expected to slow relative to the past few years in both Kentucky and the nation. Real gross state product in Kentucky is forecast to grow at a 2.5 percent rate in 2000, while real total personal income is forecast to grow by 2.3 percent, total employment by 1.5 percent, and total population by 0.8 percent. For the entire 2000 to 2002 period, real gross state product is forecast to average 2.5 percent growth each year, compared to 2.1 percent annual growth for real total personal income. This strong rate of income growth will be fueled by strong gains in wage and salary earnings. Annual employment growth over the three-year period is forecast to average 1.3 percent, or 24,300 jobs each year. The services industry, forecast to add 11,600 jobs each year, is expected by itself to account for nearly half of this employment gain. The retail trade sector is forecast to add 5,100 jobs per year, while the manufacturing sector is forecast to lose 200 jobs per year on average from 2000 through 2002. The manufacturing industry, however, is forecast to account for roughly one-third of all growth in real gross state product.

Introduction

This article describes a forecast for the Kentucky economy for the years 2000 through 2002 produced using the University of Kentucky State Econometric Model. The model, developed in 1995, is used to make quarterly forecasts of the state economy with significant sector detail three years into the future. Forecasts are made for many mining, construction, manufacturing, trade, and service industries and government at a detailed level. Forecasts also are presented for occupational groups. Population forecasts are made for five-year age groups for both men and women. Income forecasts are presented by source of income including wage and salary income, transfer income, and incomes from dividends, interest, and rents. Quarterly forecasts are presented below for the year 2000. Annual forecasts are presented for 2000, 2001, and 2002.

The Kentucky economy is forecast to experience moderate to strong growth during the years 2000 through 2002. Gross state product growth is forecast to average 2.5 percent per year over the three-year period, while employment growth is forecast to average 1.3 percent annually. Future growth in the Kentucky economy is expected to be broad-based. All major industry groups besides manufacturing and mining are expected to add employment from 2000 to 2002. Further, the manufacturing industry is forecast to perform well in Kentucky relative to the nation, with 8 of 20 specific manufacturing industries expected to add employment. All nine occupational groups are forecast to add jobs over the next three years.

Despite a forecast of moderate job growth, the forecast calls for a strong 2.4 percent annual growth rate in wage and salary income. Total personal income is forecast to grow by 2.1 percent annually, paced by this strong wage growth. This employment and income growth is forecast to encourage net migration into Kentucky and yield an increase in the state's population of 0.8 percent per year. Overall, job growth and per capita income growth rates in Kentucky are forecast to exceed national growth rates, but population is forecast to grow at the same rate in Kentucky as in the nation as a whole.

The Kentucky Forecast

By most measures, the rate of growth in the Kentucky economy is forecast to slightly exceed the national growth rate (see the Appendix for a description of the national forecast). Faster growth is forecast for Kentucky because the state is expected

to experience only a small job loss in its manufacturing sector, while manufacturing jobs nationally are forecast to decline sharply. This relatively strong performance is expected for Kentucky even though the state does not have a large concentration of rapidly growing national manufacturing industries, such as those related to technology. Instead, Kentucky has become increasingly successful at capturing growth in traditional industries such as automobiles.

Even the slightly faster growth forecast for Kentucky can have important consequences for the economy. To give one example, Kentucky's annual total employment growth rate is forecast to exceed the national rate by 0.2 percent on average from 2000 through 2002. This percentage difference translates into 11,000 additional jobs for Kentucky over the three years.

Recent Developments

During 1999, both the Kentucky and national economies grew at a rapid rate. The national economy is estimated to have added employment at a rate of 2.1 percent per year. We estimate that employment in Kentucky grew by 2.0 percent during 1999, based on currently available data (through September 1999) and projections. To achieve this growth rate, Kentucky added roughly 35,300 jobs in 1999. This strong growth in 1999 follows on the heels of similarly strong growth in 1998.

The strong performance in the Kentucky economy in 1999 was in part due to a growing manufacturing sector. Manufacturing employment is estimated to have added 1,000 jobs in Kentucky in 1999. The more rapidly growing manufacturing industries in Kentucky during 1999 included transportation equipment, fabricated metals, primary metals, plastic products, and wood and furniture products. The coal mining industry overall is estimated to have maintained employment levels during 1999.

Other major industry groups posted employment gains in 1999. The services and retail trade sectors accounted for the most job growth. The services industry is expected to have grown by 3.4 percent and added 15,200 jobs in 1999. Business and health services led the way in service industry growth. The

retail trade industry is expected to have grown at a rapid 2.5 percent rate and added 8,300 jobs.

Modest job and income growth also led to modest population growth. Population in Kentucky is estimated to have grown by 0.8 percent during 1999.[1] National industrial production and productivity by industry are variables in manufacturing and mining, gross state product, and employment equations. National consumer spending and industry employment variables are important inputs for retail and service equations. National data on income growth by source is a key variable in income growth equations. Real personal income is estimated to have grown 2.7 percent.

The Next Year

The 2000 forecast calls for growth in the Kentucky and national economies to slow from the rapid growth during 1999. This is true for a range of measures from real value-added output to real total personal income to total employment. Growth rates are forecast to be similar in Kentucky and the United States, although slightly higher in Kentucky.

Real value-added output, or real gross state product, is forecast to grow at a moderate 2.5 percent rate in 2000. Growth is forecast to be steady but rising throughout the year, as is seen in Figure 1. Real gross state product is forecast to grow at an annual rate of 2.2 percent in the first and second quarters before rising to 2.9 percent and 2.6 percent, respectively, in the third and fourth quarters.

FIGURE 1

2000 Kentucky Gross State Product Growth
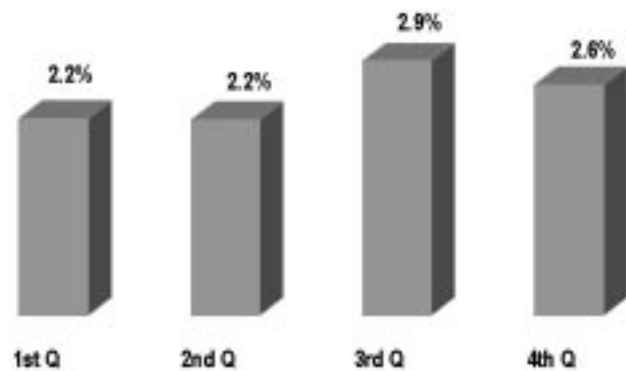
Total employment is forecast to grow by 1.5 percent during 2000. Total personal income growth is forecast to reach 2.3 percent paced by a rapid 2.8 percent growth rate in wage and salary earnings. As nationally, this strong rate of wage growth is expected to be fueled by rising productivity and tight labor markets. With moderate to strong employment and income growth, population growth in Kentucky is expected to match recent growth trends in 2000. Population is forecast to increase by 31,700 during the year, representing a 0.8 percent rate of growth.

Just as in previous years, the greatest growth among industries in 2000 is forecast for services and retail trade. Service industry employment is forecast to grow by 2.4 percent in 2000, adding a total of 11,100 jobs. Business services, growing at 4.8 percent, and health service growing at 2.3 percent, are forecast to add the most new service jobs. Retail trade employment is forecast to grow at 1.6 percent in 2000, adding 5,600 new jobs.

The manufacturing industry is expected to add about 1,000 jobs in Kentucky in 2000, for a 0.4 percent rate of growth. Transportation equipment, wood products, and plastic products are forecast to be among the strongest manufacturing industries. Losses in the coal mining industry are expected to remain modest next year, with employment forecast to decline by about 200 jobs, or one percent of total employment.

The Three-Year Forecast

Growth in the Kentucky economy is forecast to decelerate further in 2001 and 2002, but overall growth rates for the three-year period will be moderate to strong. Real gross state product is forecast to grow nearly 2.5 percent on average for the three years. Total employment growth is forecast to average 1.3 percent per year, and real total personal income is forecast to grow by 2.1 percent per year on average. Each of these growth rates meets or exceeds national forecasts. Population growth in Kentucky is expected to match national growth rates. The Kentucky statewide unemployment rate is expected to remain low, at 4.3 percent in 2000, 4.2 percent in 2001, and 4.6

Share of Kentucky Gross State Product Growth in Selected Industry Groups, 2000 - 2002
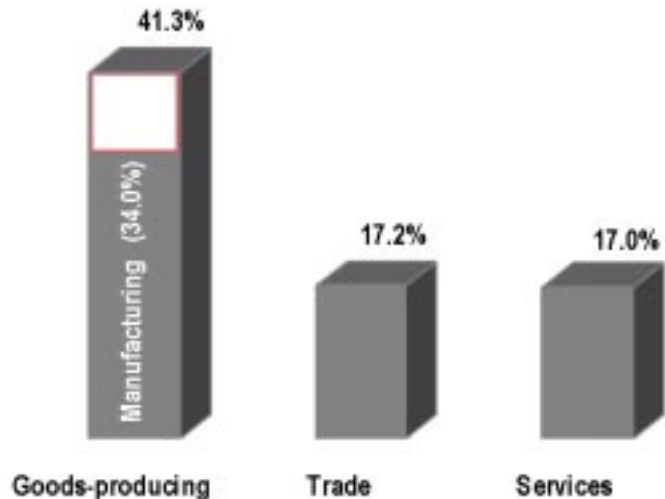
percent in 2002. The following three sections discuss the growth of industries, income, and population in more detail.

Gross State Product and Employment

Gross state product (GSP), or value-added output, is a comprehensive measure of economic activity which includes capital consumption, profits, business tax payments, as well as employment and earnings. As a result, analysis of gross state product data can sometimes lead to a different perspective than analysis of a less comprehensive measure, such as employment growth. In particular, while more rapid job growth in services is evidence of the emerging service economy, analysis of gross state product data reiterates the crucial role which manufacturing and other goods-producing industries play in the overall economy.

Manufacturing and other goods-producing industries (such as agriculture, mining, and construction) continue to account for a substantial share of gross state product. Manufacturing accounted for 27.1 percent of real gross state product in the fourth quarter of 1999, while goods-producing industries as a whole accounted for 37.6 percent. The remaining 62.4 percent of real gross state product was divided among other industries. For example, retail and wholesale trade accounted for 14.6 percent, and services accounted for 14.0 percent.

FIGURE 3

Indices of Employment Forecasts for Goods and Nongoods-Producing Industries in Kentucky and the United States, 2000 - 2002
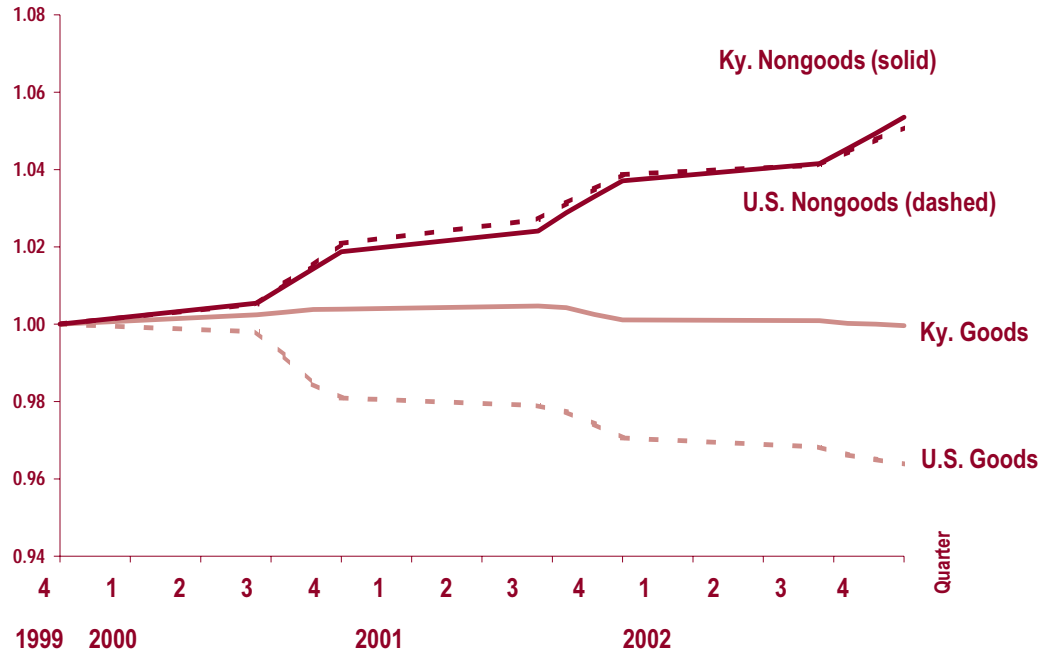
Manufacturing and other goods-producing industries are forecast to account for an even larger share of future growth in Kentucky real GSP, portending an even more important role in the economy in the future. As Figure 2 shows, manufacturing is forecast to account for 34.0 percent of growth in real GSP from 2000 through 2002. All goods-producing industries are forecast to account for 41.3 percent of growth in real GSP. Growth in manufacturing, mining, agriculture, and construction will be a crucial engine for growth in the Kentucky economy in years to come.

Figure 2 also shows the relative significance of trade and services for growth in real GSP. These industries are forecast to play a significant but secondary role in real GSP growth. Retail and wholesale trade are forecast to account for 17.2 percent of real GSP growth from 2000 through 2002, while services are forecast to account for 17.0 percent of growth.

Strong growth in real GSP is consistent with growing employment. An increase in real GSP, however, does not guarantee that employment also will increase. Productivity, or real GSP per worker,

can grow rapidly enough in some industries that total employment will decline even as real GSP rises. This trend is occurring nationally in many goods-producing industries. Figure 3 shows indices for employment in 2000 through 2002 compared to employment in the fourth quarter of 1999. As depicted, goods-producing employment is forecast to decline slightly in the United States from the fourth quarter of 1999 through the fourth quarter of 2002.

In Kentucky, however, growth in real GSP in goods-producing industries is expected to lead to steady employment. As shown in Figure 3, employment in goods-producing industries is forecast to remain steady overall for the three-year period, first rising very slightly and then falling back to original levels.

Nongoods-producing industries also are forecast to grow more quickly in Kentucky than nationally, although only slightly more quickly. Figure 3 also shows growth indices for nongoods-producing industries like services, retail trade, wholesale trade, and government in Kentucky and the United States. Nongoods-producing industries overall will grow marginally more quickly in

<div style="background:#7a1030;color:#fff;">TABLE 1</div>

Real Gross State Product (GSP) by Industry in Kentucky, 2000 - 2002 (Seasonally Adjusted)

| | Real GSP 4th Q 1999 ($mil) | 2000 Quarterly Growth at an Annual Rate | | | | Annual Growth Rate | | | Annual Averages | |
		1st Q	2nd Q	3rd Q	4th Q	2000	2001	2002	Growth ($mil)	Growth Rate
Total	$75,282.06	2.23%	2.21%	2.88%	2.61%	2.48%	2.53%	2.58%	$1,953.65	2.53%
Agriculture	1,716.90	-4.84	-4.83	13.51	5.68	2.09	1.32	1.30	27.41	1.57
Mining	2,848.54	1.90	-0.23	0.57	1.39	0.91	1.00	1.46	32.25	1.12
Construction	3,343.74	3.64	2.39	2.58	2.34	2.74	2.32	2.14	82.08	2.40
Manufacturing	20,376.97	1.57	2.35	3.52	3.39	2.70	3.27	3.51	664.36	3.16
TCPU	7,713.72	3.41	2.91	3.19	3.07	3.14	3.01	2.75	235.64	2.97
Trade	10,972.45	2.36	3.12	3.31	3.37	3.04	2.93	2.95	336.02	2.97
FIRE	9,460.09	1.71	1.49	1.50	1.46	1.54	1.45	1.40	140.56	1.46
Services	10545.95	3.26	3.07	3.09	3.05	3.12	3.04	3.00	332.00	3.05
Government	8,303.70	2.93	1.98	0.68	-0.08	1.37	1.14	1.18	103.33	1.23

TCPU = Transportation, Communications, and Public Utilities   FIRE = Finance, Insurance, and Real Estate

Kentucky than nationally. The growth rate in Kentucky is forecast to average 1.8 percent per year over the three-year period compared to a 1.7 percent for the United States.

A more detailed analysis of real GSP forecasts is presented in Table 1, which provides real GSP growth forecasts for each major industry group.

Personal Income

Income growth in Kentucky is forecast to exceed national growth over the next three years. Figure 4 shows indices of real total personal income in Kentucky and the United States. Real income refers to income adjusted for inflation. Real total personal income growth in Kentucky is forecast to slightly exceed growth in the United States, as is evident in Figure 4. The growth rate in Kentucky is forecast to average 2.1 percent per year from 2000 to 2002 compared to 2.0 percent for the United States.

Faster total income growth in Kentucky is not the result of faster population growth in the state. Population in Kentucky is forecast to match national growth over the three-year period. Instead, higher income growth in Kentucky is the result of higher income growth per person. From 2000 through 2002, growth in real per capita, or per person, income in Kentucky is forecast to average 1.3 percent compared to an average growth of 1.2 percent nationally.

Population

Population growth in Kentucky has been steady throughout the 1990s.[2] Rising in-migration, reduced outmigration, or both, have lead to positive net migration, which is the number of persons migrating to Kentucky minus the number migrating out of the state.

With more persons moving to the state than are leaving, population growth has exhibited the kind of steady growth seen elsewhere in the nation (net migration also is positive for the nation as a whole). The forecast population growth rate for Kentucky, at 0.8 percent per year, is expected to match the national average from 2000 to 2002. This figure translates into an average increase of 31,900 residents each year. Of that total, 25,800 are due to net migration.

This growth, however, is not forecast in all population groups. As nationally, Kentucky's forecast shows an aging population. The number of persons ages 35 to 44 in Kentucky is forecast to decline slightly over the next three years, and growth is very modest in other young age groups. At the same time, some older age groups should grow rapidly. In particular, population is forecast

FIGURE 4

Indices of Real Total Personal Income Forecasts in Kentucky and the United States, 2000 - 2002

Kentucky (solid)

United States (dashed)

Quarter

| 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| 1999 | 2000 | | | | 2001 | | | | 2002 | | | |
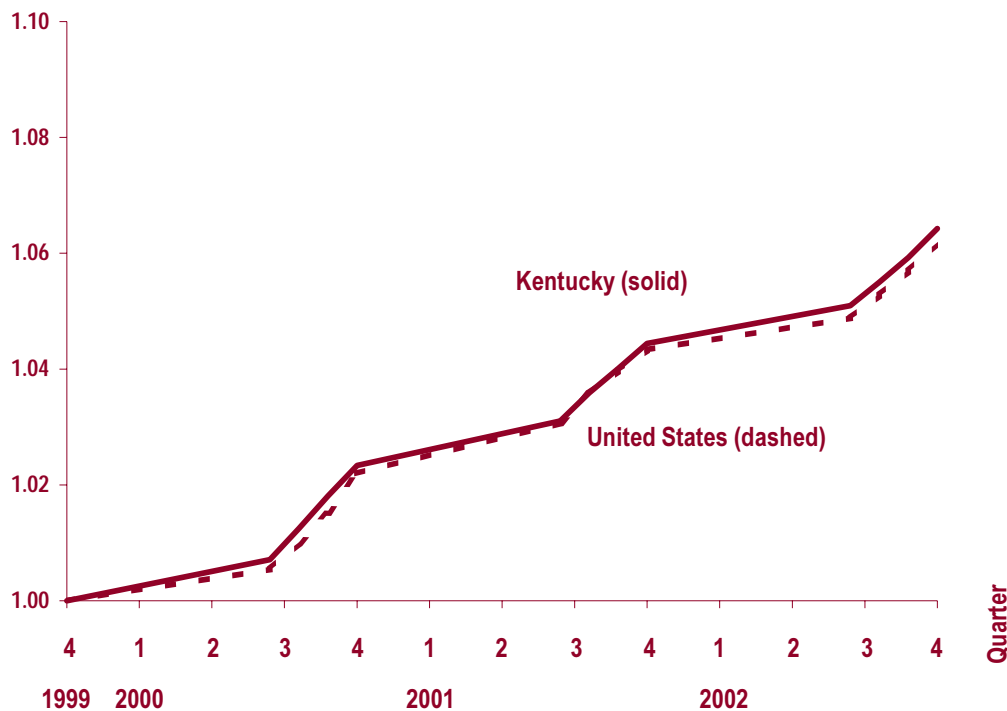
to grow quickly among the older portions of the labor force. The population of 55 to 64 year-olds is expected to grow by 3.4 percent per year from 2000 through 2002. Population is also forecast to grow quickly among the oldest portion of the population. The number of persons over age 85 should grow by 4.7 percent per year over the next three years.

Forecast Detail

The aggregate growth forecast for the Kentucky economy is not the result of a consistent growth rate among all industries, or sources of income. Employment in many industries is forecast to grow much more rapidly than total employment, while some manufacturing and mining industries will not grow at all. The following sections examine growth in industries, occupations, and sources of income in detail.

Employment

Forecast employment growth among Kentucky industries varies substantially, but it is broad-based. Most industries are forecast to add employment, with the exception of coal mining and a number of manufacturing industries. As nationally, the majority of job growth is forecast in retail trade and services.

Total manufacturing employment is forecast to decline at an average annual rate of 0.1 percent in Kentucky from 2000 through 2002, which translates to a loss of roughly 200 jobs per year. Manufacturing employment is forecast to grow by 0.4 percent in 2000, decline by 0.3 percent in 2001, and decline by 0.2 percent in 2002. The forecast loss of manufacturing employment in 2001 and 2002 is in contrast to modest growth in the manufacturing industry in Kentucky in many recent years. The forecast decline reflects a pessimistic forecast for national manufacturing employment in the next few years. Indeed, Kentucky's average annual 0.1

TABLE 2

Growth and Growth Rates for Nonfarm Employment in Kentucky by Industry, 2000 - 2002 (Seasonally Adjusted)

	Employment 4th Q 1999	2000 Quarterly Growth				Annual Growth			Average Ky.	Annual Ky. %	Growth U.S. %
		1st Q	2nd Q	3rd Q	4th Q	2000	2001	2002			
TOTAL	1,794,820	1.91%	1.41%	1.42%	1.34%	1.52%	1.31%	1.18%	24,345	1.34%	1.12%
GOODS-PRODUCING	426,898	0.99%	0.25%	0.27%	0.04%	0.39%	-0.28%	-0.15%	-56	-0.01%	-1.22%
Mining	22,766	-0.20	-1.13	-0.43	-0.29	-0.51	-2.25	-3.21	-446	-1.99	-4.52
Coal mining	18,753	-2.07	-2.72	-0.24	0.68	-1.10	-2.44	-4.10	-467	-2.55	NA
Construction	86,224	1.59	-0.49	0.55	1.42	0.76	0.39	0.88	589	0.68	-1.02
Manufacturing	317,908	0.91	0.56	0.24	-0.31	0.35	-0.32	-0.22	-199	-0.06	-1.19
Food products	25,767	-1.78	-1.68	-1.36	-0.83	-1.41	-0.51	-1.04	-252	-0.99	-0.12
Tobacco	3,566	0.50	-2.69	-4.17	-4.77	-2.80	-5.32	-4.86	-148	-4.33	-5.90
Textiles	5,373	1.53	-0.25	-5.33	-3.65	-1.96	-1.64	-1.31	-86	-1.63	-3.05
Apparel	20,557	-5.84	0.41	-5.24	-4.13	-3.73	-3.17	-4.10	-726	-3.67	-3.96
Wood	15,676	1.08	1.63	0.62	1.41	1.18	1.41	1.40	211	1.33	-1.38
Furniture	5,888	-2.35	-3.11	-1.61	-0.36	-1.86	0.95	0.37	-11	-0.18	-1.37
Paper products	12,387	0.18	1.51	2.36	0.71	1.19	1.20	1.69	171	1.36	-0.56
Printing and publishing	21,694	0.18	-1.63	-3.54	-3.30	-2.09	-2.10	-2.83	-496	-2.34	-1.36
Chemicals	14,821	-2.94	-1.66	-3.10	-1.46	-2.29	0.08	-0.05	-112	-0.75	-0.65
Petroleum and coal refining	2,599	0.77	0.48	-0.33	-0.87	0.01	-2.23	-3.11	-46	-1.77	-3.48
Rubber and plastic products	20,482	0.85	3.82	0.99	3.45	2.27	3.11	3.73	641	3.04	-0.26
Leather products	879	-0.54	-2.55	0.65	-1.03	-0.88	-0.63	-2.85	-13	-1.45	-3.91
Stone, clay, and glass products	11,918	3.84	-0.13	-1.62	-1.99	0.00	-1.31	-0.94	-89	-0.75	-1.48
Primary metals	18,531	-2.11	-2.38	-2.01	-1.28	-1.95	0.27	0.26	-88	-0.47	-1.97
Fabricated metals	26,189	-0.25	0.60	-1.12	0.13	-0.16	0.86	1.46	189	0.72	-0.97
Non-electric machinery	37,600	1.35	0.96	4.60	-0.69	1.54	-1.24	-1.17	-112	-0.29	0.45
Electric machinery	24,656	6.33	4.27	2.84	2.06	3.86	-0.26	-1.75	146	0.62	-0.90
Transportation equipment	40,689	6.10	1.37	4.41	1.27	3.27	-0.53	1.48	575	1.40	-2.99
Instruments and related products	4,507	0.55	1.13	-0.59	-0.22	0.22	0.56	0.08	13	0.28	-1.37
Miscellaneous manufacturing	4,127	4.43	2.14	1.49	1.64	2.42	0.96	-0.95	33	0.81	-1.21
NONGOODS-PRODUCING	1,367,922	2.20%	1.77%	1.78%	1.74%	1.87%	1.80%	1.58%	24,401	1.75%	1.67%
TCPU	105,016	2.19	1.13	1.72	1.47	1.63	1.33	0.78	1,322	1.24	1.20
Trade	429,224	1.70	1.48	1.38	1.52	1.52	1.42	1.18	5,980	1.37	1.11
Wholesale trade	85,758	0.61	0.88	1.54	1.24	1.07	1.22	0.86	910	1.05	1.10
Retail trade	343,466	1.98	1.63	1.34	1.59	1.63	1.47	1.26	5,070	1.46	1.12
FIRE	71,894	2.14	1.44	1.85	2.23	1.92	1.60	1.19	1,146	1.57	1.19
Services	460,975	2.22	1.99	2.64	2.82	2.42	2.60	2.36	11,614	2.46	2.40
Business services	91,317	5.23	4.10	4.90	4.98	4.80	4.17	3.57	3,977	4.18	NA
Health services	154,407	2.06	2.13	2.32	2.59	2.27	2.62	2.35	3,819	2.41	2.11
Government	300,813	2.93	2.15	1.06	0.39	1.63	1.33	1.31	4,339	1.42	1.33
Federal	36,557	4.77	10.20	-3.29	-6.44	1.10	0.02	0.22	164	0.45	0.50
State and local	264,257	2.67	1.07	1.69	1.37	1.70	1.51	1.46	4,175	1.56	1.46
State	90,431	0.73	0.41	0.44	0.52	0.52	0.77	0.81	636	0.70	NA
Local	173,826	3.70	1.41	2.34	1.82	2.31	1.88	1.79	3,539	2.00	NA

TCPU = Transportation, Communications, and Public Utilities   FIRE = Finance, Insurance, and Real Estate

percent job loss compares favorably with the national forecast of an average 1.2 percent decline in manufacturing employment each year. Kentucky may not add manufacturing employment in the next few years but is forecast to continue to do much better than the nation.

As is seen in Table 2, eight of the state's 20 manufacturing industries are forecast to add jobs in the next three years. Still, this compares favorably with the national forecast. Only one manufacturing industry is forecast to add jobs nationally. The fastest rates of employment growth for Kentucky manufacturing industries are forecast for plastic products, transportation equipment, wood products, paper products, and fabricated metals. The fastest rates of job loss are forecast for apparel products, printing and publishing, food products, and tobacco products.

Employment in the construction industry in Kentucky is forecast to grow by 0.7 percent per year. Coal mining employment is forecast to decline during each of the next three years, with an average loss of about 450 jobs per year. This loss is significant but small compared to the substantial declines during the 1980s and early 1990s. In the early 1990s, an average of 1,400 jobs was lost each year.

As with manufacturing, nongoods-producing industries in Kentucky such as retail trade and services are expected to outperform their national counterparts in terms of jobs. This result is not surprising given the faster rate of income growth expected for Kentucky. As was seen in Figure 4, income is forecast on average to grow 0.1 percent faster in Kentucky than nationally. Since demand for industries like retail and services is largely driven by local demand and incomes, faster-growing incomes in Kentucky should lead services and trade industries to grow as fast or faster in Kentucky than nationally. A faster rate of growth is clearly seen in retail employment, which is forecast to grow by 1.5 percent in Kentucky compared to 1.1 percent nationally over the next three years.

Kentucky also is forecast to have higher rates of growth in the finance, insurance, and real estate (FIRE) industry, as well as in government employment. Employment in the FIRE industry is forecast to grow by 1.6 percent each year in Kentucky compared to 1.2 percent nationally, while government employment is forecast to grow by 1.4 percent annually in Kentucky compared to 1.3

percent in the United States overall. The transportation, communications, and public utilities (TCPU) industry is forecast to add employment at the same 1.2 percent annual rate both in Kentucky and the nation. Wholesale trade employment is forecast to rise by 1.0 percent per year in Kentucky compared to 1.1 percent per year nationally.

As in the nation overall, the services industry is forecast to have the most rapid employment growth in Kentucky. The services industry is forecast to add employment at a rate of 2.5 percent per year in Kentucky and 2.4 percent nationally. The service industry can achieve such rapid growth in part because it contains some of the fastest growing portions of the economy such as business services and professional services. A trend in business towards outsourcing services rather than keeping in-house staff continues to fuel rapid growth in business and professional services. Table 2 indicates that business services are forecast to grow by 4.2 percent per year on average from 2000 through 2002. The health care industry continues to add employment at about the same rate as the service industry overall and accounts for nearly 4,000 new jobs each year in the service industry.

In summary, most trade and service industries are forecast to grow as fast or faster in Kentucky than nationally. This is consistent with the slightly faster rate of income growth in the state. The state also is forecast to benefit from a better performing manufacturing industry than the nation.

Occupations

These patterns in industry growth also are evident in the pattern of occupational growth. As Table 3 indicates, two of the three fastest growing occupational groups are services occupations, and to a lesser extent, marketing and sales occupations. Workers in service occupations include health care assistants, food preparers, cleaners, and household workers. Marketing and sales occupations are composed primarily of cashiers and other retail sales workers. Service occupation job growth is forecast to average 5,500 jobs over each of the next three years, while 3,300 marketing and sales jobs are expected to be gained each year. This growth translates into a 1.9 percent annual growth rate for service occupation jobs, and a 1.7 percent rate of

TABLE 3

Growth and Growth Rates for Employment in Kentucky by Occupation, 2000 - 2002 (Seasonally Adjusted)

	Employment 4th Q 1999	Employment 4th Q 2002	Annual Growth	Annual Growth Rate
TOTAL	1,794,820	1,867,856	24,345	1.34%
Executives, administrators, and managers	179,284	187,544	2,753	1.51
Professional specialty	223,989	240,299	5,437	2.37
Technicians and related support	64,352	67,634	1,094	1.67
Marketing and sales	188,382	198,397	3,338	1.74
Administrative support, including clerical	342,673	350,626	2,651	0.77
Service	287,874	304,373	5,500	1.88
Agriculture, forestry, fishing, and related	19,204	19,661	153	0.79
Precision production, craft, and repair	216,292	220,190	1,299	0.60
Operators, fabricators, and laborers	284,123	290,548	2,142	0.75

growth for marketing and sales jobs. Both growth rates are well above the forecast overall growth rate of 1.3 percent for all occupations. Slower growth was forecast for those occupations that account for a substantial share of manufacturing employment, such as precision, production, craft, and repair workers, and operators, fabricators, and laborers. The annual growth rate forecast for precision, production, craft and repair workers is forecast at 0.6 percent per year, while the growth forecast is 0.7 percent per year for operators, fabricators, and laborers. A substantial share of the job growth in these occupations is forecast to occur for workers performing these tasks in non-manufacturing industries such as construction, and transportation, communications, and public utilities (TCPU).

Another pattern evident in occupational growth forecasts is the growth among occupations requiring a high level of education. Among all occupational groups, workers in professional specialty occupations have the highest level of education. This occupational group also has the highest growth rate and is forecast to experience the second largest job increase in the next three years. The number of workers in professional specialty occupations is forecast to grow by 2.4 percent annually, resulting in a net increase of 5,400 workers each year. The professional specialty occupational group includes teachers, scientists, engineers, doctors, and artists, among others. Executives, administrators, and

managers, as well as technicians, are other groups of workers that, on average, have a higher level of education. The average annual rate of job growth in these two occupational groups is forecast to be 1.7 percent for technicians and 1.5 percent for executives, administrators, and managers. Both of these growth rates are above the average of 1.3 percent rate for all occupations. The rapid growth rate for these education-oriented occupations is forecast to occur throughout the economy, rather than being tied to a particular industry.

Despite these differences among particular occupations, it is worth noting that the outlook for job growth is at least fair for all of these nine aggregate occupation groupings. The growth rate is forecast to exceed at least 0.6 percent per year in all major occupational groups. While the number of jobs may be declining in some more specific occupations, these aggregate numbers indicate that there at least should be jobs available for workers in related occupations. This implies that overall there are expanding opportunities for most Kentucky workers.

TABLE 4

Growth and Growth Rates for Real Personal Income and its Components in Kentucky by Occupation, 2000 - 2002 (Seasonally Adjusted)

Income Source	Income 4th Q 1999 ($mil)	2000 Quarterly Growth at an Annual Rate				Annual Growth Rate			Annual Averages		
		1st Q	2nd Q	3rd Q	4th Q	2000	2001	2002	Growth ($mil)	Growth Rate Ky.	Growth Rate U.S.
Total personal income	$53,930.70	2.87%	2.15%	2.24%	2.10%	2.34%	2.06%	1.90%	1,155.52	2.10%	2.02%
Wage and salary income	31,189.32	2.68	2.46	3.04	2.87	2.76	2.31	2.07	760.10	2.38	2.50
Other labor income (benefits)	3,196.46	2.39	1.69	1.67	2.28	2.00	2.36	2.00	69.24	2.12	1.54
Proprietor's income	3,574.17	2.55	2.17	1.88	1.63	2.06	1.26	0.88	50.59	1.40	1.17
Residential adjustment	-325.40	5.91	5.11	5.10	4.63	5.19	4.05	4.09	-15.10	4.44	NA
Contributions to social insurance	2,802.91	4.00	1.21	3.04	3.94	3.04	2.89	2.15	77.56	2.69	2.40
Transfer income	10,651.73	4.48	1.99	1.53	1.55	2.38	2.92	2.98	302.10	2.76	2.76
Dividends, interest, rent	7,629.40	2.44	1.11	0.99	0.84	1.34	0.64	0.43	61.65	0.80	0.54
Per capita income	$13,643.98	1.42%	1.43%	1.25%	2.13%	1.56%	1.13%	1.09%	$173.68	1.26%	1.18%

Personal Income

Real total personal income is forecast to grow somewhat more rapidly in Kentucky than nationally. Income growth is forecast to average 2.1 percent per year in Kentucky from 2000 through 2002 compared to 2.0 percent nationally. An examination in Table 4 of the sources of income growth indicates that this slightly faster overall growth results from very similar growth rates for wage and salary income and transfer income, but better performance for Kentucky in dividend, interest, and rent income.

Rapid growth in wage and salary income is the source for this strong growth in real total personal income in Kentucky and the nation. Growth in real wage and salary income is forecast to reach roughly 2.5 percent per year both in Kentucky and the nation over the next few years due to continued productivity growth and tight labor markets. Although, as is seen in Table 4, the rate of growth in real wage and salary income is forecast to slow over the 2000 through 2002 period.

Real wage and salary income growth of 2.4 percent per year would translate into nearly $760 million of real income growth per year from 2000 to 2002. Benefits income (other labor income) is forecast to grow by 2.1 percent per year in Kentucky. This 2.1 percent increase is forecast to yield $69 million in new income each year. Proprietor's income is forecast to grow by 1.4 percent per year

in Kentucky from 2000 to 2002, adding $51 million per year to state income. Proprietor's income is forecast to grow by 1.2 percent per year nationally. Together, these three sources of working income are forecast to account for $880 million of $1,156 million in income growth per year in Kentucky. Earnings from work will be the key source for income growth in Kentucky. After subtracting out payments on wages for social insurance, earnings from work will account for 69.4 percent of income growth in the state.

Transfer income in Kentucky is forecast to grow at an average rate of 2.8 percent over the next three years. This is the same growth rate forecast for the nation. This rate of growth translates into a forecast growth of transfer income of $302 million per year in Kentucky. Dividend, interest, and rent income is forecast to grow by $62 million per year in Kentucky from 2000 to 2002.

A final interesting pattern in Kentucky incomes is the continued decline forecast for Kentucky's residential adjustment over the next few years. Residential adjustment is the difference between what Kentuckians earn working in other states minus what residents of other states earn working in Kentucky. The decline in residential adjustment indicates that one result of Kentucky's forecast employment growth is expected to be an increase in workers from nearby states finding work in Kentucky, a decrease in the number of Kentuckians working in nearby states, or both.

Risks to the Forecast

The forecast presented for the Kentucky economy is based in part on the baseline October 1999 forecast for the United States economy produced by DRI/McGraw Hill. This baseline national forecast represents the most likely scenario for the economy over the next three years. Use of this baseline national forecast implies that the Kentucky forecast is also a baseline forecast, the most likely scenario for the state's economy among a group of possible scenarios. The national economy has other potential outcomes, which in turn could be played out in the Kentucky economy. The two alternative national scenarios are examined below. Note that DRI/McGraw Hill no longer assigns specific probabilities to these alternative scenarios. Both scenarios involve a recession during the forecast period.

In the first alternative scenario, a mild recession occurs in late 2000 and early 2001. This recession is precipitated by a 30 percent correction in the stock market. This loss of wealth hurts consumer confidence in the economy and depresses consumer spending. The economy slips into recession as a result. With the inflation rate still moderate at this time, however, the Federal Reserve is free to cut interest rates to spur the economy and avoid a deep recession. Real gross domestic product (GDP) growth turns negative for only a few quarters and never contracts by more than 1 percent (annualized) in any quarter. The resulting recession is milder than the recession that occurred at the beginning of the 1990s.

In the second alternative scenario, the economy continues to grow at a rapid rate through 2001, but falls into recession in 2002. In this scenario, inflation begins to rise in 2000 and 2001 due to an overheated economy fueled by rising overseas demand and continued strength in domestic demand. The Federal Reserve fails to act early to stem inflation and must sharply increase interest rates once inflation reaches a 3.0 percent rate. The economy falls into a moderate recession with real GDP contracting by over 3.5 percent during the worst quarter of the recession period. This recession would be more severe than the recession that occurred in the early 1990s, but about as severe as the average recession since World War II.

Conclusion

The Kentucky economy is forecast to experience moderate to strong growth during 2000, 2001, and 2002. By most measures, growth is expected to decelerate throughout the period, with the most rapid growth occurring in the year 2000. Growth is forecast to be broad-based. Most industries are forecast to add employment, with the exception of coal mining and several manufacturing industries. All major occupational groups are forecast to add employment. Real income is forecast to grow at a rapid rate fueled by strong wage and salary income growth. Population growth is forecast to be strong and may match national averages for population growth. Overall, growth is forecast to help Kentucky maintain low statewide unemployment rates.

The services and retail trade industries are forecast to add the most new jobs during the next three years. Together, these two industries are forecast to add 16,700 of the 24,300 net new jobs expected in the Kentucky economy each year. The manufacturing industry as a whole is forecast to lose 200 net jobs per year from 2000 to 2002. Despite this slight decline in employment, manufacturing remains a key to growth in the state economy. The manufacturing sector is forecast to account for 34.0 percent of growth in real gross state product in Kentucky. Gross state product is a broader measure of an industry's contribution to the economy than employment.

Growth in the Kentucky economy is forecast to match or slightly exceed growth in the national economy for most employment and income measures. Manufacturing employment is forecast to decline at a slight 0.1 percent annual rate in Kentucky from 2000 to 2002, while nationally it is expected to decline 1.2 percent each year. Growth rates in Kentucky for retail trade, services, and government are forecast to exceed growth rates for the United States. Growth rates for real wages and salaries and transfer payments are forecast to be similar in Kentucky and the United States. Population growth in Kentucky is forecast to match national growth rates, while per capita income is forecast to grow slightly faster in Kentucky.

Appendix: National Forecast

The forecast for Kentucky is based on the baseline forecast for the national economy in the DRI/McGraw-Hill publication *The U.S. Economy* for October 1999. National variables forecast by DRI/McGraw-Hill are key variables in nearly every part of the University of Kentucky State Econometric Model.[3]

The baseline national forecast from DRI/McGraw-Hill depicts an economy in 2000, 2001, and 2002 that gradually slows relative to the rapid growth of 1999. Real GDP is forecast to grow by 2.8 percent in 2000, 2.6 percent in the year 2001, and 2.2 percent in 2002. A similar pattern is evident for employment and unemployment. Employment is forecast to grow by 1.6 percent nationally in 2000, 1.3 percent in 2001, and 0.8 percent in 2002. This slowdown in employment growth is partly attributed to a downturn in the rate of growth in the labor force, due to the aging of the population. The unemployment rate is forecast to average 4.2 percent in 2000, 4.3 percent in 2001, and 4.6 percent in 2002.

The moderation in the U.S. economy in 2000 through 2002 is expected to result from a moderation in the growth of consumer spending. Consumer spending growth will moderate as the growth of wealth in equity markets and home sales lessons, and consumers begin to save more of current income. Consumer spending, however, will continue to grow at a more moderate pace, and overall economic growth will be aided by improvement in overseas economies. Monetary policy is expected to be neutral as the federal funds rate remains at the 5.5 percent. The federal government is expected to maintain an annual budget surplus in the range of $150 to $190 billion. The consumer price index, which rose 2.2 percent in 1999, is forecast to rise by 2.7 percent in 2000, 2.0 percent in the year 2001, and 2.4 percent in 2002.

Endnotes

1. Population data for Kentucky are not yet available for the first two quarters of 1999. Thus, population values need to be forecast for the first two quarters of 1999 based on the available Kentucky employment data. In particular, Kentucky employment growth and unemployment data are key inputs into forecasts of the migration component of population. Population growth for the last two quarters of 1999 are forecast along with other Kentucky variables such as employment and income.

2. Moderate series birth and survival rates were taken from Michael Price, Thomas Sawyer, and Martye Scobee, *How Many Kentuckians: Population Forecast 1995-2020,* Population Research, Kentucky State Data Center, University of Louisville, 1993.

3. National industrial production and productivity by industry are variables in manufacturing and mining, gross state product, and employment equations. National consumer spending and industry employment variables are important inputs for retail and service equations. National data on income growth by source is a key variable in income growth equations.

Kentucky Composite Economic Indicators

Greg Harkenrider

Most states are constitutionally bound to submit and maintain a balanced budget. Since the state revenue bloodline flows from the pulse of the real economy, it becomes vitally important to properly measure the current and immediately pending short-term state economy. This article will illustrate the methodology employed in the development of a state model of leading and coincident economic indicators. The novel aspect of the Kentucky model lies in the link between the real and fiscal economies. Many state agencies have an interest in real economic variables only insomuch as these factors are used as exogenous inputs into state revenue forecasts. The job of translating an economic forecast (employment, personal income, etc.) into a revenue forecast constitutes a second level of modeling, often done casually with rough elasticities. By including fiscal variables directly into the composite reference series, forecasters can preempt the classical problem of translating changes in the real economy into revenue impacts. Thus, the interpretation of the leading and coincident indices has an embedded revenue component that will provide direct, timely information about likely short-term revenue flows. These projections can then complement more extensive quarterly econometric models to give states a short and long view of the fiscal economy.

Introduction

Short-term forecasters of the national economy have constructed a vast multitude of models and indices, designed mainly to help identify and predict turning points in the business cycle. Perhaps the most notable effort is a set of economic indicators designed by the U.S. Bureau of Economic Analysis (BEA). The Conference Board currently compiles these individual indicators into three composite indices, designed to lead, coincide, and lag the overall level of economic activity. Composite indices are particularly useful because they cumulate the often-mixed individual indicators into a single barometer of economic activity. This objective aggregation process, coupled with timely data revisions, has made composite indices a mainstay in economic forecasting.

This article will document the methodology used in computing and maintaining the Kentucky Composite Economic Indicators. Following the remainder of this introduction, section one will discuss the composite reference series and present a methodological framework for identifying coincident and leading indices. Section two will highlight the data used in each index. Section three will follow with a discussion of inferences and

interpretations for movements in the leading and coincident indices. Finally, the Appendix will provide the inaugural presentation of the Kentucky Composite Economic Indicators with accompanying data tables. The balance of the introduction will answer two questions that go to the core of why economic indicators are so widely used by economists at the state level: 1) Why bother with indicators when econometric forecasting models are already in place and useful? And 2) Since U.S. economic indicators are readily available at no cost, and since the economies of many states are closely tied to the national economy, why do states compute their own indices?

The Importance of Economic Indicators

While composite indices have become firmly entrenched in the toolboxes of most economists, they cannot be viewed as a substitute for comprehensive longer-term econometric forecasting models. Econometric forecasting models and economic indicators have a complementary rather than

adversarial relationship. Long-term models are meant to capture economic trends based on a rich historical data set and complex econometric relationships. They paint the economic landscape with broad strokes over a wide canvas. Economic indicators use a finer brush to show all of the detail in the immediate foreground that was purposely smoothed over with the broad strokes. No attempt is made to forecast specific sectors of the economy — indicators simply relate current data to a broadly based reference.

Practical considerations further highlight the complementary relationship between econometric forecasts and economic indicators. Econometric models use quarterly data while indicators use monthly time series. This aggregation to quarterly data is useful in terms of reducing the volatility of the data, but sometimes the lower frequency data mask signals of economic turning points. Since the indices will be recomputed every month, indicators can dissect the movements within a given quarter and potentially detect any imminent turning points in advance of the quarterly model. This information can be used subjectively by long-term forecasters, since 1) quarterly models have fewer observations, 2) econometric models sometimes have jagged edges where history ends and the forecast begins, and 3) many econometric models use external forecasts of the national economy, where turning points may not exactly coincide with state cycles. Since the early

signs of a recession or recovery are of keen interest to businessmen, policymakers, investors, and workers, monthly indicator models have the added benefit of generating more frequent data revisions and reports.

Why Do States Compute Their Own Indices?

State economists face the dilemma of deciding how closely their economy mirrors the broader U.S. landscape. U.S. data are plentiful, timely, and inexpensive to acquire, while state-level data are scarce, erratically available, and often costly to gather. If a state's economy has little deviation from national trends, then prudence would dictate the use of prepared national data and economic indices. If, on the other hand, substantial differences exist between the local economy and the national economy, then U.S. indices would be less useful in analyzing and predicting the state economy. Most states likely gravitate between the two extremes.

Most states are constitutionally bound to submit and maintain a structurally balanced budget. Since the state revenue bloodline flows from the pulse of the real economy, proper measurement of the current and immediately pending short-term state economy is vitally important. While states generally behave as microcosms of the aggregate U.S. economy, regional turning points do not coincide with their national counterparts. The duration of expansions and downturns may also differ, as shown in Figure 1. Note that the twin recessions of the early 1980s hit

FIGURE 1

United States and Kentucky Reference Series
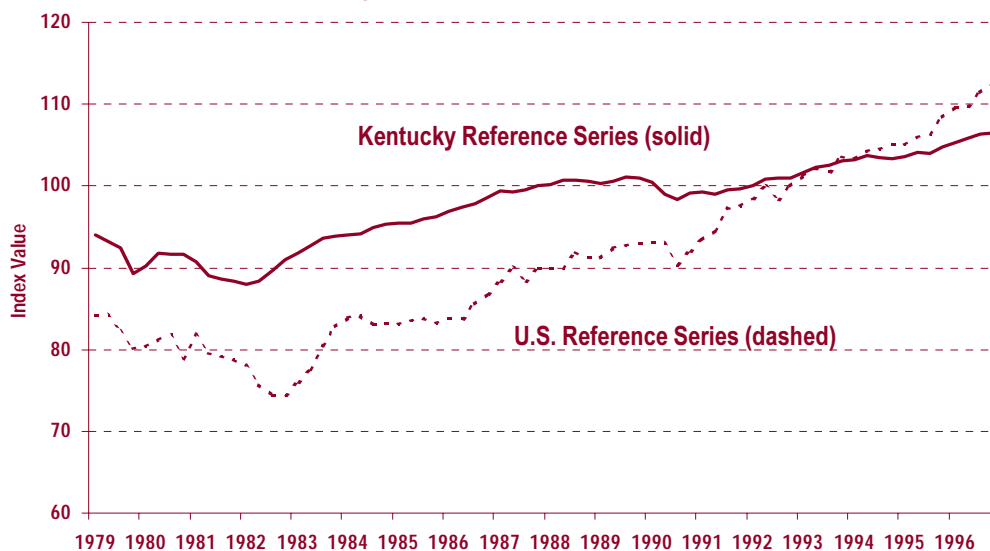
Kentucky early and hard, and the recovery from this period was much slower than in the nation as a whole. On the other hand, the recession in 1990 was relatively milder and the rebound was more abrupt in Kentucky. Thus, since economic fluctuations have fiscal consequences, states often monitor their economies more closely than simply tracking national indicators. This tracking process is acutely important near an economic peak, as the growth in tax revenue slows in a recession while expenditures increase. The monthly indicator process should provide explanatory and predictive insights into changes in the economic horizon.

Finally, the process of computing an economic index forces the Kentucky Office of Financial Management and Economic Analysis (OFMEA) to analyze and maintain monthly data. This secondary benefit provides a conduit through which OFMEA can systematically keep a watchful eye on economic conditions, both in the U.S. and the Commonwealth. A careful examination of a multitude of monthly data helps to add perspective and insights into our total forecasting effort.

Cyclical Turning Points and Economic Indicators

Selection of the Reference Series or Index

Composite economic indices, by design, translate changes in individual data series into unique barometers of overall economic activity. The entire process of developing indicators, despite the numerous statistical procedures, boils down to a very simple strategy. First, we decide what economic activity we want to mimic with indicators.[1] Second, a decision is made as to what data best characterize the activity to be modeled. Third, the data chosen in the previous step are aggregated if necessary and turning points are identified. Fourth, other data are collected and tested to examine the degree to which they match the turning points from step three. Fifth, the data from step four are combined into composite indices and turning points are revealed. Finally, the turning points of the indicators are compared to the turning points of the baseline. In the case of a leading index, the

forecasting ability of the index equals the number of periods that turning points in step five lead the turning points in step three. In the case of a coincident index, the turning points in steps three and five would ideally be close to one another.

Since indicators are always viewed in comparison to a baseline, the first step in the process involves constructing a single measure of overall economic activity. At least two possibilities exist as candidates for a baseline reference. First, a reference series may act as the sole yardstick for economic activity. Personal income, gross state product, and total nonagricultural employment are commonly used examples. Under this method, turning points in the economy are defined at the time when the reference series changes directions. The benefit of this single reference series approach lies in the simplicity and objectivity of using just one measure. In other words, the problem of deciding which data to include in the reference is avoided entirely. This inherent objectivity is counterbalanced by a potential downside. Any composite index based on a reference series is designed to lag, lead, or coincide with the reference series (and not necessarily the overall economy). Thus, an index based on a reference series provides summary information about the broader economy only insomuch as the reference series is an accurate summary of aggregate activity.

The alternative approach dates turning points in the economy by employing a comprehensive review of an extensive range of economic data. These candidate data are analyzed and weighted to form a reference index that embodies all of the underlying weighted components. Turning points in the economy, then, become the points at which the weighted reference series changes direction. Indicators developed relative to a comprehensive reference series circumvent the aforementioned problem of linking movements in the indicators to movements in the aggregate economy — the comprehensive reference series *is* the aggregate economy. The tradeoff comes in subjectively deciding turning points in the reference index. The inherent subjectivity stems from the weighting process, as the data are weighted before they are aggregated into the composite reference series. The process of aggregation, therefore, interjects an element of subjectivity that confounds any effort to

precisely date the turning points in the reference index.

OFMEA carefully thought about the merits and shortcomings of both methods, ultimately siding with a modified reference series approach to dating turning points. OFMEA is primarily concerned with forecasting the fiscal economy. Thus, since the link between personal income and tax revenue is not direct, we decided to measure the health of the overall economy in terms of both personal income and tax revenues.

Inflation-adjusted personal income less transfer payments and policy-adjusted general fund tax receipts are combined to form the OFMEA composite reference series. The need to adjust the general fund tax receipts underscores the intrinsic difficulty in using tax receipt data. Tax receipts are tallied on a cash basis rather than on the basis of any underlying economic activity. This fact interjects many elements of noise into the data that are not related to behavior we wish to model. In our case, general fund receipts were adjusted to account for two specific areas of imprecision. First, a tax law change for the individual income tax led to a unique over-withholding in the third quarter of 1990. The receipts were redistributed back across the first two quarters to account for this large bump in the withholding data. Second, we adjusted the receipts for some large refunds that were carried forward to the next fiscal year. This amounted to lowering the second quarters of 1992 and 1993 and adding to the third quarters of the same years. While we acknowledge that similar instances may have occurred over other time periods, we made no attempt to adjust for any other distortions caused by using cash data.[2]

The other adjustments to the general fund compensate for the structural provisions of the aforementioned tax law change in 1990 (House Bill 940). This law 1) eliminated the deduction of federal income taxes paid on the individual income tax, 2) raised the sales tax from 5 to 6 percent, and 3) provided better conformity with the IRS tax code, thereby broadening the tax base consistent with the federal Tax Reform Act of 1986. To account for these changes, we lowered general fund receipts by OFMEA's projection of the fiscal impacts.[3] These amounts were projected forward using an annualized percentage growth rate for the general fund between 1985 and 1990.

TABLE 1

Turning Points

	Kentucky	United States
Peak	Februrary 1979	January 1980
Trough	March 1980	July 1980
Peak	August 1981	July 1981
Trough	March 1983	November 1982
Peak	September 1990	August 1990
Trough	May 1991	March 1991

While this composite approach successfully bridges the gap between the real and fiscal economies, it highlights several of the pitfalls associated with working with tax revenue data. In addition to the general fund receipts, we tested the a) sales and use tax, b) corporate income tax (declaration payments, payments with returns, and refunds), c) motor vehicle usage tax, d) individual income tax, and e) combinations of some or all of the above. Only the general fund receipts produced a pattern that was consistent with the level of overall economic activity and free of superfluous peaks and troughs.

The turning points identified by the reference series are shown in Table 1. These turning points are displayed in juxtaposition to the U.S. business cycles to further illustrate the differences in timing of the two economies.

Selection Criteria for Economic Indictors

The next step is to define a group of candidate indicators and evaluate whether or not the turning points of these indicators mimic the turning points in the reference index. Six criteria are commonly used to appraise economic variables for the national composite indices: (1) economic significance, (2) statistical adequacy, (3) timing of cyclical turning points, (4) conformity to historical business cycles, (5) smoothness, and (6) timeliness.[4] Data are plentiful at the national level, so there are literally hundreds of variables to consider. Hence, a detailed scoring system is used to assess each indicator and aggregate the aforementioned six criteria into a unique score. Currently the ten highest scoring leading indicators are used by the Conference Board in the national composite leading index. The scores

also play a role in the weights that are assigned to each of the components of the national index.

At the state level, however, data are neither as plentiful nor as effortless to gather on a timely basis. Moreover, they often fail criteria (3), (4), and (5) above. Consequently, the detailed scoring system required at the national level did not come into play in Kentucky.[5] Since no scoring system was used, weights could not be assigned on the basis of the relative scores. Weights for the Kentucky leading indicators were determined solely by the relative volatility of each component. In order to judge each candidate series properly, we applied the NBER methodology to each Kentucky indicator.[6] The NBER method is an iterative technique in which turning points are first identified with a 12-month moving average. These turning points are adjusted in comparison with the turning points of successively "rougher" moving averages until the precise turning points are identified. A data series can be rejected at any point of the iterative process.

Kentucky Economic Indicators

Of the candidate indicator series, the primary rejection criterion was the existence of superfluous cycles that did not correspond to any significant movements in the reference index. These gratuitous turning points, if large enough in magnitude, could cause the composite index to exhibit a false turning point. Consequently, these candidate indicators were rejected. Another common cause of rejection was inconsistent indicators, i.e., variables that behaved well for one period in history but proved unreliable globally. Airline passengers at the Louisville International Airport provide one such example. Total enplanements and deplanements were a stable indictor of the twin recessions of the early 1980s, but deregulation and airport expansions have rendered that data series too volatile for use in later periods. Several other data series exhibited a similar failure of robustness over time and were discarded accordingly.

Data Sources and Model Operation

The indicators that passed muster are listed in Table 2. Several of the leading index components are indices in their own right. For example, the leading index has a labor intensity index formulated from ten underlying time series.[7] Two factors motivated OFMEA to adopt this approach of using indices as components to the leading index. First, in the case of the labor intensity index, the testing process produced periods of remarkable leading capability but the lead was not robust over time. No single industry successfully matched all turning points across the entire period of 1979-1997 without generating false signals. However, when the best five industries were combined using the aforementioned aggregation procedure, the five-industry index passed the indicator testing criteria. This fact, coupled with the knowledge that weekly hours were used very successfully in past projects for Kentucky and the U.S., prompted OFMEA to explore and ultimately accept the labor intensity index.

OFMEA also computed a variation of the U.S. leading index rather than using the widely publicized version in its unadulterated form. Since the U.S. and Kentucky turning points did not precisely coincide, we questioned whether an index designed for a given set of turning points would have leading capabilities in Kentucky. Moreover,

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TABLE 2

Kentucky Economic Indicator Components

Leading Indicators
- Initial Unemployment Insurance (UI) Claims (Claims in 1st Month)
- Initial U.S. UI Claims
- Louisville Help Wanted Index
- Kentucky Labor Intensity Index
    - Five 2-digit SIC Industries
    - Hours * Employment
- U.S. Leading (Financial)
- U.S. Manufacturing and Trade Sales

Coincident Indicators
- Kentucky Non-agricultural Employment
- U.S. Index of Industrial Production
- Continued Unemployment Insurance (UI) Claims Index
    - Kentucky Continued * Duration
    - U.S. Continued * Duration

the U.S. leading index contains components that parallel economic activity in which Kentucky-specific data are available (e.g., initial claims for unemployment insurance and weekly hours of production employees). Thus, we eliminated these two variables from the U.S. leading index and tested the remaining eight components in the normal fashion. The testing process eliminated the interest rate spread and the slower deliveries diffusion index of vendor performance, leaving the OFMEA index of U.S. leading indicators with the remaining six U.S. components. These six components were then re-indexed in the prescribed manner.

Finally, unemployment insurance (UI) claims produced more reliable turning points using the composite approach. In the leading index we have included an index of initial claims. This index has two components: Kentucky UI claims in their first month of payment and U.S. initial claims. OFMEA tested total Kentucky initial claims, which include both new claims and "additional" claims. Additional claims for UI are the subset of initial claims filed by workers who have previously filed UI claims but are currently filing new claims with intermittent workforce attachment since their original claim. The claims in their first month of payment without intermittent qualified experience performed better in the testing process and were chosen accordingly. U.S. claims also fared well, but the combination of U.S. and Kentucky claims performed better than either series individually. Thus, the composite index of UI claims was added to the leading index and U.S. claims were eliminated from the U.S. leading index. A similar situation occurred with the coincident index. We ultimately found an optimal combination by indexing two products (Kentucky continued claims for UI multiplied by the average duration of a claim in Kentucky and U.S. continued claims multiplied by the average duration of claims for the U.S.).

The Louisville help-wanted index also passed the testing process and is included as a component to the leading index. The Conference Board computes an index of help-wanted advertisements for major regions across the United States; Louisville is the only city in Kentucky covered by the Conference Board. U.S. manufacturing and trade sales round out the collection of leading indicators for Kentucky. This series outperformed Kentucky

sales tax receipts and U.S. total retail sales. Since no measure of current sales is incorporated in the U.S. leading index, a few words about the economic significance of sales may be in order. Current manufacturing and trade sales help form the basis for business expectations for the immediate short run; absent other knowledge, the best predictor of future sales is the level of current sales. The link between current sales and the expectations of future sales translates back into the real economy through higher levels of current investment and an upgraded production schedule. Since production and investment do not occur instantaneously, the formation of expectations (manifested through current sales) should slightly lead the business cycle.

OFMEA is committed to gathering additional state-level data and testing them for inclusion in the indices. We are currently in the process of obtaining bankruptcy, commercial and industrial electricity consumption, industrial effluence, and building permit data for Kentucky. We will also periodically check the existing index variables to ensure that they maintain their proper relation to the reference series.

Inference and Interpretations

A current view of the recent economic statistics for Kentucky is shown in Figures 2 and 3. These figures illustrate Kentucky's leading and coincident composite indices.

Figure 2 shows that the coincident index usually reaches a peak or trough at roughly the same time as the reference index. Figure 3 demonstrates that the leading index normally turns in advance of the reference index. These graphs also highlight another characteristic of composite indicators. The leading index exhibits month-to-month fluctuations, regardless of the direction of the overall aggregate economy. This variability, a result of the random variation in the underlying economic data, also manifests itself in the U.S. indices.

Due to the propensity for monthly fluctuations, a "three-month" criterion has been adopted. During an economic expansion, three consecutive months of decline in the leading index can be interpreted as evidence that the reference index will peak within the forecasting window of the leading index. Conversely, when the economy is contracting, three

FIGURE 2

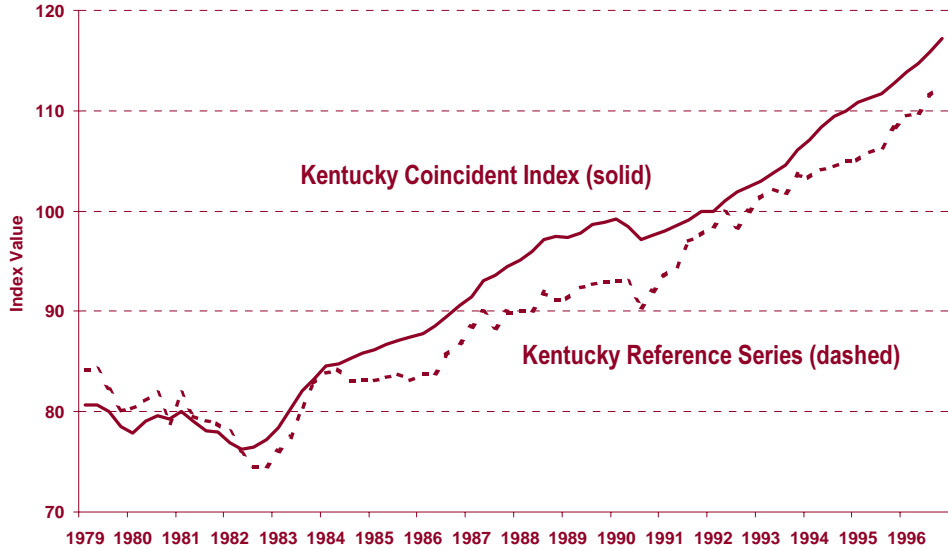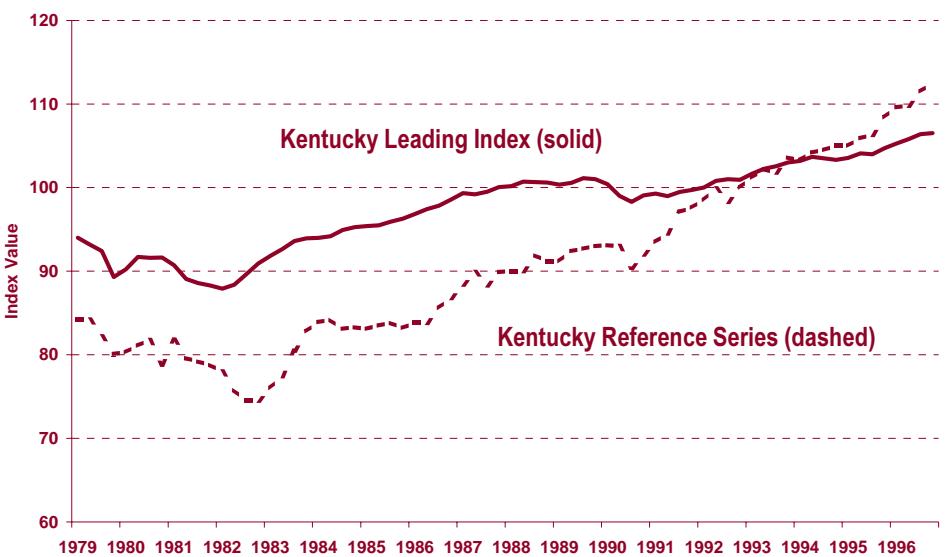## Kentucky Composite Index of Coincident Indicators

Kentucky Coincident Index (solid)

Kentucky Reference Series (dashed)

FIGURE 3

Kentucky Composite Index of Leading Indicators

Kentucky Leading Index (solid)

Kentucky Reference Series (dashed)

consecutive upturns in the leading index can be interpreted as evidence that the economy will reach a trough within the same forecasting window. Three consecutive months of turns in the composite index can be seen as further evidence that the reference series will turn (or is in the process of turning). Historically, this practice has been fairly reliable, producing no significant false alarms. Figure 4 shows the lone period where the three-month rule

produced an extraneous indication. This period underscores the fact that indicator forecasting is partly science but also partly subjective. Figure 4 also illustrates a hypothesis for potential research, in that leading indicators tend to be more volatile in periods directly before a peak (or impending downturn).

FIGURE 4

The Kentucky Leading Index and the Three-Month Rule
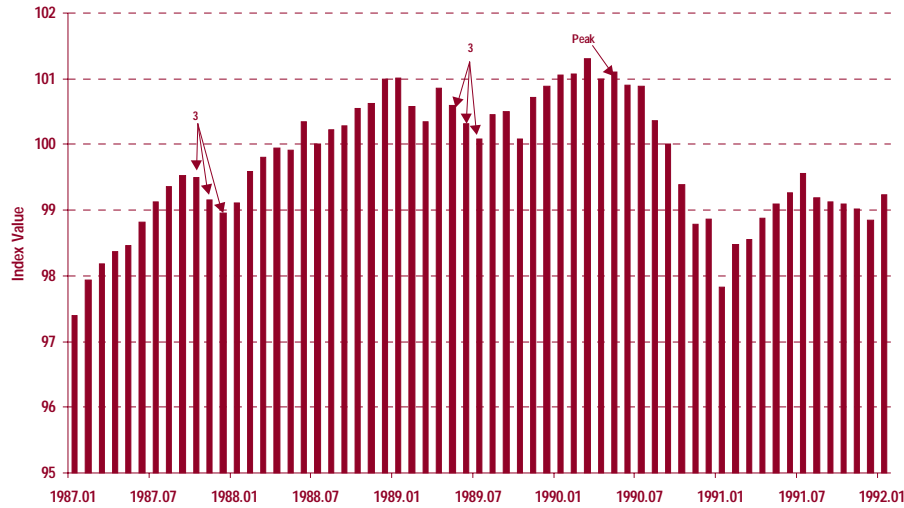
The burgeoning literature on economic indicators presents other opportunities for future research and refinement.[8] Most of the work appears to be focused on national indicators, partly due to the lack of timely and available data for most states. The literature lacks an abundance of careful state studies, and this void offers an invitation for states to apply the new advances in economic indicator methodology to their regional models.

Endnotes

1. Often the target is the aggregate economy, either at the regional, state, or national level.   Other possible baseline activities may include, for example, welfare populations or migration patterns.
2. OFMEA plans to experiment with an in-house microsimulation model to adjust the individual income tax receipts to a baseline policy regime.
3. See "Revenue Estimates for the Biennium," Finance and Administration Cabinet, Commonwealth of Kentucky, May 17, 1990.
4. *1984 Handbook of Cyclical Indicators*, U.S. Department of Commerce, 1984.
5. In the future, as additional data are collected and tested, a scoring system will be developed if necessary.
6. Mintz, Ilse. "Dating United States Growth Cycles," *Occasional Papers of the NBER*, Vol. 1, No. 1, Summer 1974.
7. We use seasonally adjusted weekly hours multiplied by employment for the following manufacturing industries: lumber products, chemical and allied products, rubber and plastic products, fabricated metals, and transportation equipment.
8. A detailed bibliography of literature is presented in *Leading Economic Indicators – New Approaches and Forecasting Records*. Edited by Kajal Lahiri and Geoffrey H. Moore, Cambridge University Press, 1991.

Appendix: Kentucky Economic Indicators

September Index as of November 23, 1999

The Kentucky Composite Index of Leading Indicators (Kentucky leading index hereafter) fell at a seasonally-adjusted annual rate (SAAR) of 3.1 percent in September, following a revised 1.3 percent increase in August (see Figure A1). September's dip in the Kentucky leading index breaks a string of four consecutive monthly increases during the summer months of 1999. Despite the monthly decline, year-over-year growth in the index remains ahead of last year's pace. The Kentucky Composite Index of Coincident Indicators (Kentucky coincident index hereafter) also fell in September, marking the first decline in this index since December 1998. Taken in tandem, the two indices tell a consistent story. The general trend in the leading index has a delayed response on the coincident index. Weaknesses in the leading index this spring are now beginning to show up slower annual growth in the coincident index. However, starting in May, the leading index has rebounded, which should become manifest in the coincident index this winter. Therefore, the outlook for the near term is somewhat more positive than the September economic indicators may imply. Both Kentucky indices are compiled and maintained by the Governor's Office for Economic Analysis (GOEA), a group formerly a part of the Office of Financial Management and Economic Analysis (OFMEA).

September's decrease in the Kentucky leading index was broadly based, as four of the five seasonally adjusted components fell from their August levels. The lone holdout was U.S. manufacturing and trade sales, which surged forward in September at a clip of 6.2 percent. This particular category of sales is thought to lead the overall economy since these transactions are intermediate inputs into the production of final demand. GOEA's U.S. leading index, a variant of the Conference Board's U.S. leading index and bell-wether indicator of the Kentucky economy, led the decline with a 1.8 percent setback. This index contains six of the ten leading indicators used by the Conference Board in the U.S. leading index, with the selection criterion being that the indicators consistently lead the Kentucky real and fiscal economies. Coincidentally, the broader U.S. leading index also fell 1.1 percent in September, suggesting that the leading indicators most relevant to the Commonwealth are performing slightly better than the entire set of U.S. leading indicators. GOEA's labor intensity index also contributed to the slide in September's Kentucky leading index with a 1.7 percent dropoff. Labor intensity is measured by statistically combining the number of employees with the average number of hours worked per week for five industry classifications in Kentucky. Changes in labor intensity have been shown to precede shifts in overall business activity, since employers tend to adjust the hours of their existing staff before resorting to new hiring (in an expansion) or worker layoffs (in a slowdown).

FIGURE A1

Kentucky and United States Leading Indices (Seasonally Adjusted Annual Rates)
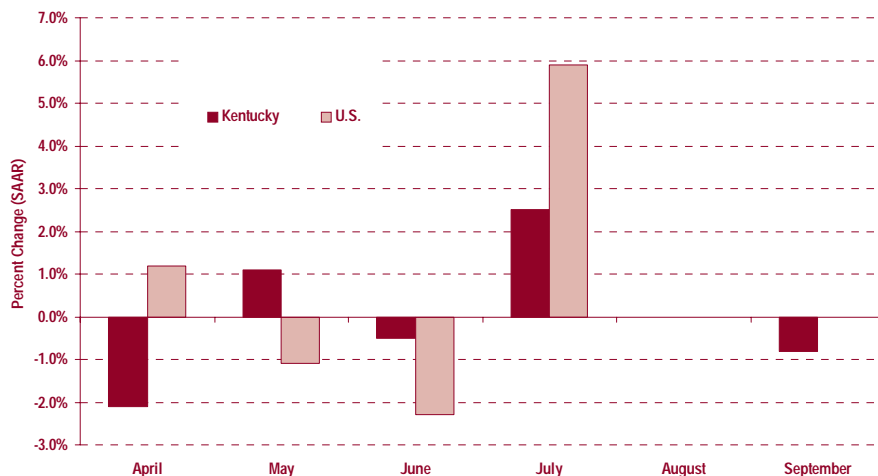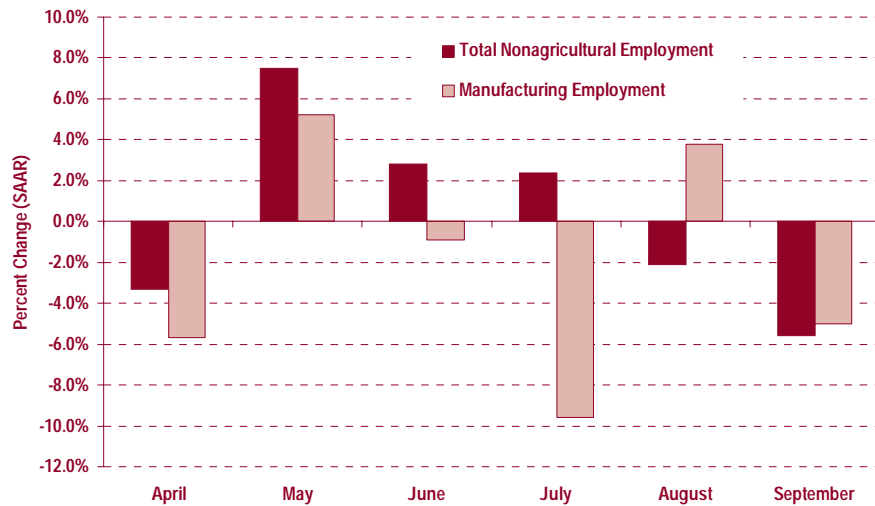
FIGURE A2

Kentucky Employment Growth (Seasonally Adjusted Annual Growth)

A third negative contribution was made by GOEA's index of initial unemployment insurance (UI) claims, which fell 3.1 percent in September, fueled by seasonally-adjusted increases in both Kentucky and U.S. initial UI claims. The initial claims index has been adjusted so that a negative economic event, such as September's increase in initial claims for unemployment insurance, translates into a downturn in the index. The Louisville help-wanted index rounded out the declining leading indicators, falling from 164 to an estimated 158 in September. Help-wanted indices are computed by the Conference Board for approximately 60 cities across the nation. A decrease in advertising intensity has been shown to precede a weaker demand for workers, signaling a potential decline in production and economic activity. While the movement in the help-wanted index is consistent with some of the employment data discussed below, labor markets conditions in the Commonwealth remain very tight, and no broader weaknesses in labor growth have been detected.

As alluded to in the introduction, Kentucky's coincident index carded a rare decline in September. The coincident index acts as a barometer of current economic conditions in the Commonwealth. Since analysts are faced with many, often conflicting, economic signals, a coincident index helps disentangle the current economic data by

quantifying the mixed signals into a single measure of our economic well-being. September's message from the coincident index was unambiguous, as all three components fell. Total Kentucky nonagricultural (nonag) employment fell 4.6 percent (SAAR), despite an aggregate increase in employment of 10,500 jobs. September is a traditionally strong month for employment growth (gains in education-related employment more than offset the reductions from the post-Labor-Day slowdown in recreation-based employment), but the seasonal adjustment process discounts for this phenomenon by ratcheting the absolute number down. Therefore, although September 1999 had employment gains, they were not as high as the usual September surge, causing a setback in the seasonally adjusted data (Figure A2).

The second coincident indictor, U.S. industrial production, fell by 3.8 percent (SAAR) in September, marking the first decline in ten months. Part of the decline may be attributable to a level adjustment, since the level of industrial production soared in July and August, attributable in part to the severe weather. Finally, U.S. personal income fell 4.0 percent. Again, GOEA would not place too much emphasis on the monthly dip in personal income, as it does not appear to be indicative of any structural weaknesses in wage growth or wealth accumulation. We will, however, continue to monitor the personal income situation very closely as it does bear significantly on many other economic and fiscal variables.

Monetary policy of the Federal Reserve Board (Fed) and its effect on the stock market have once again become fodder for many water cooler discussions among financial analysts and economists. The Federal Reserve initiated a third quarter-point hike in the federal funds rate in November, a move generally regarded as a

preemptive strike on future inflation. Rate increases in June, August, and November have exactly offset the three rate reductions that occurred in the fall of 1998, when the Fed acted to stimulate the economy amid the global financial turmoil. The November bump was largely built into the expectations of most financial analysts, but now analysts are looking for clues on whether or not the Fed will tighten further. While there is some evidence of mounting wage pressures, core inflation is very modest, suggesting that profit margins are very thin. Further tightening would be construed as a signal from the Fed that the risks of inflation outweigh the risks of recession. The good news for citizens of Kentucky is that we will continue to see modest inflation and a stable economy.

While September was a less than stellar month for the Kentucky economic indices, it would be premature to infer a weakening state economy. Recent performances in the Kentucky leading index offer reassurance that the winter and spring quarters will not usher in a downturn in economic activity of the state. Most of the downside risk in the state economy would be driven by a "correction" at the national level. The theory contends that the successful run over the 1990s will lead to unsustainable growth, higher inflation, corrective monetary policy, a loss of consumer confidence, and a reversal of fortune. This scenario has yet to play out, however, and the economy seems once again poised for another stretch of sustained growth. Expect the Commonwealth to follow suit with moderate economic growth in the winter months.

TABLE A1

Selected Kentucky Economic Indicators, Seasonally Adjusted

	1998 SEP	OCT	NOV	DEC	1999 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
KY Leading Index (1992=100)	107.0	107.2	107.5	107.2	107.6	108.1	108.4	108.2	108.3	108.2	108.5	108.5	108.4
% Chg Prev Month SAAR	1.7	1.9	3.4	-2.8	4.1	6.0	3.4	-2.1	1.1	-0.5	2.5	0.0	-0.8
% Chg Same Month Last Yr	1.6	1.6	1.7	1.9	1.7	1.6	1.9	2.0	2.0	1.7	1.4	1.5	1.3
KY Coincident Index (1992=100)	117.8	118.5	118.8	119.0	119.5	119.7	120.2	120.3	120.8	120.8	120.8	121.4	121.2
% Chg Prev Month SAAR	2.6	7.3	3.8	1.8	5.4	1.8	5.6	0.9	5.3	-0.9	0.9	5.9	-2.2
% Chg Same Month Last Yr	3.4	4.1	4.0	3.9	4.1	3.5	3.8	3.3	3.4	3.2	3.0	3.3	2.9
Nonag Employment (THOU)	1715.3	1727.3	1723.4	1723.9	1734.4	1736.9	1745.5	1740.7	1751.2	1755.2	1758.7	1755.6	1747.2
% Chg Prev Month SAAR	2.1	8.7	-2.7	0.4	7.5	1.7	6.2	-3.3	7.5	2.8	2.4	-2.1	-5.6
% Chg Same Month Last Yr	2.1	2.9	2.6	2.6	2.9	2.0	2.7	1.4	1.8	2.0	2.1	2.5	1.9
Mnfg Employment (THOU)	317.5	316.5	315.5	315.7	317.4	318.5	317.1	315.5	316.9	316.6	314.0	315.0	313.6
% Chg Prev Month SAAR	1.1	-3.6	-3.7	0.7	6.5	4.5	-5.4	-5.7	5.2	-0.9	-9.6	3.8	-5.0
% Chg Same Month Last Yr	1.8	1.6	1.3	1.8	1.9	1.8	0.6	-0.7	-0.1	-0.7	-1.8	-0.7	-1.2
KY Unemployment Rate (%)	5.2	5.0	4.9	4.8	4.6	4.1	4.5	4.0	4.2	4.4	4.2	4.4	4.1
Index of Init UI Claims[1]	103.2	103.7	104.4	102.4	103.5	103.7	104.0	103.9	103.5	101.9	103.1	104.1	104.5
% Chg Prev Month SAAR	6.9	5.2	8.0	-20.2	13.9	2.5	3.1	-1.2	-5.0	-16.4	14.6	12.6	4.7
% Chg Same Month Last Yr	0.5	1.4	1.6	1.5	0.8	-0.4	0.6	1.4	0.4	-0.9	-0.8	1.4	1.2
OFMEA US Leading Index[2]	104.7	104.9	105.1	105.0	105.3	105.7	105.9	106.2	106.0	106.1	106.4	106.4	106.4
% Chg Prev Month SAAR	1.8	2.1	2.1	-1.3	3.9	4.6	2.2	2.7	-1.3	0.5	3.6	0.3	0.0
% Chg Same Month Last Yr	1.9	2.0	2.0	1.9	1.9	2.0	2.3	2.5	2.2	1.9	1.9	1.8	1.6
KY Labor Intensity Index (92=100)[3]	103.9	103.9	103.8	104.2	104.1	104.2	104.2	103.6	103.8	104.2	104.0	103.9	104.2
% Chg Prev Month SAAR	-3.4	0.3	-1.5	4.5	-1.3	1.8	0.2	-7.2	2.6	4.6	-1.9	-1.1	3.3
% Chg Same Month Last Yr	0.5	0.3	-0.2	0.5	0.5	0.4	0.1	-0.3	0.0	0.1	-0.1	-0.2	0.3
Louisville HW Index (92=100)[4]	158.0	161.0	170.0	165.0	160.0	170.0	181.0	170.0	174.0	176.0	178.0	168.0	148.0
% Chg Prev Month SAAR	137.7	25.3	92.1	-30.1	-30.9	107.0	112.2	-52.9	32.2	14.7	14.5	-50.0	-78.2
% Chg Same Month Last Yr	4.6	4.6	12.6	11.5	9.6	14.9	17.5	6.9	12.3	13.6	12.7	14.3	-6.3
General Fund Receipts (MIL$)	576.6	450.9	471.4	586.1	533.1	435.1	443.9	668.2	396.6	612.2	436.3	430.5	570.9
% Chg Same Month Last Yr	11.2	5.4	3.4	7.3	0.5	3.9	5.9	17.6	-2.9	4.8	5.0	2.0	-1.0
GF Sales Use receipts (MIL$)	162.1	169.7	158.8	174.8	210.3	130.0	139.5	176.5	167.3	162.6	178.8	167.2	170.9
% Chg Same Month Last Yr	2.9	3.0	3.3	10.4	5.1	11.2	4.4	8.8	5.9	1.1	4.4	5.5	5.4
GF Ind. Income Tax Receipts	231.5	180.2	185.5	210.1	188.3	211.8	138.5	332.7	136.6	245.5	168.1	193.8	245.8
% Chg Same Month Last Yr	6.4	6.1	8.6	9.1	1.6	5.3	12.9	27.8	-1.6	10.0	-4.2	6.5	6.2

1. The index of initial unemployment insurance claims combines U.S. and KY initial claims, interacted by the duration of an average claim. Initial claims in KY were provided from the Workforce Development Cabinet. For more information concerning the calculation of the index, please contact OFMEA.
2. OFMEA computed a variation of the U.S. leading index rather than using the widely publicized version in its unadulterated form. Six of the ten U.S. leading indicators were used in the OFMEA index, and the weights were also recomputed. For more information, please contact OFMEA.
3. The Kentucky labor intensity index combines employment and weekly hours for five industry categories. For a list of the industries or the weights, please contact OFMEA.
4. Source: The Conference Board.

Note: Growth rates are computed with precise numbers. Due to rounding, two observations may have the same reported value but still exhibit growth at a more precise level.

TABLE A2

Selected United States Economic Indicators, Seasonally Adjusted

	1998 SEP	OCT	NOV	DEC	1999 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
US Coincident Index (1992=100)	117.2	117.5	118.1	118.6	119.0	119.3	119.7	120.0	120.3	120.4	120.4	121.0	121.0
% Chg Prev Month SAAR	4.2	3.1	6.3	5.2	4.1	3.1	4.1	3.1	3.0	1.0	0.0	6.2	0.0
% Chg Same Month Last Yr	3.4	3.6	3.8	3.9	4.0	3.7	3.8	3.8	4.0	3.6	3.3	3.6	3.2
US Leading Index (1982=100)	104.3	104.4	104.5	104.5	104.6	105.0	105.2	105.3	105.2	105.0	105.5	105.5	105.5
% Chg Prev Month SAAR	3.5	1.2	1.2	0.0	1.2	4.7	2.3	1.2	-1.1	-2.3	5.9	0.0	0.0
% Chg Same Month Last Yr	1.9	2.0	2.0	1.9	1.8	1.7	1.7	1.9	1.5	1.4	1.5	1.4	1.2
Nonag Employment (MIL)	123.3	123.6	123.9	124.3	124.6	124.8	124.9	125.2	125.6	125.8	125.9	126.2	126.2
% Chg Prev Month SAAR	3.8	2.8	3.7	3.4	3.4	1.9	0.8	3.1	3.2	1.8	1.1	3.0	0.7
% Chg Same Month Last Yr	2.6	2.7	2.7	2.8	2.9	2.8	2.6	2.6	2.7	2.6	2.5	2.7	2.4
Unemployment Rate (%)	4.9	4.8	4.6	4.7	4.7	4.6	4.7	4.3	4.3	4.5	4.5	4.5	4.6
Initial Claims for UI (THOU)	310.2	311.1	318.6	313.4	316.6	309.0	308.5	308.7	316.5	351.1	315.4	302.2	296.7
% Chg Prev Month SAAR	-45.3	3.5	33.1	-17.9	13.0	-25.3	-1.9	0.8	34.9	247.3	-72.4	-40.1	-19.8
% Chg Same Month Last Yr	-8.2	-8.0	-5.8	-11.1	-3.9	-0.6	-1.0	-8.1	-2.0	4.1	3.3	-7.4	-4.4
Industrial Production Index	125.6	126.6	127.5	127.9	127.8	127.3	128.0	128.4	128.8	127.5	127.0	129.0	128.7
% Chg Prev Month SAAR	3.3	9.6	9.7	3.4	-0.7	-4.5	6.2	4.2	4.2	-12.0	-4.2	20.7	-3.4
% Chg Same Month Last Yr	5.0	5.8	5.8	5.7	5.4	4.3	4.5	4.3	4.5	3.2	2.0	3.0	2.5
Pers Income Less Trans(BIL 92$)	5115.8	5133.9	5160.7	5169.1	5201.6	5229.0	5248.6	5261.5	5277.7	5295.0	5309.1	5328.0	5337.9
% Chg Prev Month SAAR	2.6	4.3	6.5	2.0	7.8	6.5	4.6	3.0	3.8	4.0	3.2	4.4	2.3
% Chg Same Month Last Yr	3.5	4.0	4.2	4.0	4.5	4.4	4.5	4.5	4.3	4.5	4.6	4.4	4.3
CPI, All Urban (1982-84=100)	161.3	161.6	161.8	161.9	161.9	162.0	162.0	162.4	162.9	163.0	163.3	163.6	163.6
% Chg Prev Month SAAR	3.0	2.3	1.5	0.7	0.0	0.7	0.0	3.0	3.8	0.7	2.2	2.2	0.0
% Chg Same Month Last Yr	2.2	2.1	1.9	1.7	1.6	1.4	1.4	1.5	1.8	1.6	1.7	1.7	1.4
Retail Sales (BIL 84$)	133.7	133.1	133.4	134.0	135.3	136.3	136.5	137.1	138.3	138.4	137.3	137.1	137.5
% Chg Prev Month SAAR	-7.1	-4.8	3.0	4.7	12.5	9.9	1.3	5.9	11.2	0.6	-9.6	-1.7	3.8
% Chg Same Month Last Yr	2.3	1.3	2.0	2.2	2.1	1.8	1.7	4.0	5.2	4.6	2.6	1.9	2.9
Mnfg & Trade Sales (BIL 92$)	724.1	722.8	722.7	731.8	734.9	743.7	752.2	749.4	750.1	754.3	753.6	755.8	758.1
% Chg Prev Month SAAR	14.9	-2.1	-0.3	16.3	5.2	15.4	14.6	-4.4	1.2	6.9	-1.1	3.6	3.7
% Chg Same Month Last Yr	6.4	5.4	4.6	6.5	5.5	5.5	6.9	5.9	6.5	5.8	4.2	5.6	4.7
US Consumer Sentiment (1966=100)	100.7	102.8	102.3	96.1	102.2	104.2	101.9	104.3	101.7	99.3	100.0	98.3	93.9
% Chg Prev Month SAAR	4.9	28.1	-5.7	-52.8	109.3	26.2	-23.5	32.2	-26.1	-24.9	8.8	-18.6	-42.3
% Chg Same Month Last Yr	11.8	14.4	9.0	4.7	11.9	9.8	8.9	12.8	5.3	0.4	-2.5	-2.0	-6.8
Bank Prime Interest Rate (%)	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5

...And the Band Played On: The U.S. Economy in 1999

Christopher J. Waller

The U.S. economy continued its long growth march during 1999 despite a stumble in mid-year. Volatile gas prices, rising interest rates, and a negative savings rate were the headline makers. The Federal Reserve reversed its interest rate cuts in 1998 by raising the federal funds rate three times in 1999. The Fed also spent a lot of time worrying about an asset bubble in financial markets and whether or not they should prick it to avoid a larger collapse in the future. Internationally, Asia appears to have recovered from its financial crisis but the U.S. trade deficit continued along its explosive path. In this article, I review each of these events in detail, discuss why a bubble probably does not exist in the financial markets, and discuss why the Federal Reserve will take a low profile in the coming year.

Introduction

Move over Lou Gehrig. Step aside Mr. Ripken. In 1999, the juggernaut known as the U.S. economy continued its attack on the duration record for the longest peacetime expansion in U.S. history. By this time next year, the U.S. economy should break the 1980s expansion as the longest peacetime expansion. While the year began with concern that the Asian crisis would spill into the U.S., bringing the 1990s economic expansion to a halt, the year ends with the U.S. economy humming along at a pace that continues to defy expectations. In this article, I review the key macroeconomic events of the past year and provide some insight into what lies ahead. In the end, one is led to the conclusion that we owe our economic success this past year to the combination of a computer-led productivity boom and superb economic stewardship at the Federal Reserve. While the first is likely to continue, the latter may not.

1999: The First Quarter

The year began with remarkable news that the U.S. economy had grown at a staggering rate of 5.9 percent in the fourth quarter of 1998. This suggested that the U.S. economy would weather the storm of the Asian and Russian crises that threatened to bring the global economy to its knees in 1998. The Federal Reserve had cut the federal funds rate (the interest rate under its control) three times from 5.5 percent to 4.75 percent during the fall of 1998 and it appears to have prevented the Asian flu from spreading to the U.S. As a result, we witnessed a remarkable rally in the stock market with the Dow Jones Industrial Average gaining approximately 15 percent in the first three months of the year, which has been the average *annual* gain over the last 20 years. This led many to raise the specter of a financial asset bubble in the U.S. stock market, a fear that would persist throughout the year and would be of concern to the Federal Reserve.
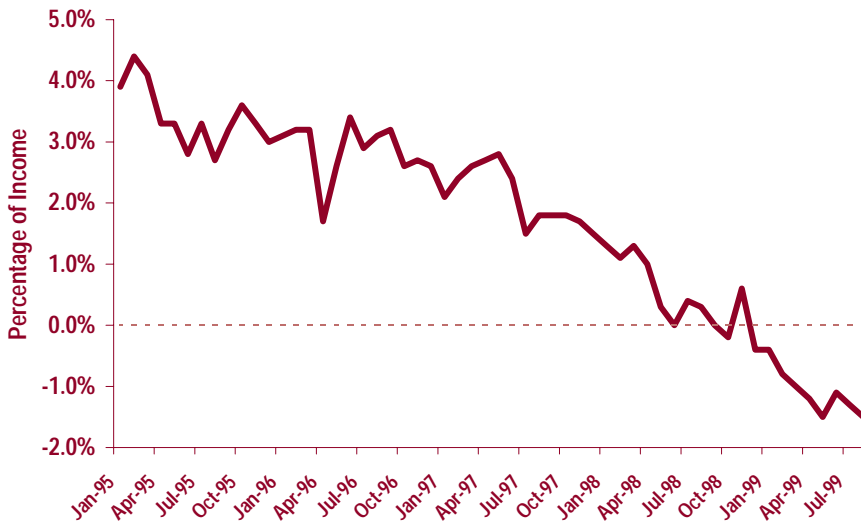
FIGURE 1

U.S. Fuel Price Index, January 1997 - October 1999

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

FIGURE 2

U.S. Savings Rate, January 1995 - August 1999
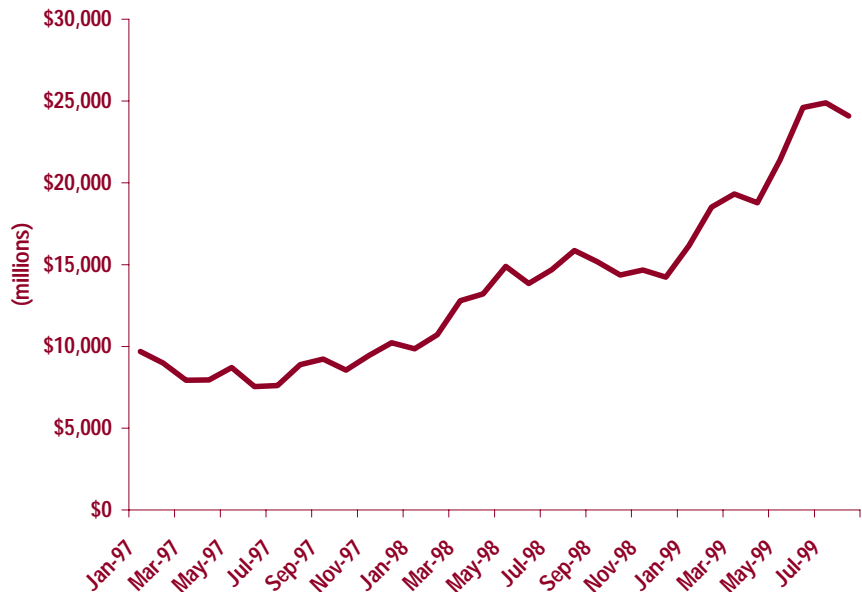

Source: U.S. Federal Reserve Bank.

around the corner and with it, rising inflation in the Consumer Price Index (CPI).

One of the most startling developments of the year was the report that in the first quarter of 1999, the U.S. saving rate became negative — an event that had not occurred in nearly 40 years (Figure 2). This led to a considerable amount of hand wringing for many economic observers who believed that doom and despair would soon follow. The negative saving rate is completely rational given the circumstances, however. Low unemployment means relatively high job security and that means people have to save less for times of unemployment and low incomes. Also, the more wealth one has, the less one needs to save for the future. The substantial increases in financial wealth incurred via

The year also began with gasoline prices at their lowest level in nearly a decade due to a worldwide glut of oil (Figure 1). Falling gasoline prices put considerable downward pressure on the U.S. inflation rate and thus acted as a buffer against demand side price pressures that were expected from the cut in U.S. interest rates. Once the glut of oil was worked off, however, everyone expected to see oil and gasoline prices rise. Thus, rising oil prices and inflation lurked in the future.

Inflation remained nearly nonexistent in early 1999, averaging around 1.5 percent despite the fact that labor markets were incredibly tight. Unemployment remained remarkably low and steady through the first quarter of 1999, averaging 4.3 percent. Tight labor markets and booming demand for goods and services spawned fears that wage inflation was just

FIGURE 3

U.S. Trade Deficit, January 1997 - August 1999

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

the U.S. stock market have led people to reduce current saving. Finally, turmoil in economies around the world led to a substantial inflow of saving from other economies to the U.S. that, combined with the Fed's interest rate cuts, produced historically low interest rates for U.S. consumers. Since this is clearly a temporary phenomenon, rational U.S. consumers responded by borrowing heavily at very low but temporary interest rates.

On the international front, the year began with the heralded beginning of monetary union in Europe. The new Euro was launched, initially trading at 1.17 dollars per Euro, and was expected to challenge the dollar as the world's reserve currency. On the other hand, the Japanese economy continued struggling to break out of its decade-old stagnation and began showing signs of life. Coupled with the cuts in U.S. interest rates by the beginning of 1999, the yen had soared to its strongest value against the dollar in nearly three years. This would benefit U.S. exports to Japan and reduce imports from Japan, both of which would ease pressure on the exploding U.S. trade deficit. As of January 1999, the trade deficit had increased by over 60 percent since January 1998 (Figure 3).

1999: The Second Quarter

By the end of the second quarter of 1999, it appeared as if the U.S economy had hit the wall. The Gross Domestic Product (GDP) grew at 3.7 percent in the first quarter but had fallen to 1.9 percent in the second quarter, which is below its long-run trend. The stock market had stalled completely with almost no perceptible gain from March through June. A "malaise" had set in, and the fear of an asset devaluation gained momentum as investors increasingly began to believe that a "bubble" had occurred in the financial markets, especially in the high-technology Nasdaq market.

The big news for this quarter, however, was that inflation had reared its ugly head, driven in part by the rebound in oil and gasoline prices. April saw an average increase in oil/fuel prices of over 6 percent for one month! While it was widely expected that rebounding oil prices would appear in the CPI, everyone was surprised that, excluding fuel and food, the April CPI still increased at an annualized rate of nearly 5 percent. Interest rates shot up on the expectation that the Fed would raise interest rates at its next meeting, which it did. Despite the unexpectedly high inflation numbers for April, many observers advocated restraint on the

FIGURE 4

U.S. Gross Domestic Product (GDP) Growth, 1997 (1st Quarter) - 1999 (3rd Quarter)
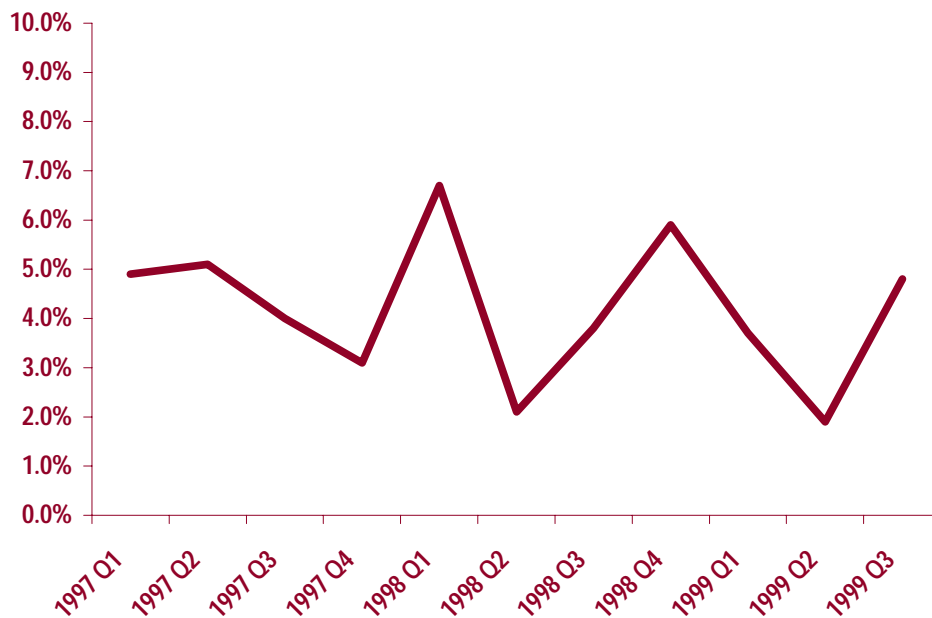
Source: Bureau of Economic Analysis, U.S. Department of Commerce.

Fed's part based on the falling GDP growth rates. The fear was that the Fed was raising interest rates just as the economy was beginning to decline — clearly the wrong policy if the Fed was concerned about stabilizing U.S. output. To reassure the public that it would not kill the U.S. expansion, the Fed took a "neutral" attitude towards future interest rate hikes.

Despite the decline in U.S. GDP growth (Figure 4), unemployment stayed low and steady. The U.S. trade deficit showed a slight decline in April despite the fact that the dollar was beginning to appreciate against the Euro and the yen. Germany and Italy were in recession, which led to a general weakening of European output and confidence in the Euro. Similarly, Japan's widely expected recovery appeared to be stalling once again.

The one glimmer of good news during this time of the year was the fact that the U.S. federal government's surplus continued to rise. The surplus hit $118 billion (annualized) in the second quarter of 1999. This led to spirited political debate as to what should be done with the surplus. Ideas ranged from large tax cuts to paying off the national debt. In the end, the typical political outcome appeared to have won once again — just spend it.

1999: The Third Quarter

Concern over additional interest rate hikes by the Fed and concerns about "bubbles" caused the stock market to take a dive during the summer and early fall. Comments by Fed Chairman Alan Greenspan about the possibility of an asset bubble led many to believe that the Fed would raise interest rates to burst the bubble. As is often the case with self-fulfilling prophecies, the market dropped. The Dow Jones Industrial Average lost nearly 10 percent of its value while the Nasdaq took a terrible beating.

On the inflation front, after the scare from April's numbers, the CPI calmed down once again with data showing that inflation continued to peacefully exist at 1.5 percent to 2.0 percent (annualized). Although inflation came in at over 4.0 percent for September, it was fully expected and was accompanied by easing wage pressures in labor markets. Nevertheless, it was enough to induce the Fed to raise interest rates by another 1/4 of a

percentage point. There was widespread speculation that the Fed would not raise rates again for the year, yet there was also the view that the Fed would raise rates one more time so that the federal funds rate would be returned to its July 1998 pre-crisis level. The argument was that in July 1998 the Fed was contemplating an increase in interest rates but the Asian and Russian crises forced the Fed to lower interest rates to stem inflows of funds from other countries into the U.S. The Fed always argued that the three interest rate cuts in 1998 were "temporary" and were to be viewed as emergency measures. Consequently, once the emergency had passed by summer 1999, many believed that the Fed would reverse its earlier cuts and return the federal funds rate to its pre-crisis level.

Internationally, the third quarter produced a weakening dollar. The dollar fell against the Euro from 1.03 to 1.07 dollars per Euro between June and September. At the same time, the dollar fell dramatically against the yen, from 122 yen per dollar in the second quarter to 106 yen per dollar by the end of the third quarter. This depreciation of the dollar against the currencies of two of its largest trading partners led to an improvement in the U.S. trade deficit, which stabilized after more than doubling over the previous 18 months.

1999: The Fourth Quarter

The fourth quarter began with the release of 3rd quarter GDP numbers, which showed that the U.S. economy grew at a 4.8 percent rate. Hence, any apparent slowdown had vanished. More importantly, wage pressures seemed to be easing despite the fact that the unemployment rate had fallen to 4.1 percent — its lowest level in nearly 30 years. By December 1, the revised figures showed GDP growth for the third quarter at 5.5 percent — nearly twice the value viewed as the long-run growth rate for the economy. So by the fourth quarter of 1999, the slowdown in growth that occurred in mid-year appeared to be over. Reports also showed that household income grew more in the third quarter than consumer spending, suggesting that the savings rate had turned positive again.

Meanwhile, inflation grew at 2 percent (annualized) based on the October numbers, which

was inside the Fed's perceived target range of zero percent to two percent. However, oil prices have continued to climb — as of November 1999, crude oil prices have risen almost 65 percent for the year and petroleum-based energy prices for consumers have increased over 30 percent for 1999 after a 15 percent decline in 1998. This has created concern that energy price increases will ripple through the economy in the coming year.

So based on this information, what did the Fed do at its November meeting? It raised the federal funds rate once again. In so doing, it showed that it did in fact intend to reverse the cuts made in 1998. Credibility is critical to central bankers and once it is acquired, they will do whatever it takes to maintain their credibility. Having spent 20 years establishing credibility in its anti-inflation policies, the Fed was not about to risk losing its credibility by leaving rates permanently lower when it had announced it would only lower them temporarily. So when Greenspan said the rate cuts were temporary, you must believe that the Fed would reverse itself completely once it believed the problems in Asia had abated. By November, the Fed had fulfilled its promise. In the process, it had avoided a meltdown in worldwide financial markets, kept the U.S. economy going, and

succeeded in keeping inflation under control. A pretty impressive year for the Fed.

Despite the third interest rate hike of the year, the market rallied on expectations that this was the last interest rate increase for the time being. As the year approaches its end, the Dow Jones Industrial average is up 20 percent, the S&P 500 is up 15 percent for the year (although most of this occurred by the end of the first quarter of 1999) and the Nasdaq is up a staggering 56 percent for the year. Over the last five years, the Dow Jones Industrial Average has increased an average of 26 percent per annum — nearly double the long-run equity return of 12 percent to 15 percent. It is unprecedented increases such as these that has generated so much talk about an "asset bubble," which many believe will burst any day now. Whether or not the last five years has been characterized by a bubble or something else is something I turn to in the next section.

"Bubbles" in the Stock Market

Throughout 1999 considerable attention was given to the possibility that the U.S. stock market was in a "bubble" and that asset prices were above their "true" or "fundamental" values. For this to be true, investors must either be irrational (since they are paying more for the asset than its true value) or they are subscribing to the "greater fool" theory, which says that it is all right to pay too much as long as you think there is someone else who will buy it from you at a higher price. The problem with bubbles, of course, is that bubbles burst. The only question is when. This seemed to be on the minds of policymakers who faced the conflict of trying to 'prick' the bubble now or let it continue to grow and then have it burst. Fed Chairman Greenspan has worried about this problem for years now dating back to his "irrational exuberance" comment. Figure

FIGURE 5

"Bubble" versus Portfolio Shift
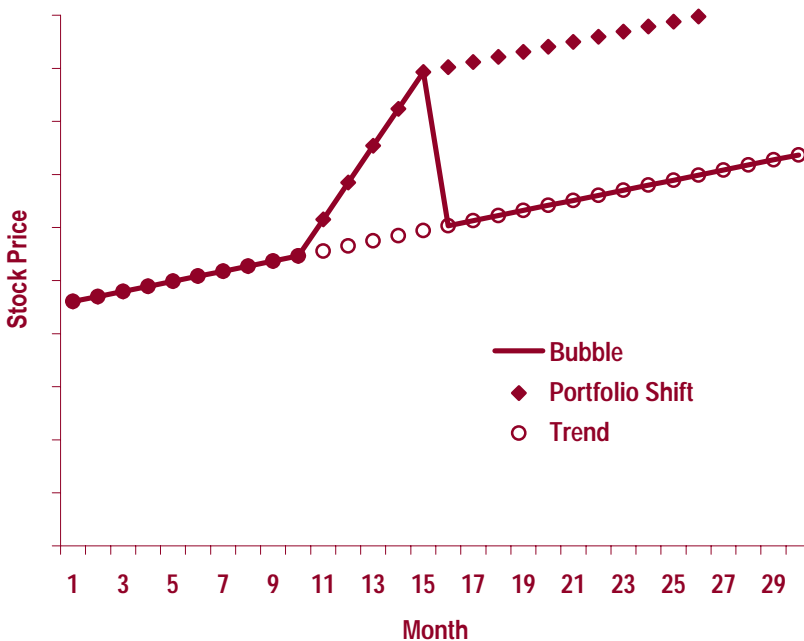
5 shows what a bubble looks like in terms of price adjustment. Prices are initially growing at a given "long run" rate. Once a bubble occurs, asset prices rise at a faster rate than the trend rate of growth. But once the bubble bursts, asset prices fall back to the long-run growth path. It is the up-and-down movement of asset prices that generates instability and concerns the Fed.

But there is an alternative explanation for the market's impressive run over the last couple of years. Back in the early-to-mid 1980s macroeconomists noted that the risk premium being paid on equities over bonds was far higher than was warranted by standard measures of individuals' attitudes towards risk. In short, the risk premium agents were being paid more than compensated them for the risk. This was particularly surprising since over the long run, the risk on equities was no different than that on bonds. As a result, there appeared to be an arbitrage opportunity by shifting one's portfolio from bonds to stocks and holding the equities for a long time. At the same time, 401(k) plans became a dominant form of retirement savings for the typical household, and a large part of retirement funds began to pour into mutual funds to exploit the return differential between equities and bonds.

Thus, what we have observed over the last decade is a dramatic portfolio reallocation on the part of U.S. households. This reallocation entails shifting wealth into equities, which permanently drives up the price of equities. As a result, one would expect to see a temporary "boom" in equity prices as households make this portfolio adjustment. This is shown in Figure 5. But once the adjustment has occurred, prices would then grow at their "long run" rate although they would be permanently higher.

The key point of this story is that there is no "bursting" of the bubble or returning to the initial long-run growth path. So far the evidence is more supportive of this latter story than the bubble story. The risk premium on equities has fallen dramatically over the last ten years and despite the Fed's best efforts to "prick" the bubble via three interest rate hikes, the market actually rallied rather than collapsed.

U.S. Productivity Growth

The biggest surprise regarding the U.S. economy over the last three years has been the continued expansion of the economy at very high rates of growth with almost no inflation. These high rates of growth are particularly surprising since the U.S. labor market is tighter now than at any time in the last 30 years.

For most of the last 50 years, the standard model used by the Fed to predict inflation is a "demand pull" model which states that the economy grows due to increases in total demand for goods and services. But as demand grows, at some point, prices must also rise due to excess demand. It is this view of the world that has led the Fed to constantly fear that inflation is just around the corner. Inflation has not materialized despite rapid economic expansion, however. So what is happening? The Fed to its credit knows that increases in productivity of workers and capital cause more output to be supplied to the market. This supply "push" view means that more goods and services are being provided by firms at existing prices. As a result, an excess supply of goods occurs, and competition means that this puts downward pressure on prices. Therefore, when productivity grows, the economy grows but prices are driven downwards, not upward.

Given that its demand pull view of inflation has proven to be invalid over the last three years, the Fed, when confronted with the evidence, has started to believe that the current expansion of the economy is being driven by a boom in productivity most likely driven by the massive investment in computer technology over the last 15 years. As a result, the Fed has been willing to "give growth a chance" and not raise interest rates too much to fight off the inflation demons. While this means inflation is less likely as the economy grows, the Fed nevertheless has made the decision to err on the side of safety by undertaking a couple of interest rate cuts to be sure that, in the event demand pull forces are at work, the Fed has taken care of them.

Where to From Here?

As the year draws to a close, the inevitable question is where are we headed? The economy will almost certainly continue on its way toward becoming the longest peacetime expansion in U.S. history. Traditionally, major shocks have thrown the economy into a recession and those shocks are typically associated with major increases in world oil prices. While 1999 has been characterized by dramatic increases in oil prices, these increases pale in comparison to the relative changes in the 1970s when oil prices quadrupled in 1973 and then doubled again in 1979. The world is more efficient now in its energy use, and the oil market is more competitive. Therefore, while the effects of the current oil shock may have some significant ripples on the economy and inflation, it is unlikely that they will derail the growth train. The fiscal position of the federal government should continue to improve but recent budget actions by the Congress show that it is willing to ignore self-imposed spending restraints when there is a lot of money on the table that can be spent on constituents. The upside of this is that federal spending will provide an additional stimulant to the economy.

The Fed may be faced with having to raise interest rates to combat increasing inflation. However, 2000 is a major election year and the Fed will almost certainly want to take a low profile to avoid being "blamed" for causing a recession and altering the presidential election outcome (recall that President George Bush blamed Greenspan for not cutting interest rates early enough in the 1991-92 recession, thereby causing him to lose the 1992 election). Greenspan is also up for reappointment in June 2000, and many feel he would like to serve another term as chairman of the Fed. Appointment politics held up his nomination for almost a year in 1995-96 as a way of pressuring the Fed not to become overly active during the election year. Thus, it is reasonable to expect that the Fed will not be anxious to raise rates further in 2000, unless it appears to be absolutely necessary, to avoid undue political pressure on the Fed.

Thus, foregoing any unforeseen shocks to international financial markets, 2000 may be a quiet but record-breaking year. Growth should continue at three percent or more and should set the duration record sometime next year. Inflation may become more meddlesome due to rising fuel prices but not to the point where dramatic interest rate hikes are required to tame it. Finally, the Fed will probably prefer to stay out of the national spotlight during a presidential election year, so do not look for aggressive interest rate actions for the next 12 months. So unless the Year 2000 computer problem turns out to be the monster some think it will be, 2000 should be a relatively good macroeconomic year.

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