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Kentucky Annual Economic Report 2001

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Kentucky Annual Economic Report



2001

Center for Business and Economic Research
Gatton College of Business and Economics
University of Kentucky



Kentucky Annual Economic Report



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Center for Business and Economic Research

Department of Economics

Gatton College of Business and Economics

University of Kentucky

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From the Director . . .

The Center for Business and Economic Research (CBER) is pleased to publish the 29th *Kentucky Annual Economic Report*. The Annual Report is one of the important ways in which the Center fulfills its mandated mission to monitor and analyze the Kentucky economy. The 2001 Report contains six articles that provide state and national economic forecasts and address many of the major economic policy issues facing the Commonwealth. We have built this annual report around the theme of the "New Economy."

We are extremely pleased to have the lead article in the 2001 *Kentucky Annual Economic Report* coauthored by the Honorable Paul Patton, Governor of Kentucky, and James Ramsey, Senior Policy Advisor and State Budget Director. In this article The Governor and Dr. Ramsey examine state government fiscal performance. They discuss four budget principles for insuring the fiscal integrity of state government. They identify these budget principles as important components in strengthening the efficiency and operations of government as the Patton Administration pursues its overall goal of bringing Kentucky's standard of living closer to the national average over the next twenty years.

The second article reports 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 3.4 percent in 2001 and that Kentucky will add about 28,600 jobs in 2001, the majority of which will be in the services sector. Overall, he forecasts employment growth to slow in 2001 before accelerating in 2002 and 2003.

Next, Dr. Christopher J. Waller, the Gatton Chair of Macroeconomics and Monetary Theory, looks back at the U.S. economy during 2000 and offers some predictions for 2001. He believes that the U.S. economy should continue to grow in 2001 but at a slower rate than has been observed in the last two years. He then investigates the new economy from a macroeconomic perspective and is unable to find much evidence of any effect.

Dr. William H. Hoyt, a Gatton Endowed Professor of Economics at the University of Kentucky continues his research on Kentucky's tax structure in the fourth article. He focuses on differences in tax bases and tax effort across Kentucky's counties. Somewhat surprisingly, he finds little relationship between tax capacity and tax effort.

Jonathan Roenker, a research associate at the Center, provides another update on computer and Internet usage at Kentucky businesses that has appeared in the last two years of the *Annual Economic Report*. This year's article is based on additional questions on e-commerce in our annual *Business Confidence Survey*. He finds that about

15 percent of Kentucky businesses with over 100 employees sell online. The growth in online sales appears to be slowing from previous years.

The last article examines employment in the "New Economy" over time in Kentucky. Arun Srinivasan, a graduate student in economics, and I track

changes in the percent of employment made up of high skilled labor in the U.S., Kentucky, and several other states from 1983-1999. While the percent of skilled jobs has grown over that period in Kentucky, it remains below the national average and the average in other states such as Ohio and North Carolina.

The past year was again very successful for the Center for Business and Economic Research. We have been engaged in several research projects for government and private sector clients. We are examining the current and future trends in the Appalachian coal industry for the Appalachian Regional Commission. We are completing a study of the economic impact of Bluegrass Airport in Lexington, KY. We have been working on several projects for the Kentucky Department of Parks and the Kentucky Tourism Development Cabinet. We assisted the Kentucky Governor's Office in its assessment of the effects of gaming on the Kentucky economy. We have examined the incidence of business taxes in Kentucky for the Kentucky Chamber of Commerce. In addition, we have done research for private sector clients such as Kentucky American Water Company and LG&E Energy Corporation. At the same time, we have continued to publish the scholarly journal *Growth and Change* and the newsletter for Kentucky businesses entitled *Kentucky Business and Economic Outlook*.

There have been a few important staff changes at the Center in the past year. Steve Allen, our full-time research associate, left us to pursue a Master's in Business Administration at the Massachusetts Institute of Technology. We were very fortunate to hire Jonathan Roenker to replace Steve. Jonathan has just completed a Master's degree in economics at the University of North Carolina at Chapel Hill and worked for CBER while as an undergraduate at the University of Kentucky. Also leaving after completing their Ph.D.'s were Amitabh Chandra and Jodi Messer. Amitabh, who was an author of many CBER publications and reports over the last several years, accepted a faculty position in economics at Dartmouth College. Jodi joined the economics faculty of Wichita State University.



Mark C. Berger

Center for Business and Economic Research

Department of Economics,
University of Kentucky

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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 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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- Kentucky Economic Information Service (KEIS)
- Complete listing of recent projects as well as selected project reports ready to download
- List of current and past *Gatton College of Business and Economics Working Papers* ready to download

Authors



The Honorable Paul E. Patton

A 1959 graduate of the University of Kentucky with a degree in mechanical engineering, Paul Patton spent the next 20 years building successful coal business and then turned to public service. He has served as Kentucky's Deputy State Transportation Secretary, leader of the State Democratic Party and three terms as Pike County Judge Executive. In 1991, Patton became Kentucky's Lt. Governor and made history by also serving as Secretary of the Economic Development Cabinet. In December 1995, Paul Patton began his first term as governor, and was reelected to a second term in November 1999. The governor is earning national recognition for his devotion to education and his leadership abilities. Most recently he assumed the chair of the Southern Governor's Association and is serving as chair of the Democratic Governor's Association. He is Chair of the Council on State Governments and

has been picked by U.S. Education Secretary, Dick Riley, to head a new education commission to look at the high school senior year. He just completed a term as Chairman of the National Education Goals Panel and the Education Commission of the States, and has chaired the Southern Regional Education Board, and the Southern Growth Policies Board.



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. William H. Hoyt

Dr. William H. Hoyt is Gatton Professor of Economics and Public Policy 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 2000, education in 1999 and welfare reform in 1997.



Dr. James R. Ramsey

James Ramsey currently serves as Professor of Economics and Public Administration at the University of Louisville and is on loan from the University of Louisville to the Patton administration serving as the Governor's Senior Policy Advisor and State Budget Director. Also serving as Interim Commissioner of the Office of the New Economy. Previously, Dr. Ramsey has served as Vice Chancellor for Finance and Administration and Professor of Public Administration at the University of North Carolina-Chapel Hill, Vice President for Finance and Administration and Professor of Economics at Western Kentucky University and as the state's Chief Economist. Dr. Ramsey has teaching experience at the University of Kentucky, Kentucky State University, Middle Tennessee University, and Loyola University. Jim is a native of the Louisville area. He has his

undergraduate degree from Western Kentucky University and Ph.D. in Economics from the University of Kentucky. Jim is married and has two daughters, ages 16 and 12.



Authors



Jonathan M. Roenker

Jonathan M. Roenker is a Research Associate at the Center for Business and Economic Research at the University of Kentucky. Mr. Roenker received a M.S. in economics from the University of North Carolina at Chapel Hill in 2000 and a B.S. in economics from the University of Kentucky in 1998. He has considerable experience in conducting economic impact studies and has worked on several studies of Kentucky business and economic issues during his time at CBER. Mr. Roenker also possesses considerable experience in econometric methods and modeling.



Arun K. Srinivasan

Arun Srinivasan is a graduate research assistant at the Center for Business and Economic Research and is a doctoral student in the Department of Economics at University of Kentucky. Mr. Srinivasan received his M.S. from the University of Kentucky in 1999 and B.Sc. in Agriculture from University of Agricultural Sciences, Bangalore, India in 1992. Prior coming to U.S., he worked as a Research Associate in National Afforestation and Eco-development Board, Bangalore, India. His primary areas of interests include environmental economics, economic development and welfare.



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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The Honorable Paul E. Patton and James R. Ramsey

Increased attention has been focused in recent years on strategic planning and performance evaluations as processes for helping to ensure the efficient allocation of resources in the public sector. Five years ago, Administration adopted a strategic plan; we are now in the process of identifying performance measures for the goals identified in the plan. One of the components of our strategic plan has been to ensure the financial integrity of the management of state resources. A strong financial management is a critical component of our ability to achieve programmatic goals. This article provides the reader with an analysis of the financial management goals that we have set for our Administration and our performance evaluation for these goals for fiscal year ended June 30, 2000.

Quarterly Forecasts for the Kentucky Economy, 2001 - 2003 7

Eric C. Thompson

The Kentucky economy is forecast to see strong income growth during each of the next three years. The rate of employment growth, however, is expected to slow in 2001 before accelerating during 2002 and 2003. Real gross state product in Kentucky is forecast to grow at a 3.4 percent rate in 2001, while real total personal income is forecast to grow by 3.5 percent, total employment by 1.2 percent, and total population by 0.8 percent. For the entire 2001 to 2003 period, real gross state product is forecast to average 3.7 percent growth each year, compared to 3.6 percent annual growth for real total personal income, and a 1.5 percent employment growth rate. 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 28,700 jobs each year. The services industry, forecast to add 14,900 jobs each year, is expected by itself to account for over half of this employment gain. The retail trade sector is forecast to add 5,900 jobs per year, while the manufacturing sector is forecast to lose 2,100 jobs per year on average from 2001 through 2003. However, some sectors of the manufacturing industry, such as transportation equipment, wood products, and plastic products, are expected to add employment. Further, the manufacturing industry is forecast to account for roughly one-quarter of all growth in real gross state product.

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Christopher J. Waller

In this article, I discuss the performance of the U.S. economy in 2000 and draw some inferences as to what will happen in 2001. In short, the U.S. economy should continue growing but at a slower rate than has been observed over the last two years as the Federal Reserve's interest rate hikes finally take a bite out of the economy. In the second half of this article, I discuss the microeconomic and macroeconomic impact of the 'new economy'. While the microeconomic impact has been dramatic, with regards to important macroeconomic data, the new economy appears to be more style than substance

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Kentucky, in many respects and perhaps more than many states, has an extremely diverse economy. Variations in economic conditions among Kentucky counties generate significant differences in another important aspect of the state's economy, its tax base. Here we provide a measure of differences in tax bases among Kentucky counties, incorporating both municipal and school districts. We apply a measure of the extent of a county's tax base referred to as tax capacity, developed by the Advisory Commission on Intergovernmental Relations, to compare the level of tax bases among states. After comparing the tax capacity of local governments, we introduce a measure of Revenue Capacity in which we adjust the tax capacity of local governments within a county to account for the state aid received by the local governments within the county. Finally, after considering how the tax bases differ for local governments among the counties of Kentucky we examine how tax effort varies among local governments in Kentucky counties.

We find that tax capacity varies dramatically among counties. However, once we adjust for aid from the state government to local governments and calculate revenue capacity, tax capacity and aid per capita, the gap among counties narrows dramatically. In fact, several counties go from being well below the average tax capacity to above it while some counties above the average tax capacity actually fall below the average in revenue capacity. Somewhat surprisingly, there seems to be little relationship between tax capacity or revenue capacity and tax effort.

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Jonathan M. Roenker

As electronic commerce in the United States continues to expand yearly, estimates of the magnitude of these sales remain elusive, particularly at the state level. This article reports the latest Kentucky figures from a recent survey of Kentucky businesses. The discussion is framed in the light of the most recent national estimates. Approximately 15% of responding Kentucky businesses with 100 or more employees report that they sell their product or service online. Comparison with previous years' survey results show that while online sales in the state are still growing, they are doing so at a slower pace. Also, fewer responding businesses indicate that they plan to implement online sales in the near future, or are at least contemplating doing so. Finally, the debate over taxation of Internet sales is addressed.

Kentucky's Employment in the New Economy 43

Mark C. Berger and Arun K. Srinivasan

We use the 1983-1999 March Current Population Surveys to examine changes in Kentucky's employment in high skilled jobs over time and to compare Kentucky's experience with the national average and the experience in nearby states. We find the share of Kentucky's employment that is in professional, managerial, and technical jobs is below the U.S. average and has been since 1983. Kentucky's share of its jobs in high skilled occupations has been similar to some nearby states such as Tennessee, above others such as Indiana, and behind others such as Ohio. Of some concern is the drop in the share of high skilled occupations in Kentucky since 1996, while the share has increased in other nearby states such as West Virginia, Ohio, and North Carolina.

Measuring State Government Fiscal Performance

The Honorable Paul E. Patton and James R. Ramsey

Increased attention has been focused in recent years on strategic planning and performance evaluations as processes for helping to ensure the efficient allocation of resources in the public sector. Five years ago, Administration adopted a strategic plan; we are now in the process of identifying performance measures for the goals identified in the plan. One of the components of our strategic plan has been to ensure the financial integrity of the management of state resources. A strong financial management is a critical component of our ability to achieve programmatic goals. This article provides the reader with an analysis of the financial management goals that we have set for our Administration and our performance evaluation for these goals for fiscal year ended June 30, 2000.

Introduction

Upon taking office in 1995, we developed a “strategic focus” to guide our Administration, programmatically and budgetarily. The overall goal of this strategic focus was to implement programs and activities that would:

“set Kentucky on the path to achieve economic opportunity and a standard of living above the national average in 20 years.”

Five strategic initiatives were identified to guide program development consistent with this goal. These strategic initiatives are listed in Figure 1 below. For each strategic initiative, a number of specific programs and activities were identified and, in most

cases, these programs and activities were prioritized for implementation. This strategic focus has guided our Administration over the last five years and it is reviewed and revised on an annual basis.

It is interesting to note that this strategic focus has generated discussion on how we measure progress in achieving the overall goal and the specific strategic initiatives. One frequently cited measure of “economic opportunity and standard of living” is the state’s per capita personal income as a percent of the national average. It has been recognized that this is an imperfect measure, and in an article last year in this publication, Berger and Blomquist¹ discussed adjustments to per capita personal income to reflect cost of living differences and quality of life differences among states. It is further interesting to note that a more concerted effort is currently underway to continue to identify



performance measures and benchmarks for assessing the states' progress in achieving this strategic focus.²

Strengthening Efficiency and Operation of Government

Underpinning the ability of state government to address important programmatic activities is the overall financial viability of state government. As a component of the "Strengthening Efficiency and Operations of Government" strategic initiative, we identified four budget principles for ensuring the fiscal integrity of state government:

1. Building the budget using conservative, independently derived revenue forecasts;
2. Ensuring that recurring expenditures are matched with recurring revenues; i.e., maintaining a structurally balanced budget;
3. Building the state's "rainy day fund," or Budget Reserve Trust Fund; and
4. Developing a rational capital investment program that recognizes the debt capacity of the state.

Presented below is a brief summary and an evaluation of each of these principles for the fiscal year which ended June 30, 2000. It is also interesting to note that each of these budget principles are critical inputs into the assessment process made by external reviewers of state government such as the bond rating services and others.³

Building the Budget Using Conservative, Independently Derived Revenue Forecast - In 1996, we supported legislation that required the budget to be based on the revenue forecasts developed by the Consensus Forecasting Group, an independent group of economists; statisticians; and revenue experts. This group includes individuals from both the Executive and Legislative branches of government, as well as higher education and the private sector. This group reviews assumptions and forecasts of the national and state economies and develops the biennial forecast of General Fund and Road Fund revenues by tax source; i.e., individual income tax, sales tax, etc.

Kentucky's revenue estimating process is made more difficult than that of most other states since Kentucky has a biennial budget process. The Consensus Forecasting Group must develop a preliminary revenue forecast for the next biennium nine months before the start of the biennium. That is, in October 1997, the Consensus Forecasting Group was required to produce a revenue forecast for the budget that would begin July 1, 1998 and end June 30, 2000, thirty-two months into the future. The Consensus Forecasting Group had the opportunity to revise this October forecast in late December 1997; this revision being final and the basis for the Governor's proposed expenditure plan.

Table 1 shows the General Fund revenue forecast which was the basis for our spending plan for FY00. Table 1 also shows actual General Fund receipts for FY00. As seen in Table 1, the difference between the estimated General Fund revenue two years before the fiscal year and the actual General Fund revenue was \$8.7 million; a differential of .001. Table 1 also provides detail of the major tax categories and the consensus forecast estimates for each tax compared to actual receipts.

As demonstrated in Table 1, the Consensus Forecasting Group (CFG) has provided a process for the development of reliable revenue forecasts for the basis of budget decision making. Throughout its brief history, the CFG has taken a position of being conservative in its assumptions of both the national and state economy and its estimates of state revenue. This tendency toward conservatism has allowed the state to realize surpluses (actual revenues exceeding estimates) when the economy has performed better than estimated. The CFG has provided a process that has enhanced the financial management and budget operations of state government. (The attachment to this paper compares actual receipts to estimates for FY97, FY98, and FY99, the period for which the CFG has been statutorily required to develop the revenue estimates.)

Ensuring that Recurring Expenditures are Matched with Recurring Revenues - i.e., Maintaining a Structurally Balanced Budget - A fundamental premise of fiscal responsibility is funding ongoing, recurring operating expenses of state government with recurring revenue sources. A mismatch between recurring expenditures and recurring

TABLE 1

**General Fund Forecast Comparison
Actual vs. January 1998 Estimate
(millions of dollars)**

	FY00 Actual	Consensus Estimate	Difference %Chg	
Sales & Use	2,171.4	2,155.4	16.0	0.7
Individual Income	2,701.6	2,626.3	75.3	2.9
Corporation Income	306.4	356.0	-49.6	-13.9
Coal Severance	145.1	167.4	-22.3	-13.3
Property	387.3	389.4	-2.1	-0.5
Lottery	156.3	154.5	1.8	1.2
Other	610.3	620.7	-10.4	-1.7
Total General Fund	6,478.4	6,469.7	8.7	0.1

revenues creates long-term budget pressures that must be addressed through future budget cuts or tax and revenue increases.

A fundamental premise of our Administration has been the development of long-term, (five-year) revenue and expenditure planning models. On the revenue side, the state projects future revenue growth utilizing an elasticity model. On the expenditure side, base budgets are inflated for: 1) estimated cost of living adjustments; and, 2) assessments by Policy and Budget Analysts in the budget office for future funding requirements; i.e., either legal obligations or policy obligations that must be funded in the future. This focus on both a five-year revenue and expenditure outlook provides the basis for ensuring a structural balance between revenues and expenditures. This five-year planning outlook has become an important part of the budget process and helps focus the budget decision-making process on the structural match between revenues and expenditures.

In addition, during the execution phase of the budget, management decisions ensure a match between revenues and expenditures on a short-term basis. While the General Assembly is responsible for authorizing or appropriating the funds to be expended by each of the Cabinets and program areas of state government, our budget office is responsible for the allotment of these appropriations. The allotment process guarantees that the state has the

cash available to pay its bills. The state cannot responsibly allot all of an agency's appropriation on the first day of a fiscal year since revenues are collected throughout the year. The allotment process is important for managing the state's cash flow but is also a mechanism that can ensure that expenditures do not exceed available revenues. For example, the budget office centrally controls some expenditures (i.e., debt service) to ensure that these funds are only expended as needed. It is through both the Cabinets' management of their budgets and the budget execution process that the expenditure of budgeted funds are matched with actual recurring revenues. Table 2 shows, by program area, the areas of the budget for which actual expenditures were less than budget for FY00.

TABLE 2

**Fiscal Year 1999-2000 General Fund Lapses
(in millions of dollars)**

SEEK Program	\$ 25.5
Debt Service	\$ 25.6
Corrections	\$ 5.0
Dept. of Education	\$ 1.9
Postsecondary Education	\$ 1.5
Military Affairs	\$ 1.1
Personnel	\$ 1.1
Alcoholic Beverage Control	\$ 1.0
Miscellaneous Appropriations	\$ 0.9
All Other	\$ 4.6
Grand Total	\$ 68.2

The combination of actual expenditures less than budget expenditures and revenues exceeding the estimates by \$8.7 million resulting in the state realizing an increase in its fund balance for the budget year ended June 30, 2000.⁴

Building the State’s “Rainy Day Fund,” or Budget Reserve Trust Fund - We established a goal of increasing the state’s Budget Reserve Trust Fund to 5% of the state’s General Fund budget, a target that is commonly identified as a critical element of a program of fiscal responsibility by external reviewers such as the bond rating companies.

Figures 2 and 3 show the history of Kentucky’s Budget Reserve Trust Fund for the past decade. As seen, the increase in the state’s fund balance for the fiscal year ending June 30, 2000 allowed the state to

increase its deposit to the General Fund Trust Fund by \$39 million, bringing the total Budget Reserve Trust Fund to \$278 million; or 4.1% of the General Fund.

It should be noted that the budget recommendation that we submitted to the General Assembly in January, 2000 contained a plan for the distribution of any increase in the state’s fund balance for the fiscal years ended June 30, 2000 and June 30, 2001. Our plan provided that any increase in fund balance be allocated first to ensure that the “Bucks for Brains” program for higher education was fully funded. Any increase in fund balance beyond this amount was to be added to the Budget Reserve Trust Fund. In the legislative process, the General Assembly designated two other uses of increases in the fund balance before additional deposits went to the Budget Reserve Trust Fund.

FIGURE 2
Commonwealth of Kentucky Budget Reserve Trust Fund
FY 1990-FY 2001

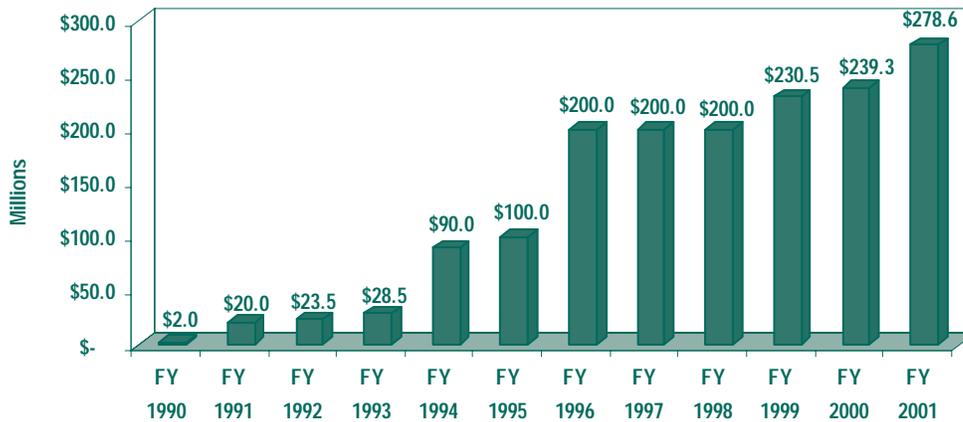
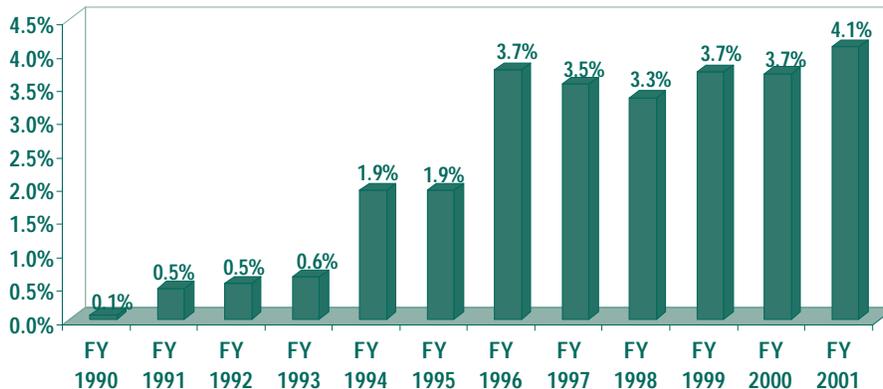


FIGURE 3
Commonwealth of Kentucky Budget Reserve Trust Fund as a % of the General Fund
FY 1990-FY 2001



It is important to note that the increase in the fund balance for year ending June 30, 2000 did permit the full funding of the “Bucks for Brains” program and funding of these other uses designated by the Kentucky General Assembly, while still allowing for an increase in the Budget Reserve Trust Fund by approximately \$39 million. Further, any increase in the fund balance that may result at the end of the current fiscal year (June 30, 2001) will be automatically deposited to the Budget Reserve Trust Fund.

Developing a rational capital investment program that recognizes the debt capacity of the state - A critical element of a fiscally responsible budget is the identification and funding of important capital investment projects. Kentucky has a six-year capital planning process for both new construction projects; major renovation projects; and, computer and information technology projects. These projects are subjected to a type of cost benefit analysis and prioritized for funding.

The development of a rational capital investment program requires a plan for consistently funding needed capital improvement projects over time. In many states, and historically in Kentucky, capital projects have often been funded only on a cash available basis. That is, when surplus funds were available or projected to be available, capital projects were authorized. The capital investment program developed as part of the state’s fiscal budget program commits approximately 6% of all state revenues (excluding federal funds) for the payment of debt service; i.e., the state is committed to spending about 6 cents of each dollar of state funds for debt service to finance capital projects. It should be noted that the use of a debt capacity target attempts to ensure that the state does not over commit to debt finance projects and hence, result in debt service “crowding out” other expenditures from the operating budget. The debt capacity analysis does not ensure that the state will commit resources to those projects that need to be financed during the budget period, rather, it ensures that the state commits to a level of debt it can afford. The state also attempts to cash fund high priority projects to supplement debt financed projects. The debt capacity model provides for a consistent, rational financing approach to capital construction; thereby eliminating the lumpiness or

inconsistency that has often occurred in the past.

The 6% debt service rule is recognition that: 1) a state, like an individual or business, has a certain “debt capacity” beyond which the commitment of ongoing recurring dollars begins to crowd priority operating expenditure projects from budget; and 2) prior research identifies this debt capacity to be approximately 6% of revenue by linking the state’s level of debt to key economic variables such as growth in state revenue; growth in state personal income; etc.⁵ Table 3 provides a summary of the state’s total revenues and debt service for recent years.

TABLE 3
Total Appropriation Supported Debt Service as a Percent of Revenue
(000,000)

Fiscal Year	Total Revenue (\$)	Total Debt Service (\$)	Total Appropriation Required Debt Service/Revenue(%)
1990	5,814.85	304.43	5.24
1991	6,143.23	314.66	5.12
1992	6,419.98	394.44	6.14
1993	6,578.18	394.76	6.00
1994	6,800.82	395.95	5.82
1995	7,554.79	424.65	5.62
1996	7,759.59	435.72	5.62
1997	8,188.75	459.56	5.61
1998	8,675.10	457.44	5.27
1999	9,123.43	460.88	5.04
2000	9,496.30	556.47	5.86
2001	10,496.66 ¹	553.75 ²	5.50
2002	10,609.11 ¹	653.96 ²	6.16

¹Estimated

²Assumes authorized debt will be issued by June 30, 2002.

Our capital budget recommendation to the General Assembly to be financed with debt would have provided debt service as a percent of total revenue to be 5.93% in FY02. The General Assembly added additional debt financed projects to increase the level of debt service as a percent of revenue to 6.16%. In reality, it is unlikely that the state’s debt will exceed the 6% guideline, since the interest rate assumptions used to project debt service are conservative on the “high side” and some of the capital projects to be financed by bonds will not proceed on a schedule that required funding during the biennium.

Concluding Comments

The fiscal performance of Kentucky state government for the year ended FY 2000 resulted in the achievement of the four budget principles established as part of our strategic focus. More importantly, external reviewers who provide independent assessments of the Commonwealth’s fiscal performance have concurred with this assessment as evidenced by the state’s recent bond rating upgrades over the last several months from two of the three major bond rating companies (the third bond rating company upgraded the state with a credit upgrade a year ago).⁶ The bond rating companies are just one set of external reviewers and, as already noted, the bond rating companies look at many variables beyond the fiscal management of the state in determining their credit rating. Yet, such upgrades do provide an independent assessment that the financial management programs of the state are on track and consistent with, not only our priorities, but accepted measures of fiscal responsibility.

Attachment

**Revenue Receipts vs. Budgeted Amount
(in millions of dollars)
CFG**

	Actual Revenue	Revenue Estimate Used for Budget	Difference
FY97	\$5,663.6	\$5,478.0	\$185.6
FY98	\$6,011.8	\$5,726.4	\$285.4
FY99	\$6,198.4	\$6,169.1	\$ 9.3
FY00	\$6,478.4	\$6,469.7	\$ 8.7

Source – Executive Budget: Revenue Estimates and Capital Financing Analysis, 1996-1998 and 1998-2000.

Endnotes

1. Mark C. Berger and Glenn C. Blomquist, “Kentucky’s Per Capita Income: What should be the Goal?” *Kentucky Annual Economic Report 2000* (Center for Business and Economic Research, University of Kentucky, 2000) pp 1-7.
2. House Bill 502, the Appropriation Bill enacted by the General Assembly during the 2000 Regular Session, requires the Executive Branch to develop a statewide

3. Strategic planning process for all the Executive Branch Cabinets. Each Cabinet is required to submit a 4-year strategic plan, including performance measures, with the budget requests for the next biennial budget. HB 502 also requires the State Budget Director to implement a performance based budgeting pilot program during the next two years.
3. Significant research over time has attempted to identify and measure the factors that are used by the bond rating companies for rating municipal governments. For a general discussion of the rating process, see Feldstein and Fabozzi, “The Municipal Bond Rating Agencies and Their Analytical Differences,” *The Municipal Bond Handbook* (Homewood, Ill.: Dow Jones Irwin, 1983). Also see Willson, “Credit Ratings and General Obligation Bonds: A Statistical Alternative,” *Government Finance Review*, Vol. 2 No. 3, June 1986; Carleton and Lerner, “Statistical Credit Scoring of Municipal Bonds,” *Journal of Money, Credit and Banking* (Nov. 1969), pp. 750-764; Horton, “A Statistical Rating Index for Municipal Bonds,” *Financial Analysts Journal* (March/April 1969), pp. 72-75; and Rubinfeld, “Credit Ratings and the Market for General Obligation Municipal Bonds,” *National Tax Journal* (March 1978), pp. 17-21. Also See Standard and Poor’s Corporation, *Debt Ratings Criteria: Municipal Overview*, 1999.
4. If revenues exceed expenditures, the state will experience an increase in its Fund Balance. For a public sector entity, the concept of Fund Balance is somewhat analogous to profit (TR-TC=Profit). The increase in the Undesignated Fund Balance was slightly less than the sum of the revenue overage and expenditure lapse due to several “current year appropriations” or increases in expenditures beyond those originally appropriated. The author has also deleted the accounting for the Tobacco Master Settlement Agreement revenues and expenditures in this discussion since all of these funds were specifically earmarked.
5. The original research that underpins Kentucky’s development and utilization of a debt capacity index is discussed in Ramsey and Hackbart, “State and Local Debt Capacity: An Index Measure,” *Municipal Finance Journal* Vol. 9 No. 1, Winter 1988.
6. On August 18, 2000, Fitch raised its rating to AA- from A+ on the appropriation-backed debt of the State Property and Buildings Commission (“SPBC”) and certain General Fund lease obligations of the Kentucky Infrastructure Authority and the Kentucky Asset/Liability Commission. Standard and Poor’s (“S&P”) also raised its ratings to AA- from A+ on the appropriation-backed debt of the State Property and Buildings Commission and Kentucky Infrastructure Authority on March 8, 2000. Moody’s upgraded the appropriation-backed debt obligation ratings for the State Property and Buildings Commission, Kentucky Infrastructure Authority and School Facilities Construction Commission to Aa3 during the summer 1999.

Quarterly Forecasts for the Kentucky Economy, 2001 - 2003

Eric C. Thompson

The Kentucky economy is forecast to see strong income growth during each of the next three years. The rate of employment growth, however, is expected to slow in 2001 before accelerating during 2002 and 2003. Real gross state product in Kentucky is forecast to grow at a 3.4 percent rate in 2001, while real total personal income is forecast to grow by 3.5 percent, total employment by 1.2 percent, and total population by 0.8 percent. For the entire 2001 to 2003 period, real gross state product is forecast to average 3.7 percent growth each year, compared to 3.6 percent annual growth for real total personal income, and a 1.5 percent employment growth rate. 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 28,700 jobs each year. The services industry, forecast to add 14,900 jobs each year, is expected by itself to account for over half of this employment gain. The retail trade sector is forecast to add 5,900 jobs per year, while the manufacturing sector is forecast to lose 2,100 jobs per year on average from 2001 through 2003. However, some sectors of the manufacturing industry, such as transportation equipment, wood products, and plastic products, are expected to add employment. Further, the manufacturing industry is forecast to account for roughly one-quarter of all growth in real gross state product.

Introduction

This article describes a forecast for the Kentucky economy for the years 2001 through 2003 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 3 years into the future. Forecasts are made for many mining, construction, manufacturing, trade, and service industries and government at a detailed level. 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. Annual forecasts are presented below for 2001, 2002, and 2003.

The Kentucky economy is forecast to experience strong income growth during the years 2001 through 2003. Real income growth is forecast to average 3.6 percent per year from 2001 to 2003, and real per capita income is forecast to grow by 2.8 percent. This rapid rate of growth will be led by strong gains in wage and salary income. Gross state product is forecast to average 3.7 percent per year over the three-year period. Growth in employment is

expected to be less consistent. Slow growth is forecast for 2001 but growth is expected to accelerate in 2002 and 2003. Employment growth of 1.2 percent is forecast for 2001 but growth of 1.7 to 1.8 percent is forecast for 2002 and 2003.

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 2001 to 2003. Further, the manufacturing industry is forecast to perform well in Kentucky relative to the nation, with 7 of 20 specific manufacturing industries expected to add employment. Employment and income growth in Kentucky is forecast to encourage net migration into the state and yield an increase in the state's population of 0.8 percent per year, which is just below the rate of population growth expected nationwide.

In general, job growth and per capita income growth rates in Kentucky are forecast to exceed national growth rates (see the Appendix for a description of the national forecast). Faster growth is forecast for Kentucky because the state is expected to experience only modest job losses 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 computers and semiconductors. Instead, Kentucky has become increasingly successful at capturing growth in traditional industries such as automobiles.

Recent Developments

During 2000, both the Kentucky and national economies grew at a strong 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 1.8 percent during 2000, based on currently available data (through June 2000) and projections. To achieve this growth rate, Kentucky added roughly 32,500 jobs in 2000. This strong growth in 2000 follows on the heels of even stronger growth in 1999.

The strong performance in the Kentucky economy in 2000 resulted primarily from growth in service and retail trade industries. The services industry is expected to have grown at 3.3 percent and added 15,400 jobs in 2000. Business and health services lead the way in service industry growth. The retail trade industry is expected to have grown at a rapid 2.2 percent rate and added 7,600 jobs. The wholesale trade, transportation, communications and public utilities, and finance industries also added jobs during 2000, as did government.

Manufacturing is estimated to have lost 3,600 jobs in Kentucky in 2000. Among the growing manufacturing industries in Kentucky during 2000 were fabricated metals, plastic products, and wood products. The coal mining industry overall is estimated to have lost only a few hundred jobs during 2000.

Overall job growth in Kentucky also contributed to modest population growth. Population in Kentucky is estimated to have grown by 0.8 percent during 2000.¹

The Next Year

The 2001 forecast calls for a significant slowdown in employment growth in the Kentucky and national economy, but continued rapid increases in total income. For the most part, growth rates in Kentucky are forecast to match or exceed forecast

growth for the nation as a whole.

Real value-added output, or real gross state product, is forecast to grow by 3.4 percent in 2001. Total employment is forecast to grow by 1.2 percent during the year. This will exceed the small 0.5 percent increase forecast for employment nationwide during 2001. Total personal income growth is forecast to grow at a rapid 3.5 percent rate paced by a rapid 3.5 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 this forecast growth in employment and income, population growth in Kentucky is expected to match recent growth trends in the year 2001. Population is forecast to increase by 33,100 during the year. This 0.8 percent rate of growth is just below the nationwide forecast for population growth.

Just as in previous years, the greatest growth among industries in 2001 is forecast for services and retail trade. Service industry employment is forecast to grow by 2.4 percent in 2001, adding a total of 11,600 jobs. Business services, growing at 3.4 percent, and health services, growing at 2.2 percent, are forecast to add the most new service jobs. Retail trade employment is forecast to grow at 1.4 percent in 2001, adding 4,900 new jobs.

The manufacturing industry is expected to lose about 3,800 jobs in Kentucky in the year 2001, for a 1.2 percent rate of loss. Transportation equipment, wood products, and plastic products are forecast to be among the growing manufacturing industries, while apparel, textiles, food products and tobacco products are forecast lose employment. Losses in the coal mining industry are expected to remain modest next year, with employment forecast to decline by about 400 jobs, or 2.2%.

The Three Year Forecast

Growth in the Kentucky economy is forecast to pick up in 2002 and 2003 relative to 2001. Growth in real gross state product is forecast to rise to 3.8 to 3.9 percent in 2002 and 2003 relative to 3.4 percent growth in 2001. Total employment growth is forecast to increase from a 1.2 percent growth rate in 2001 to 1.7 to 1.8 percent growth in 2002 and 2003. Real total personal income is forecast to grow at about the same rate in 2002 and 2003 as in 2001. Forecast growth rates for both income and employment meet

or exceed national forecasts. Population growth in Kentucky is expected to fall just short of national growth rates. The Kentucky statewide unemployment rate is expected to remain low, at 4.4% in the year 2001, 4.3% in 2002, and 4.1% in 2003. The following three sections discuss the growth of industries, unemployment, income, and population in more detail.

Gross State Product and Employment

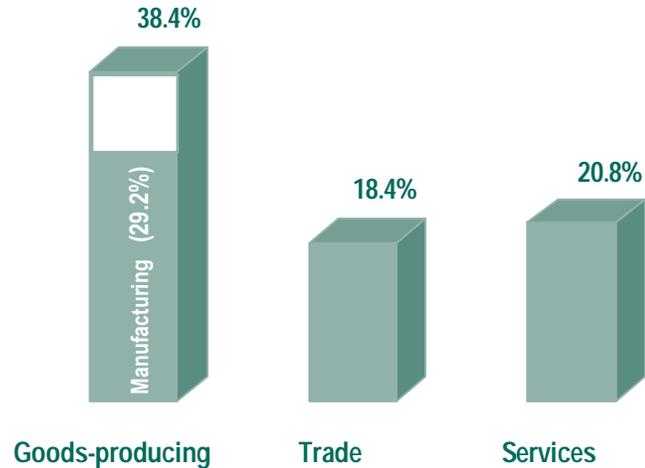
Gross state product (GSP), the measure of value-added output, is a comprehensive measure of economic activity which includes capital consumption, profits, business tax payments, as well as employment and earnings. As a result, analysis of gross state product data can sometimes lead to a different perspective 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 26.5 percent of real gross state product in the fourth quarter of 2000, while goods-producing industries as a whole accounted for 36.3 percent. The remaining 63.7 percent of real gross state product was divided among other industries. For example, retail and wholesale trade accounted for 14.8 percent, and services accounted for 14.4 percent.

Manufacturing and other goods-producing industries are forecast to account for a somewhat larger share of future growth in Kentucky real GSP, portending an even more important role in the economy in the future. As Figure 1 shows, manufacturing is forecast to account for 29.2 percent of growth in real GSP from 2001 through 2003. All goods-producing industries are forecast to account for 38.4 percent of growth in real GSP. Growth in manufacturing, mining, agriculture, and construction will be a crucial engine for growth in

FIGURE 1

Share of Kentucky Gross State Product Growth in Selected Industry Groups, 2001 - 2003



the Kentucky economy in years to come.

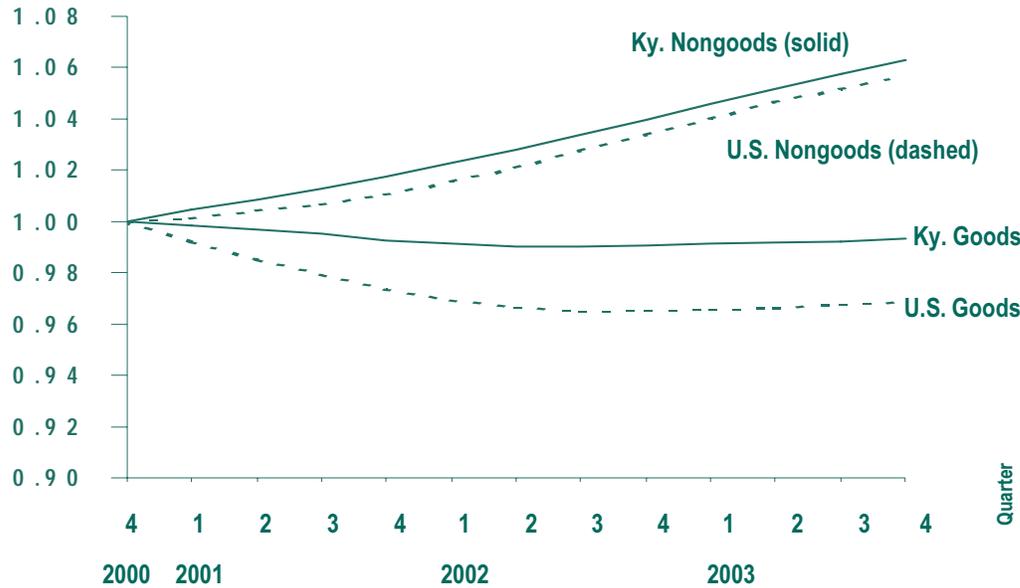
Figure 1 also shows the relative significance of trade and services for growth in real GSP. These industries are forecast to play a significant but secondary role in real GSP growth. Retail and wholesale trade are forecast to account for 18.4% percent of real GSP growth from 2001 through 2003, while services are forecast to account for 20.8% of growth.

Strong growth in real GSP is consistent with growing employment. However, an increase in real GSP 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 2 shows indices for employment in 2001 through 2003 compared to employment in the fourth quarter of 2000. As depicted, goods-producing employment is forecast to decline significantly in the United States from the fourth quarter of 2000 through the fourth quarter of 2003. The annual decline is expected to average 1.1 percent.

In Kentucky, however, growth in real GSP in goods-producing industries is expected to lead to only a very modest decline in goods-producing employment. As shown in Figure 2, employment in goods-producing industries is forecast to fall slightly in the years 2001 and 2002, and then grow slightly

FIGURE 2

Indices of Employment Forecasts for Goods and Nongoods-Producing Industries in Kentucky and the United States, 2001 - 2003



during the year 2003, for an overall decline of 0.2 percent per year.

Nongoods-producing industries also are forecast to grow more quickly in Kentucky than nationally, although only slightly more quickly. Figure 2 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 Kentucky than nationally. The growth rate in Kentucky is forecast to average 2.1 percent per year over the three-year period compared to a 1.9 percent for the United States.

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

TABLE 1

Real Gross State Product (GSP) by Industry in Kentucky, 2001 - 2003

	Real GSP 4th Q 2000 (\$mil)	Annual Growth Rate			Annual Averages	
		2001	2002	2003	Growth (\$mil)	Growth Rate
Total	\$76,830.51	3.44%	3.87%	3.77%	\$2942.51	3.69%
Agriculture	1,470.84	1.83	-3.41	-3.23	-23.64	-1.60
Mining	2,711.12	0.47	3.57	3.14	66.16	2.39
Construction	3,391.18	6.69	6.45	5.91	229.35	6.35
Manufacturing	20,329.08	3.56	4.46	4.17	860.36	4.07
TCPU	8,084.74	2.82	3.09	3.31	256.32	3.08
Trade	11,360.71	4.16	4.89	4.64	542.37	4.56
FIRE	9,535.40	1.39	1.60	1.66	149.90	1.55
Services	11,081.96	5.16	5.26	5.32	612.41	5.25
Government	8,865.47	2.76	2.75	2.70	249.30	2.74

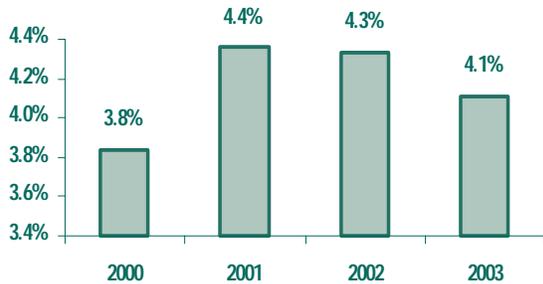
TCPU = Transportation, Communications, and Public Utilities

FIRE = Finance, Insurance, and Real Estate

Unemployment

Continued job growth in Kentucky is expected to help keep unemployment near its current low levels in Kentucky during the next three years. Figure 3 shows the forecast average annual rate of unemployment in Kentucky for 2000 through 2003. Note that the slower employment growth

FIGURE 3
Forecast Annual Unemployment Rates for Kentucky: 2000-2003



forecast for Kentucky in 2001 is expected to cause the unemployment rate to rise modestly from around 3.8 percent in 2000 to 4.4 percent in 2001. But this 4.4 percent unemployment rate is still very low by historic standards. The increase in the rate of employment growth in 2002 and 2003 is expected to cause unemployment to drop during those years.

Income

Income growth in Kentucky is forecast to match the national growth over the next three years. The growth rate in real personal income is forecast to average 3.6 percent in both Kentucky and the United States. Total income growth in Kentucky will match the national rate despite forecasts of somewhat slower population growth in Kentucky. This suggests faster growth in income per person in Kentucky. From 2001 through 2003, growth in real per capita, or per person, income in Kentucky is forecast to average 2.8 percent versus 2.7 percent in the nation. Both figures suggest rapid growth in personal income and the standard of living in Kentucky and the nation in the next few years.

Population

Population growth in Kentucky has been steady throughout the last decade.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 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 fall just below the national average growth rate from 2001 to 2003. This figure translates into an average increase of 32,500 residents each year. Of that total, 26,600 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 age 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 to grow quickly among the older portions of the labor force. The population of 55 to 64 year-olds is expected to grow by 3.3 percent per year from 2001 through 2003. Population is also forecast to grow quickly among the oldest portion of the population. The number of persons over age 85 should grow by 5.0 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 and sources of income.

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 0.7 percent in Kentucky from 2001 through 2003, which translates to a loss of roughly 2,100 jobs per year. Manufacturing employment is forecast to shrink the

most in 2001, and post smaller declines in 2002, and particularly 2003. The expected loss of manufacturing employment during the forecast period is consistent with the manufacturing job loss seen in 2000. The forecast decline reflects a pessimistic forecast for national manufacturing employment in the next few years. Indeed, Kentucky's average annual 0.7 percent job loss compares favorably with the national forecast of an average 2.0 percent decline in manufacturing employment each year from 2001 through 2003. 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, only about one-third of the state's manufacturing industries are forecast to add jobs in the next three years. Specifically, 7 of the 20 manufacturing industries are forecast to add jobs. Still, this compares favorably with the national forecast. Only 1 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, and instruments. The fastest rates of job loss are forecast for textile and apparel products, food and tobacco products, and chemical and petroleum products.

Employment in the construction industry in Kentucky is forecast to grow by 1.8 percent per year. Coal mining employment is forecast to decline during each of the next three years, with an average loss of 550 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, but only modestly. This is clearly seen in the services industry, which is also the fastest growing major industry in the state. The services industry is forecast to add employment at a rate of 3.0 percent per year in Kentucky, and 2.9 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 4.4 percent per year from 2001 through 2003. The health care industry is forecast to add employment at a 2.2 percent rate per year. Since health care is such a large industry, a 2.2 percent growth rate translates into 3,500 new jobs each year.

A faster rate of growth is clearly seen in retail and wholesale trade employment. Retail trade employment is forecast to grow by 1.7 percent in Kentucky compared to 1.1 percent nationally over the next three years. Wholesale trade employment is also forecast to grow faster in Kentucky. Kentucky is forecast to have faster rates of growth in government employment. Government employment is forecast to grow by 1.3 percent annually in Kentucky compared to 0.9 percent in the United States overall. The finance, insurance, and real estate (FIRE) industry is forecast to grow by 1.7 percent each year in Kentucky compared to 2.1 percent nationally. The transportation, communications, and public utilities (TCPU) industry is forecast to add employment at a 1.4 percent annual rate in Kentucky and a 1.3 percent rate nationally.

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

Income

Real total personal income is forecast to grow at a rapid rate in both Kentucky and the nation. As seen in Table 3, income growth is forecast to average 3.6 percent per year in both Kentucky and the nation from 2001 through 2003. This rapid rate of income growth across the nation has been fueled by rapid growth in labor productivity that has allowed wages and salary incomes to rise strongly. Growth in real wage and salary income is forecast to reach roughly 3.6 percent per year both in Kentucky and 3.7 percent nationwide. Other types of labor income such as benefits income (other labor income) and proprietor's income also are forecast to grow rapidly in Kentucky and the nation.

Real wage and salary income growth of 3.6 percent per year would translate into nearly \$1,220 million of real income growth per year from 2001 to 2003. Benefits income (other labor income) is forecast

TABLE 2

Growth and Growth Rates for Nonfarm Employment in Kentucky by Industry, 2001 - 2003

	Employment 4th Q 2000	Annual Growth			Average Annual Growth		
		2001	2002	2003	Ky.	Ky. %	U.S. %
Total	1,839,639	1.16%	1.65%	1.80%	28,688	1.54%	1.32%
GOODS-PRODUCING	427,356	-0.73%	-0.20%	0.26%	-955	-0.22%	-1.09%
Mining	21,112	-2.06	-2.41	-3.21	-528	-2.56	-4.28
Coal	17,021	-2.21	-3.42	-4.25	-543	-3.30	NA
Construction	88,284	1.12	2.22	2.14	1,642	1.83	1.61
Manufacturing	317,961	-1.15	-0.74	-0.07	-2,070	-0.65	-2.01
Food Products	28,180	-2.07	-2.16	-1.67	-543	-1.97	-1.56
Tobacco	3,141	-3.42	-4.86	-4.98	-133	-4.42	-2.39
Textiles	4,141	-6.33	-4.89	-1.85	-173	-4.36	-4.04
Apparel	18,412	-2.54	-5.64	-4.84	-766	-4.34	-7.86
Wood	16,369	0.34	1.18	1.72	179	1.08	-1.80
Furniture	6,225	-1.02	0.53	1.30	16	0.27	-1.84
Paper products	12,674	0.89	0.11	0.33	57	0.45	-1.80
Printing and publishing	21,760	-1.02	-1.33	0.06	-165	-0.76	-2.07
Chemicals	14,291	-3.45	-4.60	-2.29	-477	-3.45	-2.55
Petroleum and coal refining	2,146	-4.30	-8.36	-6.10	-126	-6.26	-3.83
Rubber and plastic products	20,761	1.60	2.63	2.15	450	2.13	-0.64
Leather products	808	-3.17	-4.63	-4.36	-31	-4.05	-8.60
Stone, clay, and glass products	11,456	-0.83	-1.12	-0.96	-110	-0.97	-2.70
Primary metals	18,280	-0.68	-0.66	-0.50	-111	-0.61	-2.92
Fabricated metals	27,864	-2.90	-0.14	1.53	-143	-0.50	-2.64
Non-electric machinery	37,108	-1.38	-2.30	-1.45	-625	-1.71	-0.52
Electric machinery	23,731	-3.40	-0.17	-0.72	-338	-1.43	0.31
Transportation equipment	41,850	0.78	2.44	2.86	864	2.03	-3.10
Instruments and related products	4,893	1.29	1.78	2.69	96	1.92	-1.65
Miscellaneous Manufacturing	3,872	2.71	-0.31	-1.60	10	0.26	-2.54
NONGOODS-PRODUCING	1,412,283	1.73%	2.20%	2.24%	29,643	2.06%	1.88%
TCPU	107,890	0.94	1.46	1.87	1,559	1.43	1.34
Trade	439,341	1.48	1.84	1.96	7,883	1.76	1.18
Wholesale trade	91,362	1.89	2.25	2.20	1,970	2.11	1.32
Retail trade	347,979	1.38	1.74	1.90	5,913	1.67	1.13
FIRE	72,517	1.34	2.01	1.88	1,286	1.74	2.11
Services	484,165	2.43	3.26	3.28	14,889	2.99	2.89
Business services	102,883	3.44	5.22	4.68	4,777	4.45	NA
Health services	155,961	2.19	2.13	2.29	3,513	2.20	1.70
Government	308,371	1.36	1.33	1.18	4,027	1.29	0.88
Federal	39,589	0.26	0.54	0.69	198	0.50	-0.07
State and local	268,782	1.53	1.44	1.25	3,829	1.40	1.02
State	92,457	0.63	0.94	0.85	751	0.81	NA
Local	176,324	1.99	1.70	1.45	3,078	1.72	NA

TCPU = Transportation, Communications, and Public Utilities

FIRE = Finance, Insurance, and Real Estate

TABLE 3

Growth and Growth Rates for Real Personal Income and its Components in Kentucky, 2001 - 2003

Income Source	Income 4th Q 2000 (\$mil)	Annual Growth Rate			Annual Averages		
		2001	2002	2003	Growth (\$mil)	Growth Rate Ky. %	U.S.%
Total personal income	\$57,968	3.49%	3.67%	3.61%	\$2,158	3.59%	3.61%
Wage and salary income	32,247	3.48	3.56	3.87	1,217	3.64	3.68
Other labor income (benefits)	4,340	4.10	3.91	4.09	182	4.03	2.76
Proprietor's income	3,938	2.78	6.04	5.57	198	4.80	4.14
Residential adjustment	-462	2.52	3.09	3.47	-14	3.03	NA
Contributions to social insurance	2,552	2.44	4.16	4.35	97	3.65	2.85
Transfer income	9,611	5.08	4.28	3.24	421	4.20	4.18
Dividends, interest, rent	10,020	2.13	2.71	2.57	254	2.47	2.89
Per capita income	\$14,496	2.64%	2.84%	2.81%	\$412	2.76%	2.69%

to grow by 4.0 percent per year in Kentucky. This 4.0 percent increase is forecast to yield \$180 million in new income each year. Proprietor's income is forecast to grow by 4.8 percent per year in Kentucky from 2001 to 2003, adding \$200 million per year to state income. Proprietor's income is forecast to grow by 4.1 percent per year nationally. Together, these three sources of working income are forecast to account for \$1,600 million of \$2,160 million of 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 68.8 percent of income growth in the state.

Transfer income in Kentucky is forecast to grow at an average rate of 4.2 percent over the next three years. This is same growth rate forecast for the nation. This rate of growth translates into a forecast growth of transfer income of \$420 million per year in Kentucky. Dividend, interest, and rent (DIR) income is forecast to grow by \$250 million per year in Kentucky from 2001 to 2003.

There is also a 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 2000 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.

In the first alternative scenario, a mild recession occurs during the middle of the year in 2001. This recession is precipitated by a further spike in oil prices, which raises the overall consumer inflation rate to 5 percent, and encourages the Federal Reserve to raise interest rates further. The stock market also falls substantially due to higher oil prices and interest rates, which depress consumer spending.

These factors combine to cause a mild recession during mid- and late-2001. However, the economy recovers quickly as the Federal Reserve cuts interest rates sharply once it is apparent that the economy is in recession. Growth returns to the economy in early 2002, meaning that the recession would only last a few quarters.

In the second alternative scenario, the economy continues to grow through 2003, but at a slower rate than in the baseline. In this alternative, oil prices remain at current high levels for the near term, rather than dropping as in the baseline scenario. This permits the Federal Reserve to keep interest rates at current levels. Slower growth means a slight increase in the unemployment rate, but the economy does not fall into recession. The economy remains healthy, but growth is not as strong as under the baseline scenario.

Conclusion

The Kentucky economy is forecast to experience strong income growth during 2001, 2002, and 2003, due to a rapid increase in wage and salary income. However, employment growth is forecast to slow during 2001, before accelerating in 2002 and 2003. Population growth is forecast to remain steady throughout the period.

Most industries are forecast to add employment, with the exception of coal mining and a number of manufacturing industries. 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 20,800 of the 28,700 net new jobs expected in the Kentucky economy each year. The manufacturing industry as a whole is forecast to lose 2,100 net jobs per year for 2001 through 2003. But, despite this slight decline in employment, manufacturing remains a key to growth in the state economy. The manufacturing sector is forecast to account for 29.2 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 modest 0.7 percent annual rate in

Kentucky from 2001 to 2003, while nationally it is expected to decline 2.0 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 fall just below 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 2000. 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 2001, 2002, and 2003 that slows somewhat in the year 2001, but accelerates towards more rapid growth in 2002 and 2003. Real GSP is forecast to grow by 3.2 percent in 2001, 4.3 percent in the year 2002, and 4.7 percent in 2003. A similar pattern is evident for employment and unemployment. Employment is forecast to grow by 0.5 percent nationally in 2001, 1.2 percent in 2002, and 2.0 percent in 2003. The unemployment rate is forecast to average 4.5 percent in 2001, 4.6 percent in 2002, and 4.3 percent in 2003.

The continued growth of the U.S. economy in 2001 through 2003 is expected to result from continued productivity growth, and steady or falling interest rates. Continued rapid growth in personal income and real gross domestic product will be possible as output per hour, a measure of productivity, rises by more than 3.5 percent each year. This rate is close to the more than 4 percent growth rate experienced during 2000. After a recent series of increases, the Federal Reserve is assumed to keep interest rates at their current level through mid-2001, before decreasing rates. This is why real gross domestic product and employment are expected to grow at more modest rates during 2001, before resuming more rapid growth in 2002 and 2003. Federal budget surpluses are assumed to

remain large during the next 3 years, at over \$230 billion in each year. The consumer price index, which rose 3.3 percent in 2000, is forecast to slow to 2.5 percent growth in 2001, 2.1 percent in the 2002, and 2.4 percent in 2003.

Endnotes

1. Population data for Kentucky are not yet available for the first two quarters of 2000. Thus, population values need to be forecast for the first two quarters of 2000 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 2000 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.

What is Really New About The 'New' U.S. Economy?

Christopher J. Waller

In this article, I discuss the performance of the U.S. economy in 2000 and draw some inferences as to what will happen in 2001. In short, the U.S. economy should continue growing but at a slower rate than has been observed over the last two years as the Federal Reserve's interest rate hikes finally take a bite out of the economy. In the second half of this article, I discuss the microeconomic and macroeconomic impact of the 'new economy'. While the microeconomic impact has been dramatic, with regards to important macroeconomic data, the new economy appears to be more style than substance

Introduction

It is almost impossible these days to pick up a business magazine that does not contain an article on how computers and information technology led to the creation of a 'new' U.S. economy. The fact that the U.S. economy has seen sustained and robust economic growth for the last nine years in conjunction with the explosion of the Internet has lead many to conclude that the Internet is responsible for the performance of the U.S economy. In this article, I first examine the performance of the U.S. economy in 2000 and then try to shed some light on what the computer revolution has done for the U.S. economy and what it has not done.

The U.S. Economy in 2000

GDP

In 2000 the U.S. economy continued expanding at annualized rates of 4.8%, 5.6% and 2.7% respectively for the first three quarters of 2000. The significant drop off in the third quarter numbers have led many to believe that the six interest rate hikes undertaken by the Federal Reserve in 1999 and early 2000 have finally begun to slow down the U.S. economy. The Federal Reserve's willingness to keep rates unchanged since this past summer show that it believes that its actions will accomplish the task of slowing down the economy without crashing it. However, one quarter's numbers do not a recession make — recall that second quarter growth in 1999 was only 2.5% but was followed by 5.7% and 8.3%

third and fourth quarter growth rates respectively. This is the reason the Federal Reserve has not changed its bias away from 'tightening' (raising interest rates) to neutral as some expected they might at the November FOMC meeting.

Inflation

Dramatically rising oil prices have started to have an impact on the U.S. economy. The CPI inflation rate for all categories over the period 1999:10-2000:10 was 3.45% compared to 2.5% for the same time period the year before. However, excluding food and energy, the CPI inflation rate for 1999:10-2000:10 was 2.5% compared to 2.1% for the same time period the year before. So while we saw a significant increase in the inflation rate for 2000, a major component of that inflation was accelerating food and energy prices. The key thing to keep in mind with oil price increases is that they will most likely stabilize, albeit at a much higher *price level* per barrel, and once that happens *the growth rate* of prices will fall significantly. Consequently, the key is not to overreact to rising oil prices since they will only have a short-term affect on the U.S. inflation rate. Only bad monetary policy can turn this temporary effect into a longer permanent affect on the inflation rate, as occurred in the 1970s.

Unemployment, Wages and Productivity

The U.S. unemployment rate stayed steady in 2000 hovering around 4.0% for most of the year. This has lead to continued concern that labor markets are extremely tight and that further increases in aggregate demand for goods will manifest itself in

the form of rising wages which will in turn be passed on by firms to consumers in the form of higher goods prices. However, to date we have not seen that because wage increases have reflected increases in labor productivity growth. Productivity growth allows firms to produce at lower costs and pass those cost savings along to customers thus putting downward pressure on prices even though workers are being paid more. In 1999, non-farm business real hourly labor compensation grew at 2.7% and productivity grew at 2.9%. But for the first three quarters of 2000, real hourly compensation has increased -0.2, 2.2, and 3.2% respectively while productivity has grown at annualized rates of 1.9, 6.1, 3.8% respectively. Thus, productivity growth has far outpaced real wage increases in 2000. The question is whether it will continue to do so in 2001. Given that productivity growth has been rising during the 1990's, it is reasonable to expect it to continue in the near future.

Government Surpluses and the National Debt

The fiscal discipline imposed by Congress in the early 1990s has continued to show up in the data. In 1996, the federal government ran a deficit of \$107 billion whereas the surplus in 2000 is estimated at \$237 billion. The surplus has been used to buy back privately held government debt over the last few years. The amount of privately held government debt was \$3.847 trillion at the end of 1997, while that number had fallen to \$3.69 trillion by the third quarter of 2000. However, there has been a large increase in government debt (a half a trillion dollars) held by agencies and trusts from \$1.656 trillion at the end of 1997 to \$2.19 trillion by the middle of 2000. Of course most of this accumulation is by the Social Security Trust Fund. Since it is not allowed to hold any assets in its portfolio other than U.S. government debt, the large Social Security surpluses have been used to buy government debt over the last three years.

Financial Markets

The stock market started the year on a high note but by the beginning of April 2000, the financial battlefield was littered with the corpses of Nasdaq billionaire wannabes. After peaking around 11,500 the DJIA has fallen to around 10,600 (at the time this article was written) with substantial volatility during the year. The Dow actually rose back to around

11,500 but then crashed down and at one point closed below 10,000. The bubble in the Nasdaq appears to have burst. By March of 2000 the Nasdaq had risen to over 5000 as financial market gamblers continued to enter the market in the hopes of striking it rich. However, as in all casinos, the gamblers' wealth eventually gets wiped out. The Nasdaq had fallen all the way to 3000 by November 2000 and in the process, wiping out an entire year's worth of capital gains. While technology may be the driving force in the economy, the market has had a rough year determining the long-term value of the firms developing and using it.

Exchange Rates and International Trade

Besides the rapid increase in oil prices, the biggest international surprise of 2000 was the continuing fall of the euro against the dollar. At its inception on January 1, 1999, the euro's value was 1.17 dollars per euro. By late 2000, it had fallen to 0.86 dollars per euro. This created considerable concern for Europe since the fall of the euro makes U.S. imports more expensive and thus raises their domestic inflation rate. For the U. S., this of course hurts exports of goods to Europe. Since the European Central Bank's mandate is to produce price 'stability' (near zero inflation), the falling euro has forced them to try and stop its fall by intervening in currency markets to buy euros and sell dollars. Unfortunately, despite two currency market interventions to raise the value of the euro, to date those efforts have not been very successful. A weak euro will continue to hurt U.S. exports to Europe and increase imports from Europe. The general strength of the dollar around the world is reflected in the continuing rise in the U.S. current account deficit, which increased by one-third over the period 1999.II-2000.II (from \$78.9 billion to \$106.14 billion). In addition to a worsening relative trade position in goods and services, the current account has also worsened due to large capital inflows over the last two years as foreign citizens continued buying both 'old' and 'new' U.S. economy stocks rather than their own domestic financial assets.

Interest Rates

In the first half of 2000, the Federal Reserve continued raising interest rates in its attempt to slow down the U.S. economy, head off inflation and burst the equity bubble that appeared to be occurring in

financial markets. Despite claims that 'new' economy firms were immune to interest rate changes, the Nasdaq bubble finally burst as it became clear that rising interest rates raise the cost of capital for all firms, even 'new' economy firms. By mid-June, the Fed stopped raising rates and opted to take a wait and see attitude in order to assess how much of an effect the previous six rate hikes were having. However, the FOMC committee did not change its policy bias away from tightening. No rate hikes occurred during the latter half of 2000 and are unlikely to occur in the first few months of 2001 unless the economy resumes speed or inflation accelerates.

Summary and Outlook

The U.S. economy appears to be in good shape heading into the new millennium (for those of us who are sticklers for correct dating procedures). The economy appears to be slowing a bit in response to the Federal Reserve's tightening over the last 18 months. Inflation still appears to be under control despite the significant increases in oil prices over the past year. If inflation backs down a bit, the Federal Reserve will most likely adopt a neutral or loosening bias in its attitude towards interest rates. It is unlikely that unemployment will fall much more but unless the economy slows down dramatically, it should remain stable or increase slightly. The trade deficit will continue to worsen as it always has for the last decade but the federal government trade surplus should continue to rise since a strongly divided government will produce very few changes in taxes or spending at the federal level over the next year. In short, as long as major oil disruptions or wars do not erupt in the Middle East, the U.S. economy should continue on its upward but slower path.

The New Economy

It appears to be an inescapable truth to the business media that, as we have entered a new millennium, the U.S. has become a 'new' economy. We have witnessed a nine-year expansion with robust growth rates and very little inflation. This expansion of the economy coincided with the rise of the Internet as an important feature in almost everyone's lives. It is this correlation with the rising

economy and exploding technology has created a new economy. However, having the media pundits declare something is true and determining if it is true is another matter (as our recent presidential election proved).

The first step is to define the 'new economy'. Having been to several conferences that have dealt with this issue, I have concluded that the typical definition is something like this: the new economy is a computer-based, Internet-based, knowledge-based, information-based, wireless economy, where firm owners are under 30, and workers are paid with stock options and cappuccino. In short, it looks a lot like Silicon Valley. However, as most of us look around our cities and states, we quickly realize we do not live in Silicon Valley.

This is too vague of a definition for an academic economist. Consequently, I will try and outline what I think is 'new' about the new economy and what is not new about the new economy.

The New Economy at the Microeconomic Level

At their most fundamental level, markets match buyers and sellers together so that they can trade and extract some 'surplus' from the trade (either profits or happiness from consumption). How well this matching works depends on the transaction costs associated with trading. Transaction costs are determined by many factors such as the number of buyers and sellers (market thickness), the frequency of trading, how easy it is to be matched with another trader, the quantity and quality of information that each trader has and, finally, the ease of switching trading partners.

Thick markets make it easy to find a buyer or seller and thus reduce the amount of time to consummate trade. It is not hard to see that the 'thickness' of a market will be larger the more standardized a product is and how common its use across individuals (gasoline, airline tickets). Consequently, any market structure that allows for greater communication and creates a 'focal point' for traders will reduce transactions costs. Furthermore, goods and services that must be purchased frequently (experience goods) require paying frequent transactions costs. Thus, in

these types of markets people have strong incentives to reduce transactions costs. Even if there are many buyers and sellers, many trades require very specialized matches due to the needs for

specific attributes of the goods (consider the marriage market or job market). Thus, any technological innovation that allows traders to quickly and efficiently search for the 'needle in the haystack' will expand trade in those products. The quantity and quality of information clearly affects the ability to find a suitable trading partner and the surplus that both sides receive from trading (for example, portfolio decisions). Finally, how easy it is to switch trading partners clearly affects one's bargaining position and, as a result, the ability to extract surplus from one's trading partner (negotiating the price of a new car).

Having laid out the trading process in this firms manner, it is not difficult to see what a computer-based, Internet-based, knowledge-based economy means – lower transaction costs of trading. Consumers can buy goods from all over the world, retailers can sell to households all over the world, can buy and sell parts to firms all over the world and firms and workers can buy and sell labor services all over the world. Furthermore, the rapid and easy access to high volumes of information allows traders to conduct better trades and to change the terms of trade in their favor. Finally, if I am not happy with my existing trading partner, it is much easier to search for a new partner and do so quickly.

Therefore, what the 'new' economy does is allow us to expend fewer resources on the process of trading and put those resources towards more valuable uses for the production and consumption of goods and services. By lowering the costs of trading, new markets can arise that otherwise could

not function due to thin markets, specialized matching or the lack of sufficient information about potential trading partner. Consequently, the 'new' economy not only allows existing goods and services to be traded more efficiently but it also creates markets for new goods and services.

The New Economy at the Macroeconomic Level

What does this all mean for the macroeconomy? Lower transactions costs means lower costs of production. Thicker markets mean more buyers and the ability to produce in larger volumes and exploit economies of scale. Both of these effects mean greater efficiency, greater labor productivity and greater production of output. Furthermore, since buyers have more choices of sellers to buy from, competition forces sellers to pass along the cost savings in the form of lower prices to consumers. So the new economy should produce three notable macroeconomic effects: 1) above average output growth, 2) lower prices and 3) above average growth in labor productivity.

How do these predictions hold up in the data? Figures 1, 2, 3 display U.S. GDP growth rates, inflation rates and labor productivity growth rates respectively from 1947-2000. Data are from the Bureau of Labor Statistics and Census Bureau (data was pulled down off their respective WebPages and from the Federal Reserve Bank of St. Louis Web Page).

Inspection of Figure 1 reveals that the economy has steadily grown over the last 10 years and has had robust growth over the last five years. But how do the 1990's compare to the entire 1947-2000 period? Clearly the 1990s are not better than the 1950's and 1960's in terms of number of years with above average growth. Consequently, it is not obvious that the 'new' economy is somehow better than the 'old' economy of earlier decades with respect to the growth of GDP.

What about inflation? The inflation rate has declined significantly over the last 10 years and is below the long run average inflation rate.

FIGURE 1
Annual GDP Growth Rates

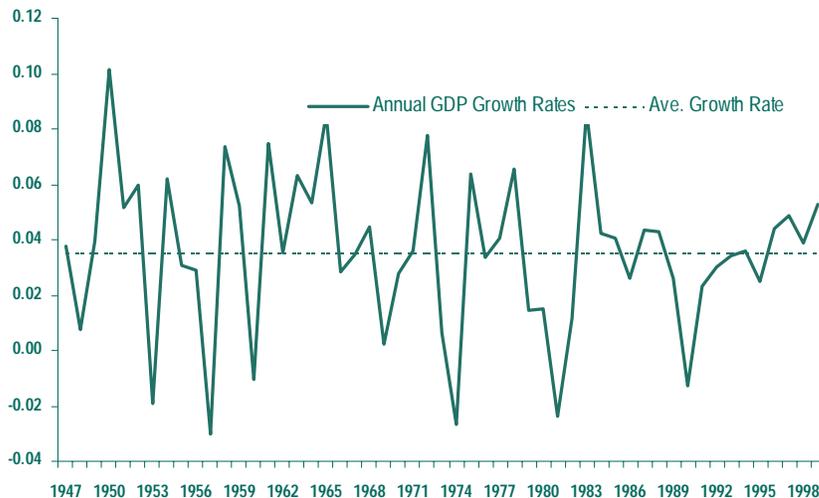
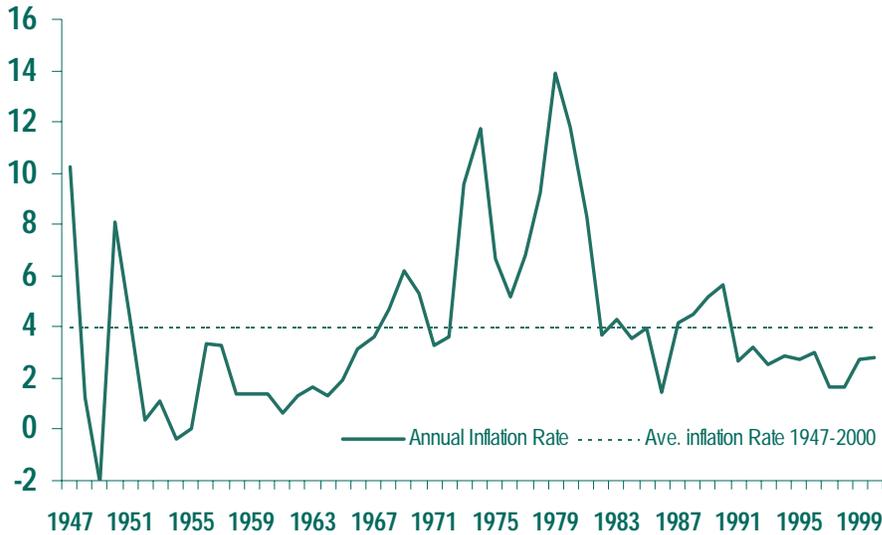


FIGURE 2

Annual Inflation Rates



But, once again, inflation was below average in the 1950's and 1960's. What stands out of course is the high inflation rates of the 1970's, which was the result of two major oil shocks and bad monetary policy in response to those shocks. Furthermore, in the 1950's and 1960's we were still on the gold standard, which served as the 'anchor' for the value of money. That anchor disappeared in 1971 and it has been argued that it took central bankers around the world a long time to learn how to control the money supply and interest rates in a gold standard-less world. So, maybe one way to interpret the 1990's inflation performance is that Alan Greenspan is a good substitute for the gold standard. Nevertheless, one could hardly call this 'new' economy stuff.

Finally, what about labor productivity? Figure 3 reveals that non-farm business productivity has only gone above the long run average in the last few years. For 2000, the growth rate shown in Figure 3 is only through the first three quarters of 2000, thus it understates the final productivity growth rate

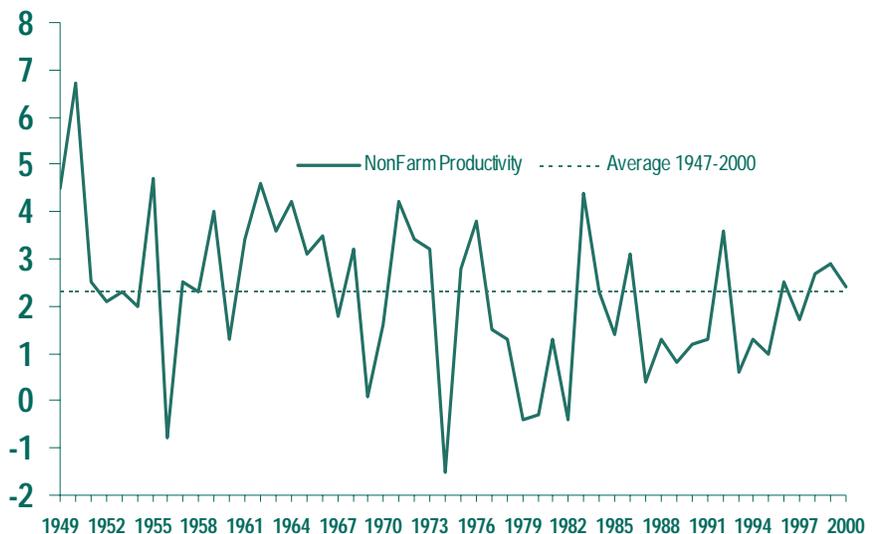
number for the year. Again, while the labor productivity growth has risen substantially over the 1990's, it has only recently gone above the long run average. Clearly, productivity growth in the 1990's is substantially worse than it was in the 1950's and 1960's. In fact, an important question raised by Figure 3 is not why labor productivity was so high in the 1950's, 1960's, and late 1990's but rather why was productivity so low in the 1970's and 1980's. When confronted with the data,

one must reach the conclusion that the high tech 'new' economy does not seem to be any more productive than the old economy of the 1950's and 1960's.

Rather than relying on 'new' economy explanations for the growth in GDP in the 1990's, one way to explain the steady rise of the GDP growth rate during the 1990s is by simply noting that the unemployment rate fell dramatically. In June 1992, there were over 10 million unemployed workers in the U.S.; in November 2000, there were 5.5 million

FIGURE 3

Annual NonFarm Productivity Growth



unemployed workers. It should not be surprising that if close to 5 million workers find jobs that we will see dramatic increases in output and high output growth rates. But it does not mean that those workers are high tech workers who have been somehow magically transformed by the Internet into high productivity workers. In fact, upon inspection of industry level data, the only place where we see dramatic and consistent increases in labor productivity is in the computer industry itself.

Conclusions

So what are to conclude from this? Everyday we see how computers and the Internet have transformed our lives in numerous ways at the microeconomic level. But at the macroeconomic level, we are still looking for evidence that the economy has profoundly changed as a result of the rise of computers and the Internet. It brings to mind Nobel laureate Robert Solow's famous comment that we see computers everywhere but in the productivity data. Maybe it will take another decade for the full fruits of this 'new' economy to show itself in the macroeconomic data (economic historians point out that it took over 20 years for electricity to fully impact the production sector). But until it does reveal itself, the best we can say about the 'new' economy is that, up till now, it is more style than substance.

Differences in Tax Bases and Tax Effort Across Kentucky Counties

William H. Hoyt

Kentucky, in many respects and perhaps more than many states, has an extremely diverse economy. Variations in economic conditions among Kentucky counties generate significant differences in another important aspect of the state's economy, its tax base. Here we provide a measure of differences in tax bases among Kentucky counties, incorporating both municipal and school districts. We apply a measure of the extent of a county's tax base referred to as tax capacity, developed by the Advisory Commission on Intergovernmental Relations, to compare the level of tax bases among states. After comparing the tax capacity of local governments, we introduce a measure of Revenue Capacity in which we adjust the tax capacity of local governments within a county to account for the state aid received by the local governments within the county. Finally, after considering how the tax bases differ for local governments among the counties of Kentucky we examine how tax effort varies among local governments in Kentucky counties.

We find that tax capacity varies dramatically among counties. However, once we adjust for aid from the state government to local governments and calculate revenue capacity, tax capacity and aid per capita, the gap among counties narrows dramatically. In fact, several counties go from being well below the average tax capacity to above it while some counties above the average tax capacity actually fall below the average in revenue capacity. Somewhat surprisingly, there seems to be little relationship between tax capacity or revenue capacity and tax effort.

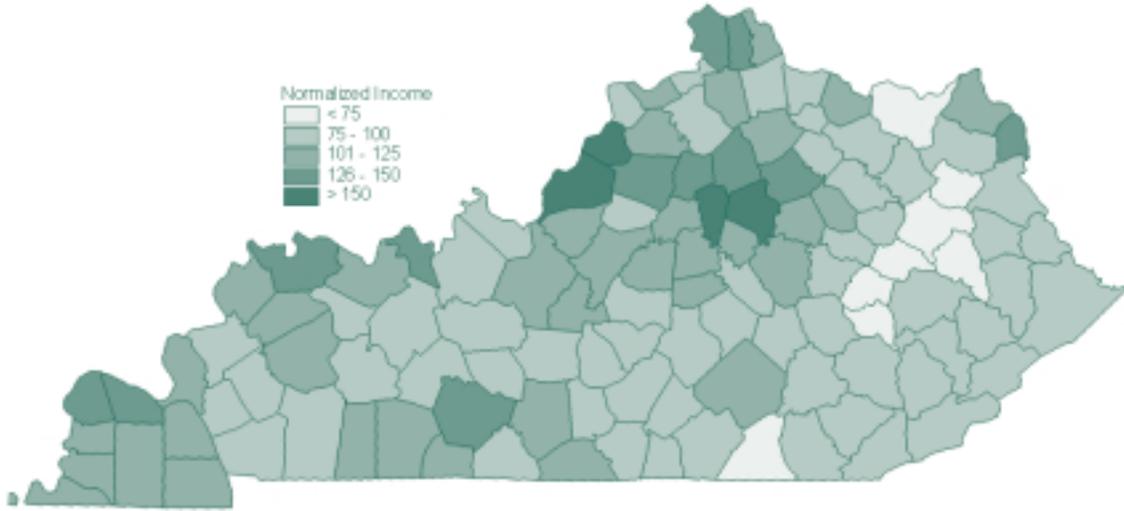
Introduction

In past issues of the *Annual Report* as well as numerous other publications, there have been frequent comparisons of Kentucky's economy to those of other states. A number of these articles have focused on how Kentucky can "catch up" with the rest of the country. In past *Annual Report* articles we have, for example, compared the Kentucky tax system to those in other states. Yet Kentucky, in many respects and perhaps more than many states, has an extremely diverse economy. While a large share of our population lives and works in the major urban areas of Lexington, Louisville, and northern Kentucky, a significant share of our population lives in rural, agricultural Western Kentucky. Others live in the distinctly rural setting of the traditional mining region of Eastern Kentucky. These different regions exhibit many differences in economic measures and characteristics, including employment, earnings, and income. One measure of economic health, per capita income, is illustrated in Figure 1. In this figure the average per capita

income in Kentucky counties is normalized to 100, so that the figure gives what percentage the per capita income in a county is of the average per capita income in Kentucky. Other comparisons, including poverty rate and average earnings are found in Table 1.

These variations in economic conditions, including incomes, earnings, and property values among Kentucky counties can also be expected to generate significant differences in another important aspect of the state's economy, its tax base. A more extensive tax base of a county, city, or school district simply means that there is greater source of taxable funds available for the government. In the case of local governments, since property taxation is a major source of tax revenue, this means more property wealth per capita. In Kentucky, at least for some counties, occupational licenses and taxes are also a source of tax revenue. Thus, greater earnings per capita mean a greater source of these tax revenues. In addition, many taxes based on consumption, such as alcohol or taxes on public utilities, can be expected to vary with the incomes in the county. The more

FIGURE 1
Average Per Capita Income (Normalized to 100)



extensive the tax base, the lower the tax rates that need to be assessed to raise any given amount of revenue. Then with a great deal of property wealth in a county, for example, lower property tax rates can be assessed. This means that property tax payments will be lower for any given amount of property owned by any resident of the county. Analogously, extensive employment and earnings in a county, and perhaps earnings of non-residents of the county, provide an opportunity for high tax revenues at relatively low tax rates.

Here we provide a measure of differences in tax bases among Kentucky counties, incorporating both municipal and school districts. We apply a measure of the extent of a county's tax base referred to as *tax capacity*. This measure was developed by the Advisory Commission on Intergovernmental Relations (ACIR)¹ to compare the extent of tax bases among states. This, to our knowledge, is the first time this measure has been applied to comparisons of local, rather than state, tax bases.

It is perhaps somewhat surprising that such an exercise has not been performed for local governments before. While there are extensive differences in the tax capacity of states, we suspect, and our study confirms that at least for Kentucky, these differences among state tax capacities are not as great as may arise among local governments. There are several reasons for suspecting greater variation in local tax capacities. First, unlike states, most local tax revenue is *source* based. That is, the

return to capital (property) is taxed, via a property tax, where the property is located, not where the income realized, as is the case with a state income tax. Second, while there is some cross-border shopping among states and commuting for employment across states, this is not as extensive as is the case of cross-border shopping among counties or commuting across county lines. Thus, for states, income and earnings as well as consumption are all closely related. Convergence in earnings across the states also means a convergence in incomes and spending. This means that taxes based on income and spending will also tend to converge.

This same convergence of earnings of residents of counties, if it occurs does, not necessarily mean convergence in the tax bases of counties. Taxes on earnings, the occupational tax, employed by the larger cities, counties, and school districts in Kentucky, are *source* based, that is, they are assessed based on where people work, not reside. Thus employment centers, Fayette and Jefferson counties, for example, will have very high earnings per capita and therefore very extensive tax bases for these occupational taxes. The property tax bases of these employment centers will also be more extensive than surrounding "bedroom" communities as they include both commercial and residential property while the bedroom communities only include residential property. Finally, while local taxes on retail sales are quite limited, primarily coming from city taxes on alcoholic beverages, to the extent that

Differences in Tax Bases and Tax Effort Across Kentucky Counties

TABLE 1
Tax Bases

County	Population	Poverty			Assessed Property Value, Per Capita					Taxes, Per Capita			
		Rate	Income	Earnings	Retail Sales, Per Capita	Residential Real Estate	Other Real Estate	Motor Vehicle	Other Tangible	State Aid, Per Capita	Total	Property	Occupational / Income
Adair	16,471	22	15,179	7,246	821	7,304	8,568	4,276	1,421	737	222	145	0
Allen	16,185	14	15,469	9,446	2,375	9,215	7,583	5,113	5,400	780	345	179	132
Anderson	18,071	8	19,659	7,233	685	20,399	11,075	7,122	5,368	659	400	286	0
Ballard	8,370	13	21,663	14,874	314	7,712	12,576	6,791	24,141	878	295	216	0
Barren	36,730	16	19,540	15,302	2,891	13,919	12,072	5,893	9,062	720	452	254	113
Bath	10,361	23	14,876	5,597	388	7,380	7,743	4,231	965	919	193	138	0
Bell	29,792	30	14,839	9,155	2,667	8,234	5,423	4,618	2,085	976	357	192	71
Boone	76,120	6	23,697	27,263	9,781	24,773	20,063	9,380	16,850	449	779	391	224
Bourbon	19,335	14	22,673	12,715	674	13,539	13,167	7,150	6,141	764	508	250	116
Boyd	49,829	17	21,983	20,592	4,240	15,067	8,815	7,035	17,070	629	468	270	3
Boyle	27,027	14	20,517	16,726	2,324	18,600	12,284	6,595	12,496	668	544	276	157
Bracken	8,351	16	16,082	5,609	212	8,017	9,416	4,690	2,197	807	248	179	14
Breathitt	15,668	33	13,411	5,869	1,201	4,834	6,503	5,088	1,860	1,016	237	124	31
Breckinridge	17,321	18	15,520	5,509	954	11,138	9,363	5,201	1,221	817	246	183	0
Bullitt	57,874	10	18,131	5,414	2,106	21,271	5,425	5,563	2,166	41	286	216	11
Butler	11,774	19	14,843	8,298	468	7,075	11,154	5,229	3,870	899	318	122	124
Caldwell	13,338	17	17,125	8,164	1,082	9,702	8,900	6,126	4,866	701	322	123	71
Calloway	33,197	15	20,208	13,978	3,515	16,897	7,894	5,807	5,990	531	340	233	0
Campbell	87,490	10	21,598	9,594	4,472	23,150	5,585	5,614	2,813	522	581	330	120
Carlisle	5,374	15	18,852	5,825	208	6,848	9,627	5,627	665	754	200	139	0
Carroll	9,589	17	19,048	21,110	803	11,378	19,343	7,667	38,454	756	574	310	99
Carter	26,553	24	14,863	5,076	1,770	7,410	6,652	4,270	1,210	875	190	120	0
Casey	14,548	22	13,920	6,695	772	6,374	9,704	3,831	2,315	827	155	116	0
Christian	73,308	17	14,651	20,957	5,287	9,623	6,691	3,774	6,492	69	304	129	84
Clark	31,658	14	21,364	12,647	2,179	18,669	10,691	6,218	7,039	624	550	235	111
Clay	22,572	34	13,332	6,001	1,539	5,775	5,435	3,612	990	1,093	184	94	43
Clinton	9,279	30	13,524	5,984	545	7,794	8,951	4,703	1,097	960	170	121	0
Crittenden	9,434	17	15,553	7,026	491	8,643	10,188	4,943	3,298	735	263	146	28
Cumberland	6,861	27	13,390	5,788	375	6,761	10,367	4,728	1,003	883	236	106	41
Daviess	90,880	13	21,018	14,035	7,049	16,446	8,869	6,212	7,091	309	480	300	68
Edmonson	11,186	19	13,211	3,404	237	11,051	8,979	4,189	139	761	163	116	10
Elliott	6,560	27	10,799	3,084	216	4,058	7,233	2,885	164	1,207	181	129	0
Estill	15,451	23	14,563	4,643	602	6,482	5,531	3,568	869	898	198	108	24
Fayette	239,907	12	28,045	24,627	20,954	27,228	14,945	8,596	6,401	350	281	116	69
Fleming	13,203	20	15,002	7,434	862	8,088	10,584	4,817	2,202	882	262	175	30
Floyd	43,354	28	15,281	8,602	2,433	7,893	6,783	5,416	1,498	84	256	186	23
Franklin	46,195	11	23,770	21,684	2,781	20,519	11,008	7,029	4,482	558	600	273	164
Fulton	7,620	25	20,313	14,111	526	8,133	11,591	5,432	9,349	1,080	431	241	97
Gallatin	6,778	16	16,237	8,921	275	13,585	14,038	6,489	46,987	700	312	223	15
Garrard	13,601	15	16,205	5,788	397	13,586	8,431	4,724	541	661	263	169	32
Grant	19,812	13	17,467	6,282	1,564	12,411	9,916	5,427	2,129	823	280	192	0
Graves	35,635	14	19,851	12,026	1,881	10,710	9,085	6,371	5,186	639	354	172	48
Grayson	23,287	20	15,441	8,213	1,304	10,138	9,093	5,153	3,958	785	300	136	85
Green	10,567	19	14,320	4,787	372	7,328	9,090	4,263	2,336	725	204	133	0
Greenup	37,080	16	18,307	8,870	1,409	14,694	6,397	5,592	4,592	724	301	256	0
Hancock	8,873	12	21,711	27,545	209	8,380	23,314	7,838	59,525	689	677	202	331
Hardin	90,783	12	18,262	15,911	7,325	14,935	9,961	5,871	4,462	150	351	205	52
Harlan	35,300	30	13,690	7,555	1,912	7,880	4,508	5,859	1,506	1,004	255	190	0
Harrison	17,272	14	18,508	9,650	926	11,847	9,306	5,533	6,361	811	392	164	108
Hart	16,549	24	14,823	6,453	835	8,159	11,422	3,971	3,427	679	210	122	29
Henderson	44,446	13	22,069	15,644	2,560	14,790	10,882	6,568	8,353	732	436	247	0
Henry	14,716	15	17,735	6,672	551	12,653	11,366	5,221	5,058	767	337	225	13
Hickman	5,238	17	18,537	8,298	145	7,214	12,611	6,061	2,128	959	263	169	0
Hopkins	46,237	17	19,245	12,907	3,058	11,845	7,520	7,088	5,445	833	404	260	91
Jackson	12,826	31	13,132	5,701	513	5,041	4,842	3,464	1,337	1,025	152	96	0
Jefferson	671,735	12	27,051	22,834	54,416	26,837	10,446	7,666	8,886	437	146	25	17
Jessamine	36,071	12	19,707	10,457	2,304	22,647	9,984	6,251	4,830	631	556	325	139
Johnson	24,032	25	15,475	7,982	2,159	10,454	7,960	4,860	1,247	1,039	349	237	35
Kenton	146,218	10	24,851	12,314	9,175	25,110	8,498	6,108	3,991	512	692	381	194
Knott	18,032	29	13,514	7,334	514	5,968	9,412	7,366	1,129	1,013	271	230	0

Differences in Tax Bases and Tax Effort Across Kentucky Counties

TABLE 1 (Cont.)

County	Tax Bases				Assessed Property Value, Per Capita					Taxes, Per Capita			
	Population	Poverty		Earnings	Retail Sales, Per Capita	Residential	Other Real	Motor	Other	State Aid, Per Capita	Total	Property	Occupational / Income
		Rate	Income			Real Estate	Estate	Vehicle	Tangible				
Knox	31,491	31	13,118	6,499	2,465	7,201	5,543	3,895	1,689	866	188	130	0
Larue	12,877	16	18,220	5,564	357	10,676	9,076	4,550	806	813	249	194	0
Laurel	50,105	21	16,478	11,378	6,223	11,121	8,336	6,203	4,896	748	325	156	79
Lawrence	15,468	28	13,379	5,504	839	7,179	6,874	4,023	636	966	181	119	0
Lee	7,981	35	12,796	5,583	597	4,967	6,393	3,666	872	1,016	194	125	0
Leslie	13,487	31	14,790	9,741	364	5,145	6,677	7,315	2,273	1,158	250	199	0
Letcher	26,503	26	13,982	6,661	1,433	5,927	5,811	6,384	2,072	953	245	188	3
Lewis	13,556	26	12,553	4,945	455	6,091	6,144	3,809	840	937	157	115	14
Lincoln	22,024	21	15,782	5,537	819	9,391	7,778	3,923	1,593	900	186	135	0
Livingston	9,362	15	20,708	8,145	417	11,961	11,845	8,708	2,662	644	251	196	0
Logan	26,129	14	18,021	12,202	1,294	11,194	10,980	6,008	16,011	742	326	175	87
Lyon	7,984	15	14,600	6,706	550	22,564	11,128	6,377	1,387	437	267	190	0
McCracken	64,773	14	24,231	18,953	6,342	16,719	9,429	7,669	4,317	569	610	278	174
McCreary	16,632	35	11,880	4,924	835	5,893	3,565	3,024	1,046	1,171	105	71	0
McLean	9,759	15	17,328	6,044	388	8,648	13,317	5,925	2,865	780	274	171	0
Madison	65,465	16	18,249	11,131	5,019	13,336	8,260	5,270	7,116	617	454	193	156
Magoffin	13,908	34	11,847	4,956	473	4,868	5,143	3,839	1,303	1,143	200	142	3
Marion	17,002	18	17,134	8,341	875	12,278	12,272	4,925	3,628	813	374	196	91
Marshall	29,876	12	20,318	14,286	1,782	18,804	9,017	8,354	28,354	572	469	224	137
Martin	12,227	31	14,988	8,932	554	5,545	9,799	12,415	3,225	1,188	275	212	0
Mason	16,972	18	18,630	15,172	1,641	13,974	14,995	8,240	14,589	680	674	341	200
Meade	28,217	12	15,026	4,149	1,068	9,617	5,171	3,902	4,828	658	197	133	0
Menifee	5,621	27	13,252	5,237	210	8,906	5,322	3,924	868	929	204	125	0
Mercer	20,431	14	19,880	11,598	929	14,921	11,566	5,808	7,405	668	459	218	126
Metcalfe	9,491	24	14,880	7,730	420	5,803	11,537	4,317	6,416	877	277	125	86
Monroe	11,301	23	17,779	9,382	676	7,043	8,305	4,618	4,684	937	257	131	49
Montgomery	20,734	17	18,992	11,369	1,568	13,101	10,110	5,786	5,755	918	421	212	86
Morgan	13,484	32	11,664	6,209	837	4,789	5,761	3,977	1,245	985	159	87	0
Muhlenberg	32,008	17	15,893	8,880	1,797	9,666	5,869	5,694	2,093	736	230	178	0
Nelson	35,170	12	20,201	10,941	2,119	15,044	10,107	5,759	7,489	627	347	251	23
Nicholas	7,031	21	15,560	6,535	199	8,668	10,810	4,281	2,189	817	335	188	87
Ohio	21,959	19	15,927	8,152	1,007	8,591	10,512	5,620	2,433	814	275	168	23
Oldham	43,237	5	29,409	9,200	1,330	35,248	6,891	6,931	1,749	567	433	341	0
Owen	10,057	18	16,372	5,659	235	10,433	10,566	4,855	1,397	840	263	205	0
Owsley	5,362	41	12,033	3,244	157	3,666	4,534	2,742	142	1,138	123	100	0
Pendleton	13,840	14	16,335	5,380	376	11,484	7,674	4,960	4,041	885	216	159	0
Perry	31,153	27	16,010	11,584	2,793	8,507	6,932	7,398	3,877	1,019	349	225	37
Pike	72,582	23	17,186	11,267	5,698	9,670	9,082	8,557	3,448	244	372	199	49
Powell	12,692	23	13,517	6,531	778	8,518	5,555	4,141	1,915	1,057	199	80	21
Pulaski	55,798	19	17,470	11,358	4,749	14,344	9,509	5,958	3,747	736	381	208	74
Robertson	2,181	20	16,215	5,624	58	5,187	10,511	3,818	191	892	236	205	0
Rockcastle	15,723	23	14,129	5,594	639	6,309	6,061	3,949	2,209	939	156	111	0
Rowan	21,950	23	13,765	9,906	2,034	10,365	8,035	4,079	1,828	715	361	143	154
Russell	16,332	22	15,125	9,628	1,502	6,729	12,641	6,357	6,237	814	258	162	28
Scott	29,447	12	22,455	33,516	1,760	18,540	28,689	6,324	65,528	652	762	291	276
Shelby	28,814	10	22,786	13,625	1,679	22,521	17,787	8,817	8,857	565	547	353	55
Simpson	16,095	12	17,889	14,280	1,541	15,152	14,420	6,561	16,803	757	445	248	55
Spencer	9,179	12	15,126	4,050	276	18,148	8,769	5,677	747	895	263	203	0
Taylor	22,872	17	17,335	12,531	1,812	11,961	8,869	5,470	6,614	736	286	175	0
Todd	11,179	16	18,707	10,724	343	7,358	10,894	4,636	2,852	872	243	138	48
Trigg	12,138	14	17,067	8,389	533	19,526	9,126	6,587	2,956	627	317	215	21
Trimble	7,282	15	15,236	4,514	178	10,696	7,687	4,854	189	700	348	282	0
Union	16,531	15	17,918	13,298	938	9,343	10,179	8,868	3,757	802	318	214	0
Warren	86,587	14	22,254	17,217	8,511	19,853	14,157	7,277	6,573	204	621	290	242
Washington	10,821	16	17,868	8,523	457	9,594	12,371	4,916	2,703	730	305	163	41
Wayne	18,802	28	13,527	6,993	1,104	10,218	7,833	4,314	2,689	983	195	134	0
Webster	13,524	15	17,892	11,748	634	8,024	9,502	8,326	2,429	1,002	355	249	0
Whitley	35,636	28	14,830	9,220	2,475	8,028	5,476	4,730	2,926	975	260	143	0
Wolfe	7,276	37	12,799	4,839	429	3,425	6,715	3,616	792	1,136	154	71	35
Woodford	22,324	8	27,925	19,613	741	23,979	19,055	7,031	11,111	541	718	326	281

some larger communities are retail centers to which residents of other localities come to shop, retail sales, and therefore the bases of any taxes related to them, are much greater in these retail centers. Inspection of Table 1 suggests that the existence of employment and retail centers may lead to significant differences in tax bases across counties. While inspection of Table 1 indicates there is significant variation in incomes and residential property value per capita across the counties, these differences are not as great as differences in earnings per capita and non-residential and tangible property, property primarily associated with commercial enterprises.

One of the major roles of state governments, particularly with respect to the financing of elementary and secondary education, is to provide funds to equalize these inequities in tax bases. Kentucky, more than most states, has centralized a great deal of its tax collections and provides an extensive system of state aid to counties, cities, and especially school districts. After comparing the tax capacity of local governments, we introduce a measure of *Revenue Capacity* in which we adjust the tax capacity of local governments within a county to account for the state aid received by the local governments within the county. Again, to our knowledge, this is the first time, at the state or local level, that the impact of intergovernmental aid on tax capacity has been explicitly modeled.

Finally, after considering how the tax bases differ for local governments among the counties of Kentucky we next examine how *tax effort* varies among local governments in Kentucky counties. Again, *tax effort* is a measure used by the Advisory Commission on Intergovernmental Relations to compare tax rates among states. We believe that this is the first application of this measure to local governments. One issue we address is how state funding designed to equalize revenue capacity might affect the tax effort of local governments.

The Sources of Local Revenues in Kentucky

The primary source of data for our study is the

TABLE 2
Source of Own Revenue, (%)

Level of Government	Charges	Total	Taxes				
			Property	Occupational	Selective Sales	Utilities	Motor Vehicles
All Governments	39.1	60.9	32.1	11.4	1.0	6.2	0.9
County	36.2	63.8	31.8	16.3	3.1	1.6	4.2
Municipal	57.7	42.3	12.7	14.3	0.7	2.2	0.3
School District	11.8	88.2	62.8	3.8	0.0	15.1	0.0

1997 *Census of Governments*, collected by the United States Census Bureau, which provides financial data for every governmental unit in the United States. This data is in a very disaggregated form available at <http://www.census.gov/govs/www/cog.html>. In Kentucky there are 119² counties, 353 municipalities, and 176 school districts reporting their finances to the Census Bureau. Reporting the separate tax capacity and effort of each of these government entities is not possible since data on property wealth collected by the Kentucky Department of Revenue is reported at the county level. Further, separate calculations for each governmental unit do not give an indication of the tax burden for any particular location. Thus we aggregate all finances to the county level, so our results should be interpreted as the “average” tax capacity or tax effort for municipalities and, where relevant, school districts within each county.

Table 2 gives the distribution of the source of own revenues for each of the three distinct forms of local governments as well as the distribution for all local governments. Kentucky has, as a state, extremely low property taxes with only school districts using the property tax for the majority of revenues. In contrast to most states, income (occupational) taxes are a significant share of taxes for county and city governments, though the use of these taxes varies dramatically across counties. Taxes on public utilities are a significant source of funds for school districts. Counties also use selective sales taxes, the vast majority of these on alcoholic beverages, and motor vehicle taxes as major sources of revenue as well. Tax revenue from other sources is not reported in Table 2 and would account for the failure of the rows to sum to 100.

For purposes of our study and consistent with the data from the Census of Governments, we disaggregate taxes and charges into six distinct categories: 1) charges; 2) property taxes; 3) occupational (earnings) taxes; 4) selective sales

taxes; 5) taxes on motor vehicles; and 6) all other taxes. Critical to our study is determining the appropriate tax base for each of these taxes. For property taxes, the obvious choice is the property wealth in the county for the relevant form of property (real estate, tangible, motor vehicle, intangible). While reported as “income” taxes in the Census of Government, in fact as mentioned before, most taxes on income in Kentucky are *source-based* taxes on earnings by the place of work, not *residence-based* taxes on income. Therefore, the appropriate tax base is the earnings by workers in the county, not by residents of the county. Earnings, by county, were obtained from the 1997 *Regional Economic Information System (REIS)* produced by the U.S. Bureau of Economic Analysis.³ Since most of the selective sales taxes are from taxes on alcohol sales we use earnings from retail food stores and restaurants as a proxy for this tax base. Again this measure is from U.S. Census Bureau’s 1997 County Business Patterns reported in the *REIS*. While information on sales from food stores and restaurants might be more desirable than earnings, and sales on alcohol better yet, such detailed data on sales is not readily available to us. Taxes on motor vehicles, other than property taxes, have, as a base, the reported value of vehicles in the county. Finally, as a base for charges, other taxes, and public utilities we use per capita income because these taxes are *residence-based* and probably vary with the incomes of individuals. For example, taxes on public utilities are collected based on the use of utilities by residents of the locality. If use of these utilities varies with income, the tax base will also vary with income. All bases are in per capita terms.

Tax Capacity

We now wish to devise a measure that gives some indication of how large is a local government tax base. As mentioned before, the measure we use is *tax capacity*. Conceptually, as well as operationally, tax capacity is a measure that determines the amount of tax revenue per capita that could be collected by a government if it applied the *average* tax rate of the governments in the comparison group on each component of the government’s tax base. Then to normalize this measure, this calculation is divided by the amount of tax revenue that would be collected

if the *average tax rate* is applied to the *average tax base* multiplied by 100. More formally, we have the tax capacity of locality *i* given by

$$TC_i = \frac{(\overline{\text{Charge}} + \overline{UT} + \overline{OT}) * PCPI_i + \overline{PT} * \text{Property}_i + \overline{OCC} * \text{Earn}_i + \overline{SEL} * \text{FOOD}_i}{(\overline{\text{Charge}} + \overline{UT} + \overline{OT}) * PCPI + \overline{PT} * \text{Property} + \overline{OCC} * \text{Earn} + \overline{SEL} * \text{FOOD}} * 100$$

where Charge is a measure of (per capita) charges as a percent of per capita income (PCPI); UT is per capita taxes on public utilities as a fraction of per capita income; OT is per capita other taxes, also as a fraction of per capita income. The term OCC is taxes on income (earnings) as a fraction of per capita county earnings (EARN); and SEL is per capita selective sales taxes as a fraction of per capita food and restaurant earnings (FOOD). The bar over a term refers to the average value across the counties.

The property tax rate and capacity is calculated in three distinct ways. First, the simplest approach is simply to create an “effective” property tax rate (PT) by dividing per capita property tax revenues by total assessed property value per capita. This treats all property as being taxed at the same rate. Of course, it is not the case that all property is taxed at the same rate. Since we only need to determine the average tax rate to determine capacity, rather than attempt to aggregate the myriad of different county, municipal, and school district tax rates within a county on different types of property, we estimate the implicit average tax rate in the county for combined taxes as well as each level of government. Then we estimate the equation

$$\text{Property Taxes}_{ij} = \beta_1(\text{Residential RE}_{ij}) + \beta_2(\text{Industrial RE}_{ij}) + \beta_3(\text{Farm RE}_{ij}) + \beta_4(\text{Mining RE}_{ij}) + \beta_5(\text{Tangible Machine}_{ij}) + \beta_6(\text{Tangible Inventory}_{ij}) + \beta_7(\text{Tangible Farm}_{ij}) + \beta_8(\text{Motor Vehicle}_{ij}) + \beta_9(\text{Intangible}_{ij})$$

where *i* refers to county and *j* is the level of government (combined, county, municipal, school district) in the county. The term *RE* refers to real estate property value. Both property taxes and property values are in per capita terms. Then estimating this equation gives the effective “average” tax rate on each form of property and we can then create a tax capacity measure for each county based on this estimated tax rate and the per capita value of each type of property in the county. In addition to estimating this equation for assessed

property values we also estimate it for equalized values as reported by the Commonwealth of Kentucky’s Department of Revenue.⁴

We calculate this measure of tax capacity for combined government effective tax rates as well as for each level of government. Results for all governments applying the same tax rate on all property are found in the first column of Table 3 and illustrated in Figure 2. The tax capacity gives a measure of how much tax revenue would be collected applying the average tax rates to a given county’s tax base. For example, applying the average tax rates to Elliot’s per capita tax base would only raise 53% of the tax revenue that those rates would yield in a county with the average tax base. In contrast, applying the average rates to Jefferson county would yield 164% of the “average” counties tax revenues. Not surprisingly, those counties with the highest tax capacity are primarily located in employment and commercial centers of the Lexington, Louisville, and Cincinnati-Northern Kentucky MSA. Again, not surprisingly, the lowest tax capacities are found in the counties of Appalachian Kentucky.

In Table 3, we also give the tax capacity measures for all governments when disaggregating property by type and estimating the average tax rate on each type of property. The results, whether using assessed or equalized property value, are very similar to when we simply determine an average rate on all property.

Given the significant amount of state aid to local

governments in Kentucky (see Table 1) and the significant variation in the per capita amounts of this aid among Kentucky counties, the tax capacity measure above overstates differences in the financial resources of counties in Kentucky. To formally incorporate the role of state aid in the resource base of local governments we devise a new, aid-augmented measure of tax capacity, we refer to as *revenue capacity*. It is formally defined as

$$RC_i = \frac{(\text{Charge} + \overline{UT} + \overline{OT}) * PCPI_i + \overline{PT} * \text{Property}_i + \overline{OCC} * \text{Earn}_i + \overline{SEL} * \text{FOOD}_i + \text{AID}_i}{(\text{Charge} + \overline{UT} + \overline{OT}) * PCPI + \overline{PT} * \text{Property} + \overline{OCC} * \text{Earn} + \overline{SEL} * \text{FOOD} + \text{AID}} * 100$$

where AID is per capita state aid.

Using this revised measure of local revenue capacity, we find dramatic changes in the fiscal differences across counties. Figure 3 illustrates this revised measure when we have a single property tax rate and base. As the figure suggests and inspection of the second column of Table 2 confirms, the inclusion of state aid dramatically decreases variation in the revenue capacity among Kentucky counties with many of the counties with the lowest tax capacity receiving enough state aid to have among the highest revenue capacities. Most of the counties in the “Golden Triangle” of Lexington-Louisville-Northern Kentucky that have extremely high tax capacities also have revenue capacities around the average of 100. By this measure, state aid has had the presumed desired effect of equalizing the revenue capacities of Kentucky counties.

FIGURE 2
Tax Capacity

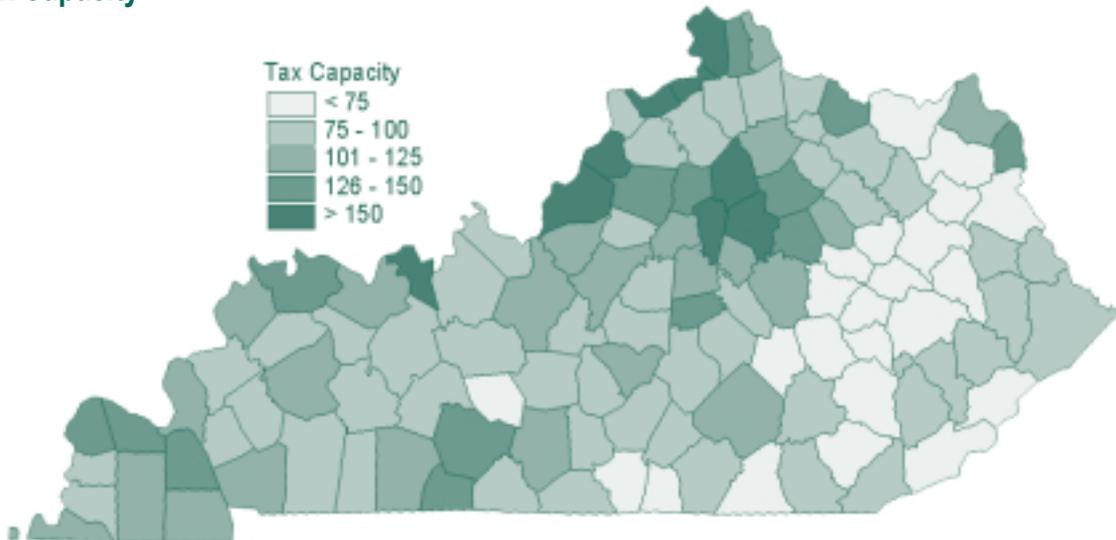


TABLE 3

Tax and Revenue Capacity, All Governments and Level of Government

County	All Governments		By Level of Government (Taxes Only)			Capacity Based on Assessed Property Value		Capacity Based on Equalized Property Value	
	Taxes	Revenue	County	City	School District	Tax Capacity, All Government	Revenue Capacity, All Governments	Tax Capacity, All Governments	Revenue Capacity, All Governments
Adair	78	88	76	84	72	79	89	81	90
Allen	88	96	88	89	85	86	95	89	96
Anderson	118	99	117	112	128	122	101	96	90
Ballard	138	124	141	130	147	111	113	116	115
Barren	120	105	124	118	122	119	104	118	104
Bath	75	101	71	81	69	76	101	74	101
Bell	78	106	77	85	69	81	108	82	108
Boone	177	109	193	158	194	183	110	181	109
Bourbon	127	111	126	130	125	125	110	119	108
Boyd	140	107	147	137	141	130	102	131	102
Boyle	135	107	140	127	143	134	107	139	109
Bracken	83	96	79	88	80	82	96	86	97
Breathitt	68	105	67	74	62	68	106	71	107
Breckinridge	84	97	82	86	84	87	98	89	99
Bullitt	101	46	97	100	105	110	49	115	51
Butler	85	103	85	85	84	83	103	88	105
Caldwell	95	93	93	97	93	93	92	93	92
Calloway	117	89	117	119	113	119	90	126	93
Campbell	118	89	115	121	117	130	94	132	94
Carlisle	90	95	84	100	81	89	94	92	96
Carroll	164	126	179	131	198	125	109	124	109
Carter	74	97	69	80	67	75	98	76	98
Casey	75	94	73	78	71	74	94	67	91
Christian	92	44	101	97	83	101	47	103	48
Clark	126	100	126	125	128	130	101	135	103
Clay	65	110	62	73	57	68	111	67	111
Clinton	74	103	72	76	71	76	105	77	105
Crittenden	86	91	84	88	85	84	91	74	87
Cumberland	73	97	72	75	72	74	98	67	95
Daviess	122	75	122	123	119	129	77	127	76
Edmonson	72	88	69	72	75	77	90	75	89
Elliott	53	113	49	58	49	54	114	54	114
Estill	69	96	63	78	60	71	98	70	98
Fayette	173	99	180	172	171	188	105	185	103
Fleming	83	101	81	85	81	82	101	86	103
Floyd	80	40	79	86	73	90	44	86	42
Franklin	141	101	146	145	134	149	105	155	107
Fulton	115	129	115	119	109	115	130	112	128
Gallatin	151	116	158	107	201	101	95	89	90
Garrard	87	86	83	89	86	92	88	95	90
Grant	95	102	91	97	94	98	103	95	102
Graves	108	94	107	114	101	107	93	105	92
Grayson	88	96	87	89	87	88	96	90	97
Green	75	86	72	78	74	75	86	77	87
Greenup	101	97	99	103	98	112	102	117	104
Hancock	202	137	222	156	250	136	109	141	111
Hardin	110	58	114	111	107	114	59	116	60
Harlan	72	106	72	77	66	73	107	74	107
Harrison	104	105	102	106	103	102	104	103	105
Hart	83	86	80	83	83	84	87	89	89
Henderson	128	109	130	130	125	129	109	132	110
Henry	100	100	97	99	104	100	100	100	100
Hickman	97	113	94	103	92	96	113	99	114
Hopkins	108	108	109	112	102	108	108	109	109
Jackson	63	104	59	71	54	63	104	60	103
Jefferson	165	102	170	165	162	176	107	154	97
Jessamine	120	98	120	115	127	129	102	125	100

TABLE 3 (cont.)
Tax and Revenue Capacity, All Governments and Level of Government

County	All Governments		By Level of Government (Taxes Only)			Capacity Based on Assessed Property Value		Capacity Based on Equalized Property Value	
	Taxes	Revenue	County	City	School District	Tax Capacity, All Government	Revenue Capacity, All Governments	Tax Capacity, All Governments	Revenue Capacity, All Governments
Johnson	83	113	82	88	79	88	116	91	117
Kenton	138	97	135	141	136	154	103	157	104
Knott	76	108	78	77	74	93	116	91	115
Knox	68	94	66	73	62	70	95	72	96
Larue	91	99	84	98	85	94	101	105	105
Laurel	96	97	98	97	94	97	97	105	100
Lawrence	68	101	65	74	63	71	103	77	105
Lee	63	103	60	70	56	67	105	61	103
Leslie	79	121	81	85	71	82	122	93	127
Letcher	73	102	73	78	67	76	104	76	104
Lewis	63	97	60	68	58	63	97	64	98
Lincoln	80	101	75	86	76	82	102	86	104
Livingston	113	96	111	115	111	116	97	120	99
Logan	117	105	120	109	126	106	101	102	99
Lyon	99	75	101	87	114	111	79	121	84
McCracken	135	100	138	143	124	142	102	148	105
McCreary	57	112	54	64	49	58	113	59	114
McLean	95	99	92	96	95	99	100	103	102
Madison	105	91	105	106	104	107	91	111	93
Magoffin	59	111	56	65	53	61	112	59	112
Marion	99	103	97	98	100	101	104	100	103
Marshall	149	106	156	127	173	125	95	130	97
Martin	91	128	98	88	92	102	133	104	133
Mason	130	106	138	117	143	127	105	129	105
Meade	78	82	73	81	76	76	82	80	83
Menifee	68	98	65	73	63	70	99	70	100
Mercer	117	100	117	116	119	117	99	115	98
Metcalfe	85	102	84	85	86	79	100	84	101
Monroe	92	109	89	100	83	90	108	88	108
Montgomery	109	115	109	110	107	110	116	112	116
Morgan	60	99	59	65	54	59	99	55	98
Muhlenberg	84	91	83	90	77	86	92	83	91
Nelson	116	96	115	116	117	121	98	112	94
Nicholas	84	97	81	87	82	84	97	78	94
Ohio	88	98	87	90	86	88	99	94	101
Oldham	158	109	149	161	159	175	116	171	114
Owen	87	100	84	90	86	89	101	87	100
Owsley	53	108	48	63	44	53	109	51	108
Pendleton	88	104	84	90	88	88	104	84	102
Perry	91	115	94	94	85	96	117	95	117
Pike	99	60	102	101	96	111	65	112	65
Powell	71	109	69	76	66	73	111	75	111
Pulaski	103	99	104	103	102	107	100	106	100
Robertson	78	100	72	87	70	78	100	80	101
Rockcastle	70	100	67	77	64	70	101	67	99
Rowan	79	87	80	81	76	84	89	88	91
Russell	92	100	94	90	95	86	98	83	96
Scott	232	147	256	170	295	163	118	164	118
Shelby	149	106	153	136	163	151	106	131	97
Simpson	128	111	134	113	144	122	108	127	110
Spencer	89	105	87	84	97	96	108	94	107
Taylor	102	98	104	103	100	102	98	103	99
Todd	97	106	94	105	87	97	106	98	107
Trigg	105	91	105	99	111	110	93	118	97
Trimble	79	86	75	82	76	81	87	86	89
Union	104	104	109	106	100	104	104	103	104
Warren	139	74	143	135	141	146	76	125	67

TABLE 3 (cont.)
Tax and Revenue Capacity, All Governments and Level of Government

County	All Governments		By Level of Government (Taxes Only)			Capacity Based on Assessed Property Value		Capacity Based on Equalized Property Value	
	Taxes	Revenue	County	City	School District	Tax Capacity, All Government	Revenue Capacity, All Governments	Tax Capacity, All Governments	Revenue Capacity, All Governments
Washington	97	96	94	100	94	98	96	100	97
Wayne	77	106	76	77	77	79	107	82	109
Webster	99	117	101	104	91	97	116	93	115
Whitley	78	106	78	85	71	80	107	78	107
Wolfe	61	111	58	69	53	61	112	63	113
Woodford	173	114	175	167	179	176	114	175	114

Tax Effort

In addition to counties’ tax bases we might also consider the rates that these counties apply to their bases. Again following the approach of the ACIR we use the measure of tax effort. Essentially this measure applies the tax rates of a locality to the average base to see how much revenue would be collected. This figure is normalized so that the average tax effort is 100. Formally, we have

$$TE_i = \frac{(\text{Charge}_i + UT_i + OT_i) * \overline{PCPI} + PT_i * \overline{\text{Property}} + OCC_i * \overline{\text{Earn}} + SEL_i * \overline{\text{FOOD}}}{(\text{Charge} + UT + OT) * \overline{PCPI} + PT * \overline{\text{Property}} + OCC * \overline{\text{Earn}} + SEL * \overline{\text{FOOD}}} * 100$$

While we disaggregated property by type to estimate tax capacity, this disaggregation would be extremely difficult for calculating tax effort. The reason is that we cannot estimate an “average” tax rate as done with capacity but instead must have

the actual tax rate for each type of property for each government within a county. Then we would need to average these rates in the county. While in the future such a task may indeed be worth doing, the similarity of our results for tax capacity suggest that there will probably not be major differences between the approaches.

Results of our tax effort calculation, by level of government and for all governments, are found in Table 4 and illustrated for combined governments in Figure 4. Inspection of Figure 4 does not suggest any patterns of tax effort geographically, with low and high effort counties relatively evenly distributed among the counties. Interestingly, inspection of Table 2 indicates that there are significant differences among types of governments in a county with respect to tax capacity. For example, Fayette County has a tax effort of 133 for schools but only 33 for the city, and Jefferson County has a tax effort of 178 for schools and 33 for the city. One possible explanation for these differences is that the majority of aid received by local governments from the state is for

FIGURE 3
Revenue Capacity

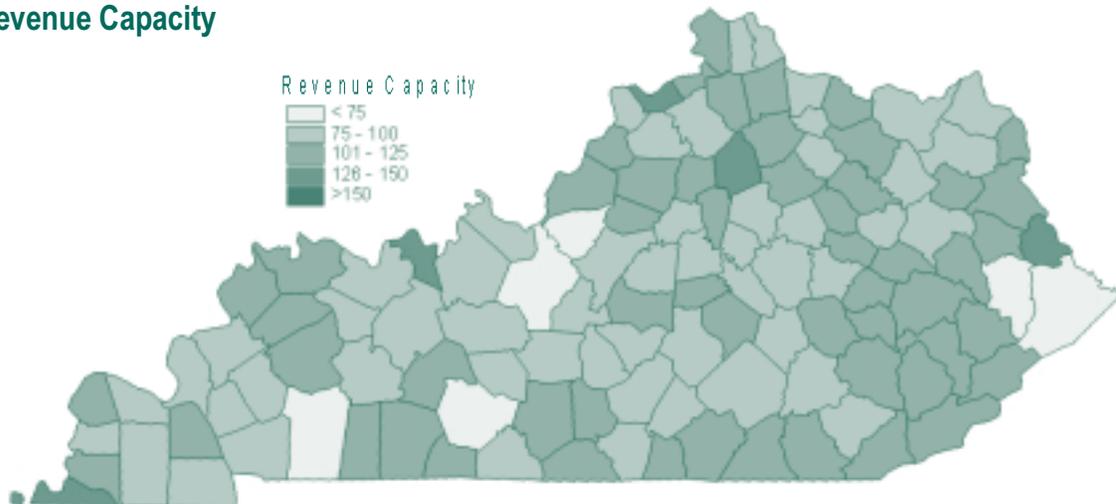


TABLE 4
**Tax Effort, All Governments and
 by Level of Government**

County	All Governments	County	City	School
Adair	91	62	91	105
Allen	137	198	148	92
Anderson	85	112	58	104
Ballard	57	52	50	68
Barren	160	42	259	98
Bath	74	61	49	110
Bell	114	83	113	132
Boone	86	129	54	104
Bourbon	108	110	122	91
Boyd	96	65	122	82
Boyle	97	92	108	87
Bracken	102	84	109	102
Breathitt	109	211	73	101
Breckinridge	84	54	77	108
Bullitt	69	80	42	96
Butler	77	132	42	91
Caldwell	174	71	290	85
Calloway	169	60	284	83
Campbell	109	107	108	110
Carlisle	88	107	83	84
Carroll	237	91	411	96
Carter	108	93	127	92
Casey	64	35	54	92
Christian	165	100	268	73
Clark	129	155	146	96
Clay	79	128	50	88
Clinton	72	25	75	93
Crittenden	88	101	77	93
Cumberland	89	55	91	103
Daviess	118	170	104	109
Edmonson	51	50	24	85
Elliott	80	156	20	113
Estill	97	170	71	92
Fayette	72	***	53	133
Fleming	93	88	91	98
Floyd	84	129	46	108
Franklin	175	88	279	93
Fulton	148	65	222	100
Gallatin	49	28	40	72
Garrard	82	95	52	112
Grant	111	30	144	113
Graves	119	70	164	88
Grayson	115	94	143	91
Green	73	56	64	95
Greenup	97	63	110	98
Hancock	68	138	24	87
Hardin	118	184	109	94
Harlan	167	490	75	112
Harrison	94	88	100	90

County	All Governments	County	City	School
Hart	62	91	42	72
Henderson	152	50	238	98
Henry	80	88	59	103
Hickman	79	58	68	103
Hopkins	164	97	237	108
Jackson	59	83	19	95
Jefferson	87	***	35	179
Jessamine	139	163	157	103
Johnson	140	183	124	138
Kenton	111	118	117	101
Knott	85	109	11	164
Knox	128	134	139	110
Larue	75	121	35	100
Laurel	78	132	47	88
Lawrence	74	69	59	96
Lee	119	187	101	106
Leslie	70	95	6	137
Letcher	90	88	52	138
Lewis	255	80	458	95
Lincoln	67	64	47	92
Livingston	55	60	28	85
Logan	74	33	88	78
Lyon	93	36	122	88
McCracken	110	85	136	91
McCreary	50	101	0	84
McLean	87	53	95	95
Madison	129	149	148	93
Magoffin	103	210	51	112
Marion	89	110	75	95
Marshall	105	136	115	76
Martin	60	42	9	133
Mason	131	136	157	97
Meade	60	81	26	91
Menifee	90	152	63	90
Mercer	96	126	91	88
Metcalfe	99	64	122	87
Monroe	85	68	79	102
Montgomery	112	185	99	89
Morgan	81	59	77	99
Muhlenberg	85	84	74	98
Nelson	129	138	149	101
Nicholas	135	170	154	95
Ohio	83	99	60	102
Oldham	56	58	15	106
Owen	75	104	37	108
Owsley	85	61	53	139
Pendleton	91	70	98	93
Perry	110	78	105	132
Pike	96	129	55	131
Powell	83	88	85	79
Pulaski	129	175	141	90
Robertson	81	146	26	114

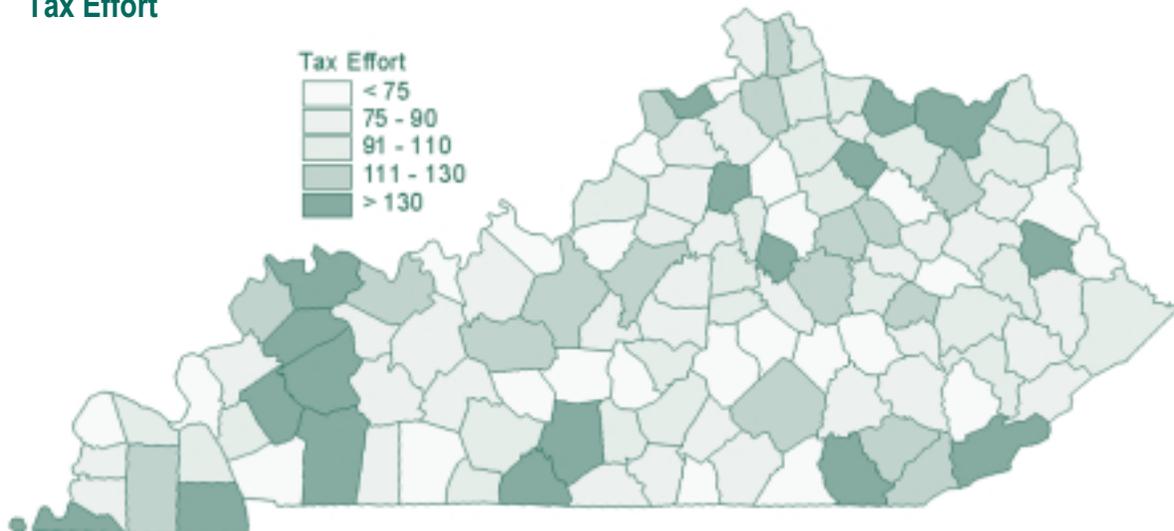
TABLE 4 (cont.)
Tax Effort, All Governments and by Level of Government

County	All Governments	County	City	School
Rockcastle	66	35	53	99
Rowan	123	107	149	99
Russell	80	41	90	89
Scott	64	75	53	72
Shelby	81	102	64	90
Simpson	106	50	144	88
Spencer	86	94	71	100
Taylor	103	55	133	90
Todd	80	90	77	78
Trigg	71	73	54	89
Trimble	111	183	40	162
Union	123	55	165	107
Warren	106	96	122	93
Washington	86	81	83	94
Wayne	77	40	79	95
Webster	141	94	174	124
Whitley	135	126	152	120
Wolfe	73	117	38	94
Woodford	103	206	66	95

education and both Fayette and Louisville receive relatively low per capita aid. In addition, relative to very rural counties, city and county services might exhibit much greater economies of scale than educational services, thus requiring few per capita expenditures in these large counties.

In addition to no apparent geographical patterns in tax effort, formal statistical analysis suggests tax effort is not significantly related to the extent of the tax base (tax capacity), income, poverty, or state aid.

FIGURE 4
Tax Effort



That tax effort is not negatively and significantly related to state aid is both surprising and, perhaps, reassuring — there does not appear to be any strong evidence suggesting state aid is reducing the tax efforts of local governments.

Implications

In one sense this study confirms and quantifies what people concerned about local tax policies in Kentucky were well aware of — there are vast differences in the available tax bases among Kentucky counties. This variation in tax bases, in fact, exceeds the variation in income across counties because so much of local tax bases is driven by employment patterns. One implication of this variation is that state aid to correct differences in tax bases cannot be based only on variation in income alone. Of course, state aid is based on a myriad of factors, one of the most important being property wealth.

Perhaps what is less obvious is the dramatic contrast between tax capacity, the ability of local governments to raise own-source revenue and revenue capacity, the ability of localities to raise revenue with the assistance of state aid. State aid has clearly led to a dramatic equalization in revenue capacity. Judged in terms of making the playing field level, state aid has succeeded and then some.

Less obvious are any apparent patterns in the tax effort among local governments. Tax effort, while varying greatly among county governments

does not appear to be systematically related to tax capacity or, surprisingly, state aid. This suggests that the extensive redistribution in which the state has engaged has not had too much of a dampening effect on local efforts to raise revenues.

Finally, the implications of the equalization of revenue capacity through extensive state aid are ambiguous. There does not appear to be significant reductions in local efforts as a result of state aid. However, state aid does change raising revenues among counties and the tax costs of firms and individuals locating in a county. Lower tax capacity and higher associated tax effort needed to collect a given amount of revenue may reflect higher incremental costs of providing services to commercial enterprises and residents. In this case, state aid, by lowering tax rates, will distort the incremental costs associated with increasing commercial activities or residential population. However, if these differences in tax capacity are unrelated to incremental costs of additional commercial activity, employment, or increases in population, then any differences in tax rates as a result of differences in tax capacity are inefficient. Equalization of tax capacity, if it leads to equalization in tax rates, would be efficiency-enhancing in this case.

Endnotes

1. See, for an example, *Significant Features of Fiscal Federalism, Volume 2, Revenues and Expenditures*, Advisory Commission on Intergovernmental Relations, Washington, DC, December 1994, Tables 98 and 99, p. 182-183.
2. Fayette County-Lexington is a consolidated government and only reports city finances with no separate county finances.
3. U. S. Department of Commerce, Bureau of Economic Analysis, *Regional Economic Information System 1969-97*. Available on CD-ROM, 1999 (May).
4. <http://www.state.ky.us/agencies/revenue/97statisticaltables/table4.htm>

Online Sales and E-Commerce Taxation at Kentucky Businesses

Jonathan M. Roenker

As electronic commerce in the United States continues to expand yearly, estimates of the magnitude of these sales remain elusive, particularly at the state level. This article reports the latest Kentucky figures from a recent survey of Kentucky businesses. The discussion is framed in the light of the most recent national estimates. Approximately 15% of responding Kentucky businesses with 100 or more employees report that they sell their product or service online. Comparison with previous years' survey results show that while online sales in the state are still growing, they are doing so at a slower pace. Also, fewer responding businesses indicate that they plan to implement online sales in the near future, or are at least contemplating doing so. Finally, the debate over taxation of Internet sales is addressed.

Introduction

In an environment as rapidly evolving as the on-line sales industry, the government, as well as private research firms, have failed to get a good grasp on the magnitude of online retail sales as well as business to business ("B2B") sales. With a projected two-thirds of households having Internet access by the year 2003, measurement of retail as well as "B2B" sales is becoming increasingly more important. The latest effort by the U.S. Department of Commerce attempts to estimate the quarterly value of online retail sales. In the 2nd quarter of 2000, this estimate was approximately \$5.5 billion dollars; a far cry from the \$200 billion by the year 2000 figure predicted by Forrester Research, Inc. in 1998.¹ It must be kept in mind that this figure understates the actual magnitude of online retail sales as many consumers use the Internet to acquire information and then complete the transaction via telephone or some other medium.

Since the publication of the Forrester estimate in *Time* magazine, the research firm has significantly reduced its estimate to \$184 billion and extended the timeline to reach this estimate to 2004.² Perhaps the emphasis on retail sales by the media and Congress is misplaced, however. The Gartner Group estimates that "B2B" e-commerce will exceed \$7 trillion by 2004.³ Although this number seems staggering, estimates of these types of sales are elusive and are not measured with much degree of accuracy or confidence as demonstrated by earlier estimates.

As data on electronic commerce is difficult to find, especially at the local level, the 2000 Business Confidence Survey, administered by the University of Kentucky Center for Business and Economic Research, once again collected data on the status of electronic commerce in the state of Kentucky. Results from similar studies, conducted by the Center in both 1998 and 1999, can be found in past articles in the *Kentucky Annual Report* by Steven Allen (1999) and Jonathan Fisher (2000). The 2000 survey once again asked respondents to comment on the status of business to business electronic commerce and posed a question concerning taxation of online transactions. The first section of this article provides an overview of the survey results and data, while the second section discusses the experience of those businesses currently selling online. The third section examines those businesses not currently selling online, and the final section of this article focuses on the issue of taxation of e-commerce. While taxation is not as significant a topic for business to business transactions, which generally are not subject to a sales tax, the taxation of online retail sales is currently a hotly debated issue in the media as well as Congress.

Data

As in the past few years the University of Kentucky Center for Business and Economic Research conducted its annual *Business Confidence Survey* aimed at assessing the confidence of

businesses in Kentucky. Respondents were asked a battery of questions about the general conditions and expectations of their business. These responses are reported in a separate Center for Business and Economic Research publication.⁴ In addition, firms were asked a series of questions concerning online sales at their business. The survey was distributed to a sample of 1,019 large businesses with 100 or more employees as well as to a sample of 2,038 Kentucky businesses of all sizes. Of the surveys mailed out, 219 from the all business sample were returned as undeliverable, and 41 from the large business sample were returned as undeliverable. A total of 141 responses from the large business sample were received as well as 200 responses from the sample of all Kentucky businesses. Examination of the two samples reveals that the characteristics of the businesses completing surveys are very similar to the characteristics of businesses in the entire sample.⁵ As a result, the returned samples can be used to describe the general conditions experienced by all businesses in the Kentucky economy.

Online Sales at Kentucky Businesses

According to NUA Internet Surveys, 56% of U.S. companies will sell their goods online by the end of the year 2000.⁶ Using this statistic as a measuring stick, it appears that Kentucky companies significantly lag behind the U.S. trend. According to the 2000 survey results seen in Table 1, approximately 15% of businesses with 100 or more employees sell their product or service over the Internet, while 9.8% of small businesses, or businesses with less than 100 employees, sell their product over the Internet. While the percentage of large businesses selling online is up from the previous year's survey, the increase in the frequency of use is smaller than the jump seen between 1998 and 1999, perhaps signaling a slowdown in the growth of online sales.

TABLE 1
Percentage of Kentucky Businesses with 100 or More Employees Selling Online, 1998-2000

	1998	1999	2000
Percent Selling Online	10.1%	14.7%	15.1%

Source: Author's calculations from the Business Confidence Survey

While Internet usage among larger firms seems to be expanding, survey results show that the majority of large businesses have been using the Internet to sell their product for at least one year, perhaps signaling a slowdown in the explosion of the number of e-retailers. The number of businesses engaging in "B2B" commerce continues to grow, albeit at a slower pace. According to survey results, approximately 86% of the large businesses responded that they used the Internet to sell their goods and services and have been doing so for at least one year. Similarly, approximately 76% of small business respondents indicated that they had been also been using the Internet for online sales for at least one. On the national level, businesses are offering their goods for sale online at an increasing rate, while businesses in Kentucky lag significantly behind. As stated above, 56% of U.S. companies expect to sell online by the end of 2000, up from just 24% two years ago.

The Nature of E-Commerce

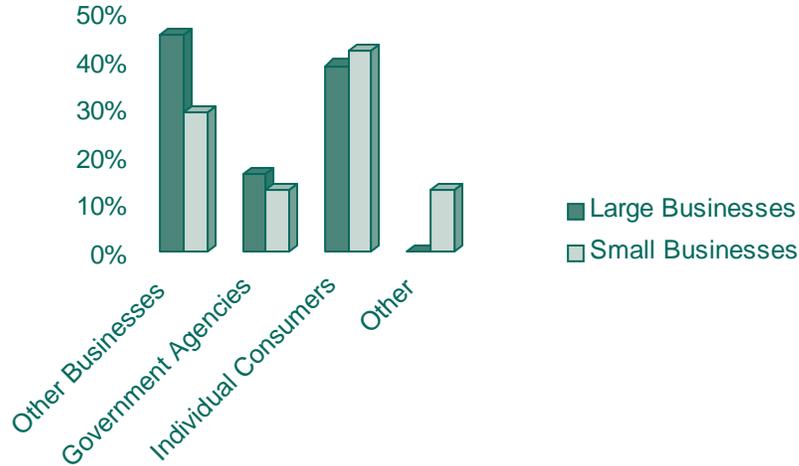
Of those businesses in the state selling online, the majority of their products and services are going to consumers and other businesses. Respondents were asked to identify to whom they were selling their online goods and services. As seen in Figure 1, large businesses tend to have a higher incidence of selling to other businesses, small businesses have a higher incidence of selling to individual consumers. Figure 1 displays the percentage of respondents indicating to whom they sell their product.

In addition to determining the end user for the goods and services sold online, the survey asked several questions aimed at discovering what online sales have done to the nature of the firm's customer base as well as what they have done for the firm's sales and/or revenue. Table 2 (next page) lists the results of these two questions for both large and small businesses.

While it appears that online sales have helped to boost sales and/or revenue for approximately 40% of firms in both samples, the majority of firms indicated that their sales and revenue did not change after instituting online sales. In addition to being asked about sales and revenue, firms were asked to indicate if their online customers were new customers or merely old customers converted to

FIGURE 1

Customers of Kentucky Businesses Selling Online



online customers. Small businesses indicated that approximately 41% of online customers were new while 41% were previous customers. The remaining 18% did not know if their online customers were new customers or previous customers. In the large business sample, two-thirds of the firms indicated that their online customers were previous customers, while 14% were new customers. Approximately 19% of these firms did not know the nature of their online customers.

to use the Internet for online sales in the future. Five percent of respondents indicated that they were unsure as to how to go about initiating online commerce. Eighty percent of the respondents replied that the greatest obstacle to initiating online commerce was the difficulty of selling their particular product through this medium. Slightly greater than 8% think that online commerce requires too much time and investment of money to initiate, while approximately 12% are concerned with security issues.

TABLE 2

Effect of Online sales on Sales/Revenue

	100 or More Employees	Less than 100 Employees
Sales/Revenue		
Increased Significantly	4.8%	0.0%
Increased Somewhat	38.1%	41.2%
Remained the Same	57.1%	52.9%
Decreased Somewhat	0.0%	5.9%
Decreased Significantly	0.0%	0.0%

Source: Author's calculations from the Business Confidence Survey

Of those businesses not currently selling online, 20% of them plan to do so in the future, down from the 22% of respondents who indicated on the 1999 survey that they planned to sell their product online in the future. Table 3 shows how respondents answered this question on both the 1999 and 2000 survey.

TABLE 3

Plans of Kentucky Businesses Not Currently Selling Online

	1999 Survey	2000 Survey
Plan to Sell online	22%	20%
Might Sell Online	43%	37%
Will Not Sell Online	35%	43%

Source: Author's calculations from the Business Confidence Survey

Kentucky Businesses Not Currently Selling Online

As in previous years, businesses not currently selling their product online were asked why they did not use the Internet for sales and did they plan

As the technology sector of the economy appears to be showing signs of a slowdown in the explosive growth witnessed in the recent past, the desire for

Kentucky firms to sell their product online appears to be fading slightly. The percentage of firms planning on selling online, as well as those contemplating selling online, has dropped since last year's survey, while the percentage who have definitively decided not to sell online has increased significantly.

Taxes and the Internet

While the majority of e-commerce transactions are not subject to taxation, the topic is one of hot debate both in the news and among lawmakers. There is some concern that this tax exemption, particularly pertaining to retail e-commerce, provides an unfair advantage for those retailers selling online. Much of online retail sales are not taxed unless the company operates a nexus, or a point of product distribution, in the state where the sale takes place. Technically, regardless of whether there is a nexus in the state or not, the consumer is liable for submitting the tax due on the purchase to the proper authority, but this is typically not enforced. Business to business transactions are typically not subject to a sales tax as sales taxes are usually applied to an end product as opposed to an intermediate good. This type of sale is treated essentially like a "brick and mortar" business to business transaction.

In the 2000 survey, respondents were asked if online sales to Kentucky residents should be taxed, including sales from out-of-state businesses. In the all business sample, approximately 56% of respondents disagreed or strongly disagreed that these transactions should be taxed. Similarly, almost 62% of respondents in the large business sample indicated that they thought these sales should not be taxed.

Since online retail sales compose only a small fraction of total retail sales at this point in time, the effect of non-collection of taxes on these sales is negligible. Many people have attempted to estimate this loss in revenue due to non-taxation of online retail sales. The general formula for calculating such a loss is to multiply total sales by the average tax rate. Most of these estimates use an average national tax rate of approximately 6 2/3%. Using the latest estimate of national online retail sales of \$5.5 billion in the second quarter of 2000, this gives a loss in tax

revenue of approximately \$369 million. In comparison, the total estimated retail sales for the second quarter of 2000 are approximately \$816 billion dollars. Applying the same average tax rate, the sales tax generated from these sales is approximately \$55 billion. For the last three quarters of available data, online sales make up less than 3/4 of one percent of total retail sales, and therefore the tax revenue lost from the lack of taxation of electronic retail transactions is relatively small.⁷

These same types of trends can be expected to apply to the Kentucky economy. While local governments are enjoying overflowing coffers, this debate will remain a non-issue. Should e-retail sales truly explode as has been forecasted in recent years, yet failed to materialize, the issue of taxation of online sales will become a more relevant issue.

Conclusion

Currently, approximately 15.5% of Kentucky businesses with 100 or more employees sell their product online. According to NUA Internet Surveys, approximately 56% of U.S. companies will be selling their product online by the end of the year 2000, up from 24% in 1998. The explosive growth in businesses selling online has appeared to slow in Kentucky, placing the state further behind the national trend. Of those firms currently selling online, approximately 40% of both large and small businesses indicated that online sales had increased their profits/revenues either somewhat or significantly. The remainder of firms selling online said that their sales were either not affected or affected negatively. Businesses not currently selling online indicated that the primary reason for not selling online was the difficulty in selling their particular product online. Of the businesses not currently selling online, only 20% indicated that they definitely planned to sell their product online in the future, down from 22% in the previous year's survey. Forty-three percent of those same respondents indicated that they had no plans to sell their product online, up from 35% in the previous year's survey. With the results noted in the Fall 2000 issue of *Kentucky Business and Economic Outlook* perhaps suggesting a slowdown in the economy's growth rate, the number of businesses selling and planning to sell online appears to also be slowing.

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Kentucky's Employment in the New Economy

Mark C. Berger and Arun K. Srinivasan

We use the 1983-1999 March Current Population Surveys to examine changes in Kentucky's employment in high skilled jobs over time and to compare Kentucky's experience with the national average and the experience in nearby states. We find the share of Kentucky's employment that is in professional, managerial, and technical jobs is below the U.S. average and has been since 1983. Kentucky's share of its jobs in high skilled occupations has been similar to some nearby states such as Tennessee, above others such as Indiana, and behind others such as Ohio. Of some concern is the drop in the share of high skilled occupations in Kentucky since 1996, while the share has increased in other nearby states such as West Virginia, Ohio, and North Carolina.

Introduction

The strong economic performance in the recent years has sparked a wide debate about the evolution of the US economy, with the claim emerging that the 1990's has marked the beginning of a unique era of economic prosperity. The underlying causes of this evolving economy are thought to have been increasing globalization and most importantly, expanding information technology, which is the defining characteristic of what is now called the New Economy. Stiroh (1999) defines the New Economy as the knowledge and idea based economy where ideas, innovation, and technology are the keys to wealth and job creation.

At the outset of 21st century an unprecedented knowledge revolution has opened vast new possibilities for economic well being. Bishop, et. al. (1999) report that in the last two decades the South has experienced remarkable growth as its economy has been transformed, but still deals with the legacy of days as an under developed natural resource-based economy. In fact, Kentucky's traditional economy has included horses, tobacco, and coal. In recent years Kentucky has increasingly emphasized manufacturing, such as automobiles, and transportation such as package shipping, in addition to other new businesses that have been spawned in the state as the economy has grown. Some of this job growth may have been in the New Economy, although much of it may have been in other sectors of the economy.

The New Economy has sometimes been measured using various economic indicators like workforce education, technology in schools, exports oriented manufacturing sectors, foreign direct investment, industries' investment in research and development, number of ".com" domain name registrations, patents, and other measures of infrastructure (Atkinson, Court, and Ward, 1999).

While these measures are of some importance, what is ultimately of interest to many is the number and types of jobs generated in the New Economy. Atkinson, Court, and Ward (1999) use several different measures of occupations created by the New Economy. They rank states according to the fraction of total employment that is made up of office jobs, the fraction of total employment that is made up of managerial, professional, and technical jobs, the fraction of total employment in fast growing companies, the fraction of total employment in high tech jobs, the fraction of total employment that are scientists and engineers. According to Atkinson, Court, and Ward (1999), Kentucky ranks 40th in the fraction of office jobs, 34th in the fraction of professional, managerial, and technical jobs, 19th in the fraction of jobs in fast growing companies, 38th in the fraction of high-tech jobs, and 47th in the fraction of scientists and engineers.

The Atkinson, Court, and Ward (1999) measures provide interesting comparisons between Kentucky and other states at a point in time (most of the measures are for 1997), but they do not give any indications of over-time changes in the New

Economy in Kentucky and other states. Most of the occupational measures are not available over time by state for a large number of years. Fortunately, the broadest based measure of the New Economy that they use, the fraction of total employment that is in professional, managerial, and technical jobs, is available over time by state using the Current Population Surveys. By using this measure, one does not look at specific categories of jobs, such as scientists and engineers, but rather looks at a state's success in creating high skilled jobs in general, all of which are consistent with the knowledge-based New Economy. In this study, we examine trends in the fraction of total employment in professional, managerial, and technical categories of jobs in Kentucky and other states from 1983 to 1999. In this way, we can not only compare Kentucky's progress in creating New Economy jobs at a point in time with the progress of other states, but we can also consider how the relative size of the New Economy has changed over time in Kentucky and elsewhere.

While CBER has been interested in employment in its previous work, we have not yet systematically examined the occupational structure of the Kentucky economy and its changes over time. In *Long Term Trends in the Kentucky Economy* (Berger et.al., 1999), we considered many aspects of employment and its trends over time. For example, we examined trends in employment and wages by education and industry. We only briefly discuss employment by occupation in Kentucky and other states (p. 46). In previous *Kentucky Annual Economic Reports*, we examined trends in employment rates by gender (Berger and Kane, 1999) and trends in the returns to employment by schooling level (Berger, 1998). This paper fills the need for a systematic occupational analysis by examining employment in the New Economy in Kentucky, the United States, and in the nearby states of Indiana, North Carolina, Tennessee, and West Virginia over time.

Current Population Survey Data

This analysis uses data from the March Current Population Surveys (CPS) that have been compiled by the Unicon Research Corporation. The Current Population Survey is conducted monthly by the U.S. Bureau of the Census for the purpose of calculating official federal statistics on employment and unemployment. The monthly questionnaire

includes data on employment, including occupation and industry, job search activity, and demographics.

In some months additional batteries of questions are included on special topics. Each March, a series of questions known as the Income Supplement are included in the survey. Each person aged 15 and over is asked questions about annual wage and salary earnings and income from non-labor sources, hours and weeks worked and health insurance coverage in the previous year, and industry and occupation for the longest job in the previous year. The main portion of each month's survey also includes questions about the industry and occupation of the main job during the survey week, usually the third week of the month. In order to provide a snapshot at a point in time, the analysis here is based on the survey week questions rather than the questions on the longest job in the previous year. However, the results presented here are very similar to those obtained using the questions about the longest job last year.

The Current Population Survey is based on the civilian non-institutional population of the United States. The sample is located in 729 sample areas comprising 1,973 counties and independent cities with coverage of every state and the District of Columbia. Each month, the Census Bureau designates approximately 71,000 housing units for interviews. Of these, typically 57,000 households are actually interviewed, consisting of approximately 115,000 persons aged 15 and over and approximately 35,000 children aged 0-14.

Occupations are classified in the Current Population Survey using the Census of Population Occupation Classification system. These codes are similar but not identical to the Standard Occupation Classification (SOC) codes. The 1983-1991 March CPS used the 1980 Census occupation codes, while the 1992-1999 March CPS have used the 1990 Census occupation codes. These two sets of codes are very similar so it is possible to examine changes over time from 1983-1999. Before 1983, however, the March CPS codes were based on the 1970 Census Occupation codes, which have important differences with the 1980 and 1990 codes. Therefore, in order to have consistent data over time, we base our analysis on the 1983-1999 March CPS.

The Census occupation codes are a "3-digit" occupational classification system with several hundred occupations represented. Within the "3-

digit" classification scheme, there are major occupation groups consisting of: 1) managerial and professional specialty occupations, 2) technical, sales, and administrative support occupations, 3) service occupations, 4) farming, forestry, and fishing occupations, 5) precision production, craft, and repair occupations, 6) operators, fabricators, and laborers.

In order to construct the Atkinson, Court, and Ward (1999) measure of the New Economy consisting of professional, managerial and technical jobs using the March CPS, we must draw occupations from 2 of the 6 major categories of occupations. In particular, we take all of the occupations in the managerial and professional specialty major occupational category, and technical jobs within the technical, sales, and administrative support major occupational category. Table 1 shows the subcategories of occupations included in our measure of New Economy employment. Within many of these subcategories there is a further breakdown of occupations. In the end, over 150 separate occupational classifications are included in our measure of New Economy employment out of the several hundred "3-digit" occupational codes in the Census classification system.

New Economy Jobs in Kentucky

Table 2 provides a percentage breakdown of employment in the U.S. and Kentucky in March 1999 across 9 occupational categories. We show the percentages in the two main subcategories of the managerial and professional specialty occupations (executive, administrative and managerial occupations; and professional specialty occupations), the three main subcategories of technical, sales, and administrative support occupations, and in the other four major occupational categories (services; farming, forestry, and fishing; precision production, craft and repair; and operators, fabricators and laborers).

The first three rows of Table 2 make up our measure of New Economy employment. The percentage of Kentucky workers in each of these categories is below the U.S. average. On the other hand, Kentucky has a higher percentage of its employment in traditional blue collar occupational categories of farming, forestry and fishing; precision

TABLE 1
Occupational Categories Included in Measure of Relative Size of New Economy

- Executive, administrative and managerial occupations
 - Legislators
 - Chief executives and general administrators, public administration
 - Administrators and officials, public administration
 - Administrators, protective services
 - Financial managers
 - Personnel and labor relations managers
 - Purchasing managers
 - Managers, marketing, advertising and public relations
 - Administrators, education and related fields
 - Managers, medicine and health
 - Post masters and mail superintendents
 - Managers, food serving and lodging establishments
 - Managers, properties and real estate
 - Funeral directors
 - Managers, service organizations
 - Managers, properties and real estate
 - Managers and administrators
 - Management related
- Professional specialty occupations
 - Architects
 - Engineers
 - Surveyors
 - Mathematical and Computer scientists
 - Natural scientists
 - Health diagnosing
 - Health assessment and treating
 - Teachers, post secondary
 - Teachers, except post secondary
 - Counselors, educational and vocational
 - Librarians, archivists and curators
 - Social scientists and urban planners
 - Social, recreation and religious workers
 - Lawyers and judges
 - Writers, artists, entertainers and athletes
- Technical occupations
 - Health technologists and technicians
 - Technologists and technicians, except health

Source: CPS Utilities on CD-ROM

production, craft, and repair; and operators, fabricators and laborers.

Table 3 provides estimates of how many U.S. and Kentucky residents are employed in each of these occupational categories. Nationwide, out of 136 million workers, approximately 45 million are employed in high-skilled New Economy jobs, with 37 million employed in traditional blue collar jobs. In Kentucky, out of 1.9 million workers, approximately 510,000 are employed in high-skilled New Economy jobs, while almost 650,000 are

TABLE 2
Percentage Occupational Breakdown of Employment in the U.S. and Kentucky, March 1999

Occupation	U.S.	Kentucky
Executive, Administrative and Managerial	14.46	12.18
Professional Specialty	15.35	12.32
Technical	3.08	2.32
Administrative Support (Clerical)	14.02	12.79
Sales	12.26	13.97
Services	13.58	12.60
Farming, Forestry and Fishing	2.35	3.04
Precision Production, Craft and Repair	11.01	12.25
Operators, Fabricators and Laborers	13.88	18.99
Total	100.00	100.00

Source: Authors' calculations from the 1999 March Current Population Survey

employed in traditional blue collar jobs. The fact that Kentucky has more blue collar jobs than high skilled jobs, while nationwide there are more high-skilled jobs than blue collar jobs, illustrates nicely the situation Kentucky faces as it attempts to enlarge its presence in the New Economy.

TABLE 3
Occupational Breakdown of Employment in the U. S. and Kentucky, March 1999

Occupation	U.S. (000)	Kentucky
Executive, Administrative and Managerial	19,700	233,000
Professional Specialty	20,900	235,000
Technical	4,200	43,000
Administrative Support (Clerical)	19,100	244,000
Sales	16,600	267,000
Services	18,500	241,000
Farming, Forestry and Fishing	3,190	49,000
Precision Production, Craft and Repair	15,000	234,000
Operators, Fabricators and Laborers	18,900	363,000
Total	136,090	1,909,000

Source: Authors' calculations from the 1999 March Current Population Survey

Table 4 compares the relative size of employment in the New Economy in the U.S. and

TABLE 4
Percentage Breakdown of New Economy Occupational Categories, U.S., Kentucky, and Other States, March 1999

Occupation	U.S.	Kentucky	Ohio	West Virginia	North Carolina	Tennessee	Indiana
New Economy as a Percent of Total Employment	32.94	26.78	34.11	32.06	33.41	26.71	27.20
Professional	46.65	46.03	49.77	49.70	41.28	38.14	54.05
Managerial	43.97	45.50	43.06	36.32	48.54	49.62	36.41
Technical	9.38	8.47	7.17	13.98	10.18	10.30	9.54
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Authors' calculations from the 1999 March Current Population Survey

Kentucky with the nearby states of Ohio, West Virginia, North Carolina, Tennessee, and Indiana. In addition, the percentages of New Economy employment in each of the three subcategories of our New Economy measure (professional, managerial, and technical) are shown in Table 4. The relative size of employment in the New Economy in Kentucky is similar to Tennessee and Indiana, but smaller than in Ohio, West Virginia, and North Carolina in March 1999. The breakdown of New Economy employment across the three subcategories illustrates the differences across states in the makeup of high skilled jobs. Ohio, West Virginia, and Indiana have relatively more professional jobs, while Tennessee and North Carolina have relatively more managerial jobs. West Virginia has the highest proportion of technical jobs within the set of high skilled New Economy employment. In Kentucky, the breakdown among the three subcategories looks more like the national average breakdown than in any of the other five states shown. Thus, even though Kentucky has relatively less New Economy jobs than the U.S. average, its mix of New Economy jobs is very similar to the U.S. average.

Tables 1 through 4 present data on the New Economy in Kentucky and other states at one point in time, March 1999. The March CPS data also allow us to examine trends over time. Table 5 shows the percentage of employment in New Economy high skilled occupations in the U.S., Kentucky, and other states from 1983 to 1999. These data are presented graphically in Figures 1 through 7.

Figure 1 shows the U.S. trends over time in the percentage of employment accounted for by high skilled New Economy jobs. The percentage has grown steadily over time, increasing from 25.61 percent in 1983 to 32.94 percent in 1999. There have

TABLE 5

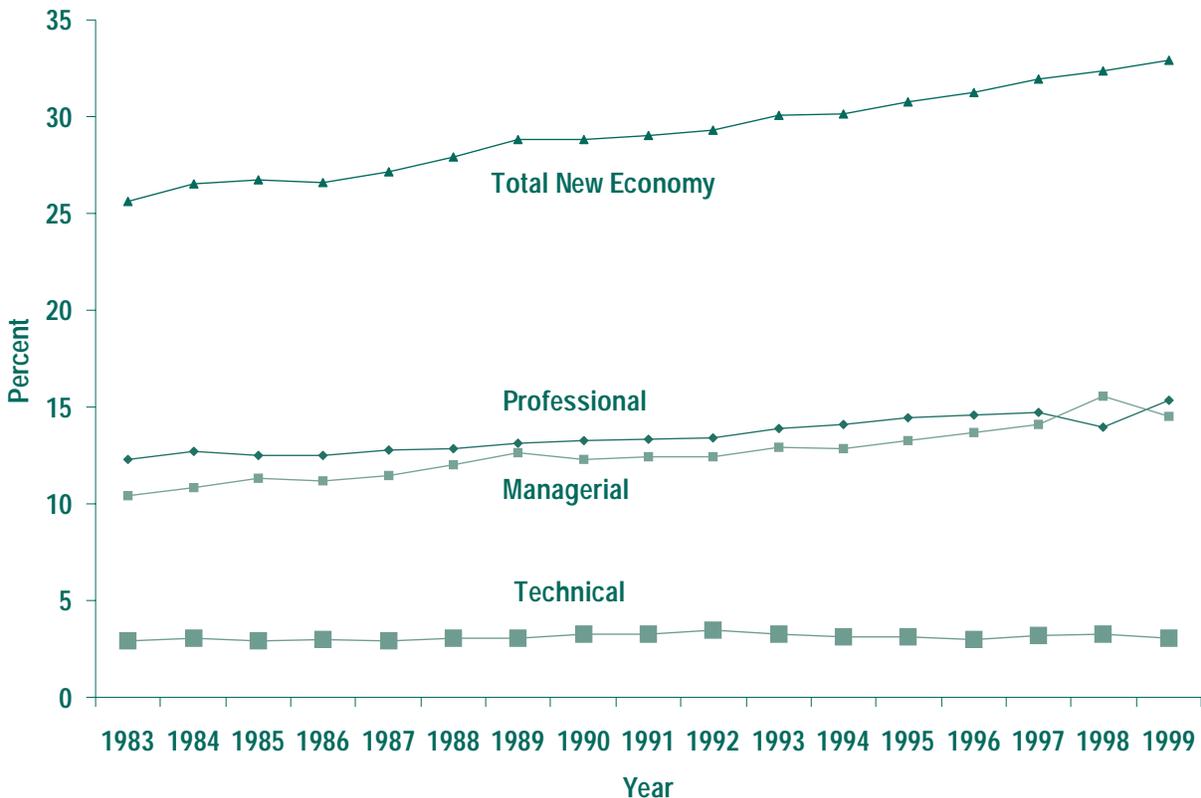
**Percent of Employment in U.S., Kentucky and Other States in New Economy Occupations
1983-1999**

Year	U.S.	Kentucky	Ohio	West Virginia	North Carolina	Tennessee	Indiana
1983	25.61	23.75	26.24	23.04	21.68	22.21	18.07
1984	26.56	22.07	26.93	23.72	22.25	21.97	21.82
1985	26.71	21.63	27.32	21.89	24.36	20.25	23.60
1986	26.61	19.26	24.41	20.39	22.89	20.08	22.36
1987	27.14	22.10	24.67	22.71	23.23	21.63	22.01
1988	27.92	23.29	26.20	24.24	24.14	20.50	23.31
1989	28.82	24.20	27.35	22.75	25.32	26.15	20.46
1990	28.83	26.08	27.63	23.96	23.90	24.27	21.63
1991	29.05	25.87	28.64	25.53	24.47	24.25	22.19
1992	28.27	25.39	28.73	25.28	25.68	24.43	22.02
1993	30.10	26.86	29.72	22.20	25.59	23.65	22.31
1994	30.12	24.56	28.26	22.24	28.01	25.75	24.36
1995	30.78	28.00	28.39	24.36	27.08	28.51	22.44
1996	31.24	31.61	30.37	25.27	28.09	28.80	23.20
1997	31.98	29.96	30.84	30.26	29.64	27.40	27.67
1998	32.37	28.27	30.72	31.86	31.23	27.66	26.96
1999	32.94	26.78	34.11	32.06	33.41	26.71	27.20

Source: Authors' calculations from the 1983-1999 March Current Population Surveys

FIGURE 1

**New Economy Employment and Components as Percentage of
Total Employment, U. S. 1983-1999**



Source: Authors' calculations from the 1999 March Current Population Survey

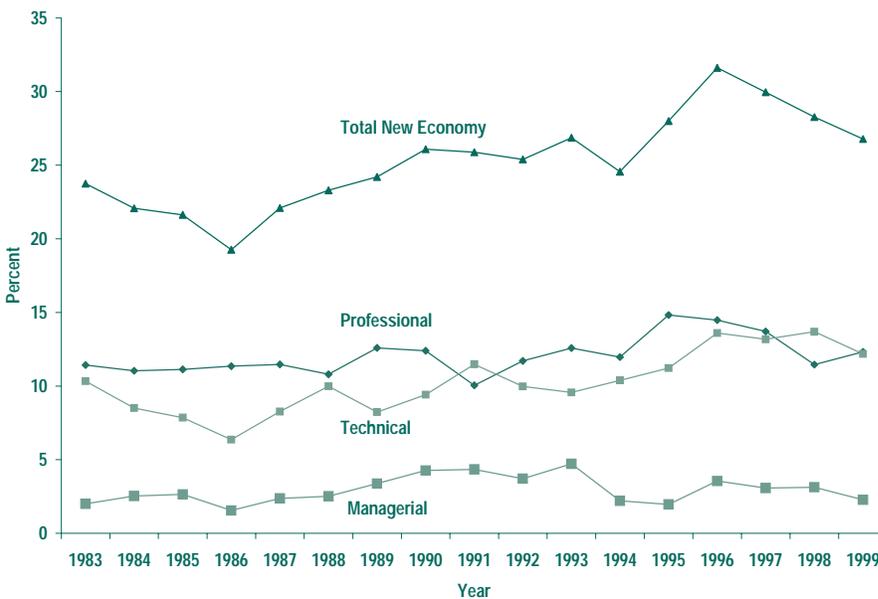
been fairly steady increases in the percentages of employment made up of professional and managerial jobs, with percentage of technical jobs staying almost constant from 1983 to 1999.

Figure 2 shows the same trends over time in Kentucky. Over the entire period, there has been a slight increase in the percentage of New Economy jobs in Kentucky (23.75 percent to 26.78 percent). There is much more variability in the Kentucky estimates from year to year than in the U.S. estimates because the CPS sample sizes for a single state are much smaller than for the entire U.S., introducing some sampling variability. However, even with this year to year variability, we can still draw important conclusions from the Kentucky trends. Over the entire period, the growth in New Economy jobs in Kentucky was slower than at the national level.

While the decline could reflect sampling variability, the decrease has occurred for three consecutive years in the March CPS, lending some credibility to the result. Other nearby states in our analysis do not show a similar sharp downward trend, although smaller decreases have been observed in Tennessee. Further analysis of Figure 2 shows that the decline comes mainly from a decline in the percentage of professional jobs in Kentucky along with a much smaller decline in the percentage of technical jobs.

How do the trends in Kentucky compare with those observed in other states? Figures 3 through 7 provide the answer. On each of the figures, the trend in the percentage of New Economy employment from 1983 to 1999 in the U.S., Kentucky and one other nearby state is shown. Figure 3 shows the comparison of trends between the U.S., Kentucky, and Indiana. Since 1988, Kentucky's percentage of employment in the New Economy has exceeded that of Indiana in most years, although by 1999, the percentages in the two states were nearly identical. Both, however, have been below the national average. Figure 4 shows comparisons with Tennessee. Of all of the states considered, the trend over time in Tennessee looks the most like the trend in Kentucky. Both are below the national average, and the patterns over time are reasonably similar, although the drop in Tennessee in the percentage of New Economy jobs has not been as severe as in Kentucky.

FIGURE 2
New Economy Employment and Components as Percentage of Total Employment, Kentucky 1983-1999



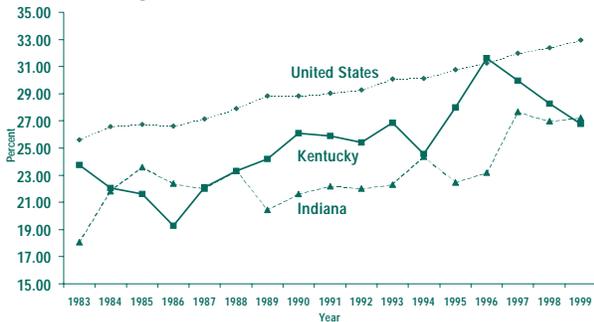
Source: Authors' calculations from the 1983-1999 March Current Population Surveys

Similar to nationally, both the percentages of professional and managerial jobs has grown, while the percentage of technical jobs has remained almost constant.

A concern in the Kentucky trends is the decline in the percentage of total employment accounted for by high-skilled New Economy jobs since 1996.

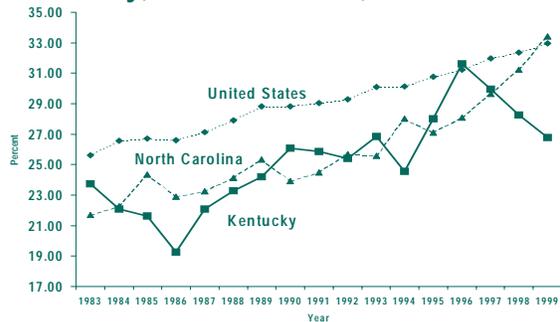
Figure 5 shows the comparisons between the U.S., Kentucky, and Ohio. Ohio looks the most like the national average of any of the states we consider, and thus except for one year, Kentucky has a lower percentage of high skilled New Economy jobs than does Ohio. Somewhat surprisingly, North Carolina and Kentucky look fairly similar in terms of the percentage of New Economy jobs until the mid

FIGURE 3
New Economy Employment, U. S.,
Kentucky, Indiana, 1983-1999



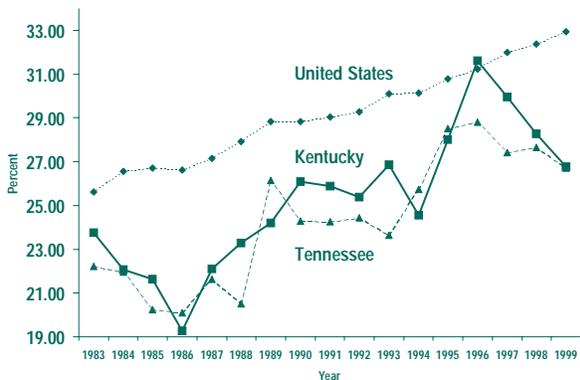
Source: Authors' calculations from the 1983-1999 March Current Population Surveys

FIGURE 6
New Economy Employment, U. S.,
Kentucky, North Carolina, 1983-1999



Source: Authors' calculations from the 1983-1999 March Current Population Surveys

FIGURE 4
New Economy Employment, U. S.,
Kentucky, Tennessee 1983-1999



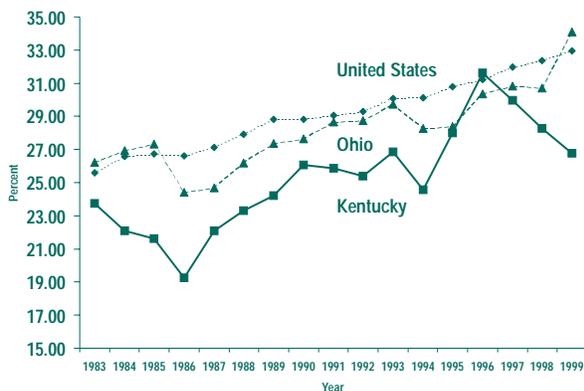
Source: Authors' calculations from the 1983-1999 March Current Population Surveys

FIGURE 7
New Economy Employment, U. S.,
Kentucky, West Virginia, 1983-1999



Source: Authors' calculations from the 1983-1999 March Current Population Surveys

FIGURE 5
New Economy Employment, U. S.,
Kentucky, Ohio 1983-1999



Source: Authors' calculations from the 1983-1999 March Current Population Surveys

1990's (Figure 6). After that time, North Carolina's percentage of New Economy jobs has increased, while since 1996, Kentucky's has fallen. Finally, the case of West Virginia is shown in Figure 7. Kentucky and West Virginia followed an almost identical path until 1992, after which time West Virginia's percentage of New Economy jobs has increased steadily while Kentucky's increased until 1996 and then has fallen. In 1999, while over 32 percent of West Virginia's jobs are in high-skilled New Economy occupations, less than 27 percent of Kentucky's jobs are in the New Economy.

Conclusion

Increasing globalization and the information technology has created many jobs in the New Economy. In United States, jobs in the new economy have been growing steadily over the past two decades. However, the share of Kentucky's employment that is in professional, managerial, and technical jobs is below the U.S. average and has been since 1983. While Kentucky's share of its jobs in high skilled occupations has been above some nearby states such as Indiana for most of this time period, it has been behind others, such as Ohio.

Of some concern is the drop in the share of high skilled occupations in Kentucky since 1996, while the share has increased in other nearby states such as West Virginia, Ohio, and North Carolina. This trend suggests that Kentucky is adding New Economy jobs at a slower rate than these other states. In order to change this trend and to start adding New Economy jobs at a faster rate, it will be important for Kentucky to increase the education level in order to help qualify its citizens for high-skilled jobs. While Kentucky can attempt to attract high skilled jobs without significant improvements in the education levels of Kentuckians, such a strategy could ultimately be self-defeating. On the one hand, many of the new jobs would have to be filled by new migrants to the state, and on the other, Kentucky would then have to get into the business of not only attracting high-skilled jobs, but also high-skilled workers to fill the jobs.

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