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# Kentucky Annual Economic Report 2002

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# Kentucky Annual Economic Report






# 2002






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

UK Gatton COLLEGE OF BUSINESS AND ECONOMICS CBER

# Kentucky Annual Economic Report



## 2002


**Center for Business and Economic Research**

**Department of Economics**

**Gatton College of Business and Economics**

**University of Kentucky**

**Mark C. Berger**, *Director*
Center for Business and Economic Research
**Glenn C. Blomquist**, *Chair*
*(on sabbatical 07/01/01-06/30/02)*
**Frank A. Scott Jr.,** *Acting Chair*
Department of Economics
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**Roy A. Sigafus**, *Managing Editor*


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# From the Director . . .

The Center for Business and Economic Research (CBER) is pleased to publish the 30th 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 2002 Report contains six articles that provide state and national economic forecasts and address some of the important differences in economic activity and growth across the Commonwealth. Several articles investigate how population growth, income growth, earnings per job, and other economic outcomes vary throughout the state. Thus, this issue of the annual report is built on the theme of regional variation within Kentucky.

In putting together this issue of the Annual Report, we draw upon the expertise of faculty, staff, and students at the University of Kentucky and the University of Louisville. Contributors include four faculty members, one graduate student, and one undergraduate student from the Department of Economics and a professional staff member from the Center for Business and Economic Research at the University of Kentucky, and one faculty member from the University of Louisville. Once again, we are have been able to assemble some of the best economists in the state to write about important economic issues.

Our lead article by Dr. Christopher J. Waller, the Gatton Chair of Macroeconomics and Monetary Theory, focuses on the events in the national economy in the last year and offers predictions for 2002, especially in light of the tragic events of September 11th. 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.

The next two articles focus on regional variation in the state. We are pleased to have an article written by Dr. Paul Coomes, Professor of Economics and National City Research Fellow at the University of Louisville. Dr. Coomes examines the progress of the nine economic regions in Kentucky over the decade of the 1990's. My article with Dr. Chris Bollinger, Associate Professor of Economics at the University of Kentucky, and John Perry, a graduate student at the University of Kentucky, examines variation in population, income, and per-capita income growth across counties and Census tracts in the state during the 1990's. These two articles provide a fairly complete picture of regional variation in economic activity in Kentucky over the last ten years.

Jon Roenker, Research Associate at the Center, takes a look at the importance of the coal industry in the Appalachian region of the state. He finds that the economies of Kentucky's Appalachian coal counties, counties in the extreme eastern part of the state, are more dependent on the coal industry than are coal counties in other parts of Appalachia. In several of these counties, 40 percent or more of total county earnings can be traced to the coal industry. The downside of this dependence is that it leaves these counties very susceptible to downturns in the industry.



Finally, Joe Miller, a senior in the Department of Economics, provides an update on e-commerce activities of Kentucky businesses. From our statewide surveys, we now have a four-year time-series of the experiences of Kentucky businesses in the "new economy." Joe finds significant growth in the percentage of Kentucky businesses that are selling their products online. In fact, the percentage of smaller businesses in Kentucky selling online appears to be similar to the percentage nationally.

We are pleased to have worked on a number of important projects this past year at the Center for Business and Economic Research. Perhaps the most innovative is a yearlong study of labor supply and demand in Kentucky for the Workforce Development Cabinet. We are leading a consortium of four units at the University of Kentucky and the University of Louisville that are undertaking this project: CBER, the Survey Research Center at the University of Kentucky, and the Department of Economics and the Survey Research Center at the University of Louisville. Our other work includes several studies for the Kentucky Department of Parks and the Kentucky Tourism Development Cabinet. We assisted the Governor's Smart Growth Task Force. We have also completed projects for the Kentucky Transportation Cabinet, the Kentucky Cabinet for Health Services, and the Kentucky Cabinet for Natural Resources and Environmental Protection. In addition, we have done research for private sector clients such as 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. We look forward to continuing work on these and other projects in the coming year.

I am very pleased with all of the help we have received on our various projects and publications in the past year. Those contributing include our full-time staff of four, seven faculty members from the Department of Economics, one faculty member from the Department of Geography, and several fine graduate and undergraduate students. I am also proud of the continuing success of CBER alumni in the profession. Dr. Amitabh Chandra, who worked for many years as an undergraduate and graduate student research assistant at the Center, received the 2001 award for the best dissertation in labor economics and employment research from the Upjohn Institute for Employment Research. This is a prestigious award that has in the past been given to students from schools such as the University of Chicago, Princeton University, Carnegie-Mellon University, and the University of Michigan. It is exciting that one of our own has received this award.

Mark C. Berger

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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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# Authors



## 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. Christopher R. Bollinger

Christopher R. Bollinger joined the faculty in the Department of Economics in the fall of 1998. Dr. Bollinger earned his Ph.D. in Economics from the University of Wisconsin. His thesis, written under the direction of Charles F. Manski, was titled Measurement Error in Binary Regressors, With an Application Bounding the Union Wage Differential. A chapter from this thesis appeared in the Journal of Econometrics (August 1996). Recent papers include "Measurement Error in the CPS: A Nonparametric Look" (Journal of Labor Economics, July 1998), "Modeling Food Stamp Program Participation in the Presence of Reporting Errors" (Journal of the American Statistical Association, September 1997), "Estimation with ResponseError and Non-response: Food Stamp Participation in the SIPP" ( Journal of Business and Economic Statistics , 2001), "The Impact of Rapid Rail Transit on Economic Development: The Case of Atlanta's MARTA" (Journal of Urban Economics, September 1997).



## Dr. Paul Coomes

Paul Coomes is Professor of Economics and National City Research Fellow at the University of Louisville. Dr. Coomes received his Ph.D. in economics from the University of Texas in 1985. Before going to Texas to finish his graduate training, Paul was assistant director of CBER and helped build databases and models to improve economic intelligence on the Kentucky area. At the University of Louisville, Paul has specialized in regional economic development studies, with particular attention to industrial impacts, peer city analyses, workforce issues, and measurement problems. His research has been published in the Journal of Economic Dynamics and Control, Urban Studies, Environment and Planning A, Economic Development Quarterly, the International Journal of Forecasting, and the Journal of Economicand Social Measurement.



## Joseph Miller

Joseph Miller is a research assistant at the Center for Business and Economic Research and is a student in the Department of Economics at the University of Kentucky. Mr. Miller is working toward the completion of a B.A. in economics and a B.A. in history, both of which he expects to complete in 2002. He plans to attend law school in the Fall of 2002.

# *Authors*



## John J. Perry

John J. Perry is a graduate research assistant at the Center for Business and Economic Research and is a doctoral student in the Department of Economics at the University of Kentucky. Mr. Perry graduated from Centre College in 2000 with a B.S. in economics. Before coming to the University of Kentucky he worked as an actuarial consultant in employee benefits for Milliman USA. His primary areas of interest are public and labor economics.



## 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.



## 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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*In this article, I review the performance of the U.S. economy in 2001 and the policy remedies that have been employed to stabilize the economy. I also present some general thoughts on the post-terrorist economy and address concerns that the U.S. may be entering a prolonged recession much like Japan in the 1990's. I argue that relatively little may change in the behavior of the overall economy in the post-terrorist era but there may well be permanent changes that affect our lives in important ways. I also argue that comparisons to Japan are far-fetched and address the concern that the Federal Reserve is facing a liquidity trap much like the Bank of Japan.*

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### *Eric C. Thompson*

*The Kentucky economy is forecast to grow slowly during most of 2002 as the national economy recovers from the current recession over the course of the year. Economic growth is then expected to accelerate late in 2002, and 2003 and 2004. In 2002, real gross state product in Kentucky is forecast to grow at a 1.8 percent rate, while real total personal income is forecast to grow by 2.4 percent, total employment by 0.9 percent, and total population by 0.7 percent.*

*For the entire 2002 to 2004 period, real gross state product is forecast to average 2.7 percent growth each year on average, compared to 2.6 percent annual growth for real total personal income, and 1.6 percent annual growth in employment.*

*These forecasts for the Kentucky economy are based on baseline expectations for the national economy as presented in the November 2001 U.S. Economic Outlook prepared by DRI-WEFA. These baseline forecasts assume a mild recession for the national economy with output continuing to contract through the first quarter of 2002.*

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### *Paul Coomes*

*The Kentucky Economic Development Partnership was created by the state legislature in 1992 to oversee industry recruitment, incentive programs, and other efforts to improve the standard of living of Kentucky residents and workers. The national economy was red hot between 1992 and 2000, and our region performed well, particularly in manufacturing assembly and distribution operations. The state border cuts through many large economic markets, most notably those of Cincinnati, Louisville, Evansville-Henderson-Owensboro, Nashville, and Huntington-Ashland. Consistent with the larger bi-state economic areas, I identify nine regions in Kentucky and report on their recent relative economic performances. I find solid job, business, and population growth, especially in the Louisville, Northern Kentucky, and Lexington regions. However, jobs in all regions still pay on average less than in the United States, and the gap widened during the decade. The gap is most likely due to the low rate of college attainment of adults in Kentucky. Preliminary data from the 2000 Census suggest that the college attainment rate of Kentuckians improved during the nineties, but not as much as it improved nationally. I discuss some economic development policy issues to address the new challenges in the state. For example, I suggest that state government institute pay hurdles in its tax incentive programs, so that companies only qualify if they pay employees more than the current average pay in each industry and region.*

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*Mark C. Berger, Christopher Bollinger and John Perry*

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*Jonathan M. Roenker*

*In the Appalachian region, particularly in the mountains of eastern Kentucky, the importance of the coal industry looms large in most facets of the lives of this region's citizens. This article examines the current significance of the coal mining industry in coal producing Appalachian counties in Kentucky by examining a number of economic indicators. Kentucky coal producing counties, compared to other coal producing counties in the Appalachian region, are often particularly more dependent on coal as is revealed by the high percentage of coal mining earnings and employment relative to total earnings and employment in those counties. This heavy dependence on the coal industry in Kentucky coal producing counties often leaves these counties susceptible to changes in the fortunes of the industry. As a result, losses in coal mining earnings in these counties often leads to increased poverty and dependence on social welfare programs. In this vein, this article also examines the dependence of Kentucky coal producing counties on social welfare programs in comparison to other counties in the Appalachian region.*

## E-Commerce, Online Sales, and the Experiences of Kentucky Businesses in the New Economy ..... 39

*Joseph Miller*

*The economic importance of e-commerce has been the focus of widespread debate, much of which has suffered from a paucity of tangible data. This article helps alleviate this deficit by reporting the results of recent survey of Kentucky businesses. Over one-quarter of large Kentucky businesses that responded to the survey indicate that they sell their product or service online, which is a sizeable increase over past survey years. This growth means that Kentucky firms are now selling online at a rate comparable to the national average, according to available estimates. The characteristics of Kentucky firms that sell their products online are addressed, as is online buying behavior among Kentucky businesses. Finally, firms' experiences with e-commerce are analyzed, including attributes of their online shoppers and the effects that online sales have had on revenues and profits.*

# The U.S. Economy in 2001:

## "Dr.s Bush and Greenspan you are needed in trauma…"

*Christopher J. Waller*

*In this article, I review the performance of the U.S. economy in 2001 and the policy remedies that have been employed to stabilize the economy. I also present some general thoughts on the post-terrorist economy and address concerns that the U.S. may be entering a prolonged recession much like Japan in the 1990's. I argue that relatively little may change in the behavior of the overall economy in the post-terrorist era but there may well be permanent changes that affect our lives in important ways. I also argue that comparisons to Japan are far-fetched and address the concern that the Federal Reserve is facing a liquidity trap much like the Bank of Japan.*

### Introduction

What began as a significant economic slowdown in the beginning of 2001 became a rout after September 11. The U.S. economy is in a full-blown recession for the first time in a decade, which has caused fiscal and monetary stimulus to be applied in doses not seen in a generation. In this article, I review the performance of the U.S. economy in 2001 and the policy remedies that have been employed to stabilize the economy. I also present some general thoughts on the post-terrorist economy and address concerns that the U.S. may be entering a prolonged recession much like Japan in the 1990's. I argue that relatively little may change in the behavior of the overall economy in the post-terrorist era but there may well be permanent changes that affect our lives in important ways. I also argue that comparisons to Japan are far-fetched and address the concern that the Federal Reserve is facing a liquidity trap much like the Bank of Japan.

### 2001 QI: "Calling Dr. Greenspan…"

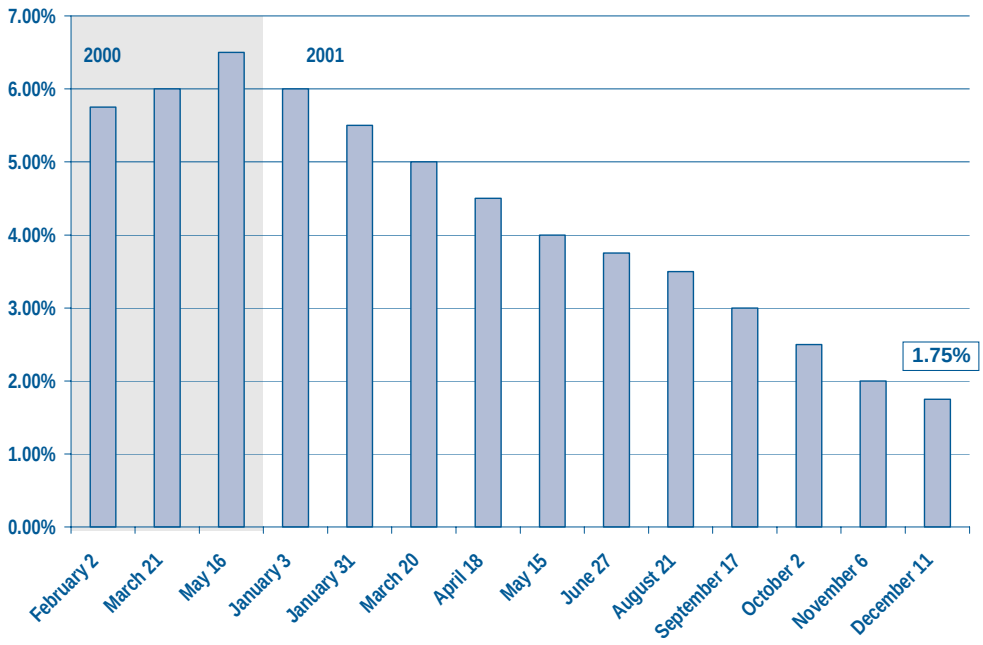
The year began with Alan Greenspan cutting the federal funds rate by half of a percentage point on January 3 (see Figure 1). This was a surprise because it occurred between FOMC meetings and it was a large cut in the fed funds rate. It certainly caught everyone's attention. Despite the fact that the U.S. economy continued to grow at a respectable 2% in the last quarter of 2000, the Federal Reserve had sufficient inside information that the economy was headed for a recession and immediate actions were needed. There was considerable discussion that the growth rate was already at zero by the time the Fed acted. However, the feeling at the time was that despite a major recession in U.S. manufacturing, the rest of the economy seemed to be doing fine. An economic slowdown was likely but not an outright recession. Part of the reason the Fed moved so fast was that in the last recession in 1990-91, the Fed started cutting interest rates too late to stop the recession. Greenspan was late last time – he would not be late again.

During the quarter, the Fed lowered the federal funds rate by half of a percentage point three different times. This is part reflected belief that inflation was under control despite large run-ups in energy prices – oil and natural gas prices peaked in January with a 32% increase from December 2000 to January 2001 in the crude energy price index. However, by the end of the quarter, the index had fallen below its December 2000 value. Nevertheless, the Consumer Price Index excluding food and energy was increasing at a moderate 3-3.5% annualized. The stock market was still fluctuating up and down based on concern about the recession and the decline of the tech sector but was basically flat with the DJIA hovering around 10,750 for most of the quarter. It looked as though the market might turn around once the economy stabilized. However, at the end of March, the stock market took a turn for the worst with over a 10% drop in March 2001. Gloomy profit reports were driving the market down due to increasingly likelihood that we would not avoid a recession in the second half of 2001.

Meanwhile the new Republican administration was voicing the concern that the economy was in a recession before they took office in order to saddle the blame for the economic slowdown on the Clinton administration. Having raised the alarm on the economy the President and Congress began discussions of implementing tax cuts to spur the economy. Even without the justification of fiscal stabilization, the large surpluses that had been accumulated over the previous five years gave rise to the argument that Americans deserved to keep more of their income rather than giving it to the government. The large surpluses had led to a dramatic decline in the national debt. The ratio of privately held federal government debt to GDP had fallen from a peak of 0.43 in 1996:IV to 0.29 in 2001:II. The fiscal situation of the U.S. had not been this good since the early 1980s.

**FIGURE 1**

**Federal Reserve Decisions: Federal Funds Rate**




## 2001 QII: "Calling Dr. Bush…"

The release of the first quarter GDP growth numbers showed that the economy had slowed significantly but was still growing albeit a just a bit over 1% per annum. The Fed continued its methodical reduction of interest rates. Despite a razor thin majority in the House and the loss of the Senate due to the defection of a single senator to the Democratic Party, the Bush administration was able to get Congress to pass a major tax cut. However, other than a one-time rebate of $300 - $600, most of the cuts in taxes would not occur until five years out or more. Thus the tax cut was more of a 'promise' than a reality. The argument for the long delay in the realization of the tax cuts was that we had to wait and see if the surpluses would persist for years or would be a temporary phenomenon.

The tax cuts coupled with three more interest rate cuts by the Federal Reserve gave hope to the markets that a recession would be avoided. The market rallied in late May / early June surpassing its early January level and peaking near 11,500 in June before falling back to 10,500 at the end of the quarter. The markets believed the aggressive monetary and fiscal actions would allow the economy to avoid an outright recession. Oil prices peaked in May but the CPI was nearly stagnant. Nevertheless, the aggressive monetary and fiscal policy actions raised concern that inflation would pick up later in the year. This created inflation fears and put upward pressure on long-term bond rates. This is why mortgage rates did not come down much despite the large cuts in short-term interest rates. Nevertheless, things appeared to be bottoming out.

## 2001 QIII: Slowdown Becomes Recession as Fear Takes Hold

The third quarter started with surprising data showing the economy growing by 1.7% in the second quarter. This was higher than expected and

suggested that the economy might avoid a recession. However, other data suggested that this was optimistic and subsequent revisions would lower it. The Fed again cut interest rates and the Bush rebate checks began arriving in taxpayer's mailboxes. Unfortunately, bad profit reports continued to pour in and the stock market fell another 10% in August and early September. The unemployment rate jumped nearly 4/10$^{ths}$ of a percentage point – the largest single month increase since late 1982. The markets and policymakers held their breath to see if a recession would arise or be skirted through the actions of monetary and fiscal policymakers.

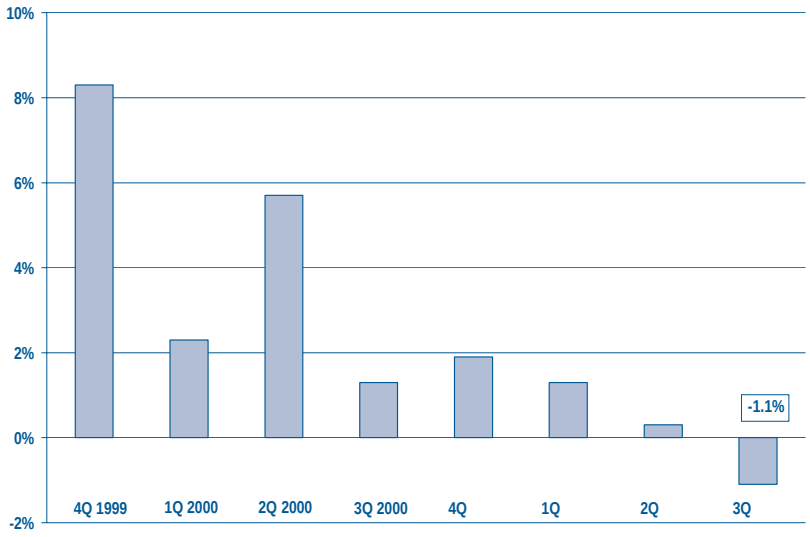
Then the roof caved in on September 11, 2001. The terrorist attacks on New York City and Washington D.C. were the types of shocks that economists could never dream of. An era of fear and uncertainty unknown since the Cuban missile crisis took hold of America and the world. The consequences of this terrorist attack are only now being determined. The major effect on the economy from the terrorist attack is the creation of tremendous uncertainty about the future. It is this uncertainty that is wreaking havoc on the economy.

Economists make a distinction between risk and uncertainty. Risk involves random outcomes that have probabilities attached to them. Uncertainty involves outcomes that do not have probabilities. Thus, we can make statements about the probability that a plane will crash. Consequently, we all can make rational decisions as to whether or not to fly and we can create contingency plans to deal with it. We do not know what the probability is of a terrorist using an airplane as a weapon of mass destruction. We do not know how to plan in this environment nor can we create contracts to deal with it. Thus, terrorism creates uncertainty that we have a difficult time dealing with. When uncertainty increases, households and firms become more cautious in order to learn how the world now works. Uncertainty affects investment decisions, hiring decisions, ordering decisions, purchasing decisions and saving decisions. All of these decisions have been thrown into turmoil after September 11.

It is clear by now that this attack threw a slowing economy into a full-scale recession. It led to even greater concerns about future terrorist attacks that in many ways could be even more ominous than what happened on September 11. Major structural changes began in late September – travel and tourism industries were thrown into major depression. Airlines required a massive subsidy of $15 billion dollars from the federal government to keep from going bankrupt. Consumer confidence fell dramatically, massive layoffs in the airline and travel industry occurred. Employment in non-farm occupations fell by nearly 400,000 in September alone. The worst had just begun.

**FIGURE 2**

**U.S Quarterly GDP Growth Rates**




## 2001 QIV: Our Darkest Hour

The fourth quarter began with the news of what we expected would happen – GDP growth was revised down in the second quarter from 1.7% to 0.7%. This caused everyone to expect a negative growth rate for the third quarter. It was. However, instead of the –1% that was expected, the economy shrank at a –0.4% annual rate in the third quarter although there were warnings that future revisions

would push that number down. Projections were for QIV GDP growth to fall by nearly 2%.

The Federal Reserve continued slashing interest rates and fiscal stimulus was being created at a staggering rate – by some estimates, Congress was prepared to generate an extra $100 billion in fiscal stimulus. Unemployment jumped to 5.4% in October and was expected to continue rising. There were a couple of bright spots though; the Dow Jones Industrial average surpassed its pre-September 11 value in mid-November (the time this article was written), the trade deficit continued to decline as it had for most of the previous 12 months and finally, low interest rates caused a surge in mortgage refinancing that improves household debt positions. Furthermore, the producer price index registered its largest decline in over 50 years dropping 1.6% in a single month, which annualizes out to –21% per year. Coupled with falling oil prices, this meant inflation was nowhere to be seen. Unfortunately, deflation became a serious possibility. Normally this would mean that the Fed would have considerable latitude to cut interest rates but rates were already so low that the Fed was running into the zero lower bound on interest rates.

The fourth quarter also saw an anthrax scare furthering uncertainty about America's future. A protracted war and further attacks such as chemical or nuclear became serious concerns. It is clear that a second attack with massive loss of human life would lead to a fundamental change in our behavior and attitudes. Thankfully, military success drove the Taliban from power and this greatly relieved fears of a sustained terrorist war on the U.S. at least for the near future. Whether this will create optimism about our future and a burst of economic activity is yet to be seen. This may well be a situation where the U.S. military does more for American economic confidence than any fiscal or monetary stimulus ever could.

## General Thoughts

### The Post Terrorist Economy

How will the U.S. economy be affected by the 9-11 attacks in the long run? In short, very little. The U.S. economy is enormous – we have a national income of nearly $10 trillion dollars per year, we have around 130 million workers, we invest $1.7 trillion per year in physical capital and we engage in nearly $800 billion dollars of international trade (counting combined imports and exports). The next largest economy is China with less than half that amount of income despite having over 1 billion citizens (nearly 4 times our size). We are 'Economic Monster Inc.' If the entire state of California were destroyed and fell into the ocean, these numbers would fall by approximately 20-25% — a catastrophe yes, but nothing worse than the Great Depression. Even nuclear terrorism could not produce anywhere near that type of devastating loss. It is important to note that economies always continue to function well under duress – look at Britain and Germany during WWII.

So we must keep things in perspective – the U.S. economy will continue to grow as long as we do not do anything stupid. What could we do that is stupid? Anything that cuts us off from the world economy. Isolation for security purposes is bad economic policy. The U.S. is a dynamic and powerful economy because we risk our security every single day by having free and relatively frictionless trade in goods, people and ideas. Now more than ever we must continue to keep our eyes on greater integration into world markets as well as continuing to allow immigration from abroad, in particular from the developing world. It is our flexibility and willingness to allow markets to work that has kept us at the top of the economic leader board.

In order to understand the importance of remaining an open society, consider the following demographic facts and projections:

- In 1950, Europe and the Russian Republic comprised 22% of the world population. By 2050 that will be 7.5%
- In 1950, six of the 10 most populous nations were in the developed world. By 2020, only the U.S. will remain.
- By 2020, if were to project the world's population ratios onto 100 people, 72 would be from Asia and Africa. Only 9 would be from the U.S. and Western Europe.
- The largest proportional youth bulges in the next 50 years will occur in Pakistan, Afghanistan, Saudi Arabia, Yemen, Iraq and Iran.

Thus, our long-term economic well-being will require us to be more integrated with the currently developing world rather than our historical allies.

How will the post-terrorist economy affect our lives? We will see greater security everywhere we go. But as we have seen already, technology will make that security less time consuming and efficient than it currently is. So, despite more thorough inspections at borders and airports, we will be inspected faster and more efficiently. As for economic output, we are simply shifted expenditures from one type of good (travel) towards another type of good (security). This represents a shift in the allocation of our resources, but not a decline in our total resources or the growth of our income. We will suffer more invasions of our privacy, at least for a while, yet that simply continues the trend associated with living in the information age.

We will also see more scrutiny given to immigrants coming into the U.S particularly from certain parts of the world. This again will affect our ability to attract the best and the brightest from around the world. A large share of our immigrants comes from Latin and South America – areas that are peaceful towards the U.S. and present very little threat regards to terrorism (narco-terrorism aside). Overall, these changes require one-time adjustments. Finally, we may well see an increase in military spending as we increasingly have to deal with non-state actors such as terrorists and because, with more of our attention focused on the developing world, our need to project military power will require new bases in new lands or the capital to move our military around the world (a larger and more powerful navy).

## The Next Japan?

There has been considerable discussion and concern that the U.S. could fall into the same situation as Japan in the coming years. Japan has essentially been in a Depression for a decade. In that time the Bank of Japan (their equivalent of our Federal Reserve) has slowly been cutting interest rates in an attempt to jump-start the Japanese economy. Furthermore, the Japanese government has undertaken massive fiscal policies actions to try and stimulate the economy as well. Neither has worked. The Japanese equivalent of the federal funds rate is 0.5% — essentially a zero nominal interest rate. Yet nothing happens. Since Japan is one of the world's major economic powers and was a 'model' economy up until 1990, many have suggested that the U.S. may be in for a similar period of economic stagnation in the years ahead. Furthermore, with the Fed having already cut interest rates to 2% they are getting themselves into the same position as the Bank of Japan in which monetary policy becomes powerless.

While there are similarities between the Japanese situation and the U.S. situation, Japan's problems are different. They experienced a massive real estate and financial market bubble that collapsed and left their banking system a complete mess. Sadly, they have stubbornly refused to write off bad loans or close insolvent banks for essentially cultural reasons (the keritsu system). Furthermore, Japan is a very closed economy that does not allow immigration except for menial tasks. They do not attract the world's best and brightest. Furthermore, they are a rapidly aging society that will face ever-increasing pressure on young workers to support their aging population. They have very rigid, inflexible markets that prevent the growth of efficiency and innovation which are typically born in the fires of competition. Finally, Japan's citizens are notorious savers and their saving is being used to prop up bad banks and bad firms or is sent abroad. Thus any monetary or fiscal policies aimed at getting Japanese consumers to spend more have been feckless.

By contrast, the U.S. banking system is in superb shape, our markets are extremely competitive and we are an open society – if we cannot breed the best, we'll buy it from abroad. We also have an aging population but a vast proportion of our immigrants are young, thereby providing the future work force that will support us. And last but not least, Americans typically have no problems spending their incomes or wealth on consumer goods. So, monetary and fiscal polices aimed at spurring consumer demand for goods and services are more likely to be successful. Consequently, we will not become the next Japan.

## The Zero Interest Rate Bound

One aspect of the Japanese situation that is of concern for policymakers in the U.S. is the zero lower bound on nominal interest rates. The Federal Reserve is very concerned that they are running out of maneuvering room on interest rates. The problem is that the Fed cannot push interest rates below zero via open market operations. Once a zero interest rate is reached, it becomes optimal just to hold cash,

which by definition pays exactly zero nominal interest – nothing more and *nothing less*! Since the Fed's main policy objective at the moment is to lower interest rates and get us to borrow more to finance spending on consumer durables and housing, once we hit zero interest rates, the Fed will have exhausted its policy ammo. John Maynard Keynes called this situation the 'liquidity trap.'

Because of this problem and to avoid looking like the Bank of Japan, the Fed may well push interest rates down to zero very rapidly in the next couple of months. The Fed's fear is that they will look ridiculous or be viewed as irrelevant if they allow interest rates to go on a slow death march towards zero by cutting the fed funds rate to 1½, then 1, then 3/4, then 1/2, then 1/4th, then 1/8th, then 1/16th, then 1/32nd and so on. So there is considerable sentiment that if interest rates need to go to zero, then the Fed should do it quickly.

Despite the concern at the Fed and various financial writers, the liquidity trap is nothing more than a bogeyman. The Fed has painted itself into this box by thinking that they control interest rates rather than what they truly control – the stock of currency in the economy. By reducing interest rates the Fed simple injects more cash into the economy via purchases of government debt. Is this the only way of injecting cash into the economy? No. The Fed can simply give it away! If the objective is to get consumers to buy more goods and services, then the quickest way to do that is have the Fed print $100 bills and mail them directly to U.S. citizens. Bypass the banking system and financial markets altogether! My personal favorite is to create 'Fed Lotto' whereby once or twice a month, Alan Greenspan pulls numbers at random and makes someone a *billionaire*. The Fed would be the most popular government agency in the history of the world. Once the individual gets the money, he or she will decide how to allocate it or spend it rather than some investment banks in New York.

Does this sound ridiculous? Maybe, but it is fundamentally no different than the tax rebates we all received this year. The only difference in my example is that the rebate checks come from the Federal Reserve rather than the treasury. Remember a rebate check is equivalently a loan with a -100% interest rate, i.e., it does not have to be paid back. Thus, the Federal Reserve and the Bank of Japan have painted themselves into the liquidity trap box. Now it is time for them to think and act outside the box.

# Quarterly Forecasts for the Kentucky Economy, 2002 - 2004

*Eric C. Thompson*

*The Kentucky economy is forecast to grow slowly during most of 2002 as the national economy recovers from the current recession over the course of the year. Economic growth is then expected to accelerate late in 2002, and 2003 and 2004. In 2002, real gross state product in Kentucky is forecast to grow at a 1.8 percent rate, while real total personal income is forecast to grow by 2.4 percent, total employment by 0.9 percent, and total population by 0.7 percent.*

*For the entire 2002 to 2004 period, real gross state product is forecast to average 2.7 percent growth each year on average, compared to 2.6 percent annual growth for real total personal income, and 1.6 percent annual growth in employment.*

*These forecasts for the Kentucky economy are based on baseline expectations for the national economy as presented in the November 2001 U.S. Economic Outlook prepared by DRI-WEFA. These baseline forecasts assume a mild recession for the national economy with output continuing to contract through the first quarter of 2002.*

## Introduction

This article describes a forecast for the Kentucky economy for the years 2002 through 2004 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 2002, 2003 and 2004.

The Kentucky economy is forecast to steadily recover from the current recession during the 2002 to 2004 period. The economy will grow slowly during most of 2002, but growth will accelerate in the fourth quarter of 2002, and in 2003 and 2004. Real income growth is forecast to average 2.6 percent per year from 2002 to 2004, and real per capita income is forecast to grow by 1.9 percent. This strong rate of income growth will be lead by strong gains in wage and salary income, which will be fueled by continuing productivity gains in the economy. Gross state product is forecast to average 2.7 percent per year over the three-year period, while employment growth is forecast to average 1.6 percent from 2002 through 2004.

Future growth in the Kentucky economy is expected to be broad-based. All major industry groups besides mining are expected to add employment from 2002 to 2004, with the exception that manufacturing will to lose employment during 2002. However, over the entire three-year period, the manufacturing industry is forecast to perform well in Kentucky relative to the nation, with 13 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 0.7 percent per year, which is somewhat 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 stronger growth in the manufacturing sector. 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 semi-conductors. Instead, Kentucky has become increasingly successful at capturing growth in traditional industries such as automobiles.

## Recent Developments

During 2001, both the Kentucky and national economies fell into recession. This is reflected in anemic employment growth. The national economy is estimated to have lost employment during the year, with a decline of 0.5 percent. We estimate that employment in Kentucky grew by 0.4 percent during 2001, based on currently available data (through September 2001) and projections. To achieve this growth rate, Kentucky added roughly 7,700 jobs in 2001. This is a marked slowdown in the Kentucky economy. Although it is interesting to note that the recent tendency for the Kentucky economy to outperform the national economies appears to persist even during this recession period.

Kentucky managed to add employment in 2001 because growth in the retail trade and services industries offset losses in the manufacturing industry. The services industry is expected to have grown by 3.1 percent and added 14,700 jobs in 2001. Business and health services lead the way in service industry growth. The retail trade industry is expected to have grown at a rapid 1.0 percent rate and added 3,300 jobs. The manufacturing industry is estimated to have lost 17,300 jobs in Kentucky in 2001. The coal mining industry added a few hundred jobs during 2001.

Overall job growth in Kentucky also contributed to modest population growth. Population in Kentucky is estimated to have grown by 0.7 percent during 2000.[1]

## The Next Year

The 2002 forecast calls for a gradual recovery in the Kentucky and national economy over the course of the year. 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 1.8 percent in Kentucky in 2002. Total employment is forecast to grow by 0.9 percent during the year. This will exceed the small 0.3 percent increase forecast for employment nationwide during 2002. Total personal income growth is forecast to reach 2.4 percent rate paced by a rapid 2.4 percent growth rate in wage and salary earnings.

With this forecast growth in employment and income, population growth in Kentucky is expected to fall just below national levels in the 2002. Population is forecast to increase by 29,700 during the year. This 0.7 percent rate of growth is just below the nationwide forecast for population growth.

Just as in previous years, the greatest growth among industries in 2002 is forecast for services and retail trade. Service industry employment is forecast to grow by 2.4 percent in 2002, adding a total of 12,000 jobs. Business services, growing at 4.0 percent, and health services, growing at 3.9 percent, are forecast to add the most new service jobs. Retail trade employment is forecast to grow at 1.3 percent in 2002, adding 4,600 new jobs.

The manufacturing industry is expected to lose about 2,000 additional jobs in Kentucky in the year 2002, for a 0.7 percent rate of loss. Fabricated metals, wood products, and plastic products are forecast to be among the growing manufacturing industries, while apparel, textiles and tobacco products are forecast lose employment. The coal mining industry is forecast to begin losing jobs again in 2002, with a decline in 600 jobs, or 4.0%.

## The Three Year Forecast

Growth in the Kentucky economy is forecast to accelerate in 2003 and 2004, after modest growth returns in 2002. Growth in real gross state product is forecast to rise between 3.0 to 3.3 percent in 2003 and 2004 relative to 1.8 percent growth in 2002. Total employment growth is forecast to increase from a 0.9 percent growth rate in 2002 to between 1.5 to 2.2 percent growth in 2003 and 2004. Real total personal income is forecast to grow at 2.9 percent and 2.6 percent in 2003 and 2004 after growing 2.4 percent in 2002.

Forecast growth rates for both income and employment meet or exceed national forecasts. Population growth in Kentucky is expected to fall

short of national growth rates. The Kentucky statewide unemployment rate is expected to rise to 6.6 percent in 2002 before falling back to 6.0 percent in 2003, and 5.4 percent in 2004. 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 that 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 that 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 25.2 percent of real gross state product in the fourth quarter of 2001, while goods-producing industries as a whole accounted for 31.6 percent. The remaining 68.4 percent of real gross state product was divided among other industries. For example, retail and wholesale trade accounted for 17.3 percent, and services accounted for 16.5 percent.

Manufacturing and other goods-producing industries are forecast to account for a somewhat larger share of future growth in Kentucky real GSP, portending and even more important role in the economy in the future. As Figure 1 shows, manufacturing is forecast to account for 36.8 percent of growth in real GSP from 2002 through 2004. All goods-producing industries are forecast to account for 40.7 percent of growth in real GSP. Growth in manufacturing, mining, agriculture, and construction will be a crucial engine for growth in the Kentucky economy in years to come.

**FIGURE 1**

**Share of Kentucky Gross State Product Growth in Selected Industry Groups, 2002 - 2004**

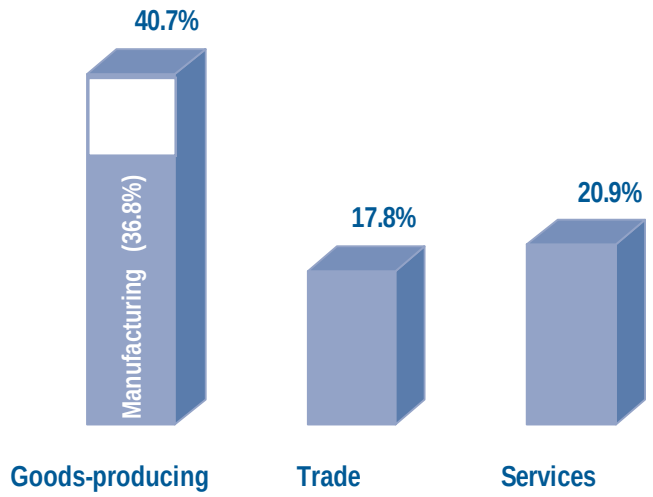


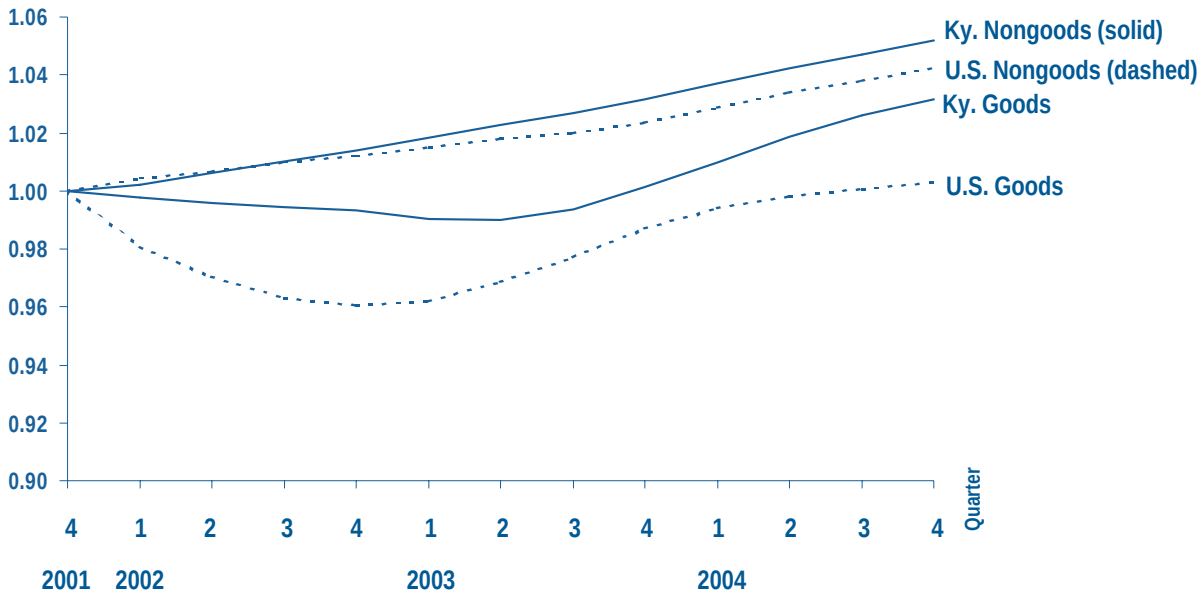

Figure 1 also shows the relative significance of trade and services for growth in real GSP. These industries are forecast to play a significant but secondary role in real GSP growth. Retail and wholesale trade are forecast to account for 17.8% percent of real GSP growth from 2002 through 2004, while services are forecast to account for 20.9% 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 2002 through 2004 compared to employment in the fourth quarter of 2001. As depicted, goods-producing employment is forecast to decline significantly in the United States from the fourth quarter of 2001 through the first quarter of 2003. The cumulative decline is 4%. After this point, however, goods- producing employment begins to rise again through the fourth quarter of 2004. Goods-producing employment eventually rises slightly above its original level.

A similar pattern is observed in Kentucky, but the initial decline is not as large. In Kentucky, as Figure 2 shows, goods-producing employment

**FIGURE 2**

## Indices of Employment Forecasts for Goods and Nongoods-Producing Industries in Kentucky and the United States, 2002 - 2004




drops roughly 1.0% by the first half of 2003, but grows thereafter. By the fourth quarter of 2004, goods-producing employment is 3.2% higher than in the fourth quarter of 2001.

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 1.7 percent per year over the three-year period compared to a 1.4 percent for the United States.

A more detailed analysis of real GSP forecasts is 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, 2002 - 2004

| | Real GSP 4th Q 2001 ($mil) | Annual Growth Rate 2002 | 2003 | 2004 | Annual Averages Growth ($mil) | Growth Rate |
|---|---|---|---|---|---|---|
| **Total** | $108,314.57 | 1.80% | 3.35% | 3.01% | $3,024.76 | 2.72% |
| **Agriculture** | 2,153.49 | -8.96 | 0.68 | 1.13 | -52.46 | -2.38 |
| **Mining** | 2,783.65 | 2.77 | 3.74 | 2.72 | 88.24 | 3.08 |
| **Construction** | 4,307.22 | 0.96 | 1.88 | 2.77 | 81.96 | 1.87 |
| **Manufacturing** | 27,306.64 | 1.60 | 5.72 | 4.49 | 1,113.21 | 3.94 |
| **TCPU** | 9,017.49 | 3.09 | 3.42 | 4.00 | 327.00 | 3.50 |
| **Trade** | 18,699.89 | 1.99 | 3.46 | 2.97 | 539.08 | 2.81 |
| **FIRE** | 11,687.97 | 1.33 | 1.35 | 1.43 | 162.38 | 1.37 |
| **Services** | 17,904.73 | 3.44 | 3.52 | 3.27 | 631.69 | 3.41 |
| **Government** | 14,453.48 | 1.17 | 0.77 | 0.81 | 133.65 | 0.92 |

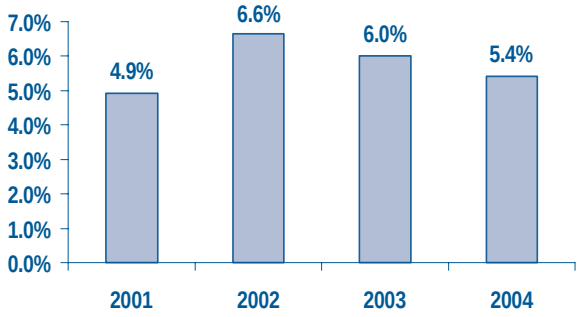
TCPU = Transportation, Communications, and Public Utilities FIRE = Finance, Insurance, and Real Estate

## Unemployment

Unemployment levels are expected to rise in 2002 in response to current recession conditions and a modest recovery next year. Figure 3 shows the forecast average annual rate of unemployment in Kentucky for 2001 through 2004.

**FIGURE 3**

**Forecast Annual Unemployment Rates for Kentucky: 2001-2004**




The average annual unemployment rate is expected to have reached 4.9 percent in 2001, before rising to an annual average 6.6 percent in 2002. More rapid economic growth in 2003 and 2004 is expected to cause unemployment to drop during those years. The unemployment rate is forecast to drop to 5.4 percent by 2004.

## Income

Income growth in Kentucky is forecast to be similar to national growth over the next three years. The growth rate in real personal income is forecast to average 2.6 percent in Kentucky and 2.6 percent in the United States over the period. 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 2002 through 2004, growth in real per capita, or per person, income in Kentucky is forecast to average 1.9 percent versus 1.7 percent in the nation. Both figures suggest significant growth in personal income and the standard of living in Kentucky and the nation in the next few years despite current recession conditions.

## 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 0.7 percent per year, is expected to fall just below the national average growth rate from 2002 to 2004. This figure translates into an average increase of 29,600 residents each year. Of that total, 22,000 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 3.4 percent per year from 2002 through 2004. Population is also forecast to grow quickly among the oldest portion of the population. The number of persons over age 85 should grow by 4.8 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 rise at an annual rate of 1.4 percent in Kentucky from 2002 through 2004, which translates to an increase of roughly 4,300 jobs per year. The performance of the industry, however, will vary significantly from year to year. Manufacturing employment is forecast

to shrink by 0.7 percent in 2002, and grow by 1.3 percent in 2003, and 3.6 percent in 2004. This pattern reflects the acceleration of the U.S. and Kentucky economic growth throughout the period, and national patterns of employment growth for the industry.

Throughout the 3-year period, the Kentucky manufacturing industry is forecast to outperform the national manufacturing industry. Kentucky's average manufacturing job growth of 1.4 percent compares favorably with the national forecast of an average 0.2 percent increase in manufacturing employment each year from 2002 through 2004.

As is seen in Table 2, two-thirds of the state's manufacturing industries are forecast to add jobs in the next three years. Specifically, 13 of the 20 manufacturing industries are forecast to add jobs. This is similar to the national forecast that calls for 12 manufacturing industries to add jobs. The fastest rates of employment growth for Kentucky manufacturing industries are forecast for wood products, plastic products, and printing. The fastest rates of job loss are forecast for tobacco products, leather products, and miscellaneous manufacturing.

Employment in the construction industry in Kentucky is forecast to grow by 1.0 percent per year. Coal mining employment is forecast to decline during each of the next three years, with an average loss of 800 jobs per year. Employment in both the Kentucky and national mining industries are forecast to decline by roughly 5 percent annually during the next three years.

As with manufacturing, nongoods-producing industries in Kentucky such as services are expected to match or exceed their national counterparts in terms of job growth. The services industry is forecast to add employment at a rate of 2.6 percent per year in Kentucky, and 2.6 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 2002 through 2004. The health care industry is forecast to add employment at a 2.9 percent rate per year. Since health care is such a large industry, a 2.9 percent growth rate translates into 4,600 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 0.6 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 0.8 percent annually in Kentucky compared to 0.4 percent in the United States overall. The finance, insurance, and real estate (FIRE) industry is forecast to grow by 0.2 percent each year in Kentucky compared to 1.0 percent nationally. The transportation, communications, and public utilities (TCPU) industry is forecast to add employment at a 1.1 percent annual rate in both Kentucky and the nation.

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 steadily in both Kentucky and the nation. As seen in Table 3, income growth is forecast to average 2.6 percent per year in both Kentucky and the nation from 2002 through 2004. This strong rate of income growth will be fueled by rapid growth in labor productivity that will allow wages and salary incomes to rise strongly. Growth in real wage and salary income is forecast to reach roughly 2.7 percent per year in Kentucky and 2.5 percent annually 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 2.7 percent per year would translate into nearly $890 million of real income growth per year from 2002 to 2004. Benefits income (other labor income) is forecast to grow by 3.0 percent per year in Kentucky. This 3.0 percent increase is forecast to yield $130 million in new income each year. Proprietor's' income is forecast to grow by 4.1 percent per year in Kentucky from 2002 to 2004, adding $180 million per year to state income. Proprietor's income is forecast to grow by 3.9 percent per year nationally. Together, these three sources of working income are forecast to

**TABLE 2**

## Growth and Growth Rates for Nonfarm Employment in Kentucky by Industry, 2002 - 2004

| | Employment | Annual Growth | | | Average Annual Growth | | |
|---|---|---|---|---|---|---|---|
| | 4th Q 2001 | 2002 | 2003 | 2004 | Ky. | Ky.% | U.S. % |
| **Total** | 1,834,430 | 0.95% | 1.54% | 2.18% | 28,928 | 1.55% | 1.16% |
| **GOODS-PRODUCING** | 406,129 | -0.67% | 0.80% | 3.03% | 4,283 | 1.00% | 0.10% |
| Mining | 19,493 | -3.64 | -5.48 | -4.25 | -831 | -4.45 | -5.19 |
| Coal | 15,149 | -4.05 | -6.83 | -5.50 | -784 | -5.46 | NA |
| Construction | 84,837 | -0.02 | 0.40 | 2.53 | 827 | 0.97 | 0.30 |
| Manufacturing | 301,798 | -0.66 | 1.31 | 3.60 | 4,286 | 1.42 | 0.20 |
| Food Products | 28,247 | 2.30 | 2.02 | 3.19 | 724 | 2.50 | 0.74 |
| Tobacco | 1,902 | -12.30 | -4.25 | -7.25 | -140 | -7.94 | -2.96 |
| Textiles | 3,642 | -6.67 | 5.25 | 2.63 | 10 | 0.40 | 4.63 |
| Apparel | 15,307 | -6.45 | 4.11 | -0.55 | -160 | -0.96 | -3.51 |
| Wood | 15,519 | 2.39 | 5.40 | 3.86 | 625 | 3.88 | 1.59 |
| Furniture | 5,355 | -8.27 | 5.02 | 1.48 | -40 | -0.59 | -0.68 |
| Paper products | 11,958 | -2.16 | 6.74 | 3.87 | 338 | 2.82 | -0.18 |
| Printing and publishing | 21,517 | -2.52 | 9.99 | 5.69 | 955 | 4.39 | 2.10 |
| Chemicals | 14,339 | 2.01 | 4.09 | 1.54 | 374 | 2.55 | 3.15 |
| Petroleum and coal refining | 1,339 | -7.89 | 0.46 | -0.92 | -37 | -2.78 | -0.23 |
| Rubber and plastic products | 19,888 | 1.78 | 2.81 | 2.71 | 496 | 2.43 | 3.63 |
| Leather products | 671 | -12.37 | -11.04 | -6.93 | -61 | -10.11 | -5.06 |
| Stone, clay, and glass products | 10,807 | 1.52 | 0.10 | 4.89 | 238 | 2.17 | 0.32 |
| Primary metals | 19,169 | 0.30 | 1.20 | 1.66 | 203 | 1.05 | 1.09 |
| Fabricated metals | 26,566 | 1.87 | 3.69 | 3.49 | 825 | 3.02 | 1.41 |
| Non-electric machinery | 34,757 | -4.59 | -5.24 | 4.80 | -609 | -1.68 | -7.96 |
| Electric machinery | 20,379 | 3.13 | -0.43 | 1.69 | 300 | 1.46 | 3.90 |
| Transportation equipment | 42,293 | -0.52 | -3.96 | 7.94 | 440 | 1.15 | -1.82 |
| Instruments and related products | 3,970 | 3.46 | 3.32 | 2.48 | 126 | 3.09 | 0.54 |
| Miscellaneous Maufacturing | 4,174 | -10.64 | -8.95 | -5.30 | -319 | -8.29 | 1.16 |
| **NONGOODS-PRODUCING** | 1,428,302 | 1.41% | 1.74% | 1.94% | 24,645 | 1.70% | 1.39% |
| TCPU | 106,925 | 0.12 | 0.93 | 2.28 | 1,197 | 1.11 | 1.14 |
| Trade | 437,650 | 1.34 | 1.72 | 1.96 | 7,447 | 1.67 | 0.62 |
| Wholesale trade | 89,456 | 1.37 | 1.91 | 1.69 | 1,507 | 1.66 | 0.68 |
| Retail trade | 348,194 | 1.33 | 1.68 | 2.03 | 5,939 | 1.68 | 0.60 |
| FIRE | 76,510 | -0.06 | -0.23 | 0.91 | 158 | 0.21 | 1.04 |
| Services | 491,829 | 2.45 | 2.79 | 2.65 | 13,276 | 2.63 | 2.56 |
| Business services | 109,693 | 3.95 | 4.43 | 4.89 | 5,071 | 4.42 | NA |
| Health services | 154,491 | 3.90 | 2.96 | 1.81 | 4,592 | 2.89 | 2.47 |
| Government | 315,388 | 0.68 | 0.85 | 0.89 | 2,566 | 0.81 | 0.42 |
| Federal | 36,998 | 1.26 | 1.51 | 1.38 | 518 | 1.38 | 0.34 |
| State and local | 278,390 | 0.60 | 0.76 | 0.83 | 2,048 | 0.73 | 0.43 |

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, 2002 - 2004

| Income Source | Income 4th Q 2000 ($mil) | Annual Growth Rate 2002 | 2003 | 2004 | Annual Averages Growth ($mil) | Growth Rate Ky. % | U.S.% |
|---|---|---|---|---|---|---|---|
| Total personal income | $59,574 | 2.39% | 2.90% | 2.65% | $1,618 | 2.65% | 2.55% |
| Wage and salary income | 32,392 | 2.41 | 2.77 | 2.87 | 893 | 2.68 | 2.53 |
| Other labor income (benefits) | 4,101 | 2.91 | 3.15 | 2.81 | 125 | 2.96 | 1.59 |
| Proprietor's income | 4,375 | 7.44 | 3.41 | 1.35 | 184 | 4.07 | 3.91 |
| Residential adjustment | -512 | 2.26 | 3.80 | 5.60 | -21 | 3.89 | NA |
| Contributions to social insurance | 2,410 | 2.05 | 3.60 | 3.09 | 72 | 2.91 | 2.22 |
| Transfer income | 10,498 | 4.02 | 2.32 | 2.85 | 331 | 3.06 | 3.11 |
| Dividends, interest, rent | 9,884 | -1.71 | 4.15 | 2.73 | 170 | 1.73 | 1.86 |
| Per capita income | $14,578 | 1.65% | 2.16% | 1.92% | $284 | 1.91% | 1.66% |

account for $1,200 million of $1,620 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 67.4 percent of income growth in the state.

Transfer income in Kentucky is forecast to grow at an average rate of 3.1 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 $330 million per year in Kentucky. Dividend, interest, and rent (DIR) income is forecast to grow by $170 million per year in Kentucky from 2002 to 2004.

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 November 2001 forecast for the United States economy produced by DRI-WEFA. 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.

In the first alternative scenario, the recession lasts past the first quarter of 2002. Economic output continues to decline through the second quarter of 2002, and slow growth persists through the third quarter of 2002, with strong growth only returning in the fourth quarter of 2002. This scenario occurs as consumers and businesses remain cautious in their spending for longer than expected, perhaps due to further unexpected international developments. This scenario further assumes that implementation of the new fiscal stimulus package for the economy is delayed.

In the second alternative scenario, consumer confidence improves significantly at the very end of 2001, leading to a strong Christmas season and growth in economic output in the fourth quarter of 2001. Strong growth is present throughout the year 2002. This scenario is based on a rapid return of consumer and business confidence fueled by favorable international developments, and

aggressive monetary and fiscal policy. Weak business investment remains the only drag on the economy.

## Conclusion

The Kentucky economy is forecast to experience steady income growth during 2002, 2003, and 2004, due to a steady increase in wage and salary income. Growth in income will be weakest in 2002, as the economy begins to recover from recession. Employment growth is forecast to be slow during 2002, before accelerating in 2003 and 2004. 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 19,200 of the 28,900 net new jobs expected in the Kentucky economy each year. The manufacturing industry as a whole is forecast to gain 4,300 net jobs per year for 2002 through 2004. Manufacturing remains a key to growth in the state economy. The manufacturing sector is forecast to account for 36.8 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 grow by 1.4 percent annual rate in Kentucky from 2002 to 2004, while nationally it is expected to grow at 0.2 percent each year. Growth rates in Kentucky for retail trade, services, and government are forecast to meet or 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-WEFA publication The U.S. Economy for November 2001. National variables forecast by DRI-WEFA are key variables in nearly every part of the University of Kentucky State Econometric Model.[3]

The baseline national forecast from DRI-WEFA depicts an economy that returns to growth in the second quarter of 2002, with more rapid growth beginning in the fourth quarter of the year. Growth accelerates further in 2003 and 2004. Payroll employment is forecast to grow by 0.3 percent from the fourth quarter of 2001 through the fourth quarter of 2002. Payroll employment is forecast to grow by 1.4 percent in 2003 and 1.8 percent in 2004. The unemployment rate is forecast to average 6.2 percent in 2002, 5.7 percent in 2003, and 5.1 percent in 2004.

The recovery from recession beginning in the second quarter of 2002 is expected to result from improving consumer confidence and continued fiscal and monetary stimulus. It is assumed that there are no major negative international developments, and continued accommodation in terms of fiscal and monetary policy. The federal funds rate is assumed to remain at just 2.5 percent on average in 2002, before recovering to between 4.5 and 5.0 percent in 2003 and 2004. Consumer confidence is expected to recover slowly in 2002. The federal government is expected to run an annual budget deficit from between $5 to 30 billion during the forecast period. Inflation is expected to remain low, rising just 1.9 percent in 2002, 2.4 percent in 2003, and 2.6 percent in 2004.

## Endnotes

1. Population data for Kentucky are not yet available for the first two quarters of 2001. 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 2001 are forecast along with other Kentucky variables such as 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.

# Improving Earnings per Job:The New Economic Development Challenge in Kentucky

*Paul Coomes*

*The Kentucky Economic Development Partnership was created by the state legislature in 1992 to oversee industry recruitment, incentive programs, and other efforts to improve the standard of living of Kentucky residents and workers. The national economy was red hot between 1992 and 2000, and our region performed well, particularly in manufacturing assembly and distribution operations. The state border cuts through many large economic markets, most notably those of Cincinnati, Louisville, Evansville-Henderson-Owensboro, Nashville, and Huntington-Ashland. Consistent with the larger bi-state economic areas, I identify nine regions in Kentucky and report on their recent relative economic performances. I find solid job, business, and population growth, especially in the Louisville, Northern Kentucky, and Lexington regions. However, jobs in all regions still pay on average less than in the United States, and the gap widened during the decade. The gap is most likely due to the low rate of college attainment of adults in Kentucky. Preliminary data from the 2000 Census suggest that the college attainment rate of Kentuckians improved during the nineties, but not as much as it improved nationally. I discuss some economic development policy issues to address the new challenges in the state. For example, I suggest that state government institute pay hurdles in its tax incentive programs, so that companies only qualify if they pay employees more than the current average pay in each industry and region.*

## Introduction

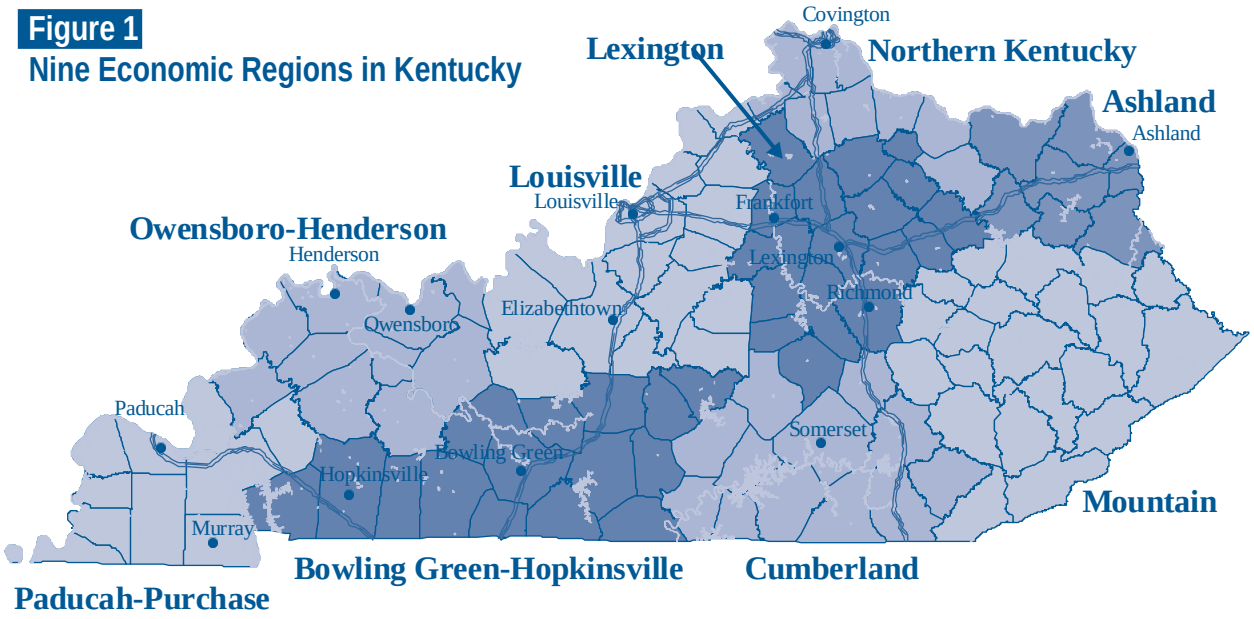
The decade of the nineties was one of great economic progress around Kentucky. The national economy was the strongest in thirty years. The automobile manufacturing industry continued to favor our region as it moved southward along and around Interstates 65 and 75, and particularly in the center of the state. Kentucky state government invested billions of dollars for transportation and education infrastructure in relatively undeveloped areas. Major air hubs developed, for passengers in Northern Kentucky and for freight in Louisville. Federal welfare reform induced hundreds of thousands of previously dependent persons to join the labor force, and just at a time when the major urban areas were getting desperate for workers.

This strong economic tide has lifted all regional boats in Kentucky. All economic regions in the state have posted gains in businesses, jobs and payroll, personal wealth, per capita income, and local tax bases. Naturally not all regions grew at the same pace, in the same way, or for the same reasons. The Mountain region posted gains in manufacturing employment and earnings per job, but lost on net around one thousand residents since 1992. The Cumberland region, while gaining residents during the last decade, supports jobs that pay on average less than $20,000 per year. The Northern Kentucky, Louisville, and Lexington regions grew the most in terms of nearly all demographic and economic measures. These regions have benefited from the intersections of major interstate highways and the national movement of people and industry from the northeast to the southwest. The Bowling Green-Hopkinsville area posted solid economic and demographic and growth, as did the Paducah-Purchase area and the Owensboro-Henderson area. The Ashland area posted the slowest job growth, and lost one-fifth of its manufacturing jobs, but nonetheless managed to add two thousand residents and to post decent gains in personal wealth.

In this article, I summarize the findings of a study of the recent economic performance of regions in Kentucky, and highlight patterns that might lead to better economic development policies.[1] In the study, we describe the economic regions of Kentucky, and analyze a large flow of public data on the performance of these regions since 1992 - the year the Kentucky Economic Development

Partnership was created. We also compare the performance in each region with that of similar regions outside Kentucky. Because the state includes such a variety of economic assets and opportunities, it is important to benchmark the regions of the state not just against each other, but to places that have comparable potential. Finally, we examine some of the most critical causes of differential regional economic performance, including topography, demography, and human capital.

**Figure 1**
**Nine Economic Regions in Kentucky**




## Major Findings

The state border cuts through many economic markets, most notably those of Cincinnati, Louisville, Evansville, and Nashville. Any state-level analysis and policy should begin with an understanding of these large bi-state economies. For this study, we found it useful to subdivide the Kentucky into nine economic regions. The regions roughly correspond to labor, housing, and retail markets, or at least Kentucky's share of those markets. The economic activity inside each region is linked to the distinct topography, infrastructure, and human capital of the region.

The three most urbanized regional economies - Louisville, Northern Kentucky, and Lexington - account for 55 percent of the state's population, 60 percent of the jobs, and 65 percent of the payrolls. The three most urbanized regional economies also have the most educated citizens, as measured by the percentage of adults with a high school or a college degree. However, all Kentucky regions are below the national average in the educational attainment of its adults.

Kentucky added on net almost 300,000 jobs over the 1992-98 period, a gain of 15 percent. The Northern Kentucky area was the fastest growing, with a growth rate of 24 percent. Payrolls of workers rose by $15 billion, or 34 percent, over the 1992-98 period. Nearly three quarters of the payroll growth was generated in the three most urbanized regions.

Average annual earnings per job rose from $23,000 to $27,000 per job statewide. However, jobs in all regions still pay on average less than in the nation as a whole. Even in the Louisville region, with its concentration of high paying professional and manufacturing jobs, the pay is still $3,000 below the national average.

Given the wide diversity of topography, infrastructure and economic bases among the nine Kentucky regions, it is not very valid or interesting to benchmark the regions against each other. Thus, we used cluster analysis to discover other regional economies around the United States that were statistically similar to the nine Kentucky regions in 1992 - the year the Kentucky Economic Development Partnership was created. We chose two comparison regions outside Kentucky for each of the nine inside the state. For example, we found that the Lexington economy is statistically similar to that of Columbia, Missouri and Knoxville, Tennessee. The Paducah-

**Table 1**

## Summary Economic Statistics

### Nine Kentucky Regions and Comparison Regions

| KY Region | Comparison Regions | Population 1998 | Earnings per Job, 1998 | Per Captia Income, 1998 | Indicator of Wealth per capita 1998* | Indicator of Dependency per capita, 1998** |
|---|---|---|---|---|---|---|
| 1 | **Lexington** | **667,307** | **$28,396** | **$25,004** | **$4,402** | **$3,176** |
| | Columbia MO | 350,437 | $24,280 | $23,396 | $4,580 | $3,272 |
| | Knoxville TN | 949,371 | $27,563 | $22,768 | $3,853 | $3,898 |
| 2 | **Mountain** | **438,075** | **$23,938** | **$15,433** | **$2,065** | **$5,209** |
| | WV-TN Appalachia | 327,829 | $26,079 | $16,417 | $2,377 | $5,421 |
| | Ozarks | 184,069 | $19,701 | $18,874 | $4,519 | $4,395 |
| 3 | **Cumberland** | **290,106** | **$19,899** | **$16,033** | **$2,279** | **$4,686** |
| | TN-Cumberland | 150,413 | $18,806 | $16,520 | $2,319 | $5,096 |
| | Redding CA | 334,694 | $25,565 | $20,611 | $4,271 | $4,626 |
| 4 | **Bowling Green - Hopkinsville** | **373,882** | **$25,052** | **$19,005** | **$3,230** | **$3,591** |
| | North Central Tennessee | 394,789 | $23,226 | $21,945 | $2,970 | $3,084 |
| | Jonesboro AR | 294,630 | $22,688 | $18,555 | $2,887 | $4,105 |
| 5 | **Paducah - Purchase** | **221,322** | **$25,337** | **$22,103** | **$4,237** | **$4,186** |
| | TN-MO Delta Counties | 297,302 | $23,128 | $19,540 | $3,192 | $4,676 |
| | Minot ND | 111,797 | $21,819 | $22,109 | $4,957 | $3,772 |
| 6 | **Owensboro - Henderson** | **294,382** | **$25,262** | **$20,404** | **$3,704** | **$3,921** |
| | TN-Jackson Area | 207,725 | $25,193 | $21,663 | $3,083 | $4,367 |
| | Richland WA | 650,915 | $26,242 | $21,454 | $4,083 | $3,696 |
| 7 | **Louisville** | **1,084,188** | **$30,195** | **$26,272** | **$5,200** | **$3,609** |
| | Indianapolis | 2,952,661 | $30,686 | $25,814 | $4,625 | $3,237 |
| | Omaha | 1,016,649 | $28,945 | $27,082 | $5,269 | $3,289 |
| 8 | **Northern Kentucky** | **393,834** | **$27,373** | **$24,314** | **$3,751** | **$3,103** |
| | Asheville NC | 416,616 | $25,342 | $24,287 | $5,999 | $4,257 |
| | Kansas City KS | 831,374 | $31,213 | $30,108 | $5,757 | $2,710 |
| 9 | **Ashland** | **171,214** | **$24,735** | **$18,182** | **$2,812** | **$4,354** |
| | Great Falls MT | 163,995 | $21,928 | $21,161 | $5,216 | $3,860 |
| | Johnstown PA | 504,120 | $26,340 | $20,925 | $3,617 | $4,867 |

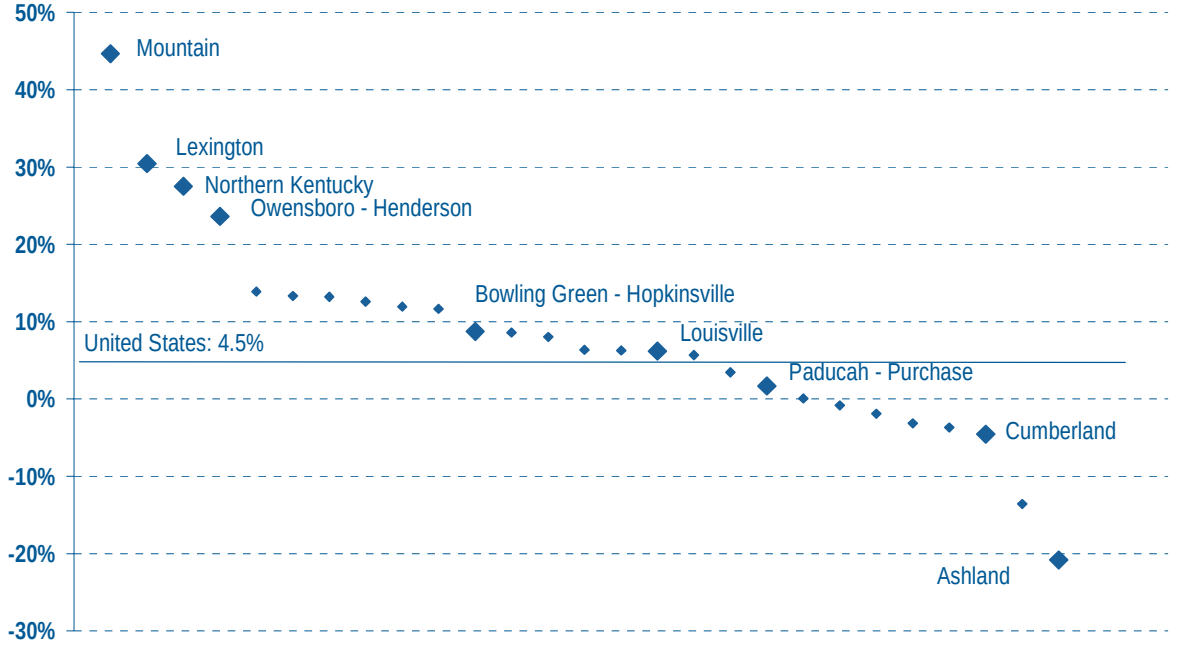
Source: US Bureau of Economic Analysis, Regional Economic Information System, 1969-98, June 2000.
* Personal income from dividends, interest and rent per capita.
** Personal income from transfer payments per capita.

Purchase economy is similar to that of Minot, North Dakota as well as the delta counties of northwestern Tennessee. We then compared the economic performance of the Kentucky regions to those 'peers'. Generally, the Kentucky regions performed much like their peer regions during the 1992-98 period. In terms of growth in population, manufacturing and other jobs, payrolls, and per capita income, the peer regions tracked each other fairly consistently.

**Figure 2**

## Growth in Manufacturing Jobs, 1992-98

### Nine Kentucky Regions and Comparison Regions




There were some interesting deviations, however. Perhaps the most positive statistical finding is the strong growth in manufacturing employment in the Mountain region of Kentucky, posting a growth rate of 45 percent against a loss of manufacturing jobs in neighboring Appalachian counties of West Virginia and Tennessee, and but an 8 percent growth in the Ozark region of Arkansas. Other Kentucky regions also outperformed their peers in manufacturing job growth, especially Lexington, Owensboro-Henderson, and Northern Kentucky. Overall, Kentucky added manufacturing jobs at twice the rate of the United States over this period.

Probably the most negative finding from our tracking of peer regions is that Kentucky areas gained so little in terms of average earnings per job. Only the Northern Kentucky, Paducah-Purchase, and Lexington regional economies outperformed their peers in this key measure.

We have calculated earnings per job by dividing total annual labor and proprietors' income by the average number of jobs in each region. I believe this is a better measure of regional economic development than per capita income. Per capita income, as a measure of economic development has two problems. First, the numerator includes income from government and other transfer payments, so that a region receiving major infusions of retirement, disability, and poverty aid would post high growth in per capita income whether the local economy was healthy or not. This is not just an academic point in Kentucky, where transfer payments account for 34 percent of personal income in the Mountain region, and 29 percent in the Cumberland region. Second, the denominator of per capita income includes children and retirees, i.e., the entire population, not just those in the labor market. Thus, ceteris paribus, a region with many large families would appear poorer on a per capita basis than one with small families.

The modest performance in terms of earnings appears to be directly related to the low educational attainment of adults in Kentucky. The accompanying chart shows clearly the positive relationship between education and earnings for the nine Kentucky regions and the eighteen peer regions around the US. Note that all Kentucky regions fall below the US average in terms of both college attainment and earnings per job, but that the greater the education level the higher the earnings.

Factors other than formal education are no doubt at work Many have pointed to the low cost of living in Kentucky as a reason that wages and salaries are lower here[2]. However, there is no reason to believe that the cost of living is lower in the

**Table 2**

## Economic Performance since 1992

### Nine Kentucky Regions and Comparison Regions

| KY Region | Comparison Regions | Population growth, 1992-98 | Job growth 1992-98 | Manufacturing job growth, 1992-98 | Payroll growth, 1992-98 | Growth in earnings per Job, 1992-98 | Growth in per capita income, 1992-98 | Growth in Wealth per capita, 1992-98 | Growth in Transfer Payments per capita, 1992-98 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | **Lexington** | **7.3%** | **18.3%** | **30.4%** | **40.9%** | **19.1%** | **30.7%** | **33.4%** | **28.8%** |
| | Columbia MO | 6.8% | 18.4% | 13.2% | 39.9% | 18.2% | 31.3% | 32.6% | 28.6% |
| | Knoxville TN | 9.0% | 14.8% | -0.8% | 34.5% | 17.1% | 25.8% | 36.4% | 26.6% |
| 2 | **Mountain** | **0.0%** | **6.7%** | **44.7%** | **17.3%** | **9.9%** | **24.5%** | **29.4%** | **34.2%** |
| | WV-TN Appalachia | -3.2% | -1.8% | -1.9% | 4.8% | 6.7% | 21.5% | 30.7% | 30.7% |
| | Ozarks | 11.1% | 16.7% | 8.0% | 37.7% | 18.1% | 26.6% | 26.6% | 29.4% |
| 3 | **Cumberland** | **7.1%** | **12.1%** | **-4.6%** | **29.0%** | **15.0%** | **24.6%** | **31.3%** | **28.9%** |
| | TN-Cumberland | 6.9% | 10.8% | -13.6% | 28.3% | 15.9% | 26.0% | 39.7% | 32.0% |
| | Redding CA | 4.0% | 10.5% | 0.1% | 24.6% | 12.8% | 21.3% | 25.9% | 20.1% |
| 4 | **Bowling Green - Hopkinsville** | **6.2%** | **10.3%** | **8.7%** | **27.2%** | **15.3%** | **24.8%** | **34.9%** | **31.3%** |
| | North Central Tennessee | 16.2% | 26.8% | 13.3% | 50.5% | 18.7% | 26.2% | 34.2% | 27.5% |
| | Jonesboro AR | 1.8% | 12.6% | 6.3% | 26.8% | 12.6% | 27.7% | 37.2% | 30.9% |
| 5 | **Paducah - Purchase** | **3.7%** | **16.1%** | **1.7%** | **31.1%** | **12.9%** | **26.5%** | **28.1%** | **27.7%** |
| | TN-MO Delta Counties | 1.9% | 8.9% | -3.1% | 21.7% | 11.7% | 23.7% | 29.3% | 30.2% |
| | Minot ND | -1.4% | 9.7% | 12.6% | 22.6% | 11.8% | 27.8% | 35.8% | 30.0% |
| 6 | **Owensboro - Henderson** | **2.2%** | **12.3%** | **23.6%** | **23.4%** | **9.8%** | **23.7%** | **29.3%** | **26.6%** |
| | TN-Jackson Area | 6.0% | 16.9% | 3.4% | 42.1% | 21.5% | 31.7% | 33.4% | 32.1% |
| | Richland WA | 12.6% | 13.5% | 13.9% | 29.2% | 13.8% | 18.2% | 31.4% | 19.0% |
| 7 | **Louisville** | **4.3%** | **15.1%** | **6.2%** | **35.4%** | **17.7%** | **28.4%** | **28.4%** | **27.4%** |
| | Indianapolis | 4.9% | 14.2% | 8.6% | 37.9% | 20.7% | 30.0% | 34.8% | 20.1% |
| | Omaha | 4.4% | 15.4% | 11.7% | 39.7% | 21.0% | 33.2% | 33.3% | 30.7% |
| 8 | **Northern Kentucky** | **8.2%** | **24.3%** | **27.5%** | **57.0%** | **26.4%** | **33.9%** | **38.9%** | **23.3%** |
| | Asheville NC | 8.8% | 17.0% | -3.7% | 36.6% | 16.8% | 30.9% | 40.2% | 37.7% |
| | Kansas City KS | 9.2% | 23.9% | 11.9% | 50.4% | 21.4% | 32.0% | 27.2% | 17.4% |
| 9 | **Ashland** | **1.7%** | **5.3%** | **-20.8%** | **9.7%** | **4.1%** | **21.6%** | **34.3%** | **36.1%** |
| | Great Falls MT | -0.6% | 9.5% | 6.3% | 17.6% | 7.4% | 23.9% | 33.1% | 31.9% |
| | Johnstown PA | -1.3% | 8.6% | 5.7% | 24.1% | 14.3% | 25.6% | 28.7% | 22.5 |

Source: US Bureau of Economic Analysis, Regional Economic Information System, 1969-98, June 2000.

Appalachian mountain area of Kentucky than the mountain regions of Tennessee or West Virginia. The cost of housing, utilities, groceries, clothing, and transportation do not vary much among the peer regions. Moreover, Nashville reports a lower cost of living index value than does Louisville or Lexington. If taxes on households were taken into account, Nashville would appear to be an even cheaper place to live. My impression is that, here in the middle of the US, the measured local cost of living increases with the degree of urbanization. Population density raises real estate and transportation costs (parking, pollution costs), while the price of most retail items varies little from city to city, or urban to rural.

Geographic and demographic differences also may help explain the variation in earnings per job. High pay in coal mining keeps overall earnings per job in Kentucky's Mountain region above that in the mineral-poor Ozarks region of Arkansas, even though adults in both regions have relatively little formal education. The Ozark region, on the other hand, is a mecca for retirees and thus has posted strong job growth in the lower-paying service industries. The Lexington region has benefited greatly by its location at the center of the US population (east of the Rockies), picking up almost one-half of the net manufacturing job growth for the entire state of Kentucky during the study period.

These jobs on average pay well above those in other local industries, giving the Lexington region one of the strongest performances in terms of earnings per job and per capita income.

## Policy implications

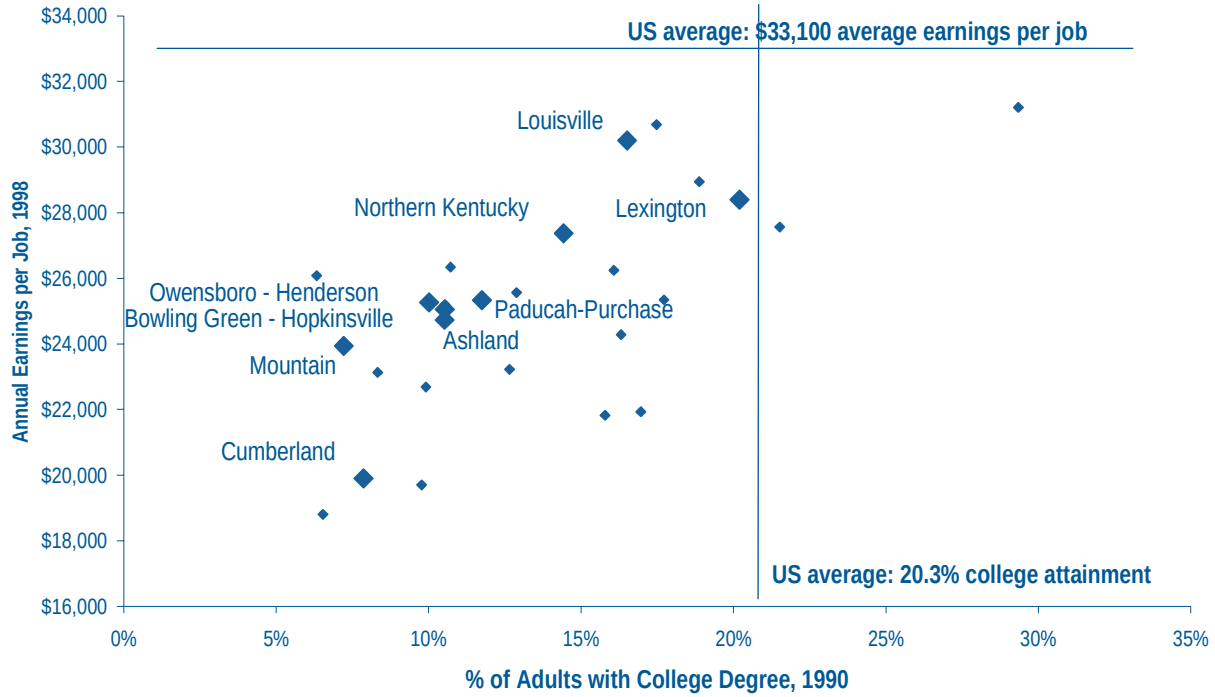
There is little state or local governments can do about geographic and demographic factors in the economic development competition among regions. However, they can affect other dimensions of the competition. I consider three here – education, taxes and business climate, and incentives.

Kentucky has embarked on an ambitious plan to rationalize its public higher education system. The state has declared two universities to be research universities, with special funding initiates and high expectations for scholarship, reputation, patents, royalties, and ultimately business formation. Given the premium on knowledge in the economic environment of the last twenty years, and the major investments made in the research universities in surrounding states, this is long overdue. Regarding the educational attainment of Kentucky residents, there is a limit to what state policy can accomplish.

**Figure 3**

**Education and Earnings per Job**

**Nine Kentucky Regions and Comparison Regions**




Inexpensive higher education is available in nearly every corner of the state. However, enrollments and the number of graduates has been relatively flat over the past decade, partly due to the paucity of residents in college-going age cohorts, and partly to the lure of work in a strong economy. Initial indications from the 2000 Census suggest that the rate of college attainment for Kentucky adults improved from the 1990 Census, but actually lost ground against the national average. A more fruitful approach to raising the human capital in Kentucky might be to attract more educated persons to move here.

A case can be made that Kentucky has a good business climate for mobile, capital-intensive firms needing modestly educated and inexpensive workers, but a bad business climate for mobile persons with high human capital, entrepreneurial instincts, and high wealth. State taxes on individual income and expenditures are among the highest in the US, and higher education is only now getting the focused attention it needs to make Kentucky more competitive in terms of innovation, business formation and wealth creation. Decades of aggressive redistribution of income around the state has led to a poor business climate for those that might generate wealth and an entitlement culture for many of those that receive the payments and services. Talented and ambitious people leave,

exacerbating the problem. This is especially relevant in a state like Kentucky, where two-thirds of the population live, work, and shop along and within the border of one of the seven adjacent states. Indeed, the biggest urban economy in Kentuckiana is Cincinnati, and the fastest growing city in the region is Nashville. The internet and the interstate have made state boundaries relevant only to tax collectors and regulators. State tax and expenditure policy needs to reflect these geographic and market realities.

Finally, Kentucky state government should reevaluate its incentive programs. In response to the rustbelt shakeout, unemployment and out-migration of the early 1980s, state officials devised a set of industrial incentive programs that have largely worked. KREDA, KIDA, and KJDA effectively lower the state tax liability on mobile firms while retaining statutory tax rates for immobile firms and workers. These programs have been used to attract hundreds of manufacturing plants, distribution centers, and office operations. Today, with essentially full employment, a growing population, and lagging pay scales around the state, the economic development challenge is different and calls for new programs. To raise earnings per job, we need to attract more scientists, engineers, health-related researchers, and entrepreneurs. That is, rather than attracting jobs for our people, we need to attract and retain smart and industrious people to create jobs and wealth. Our tax structure and incentive programs should reflect this goal. One simple improvement would be to prorate tax incentives to companies, with incentives rising for companies that pay workers above the current average in each industry and region. State policy would then clearly support raising earnings per job, rather than just encouraging more jobs and investment.

## Endnotes

1 "The Recent Economic Performance of Regions in Kentucky", by Paul Coomes and Michael Price, for the Kentucky Economic Development Cabinet, University of Louisville, May 2001, 67 pages. Available in pdf format at www.thinkkentucky.com.

2 Berger and Bloomquist estimate that Kentucky moves up four ranks, from 40th to 36th, among states in terms of per capita income when adjustments are made for differences in cost of living and quality of life. However, none of the states Kentucky passed in the ranking have economic regions that we found to be most comparable to those in Kentucky. See "Kentucky's Per Capita Income: What Should the Goal Be?", by Mark Berger and Glenn Bloomquist, *Kentucky Annual Report 2000*, pages 1-7. Also, the study examined per capita income rankings, not earnings per job rankings, so are not directly applicable to this discussion.

# Geographic Patterns of Population and Income Growth Across Kentucky, 1990-2000

*Mark C. Berger, Christopher Bollinger and John Perry*

*We examine population, real income, and real per-capita income growth across Kentucky counties from 1990 to 2000 (1999 for income). Kentucky's population growth was slower than the U.S. average, while its per-capita income increased slightly relative to the U.S. average over the decade. However, growth in population, real income, or per-capita income was not uniform throughout the Commonwealth. We find that the largest population growth occurred in suburban counties within the Golden Triangle formed by Lexington, Louisville, and Cincinnati, and in some counties along Interstate highways and parkways. The smallest population growth occurred in the Appalachian East and in the Western part of the state. Total real personal income growth followed much the same pattern. On the other hand, growth in real per-capita personal income did not follow any immediately evident pattern. Real per-capita personal income around some smaller cities grew fairly rapidly, while suburban counties had slower per-capita income growth. Overall, while low per-capita income counties grew slightly faster on average than high per-capita income counties, the absolute dollar gap actually grew in real terms between 1990 and 1999*

## Introduction

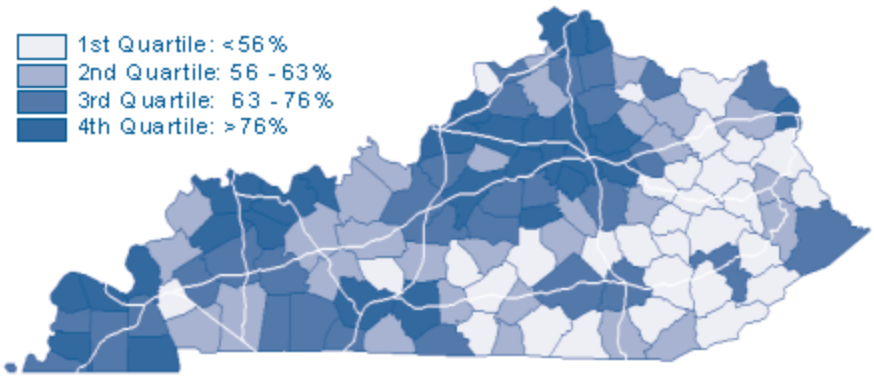
At the beginning of the 1990's, Kentucky's per capita income stood at 79 percent of the national average. By 1992, Kentucky's relative position had risen to 82 percent. During the rest of the decade, Kentucky's relative position remained fairly constant and in 1999 stood at 81 percent of the national average. Although the general trend within the state has been upward, the variation in where the gains were made provides an interesting story of variety of experiences Kentucky residents have faced.

Kentucky has a remarkable variation in incomes, and that variation may also be present in income growth. In 1990, 4 counties had per capita incomes above the U.S. average, while at the same time, 14 counties had per capita incomes below one-half of the U.S. average. The overall growth in per capita income is reflected by the changes in the top and bottom counties: by 1999 five counties were above the U.S. average while only 8 counties were below one-half the national average. Figure 1 shows 1999 county level per capita income for Kentucky measured as a percentage of the U.S. average.

At the same time that the state as a whole improved slightly relative to the national average per capita income, it is important to know which regions of the state gained or lost ground. Did the areas of the state that had higher per capita incomes at the beginning of the decade improve their position more than low per capita income areas by the end of the decade? For example, did the low per capita

**Figure 1**

**Per Capita Income in Kentucky Counties relative to the U.S. Average, 1999**



income in Eastern Kentucky counties shown in Figure 1 improve less than the counties in the Golden Triangle? Were there any other notable patterns in per capita income growth in Kentucky? We address these issues in this study.

Per capita income is calculated by dividing total personal income by population. Thus, changes in per capita income depend on changes in its components: total personal income and population. If total personal income grows at a faster rate than population, then per capita income increases, and it decreases if population grows faster than total personal income. Thus, to better understand changes in per capita income across the state, it is important to examine changes in both population and personal income over the last decade.

The ongoing release of 2000 Census of Population data makes this analysis very timely. We examine changes in population for each county from 1990 to 2000 using Census data. We are also able to examine changes within sub-county units called Census tracts from 1990 to 2000. In the process, we can examine whether there are any statewide patterns in population growth, for example comparing urban, suburban, and rural areas, different regions of the state, and areas that are and are not along Interstate highway corridors.

At the same time, we examine total real personal income growth and per capita income growth across counties from 1990 to 1999. We determine whether total personal income growth follows the same pattern as population growth, and whether there is any discernible pattern in per capita income growth across counties. Finally, to address the question of which counties fared better in the decade of the 1990's, we examine changes in the overall distribution of per capita income across Kentucky counties.

## Population Growth in Kentucky, 1990-2000

Kentucky population grew by a total of 354,877 persons between 1990 and 2000. This is a 9.7% increase in total population. The United States as a whole grew by 13.1% (about 32 million people). Like the U.S. as a whole, the population growth in Kentucky was not uniform. For example, Fayette County added 35,146 new residents (the most of any county), while Pike County lost 3,848 residents. The average county had population growth of 11.1% (the average across counties differs from the state total because more weight is placed on smaller counties in the average as compared to the total). Spencer County had the highest percentage growth: 73%. In contrast Harlan County lost 9% of its population.

Figure 2 presents the county population growth broken into four groups of 30 counties (1/4 of the 120 counties) by the population growth rate between 1990 and 2000. The darker shades represent the fastest growing counties, while the lighter shades represent the slowest (or even declining) population growth. In fact, 14 counties lost population. In Figure 2, we see three interesting patterns emerge. Many of the State's fastest growing counties are located in the Lexington-Louisville-Cincinnati Golden Triangle, while many of the slower growing counties are located in the Eastern and Western parts of the state. Second, many of the fastest growing counties are suburban counties: those counties adjacent to a major urban area, but not containing the central city. Examples of the suburban growth are Jessamine, Boone and Spencer Counties. Third, some of the growth is concentrated around the major highways, for example, I-75 and the Cumberland Parkway.

Like the variation by county across the state, there is substantial variation in growth even within counties. A smaller geographic unit for which

**Figure 2**

**Population Growth in Kentucky Counties, 1990 - 2000**

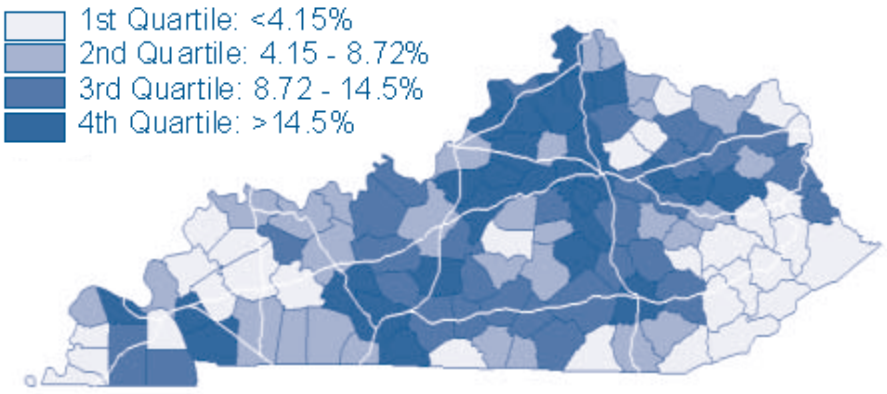
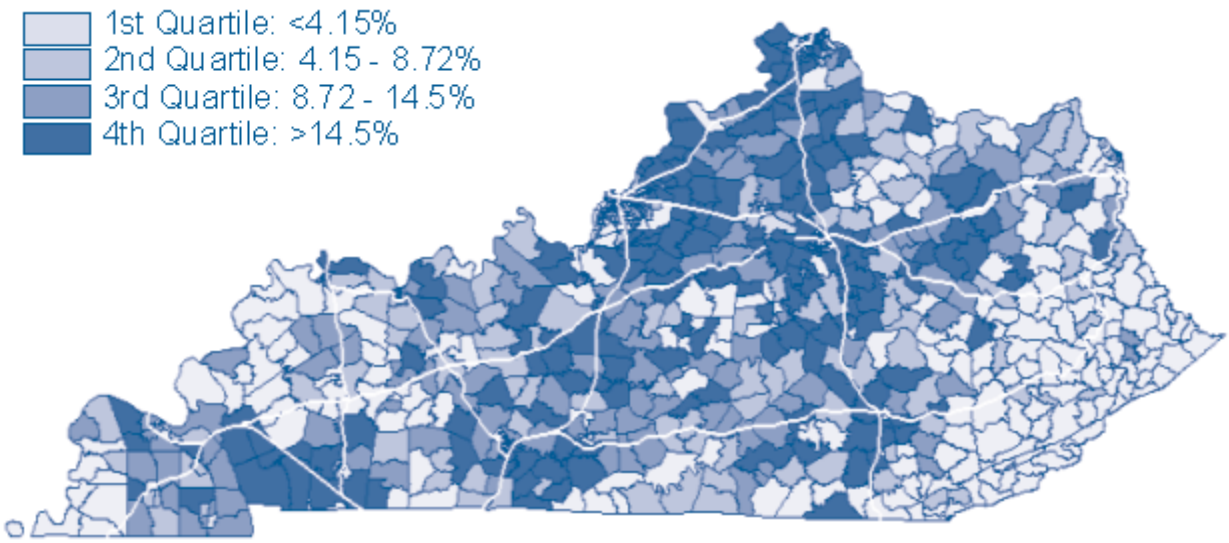


**Figure 3**

**Population Growth by Census Tract, 1990 - 2000**




population figures can be obtained is the Census tract. Census tracts are small statistical subdivisions of counties. Census tracts usually have between 2,500 and 8,000 persons and are designed to be relatively homogenous with respect to population characteristics, economic status, and living conditions (see http://www.census.gov/geo/www/cen_tract.html). Each county in Kentucky has at least two Census tracts. Figure 3 presents the same growth categories as Figure 2, but using the census tract geography. Many of the same patterns are re-enforced, and some of the variation within counties can be seen.

First consider the Golden Triangle of Lexington-Louisville-Cincinnati. Population growth in and around each of these major cities is quite high, as represented by the darkly shaded regions in either figure. Nearly all of the areas in the Golden Triangle (roughly described by I-75 on the east, I-64 on the south and I-71 on the northwest) grew by over 9%. Many of those areas grew by more than 16%. Indeed, of the 354,877 new residents in Kentucky, 212,334 were located in the Golden Triangle area. While the typical county in Kentucky added about 3,000 new residents, the average county in the Golden Triangle area added over 8,000 new residents. The average county growth rate in the Golden Triangle area was 24.3%. Table 1 presents these figures.

**Table 1**

**Population Growth by Area in Kentucky, 1990-2000**

| Area | Average Growth | Average Growth Rate |
|---|---|---|
| State Total | 354,877 | 9.7% |
| All Counties | 2,957 | 11.1% |
| Golden Triangle Counties | 8,493 | 24.4% |
| Appalachian Counties | 1367 | 7.6% |
| Western Counties | 1291 | 5.3% |
| Golden Triangle Suburb Counties | 8,265 | 28.9% |
| Golden Triangle Interstate Counties | 10,940 | 25.6% |
| All Interstate Counties | 6,611 | 17.8% |
| Parkway Counties | 3,463 | 8.7% |

Source: Authors' Calculations from the 1990 and 2000 Censuses of Population.

The Golden Triangle area is in contrast to the Appalachian region and the Western part of the state. The Appalachian area is defined by the Appalachian Regional Commission (see http://www.arc.gov/) and consists of the 49 counties south and east of a line running from Monroe County in the areasSouthwest to Lewis County in the Northeast. The western counties are defined as the 23 counties in the 3 western Area Development Districts (Pennyrile, Green River and Purchase

districts). This corresponds roughly to all counties west of a line running from Todd County to Hancock County. The average county in the Appalachian Region added 1367 and the average county in the West added 1291 residents. The average growth rate for Appalachia was 7.8%, while the average growth rate for the Western Counties was 5.3%. Both of these groups are below the state level average and well below the Golden Triangle. Even within these regions, there are areas of strong growth and of very weak growth. For example, Lyon, Trigg, Menifee and Morgan Counties all had population growth of over 20%. In contrast, Harlan, Leslie, Fulton and Union Counties all lost more than 5% of their population. Of the 30 counties with less than 4% population growth, 26 of them are located in either the Appalachian region or the Western region. Indeed of the 49 counties in the Appalachian region, 10 of them declined in population and 16 had population growth below 4%. Similarly, of the 23 counties Western region, 4 of them declined in population and 9 of them had less than 4% growth.

The second major feature of population growth in Kentucky is the suburban county growth. This is clearly highly related to the Golden Triangle growth, but extends itself to other areas as well. As can be clearly seen in both Figures 2 and 3, much of the growth in the Golden Triangle area is concentrated in the suburban counties like Jessamine, Shelby and Boone. Defining the suburban ring as those counties adjacent to Louisville, Lexington and Cincinnati, we see that suburban counties in the Golden Triangle area added an average of 8,265 people between 1990 and 2000, for an average growth rate of 28.9%. This is higher than the average over the entire Golden Triangle region. It is also grew by 15.6%. Even Fayette County, with above average growth was still below the average for the suburban counties.

The final major feature of the population growth in Kentucky is the concentration around the highways. This is particularly evident along the I-75 corridor, and along the Cumberland Parkway. This is especially true within the Golden Triangle area. In both Figure 2 and Figure 3, it is evident that the population growth counties tend to be proximate to the three interstate highways (I-75, I-64 and I-71). Overall, the counties along the highways in the Golden Triangle area added an average of 10,940 new residents. These counties had a growth rate of 25.6%. While this is slightly lower than the suburban counties, it is slightly higher than the overall Golden Triangle average. In general counties located along the six interstate corridors added an average of 6,611 new residents, for an average growth rate of 17.8%.

Along the parkways (Mountain, Bluegrass, Cumberland, Western, Boone, Natches and Pennyrile) there was mixed growth. The average county along the parkways added 3, 463 new residents, for an average growth rate of 8.7%. Again, there is substantial variation across the parkways. For example the counties along the Boone and Western parkways averaged 4% growth, while the counties along the Cumberland and Bluegrass parkways averaged 15% growth. This is evident from both Figures 2 and 3. Both the Cumberland and the Bluegrass parkways do not pass through either the Appalachian or the Western regions discussed above.

In summary, Central and Northern Kentucky had the highest population growth. The population growth was focused on the Lexington-Louisville-Cincinnati triangle. Within the Golden Triangle the suburban counties and counties along the Interstate corridors were the fastest growing counties. However, the interstate and parkway counties throughout the state exhibited fast growth. The I-75 corridor had the strongest growth. The Bluegrass parkway from Lexington to Elizabethtown and the Cumberland Parkway also showed strong growth.

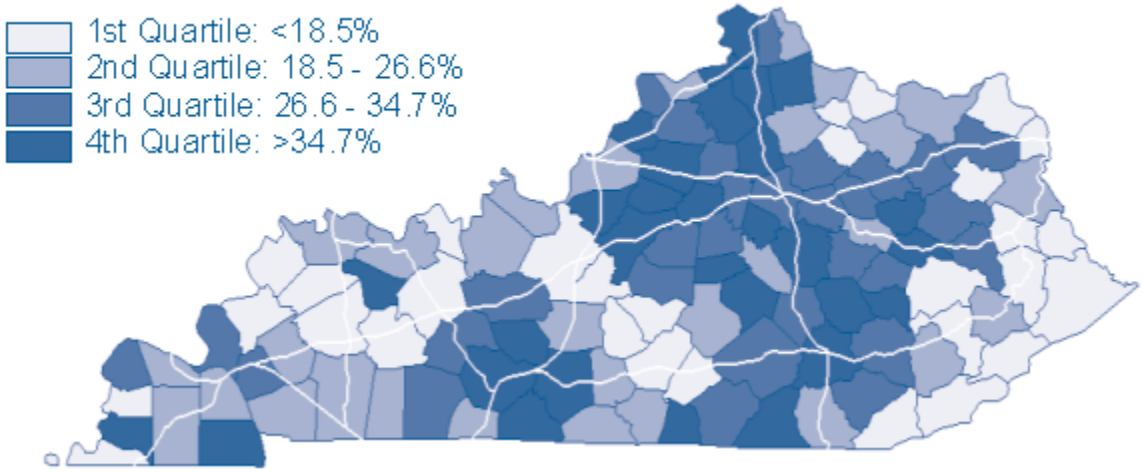
## Income Growth in Kentucky, 1990-1999

One might expect that the counties with the largest percentage population growth would exhibit the largest percentage increases in total real personal income. After all, each additional person in a county's economy generates additional economic activity. This tends to be the case. In fact, 13 of the 20 counties with the fastest real personal income growth are also in the top 20 with respect to population growth. Figure 4 shows the total real personal income growth by county from 1990 to 1999. If Figure 4 is compared to Figure 2, the similarities are fairly obvious.

Real personal income growth tends to be found, as with population growth, along interstate corridors with 10 of the 20 fastest growing real personal income counties found on interstates. Also, the triangle region of Louisville, Lexington and

**Figure 4**

**Real Total Personal Income Growth in Kentucky Counties, 1990-1999**




Cincinnati experienced faster than average real personal income growth, as it did with population growth. This growth is more pronounced for suburban areas. Among the most notable are the counties surrounding Jefferson, including Bullitt, Shelby, Oldham, and Spencer. Each posted greater than a 43% advance in real personal income along with a more than 34% increase in population. Counties neighboring Fayette posted an average of 41% gain in real personal income accompanied by an almost 18% average jump in population. Other pockets of population growth also had above average real personal income growth. The Laurel and Warren county areas both showed strong gains with Warren County registering an almost 40% increase in real personal income while Laurel County posted almost a 42% rise.

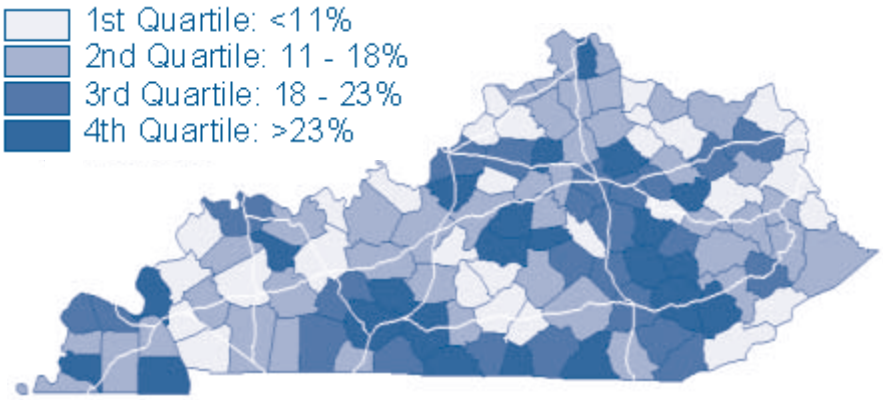
Unfortunately, counties with the slowest (and sometimes negative) population growth also compiled some of the worst real personal income changes. The traditional coal-producing region of Eastern Kentucky lagged in both population and real personal income growth. The same is seen in the western part of the state, notably in the Pennyrile and Green River areas.

However, the entire story is not told with population and real personal income growth. Both of these provide a measure of how much an economy has grown in the aggregate but by themselves do not yield insights into the improvement of an average citizen's wealth. A better measure of this is found in real per capita income growth, a combination of the growth in people and the growth in dollars. Figure 5 provides a map of real per-capita income growth by county from 1990 to 1999.

As is evident from Figure 5, the relationship between real per capita income growth and

**Figure 5**

**Real Per Capita Income Growth in Kentucky Counties, 1990-1999**



population growth is not immediately evident. In fact, no clear pattern of real per capita income growth presents itself in Figure 5. Of the 20 counties that displayed the fastest real per capita income growth, only 4 of them were located on an interstate. Additionally, only 2 of them were in the top 20 in population growth and 7 of them were in the top 20 of personal income growth.

In many cases, we find that counties with higher population growth have lower real per capita income growth. This can be clearly seen in the Louisville and Lexington metropolitan areas. Jefferson, with its 4.3% population growth had a 23.3% rise in real per capita income while Oldham, with its 38.8% population increase, had only a 5.4% move in real per capita income. Bourbon's real per capita income soared 33.8% while population crept up less than 1% as Scott's population climbed 38.5% with income moving up only 16.6%.

However, there are areas that achieved both high population and per capita income growth. Foremost are the Warren and Pulaski county regions. This is also seen in the I-75 corridor from Fayette to Laurel. These counties enjoy expanded economies with a greater number of citizens who, on average, have higher incomes. In each of the three measures, population growth, total real personal income growth, and per capita real income growth, these areas grew faster than many other areas in Kentucky.

What can we conclude overall about the change in per capita income across counties in Kentucky? Have the high per capita income counties continued to do better than the low per capita income counties? Or has there been some convergence of per capita incomes across counties in Kentucky? We address this question by calculating the growth rate in per capita income from 1990 to 1999 for the 55 counties that were above the Kentucky average in 1990 and comparing that with the growth rate for the 65 counties that were below the 1990 Kentucky average. It appears that there was some slight convergence in that real per capita incomes in the 65 below average counties grew by 17.26%, while real per capita incomes grew by 16.15% for the 55 above average counties. However, it would take several decades for convergence to occur with this slight difference in average growth rates. In fact, absolute dollar differences in real per capita income actually widened over the period. In September 2001 dollars, the gap between the average incomes of the 1990 below average and above average counties grew from $6,107 to $6,931. Similarly the gap between the 75$^{th}$ and 25$^{th}$ percentiles (i.e., the gap between the 30$^{th}$ and 90$^{th}$ ranked counties) grew from $4,763 to $6,076. Finally, the standard deviation in per capita incomes across counties grew from $3,858 to $4,661 between 1990 and 1999 in September 2001 dollars. Thus, while there has been slight convergence in growth rates, the absolute gaps have continued to widen between the high and low per-capita income counties. Convergence will have to occur at faster rates in the future for the absolute dollar differences in per capita incomes across counties to begin to narrow more quickly.

## Conclusions

In this paper, we examine population and real income growth across Kentucky counties from 1990 to 2000 (1999 for income). In order to understand changes in real per capita income over time across the state, it is important to understand changes in both population and total personal income. We find that the largest population growth occurred in suburban counties within the Golden Triangle formed by Lexington, Louisville and Cincinnati, and in some counties along Interstate highways or parkways. The smallest population growth occurred in the Appalachian East and the Western part of the state. Total real personal income growth followed much the same pattern.

The growth in the ratio of total real personal income to population, i.e. real per capita personal income, did not follow any immediately evident pattern. Real per-capita personal income in some areas around smaller cities grew fairly rapidly, while suburban counties had slower per capita income growth. Overall, while low per capita income counties grew slightly faster on average than high per capita income counties, the absolute dollar gap between the high and low per capita income counties actually grew in real terms between 1990 and 1999.

# The Economic Impact of Coal in Appalachian Kentucky

*Jonathan M. Roenker*

*In the Appalachian region, particularly in the mountains of eastern Kentucky, the importance of the coal industry looms large in most facets of the lives of this region's citizens. This article examines the current significance of the coal mining industry in coal producing Appalachian counties in Kentucky by examining a number of economic indicators. Kentucky coal producing counties, compared to other coal producing counties in the Appalachian region, are often particularly more dependent on coal as is revealed by the high percentage of coal mining earnings and employment relative to total earnings and employment in those counties. This heavy dependence on the coal industry in Kentucky coal producing counties often leaves these counties susceptible to changes in the fortunes of the industry. As a result, losses in coal mining earnings in these counties often leads to increased poverty and dependence on social welfare programs. In this vein, this article also examines the dependence of Kentucky coal producing counties on social welfare programs in comparison to other counties in the Appalachian region.*

## Introduction

The Appalachian region of Kentucky has long been dependent on the rich coal mines that dot the landscape. The coal industry is an industry of booms and busts, and hence the welfare of the Appalachian region in closely tied to the health of the coal industry. Energy-related issues are always of national importance, especially during periods of economic uncertainty or instability. In the Appalachian region, particularly in the mountains of eastern Kentucky, the importance of the coal industry looms large in most facets of the lives of this region's citizens. As a result, the importance of this industry in the local economy often leaves residents vulnerable to the changing winds of the industry. Given this dependence, small changes in the demand for coal in these coal-dependent counties can often bring about drastic changes in the local economy.

This article examines the current significance of the industry in the Appalachian counties in Kentucky by examining a number of economic indicators of the influence of coal mining on the region.* The article also seeks to identify where local economies are most dependent on the coal industry and also those counties where the economic impact of the industry on the county is the greatest. Additionally the impact of coal on other indicators of regional economic health including, welfare and income transfer programs, is examined. The article investigates these issues using data from the Department of Energy's ***Energy Information Administration*** and the Department of Commerce**,** ***Bureau of Economic Analysis*.**

The Appalachian Regional Commission (ARC) was established by act of Congress in 1965 in order to better promote and support economic and social development in the Appalachian region of the country. Much of the Commission's resources are devoted to developing a strong economic base in the region as well as helping to build and strengthen the region's infrastructure. Also, as a result of the Congressional Act, the Appalachian Region was clearly defined. The ARC region in Kentucky includes the counties displayed in Map 1 (next page). Map 1 also indicates which of the ARC counties are major coal producing counties.

* *This article is based on and draws from the 2001 University Kentucky Center for Business and Economic Research publication "A Study on the Current Economic Impacts of the Appalachian Coal Industry and its Future in the Region." This research was sponsored by the Appalachian Regional Commission.*

## Current Situation in Appalachia

In the Appalachian Region, Kentucky ranks second only to West Virginia in terms of total coal production as seen in Table 1. Table 1 provides several key descriptive figures concerning the importance of the coal industry in ARC counties in several key states. These coal producing counties, displayed in Map 2, are the focus of this article and all references from here forward are to these coal producing counties. Employment in those Kentucky coal producing counties is particularly focused in the coal mining industry with coal mining employment representing almost fourteen percent of the total employment in these counties. Similarly, coal mining earnings represent over nineteen percent of total earnings in those same counties. In Appalachian Counties in other large coal producing states, the picture can be quite different. West Virginia is the largest coal producing state in the Appalachian Region, but employment in the industry represents only 6.1% of the total employment in its coal producing counties. Similarly, coal earnings in those same counties comprise only approximately ten percent of total earnings in the coal producing counties. Pennsylvania, the third largest producer in the region, exhibits an even lower dependence on the coal industry.

The figures in Table 1 illustrate the importance of coal in Kentucky's Appalachian counties. The lack of a strong presence of other industries in the region is quite evident given the large percentage of employed persons working in the coal mining industry. While production in West Virginia is significantly higher than in Kentucky, the work force is significantly more diversified with only six percent of the employed in the county holding a job in the coal mining industry. Likewise, coal mining earnings in West Virginia comprise a significantly smaller portion of the total earnings in ARC counties in that state, further cementing the notion that Kentucky Appalachian counties are particularly dependent on the coal mining industry for their livelihood.

## County Level Dependencies

Within the ARC region in Eastern Kentucky, there exist varying degrees of dependence on the coal industry. Previous measures including employment and earnings have been used to

**MAP 1**

**ARC Region and Major Coal Producing Counties in Kentucky**

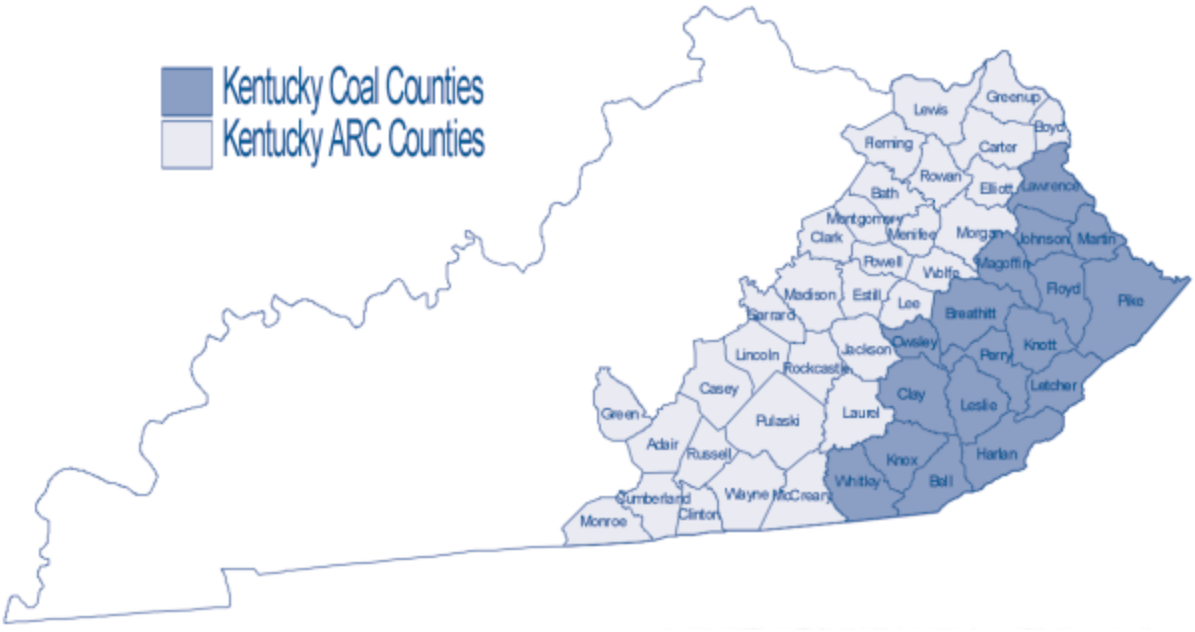


**TABLE 1**

## Descriptive Statistics About The Coal Mining Industry in Coal Producing Counties in Selected ARC States.

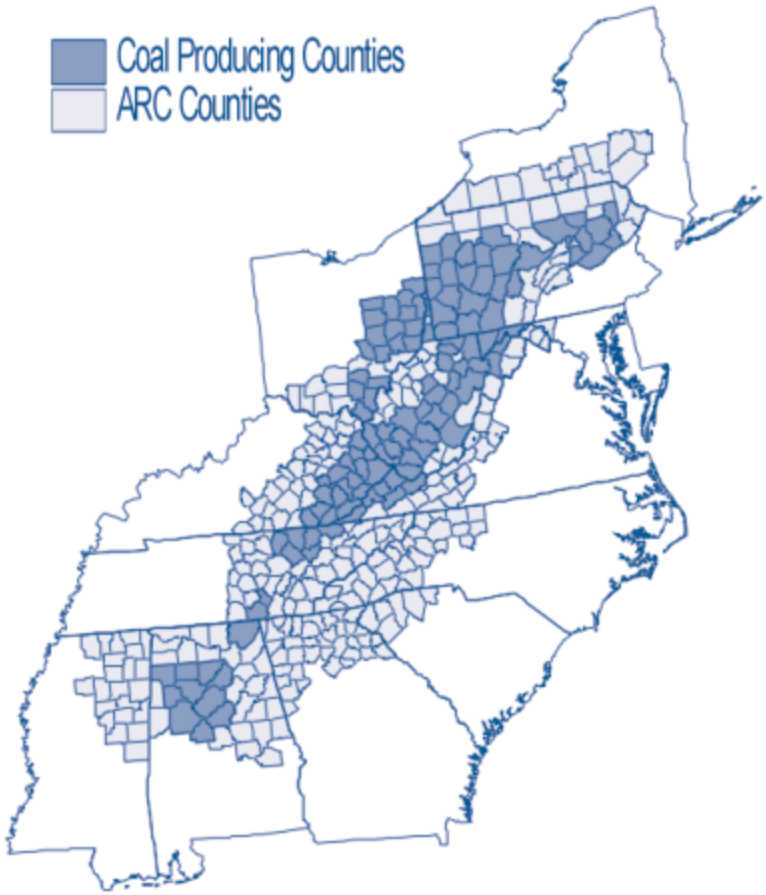
| | Kentucky | West Virginia | Pennsylvania |
|---|---|---|---|
| Total Coal Production | 120.9 million | 173.7 million | 76.2 million |
| Coal Mining Employment | 13,061 | 18,937 | 10,409 |
| As Percentage of Total Employment | 13.7% | 6.1% | 0.6% |
| Coal Mining Earnings | $719.6 million | $1.246.7 million | $1,025.7 million |
| As Percentage of Total Earnings | 19.1% | 9.8% | 1.5% |
| Coal Output | $2,979.5 million | $4,530.0 million | $2,033.1 million |

Source: Energy Information Administration, *Coal Industry Annual*

demonstrate this dependence at the state level in comparison with other large coal-producing states. At the county level, the use of gross county product vividly reveals just how large this dependence can be. Like gross national product, gross county product (or value added), in concept, is equal to the county's gross output (sales or receipts and other operating income, commodity taxes, and inventory change) minus intermediate inputs. Thus, gross county product (GCP) is a good measure of the final output of the county's economy. Map 3 (next page) displays coal GCP as a percentage of total GCP in the ARC counties in Kentucky and the entire ARC region.

**MAP 2**

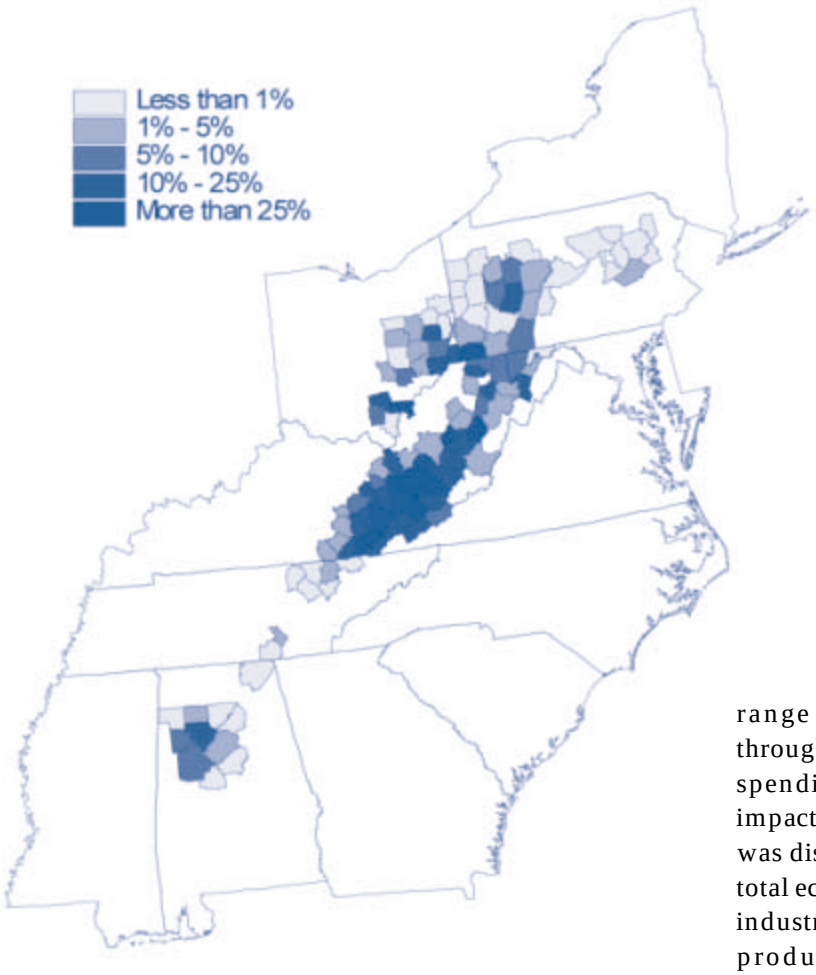
## ARC Region and Major Coal Producing Counties




The map reinforces the notion that many of these counties are highly dependent on the coal industry to support the county economy, in particular the far eastern counties of Martin (47.1%), Pike (34.3%), Letcher (30.3%), Knott (54.0%), and Harlan (31.3%) and are more highly dependent on coal than most of the ARC counties. All of these counties rely heavily on coal production and its associated activities to produce approximately one-third or more of the county's value added. These same counties also have extremely high coal employment to total employment ratios with coal employment in Knott and Martin Counties totaling 41.1% and 44.4% of total employment, respectively.

**Map 3**

## Coal Gross County Product as a Percentage of Total Gross County Product in ARC Counties




## Economic Impact of Coal

While the gross county product and employment situation goes far to demonstrate the dependence of many Kentucky counties on the coal mining industry, the economic impact of the industry on those counties actually exceeds the figures discussed above. The coal mining industry often supports much of the economic activity in the economies of these major coal-producing counties in the ARC region in Kentucky. For example, coal companies often support the activities of their suppliers in the manufacturing, machine shop, construction, and business service industry. In this example, the wages earned by the employees of the coal mining companies support their spending for a wide range of retail goods and services throughout the economy. This additional spending indicates a larger economic impact for the coal mining industry than was discussed earlier. In this section, the total economic impact of the coal mining industry on Kentucky Appalachian coal producing counties is considered, including both the direct and "multiplier"

**TABLE 2**

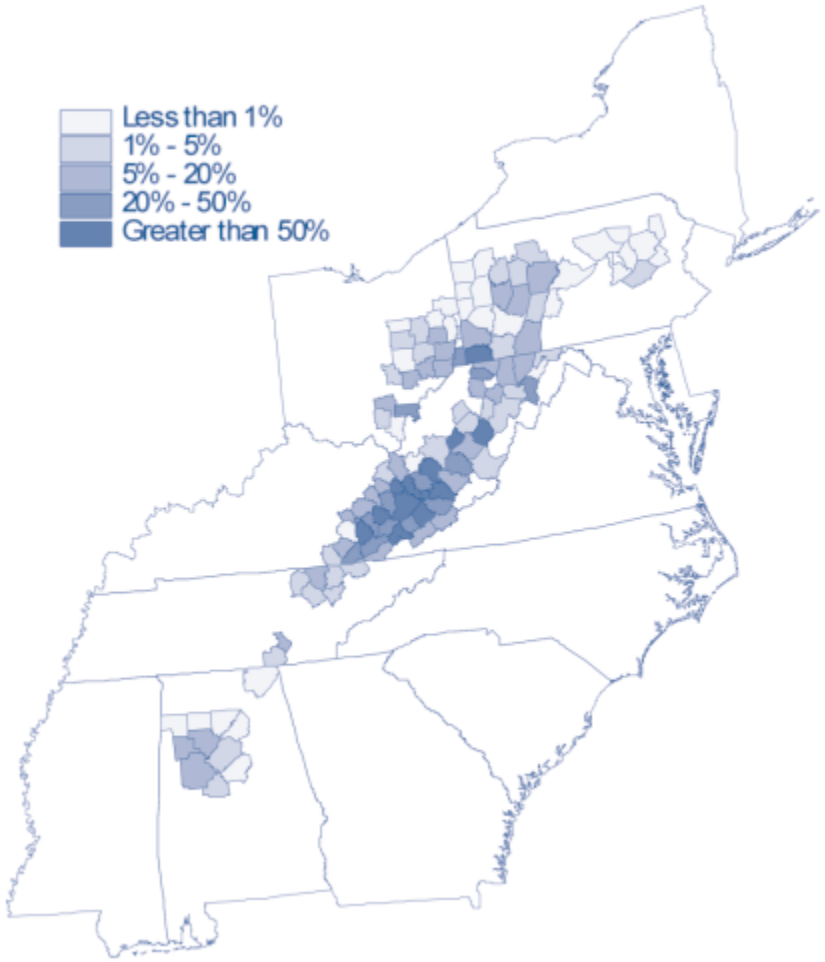
## Economic Impact of the Coal Mining Industry in Selected ARC States.

| | Kentucky | West Virginia | Pennsylvania |
|---|---|---|---|
| **Total Coal Production** | 120.9 million | 173.7 million | 76.2 million |
| **Total Employment Impact (jobs)** | 30,300 | 43,600 | 27,100 |
| **Share of Total Employment** | 31.9% | 14.6% | 1.6% |
| **Total Earnings Impact** | $1,280.3 million | $1,935.7 million | $1,625.7 million |
| **As Percentage of Total Earnings** | 34.0% | 15.2% | 2.3% |
| **Coal Output** | $4.4 billion | $6.9 billion | $2.9 billion |

Source: Energy Information Administration and author's calculations

**Map 4**

## Total Coal Mining Employment Impact as a Share of Total Employment in ARC Coal-Producing Counties




effects of the industry. The "multiplier" effect occurs as coal companies spend locally on supplies and coal company employees spend on goods and services required by households. The total economic impact on earnings, employment, and output, as seen in Table 2, is significantly greater than the direct impact discussed in the previous section.

The calculation of the indirect, induced, and total economic impacts are based on the direct impacts outlined in the previous sections.[1] Table 2 shows an even greater dependence on coal in the Kentucky ARC counties than is revealed by the direct impacts in Table 1. Table 2 reveals that the total economic impact of the coal mining industry on earnings in Kentucky coal producing counties represents 34% of total earnings in those counties. The total employment impact of the industry represents almost 32% of the total jobs in these same counties in Kentucky. The other large coal producing states in the ARC region, Pennsylvania and West Virginia, show a much lower impact of the industry on earnings as well as employment.

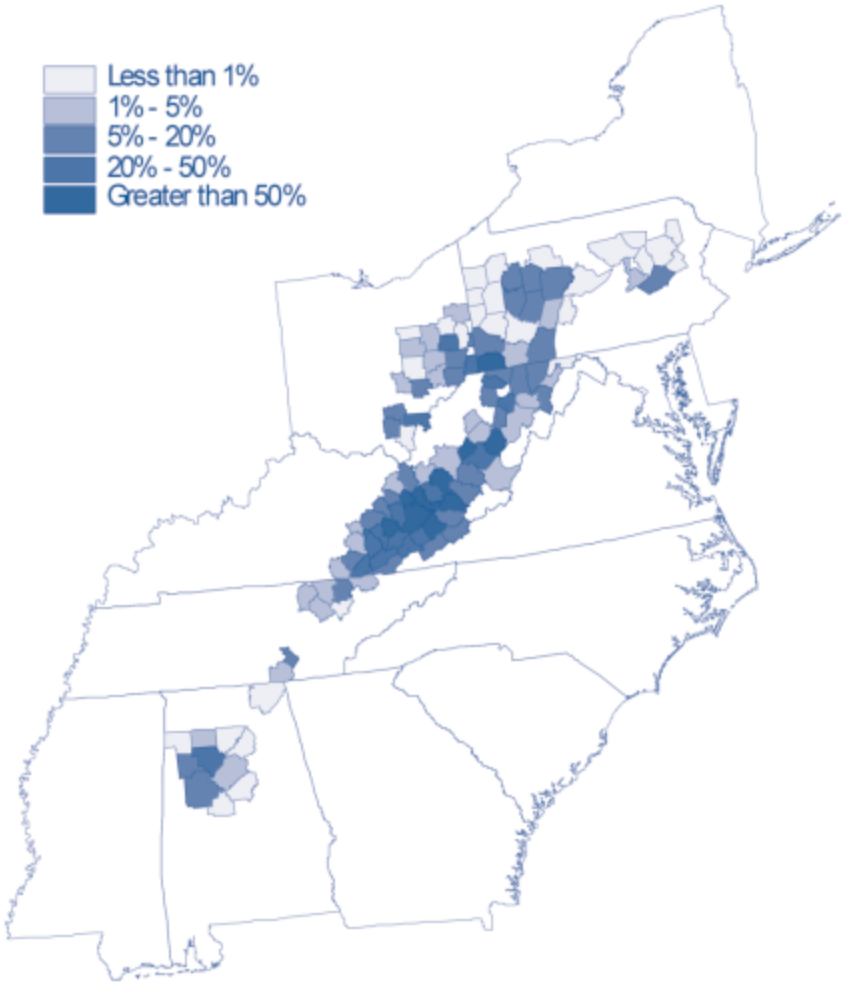
Map 4 again reinforces the fact that many of the Kentucky ARC coal-producing counties are highly dependent on the industry. As in the direct impact, the counties of Martin and Knott once again emerge as two of the counties most highly dependent on the coal industry. Martin (66.2%) and Knott (75.7%) derive well over 50% of their total employment from the coal industry, while Pike (52.0%), Letcher (44.2%), and Harlan (44.9%) Counties all have coal mining shares of employment in excess of 40%. Similar to the impact at the state level seen in the comparison of Tables 1 and 2, the total economic impact at the county level magnifies the degree of dependence on the coal mining industry of many Kentucky coal producing counties.

A map of the total economic impact of coal mining earnings as a share of total earnings in these same counties, Map 5, tells much the same story as the coal mining share of employment map. Again, the counties of Martin (72.1%), Knott (70.1%), Pike (50.6%), Letcher (41.2%), and Harlan (44.8%) have some of the highest ratios of coal mining earnings to total earnings when measuring total economic impact in the county.

While income, earnings, and employment are important aggregate indicators of the economic health of a region, they are not the sole indicators.

**Map 5**

## Total Coal Mining Earnings Impact as a Share of Total Earnings in ARC Coal-Producing Counties




Due to the fact that the coal mining industry accounts for such a large share of the local economy in many of the coal producing counties in the Kentucky ARC counties, changes in the industry can often have a large and dramatic impact on the rate of social welfare dependency in these counties.

Recent research concerning the linkage between the performance of major industries and key socioeconomic indicators, including social welfare dependency, has been explored by Dr. Dan A. Black, as well as others.[2] The coal mining industry frequently offers relatively high paying jobs to workers with low general skill levels, although it is most often the case that these workers have developed industry-specific skills for use in coal mining. The result is that losses in coal mining earnings in these counties often leads to increased poverty and dependence on social welfare programs. The opposite is also true. As earnings in the industry increase, poverty and social welfare dependency often decrease.

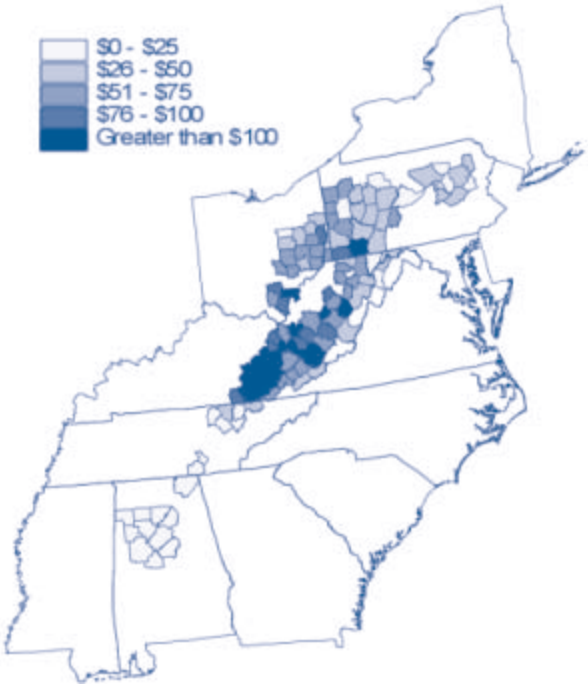
Map 6 shows Temporary Aid to Needy Families (TANF) payments per capita by county in the Appalachian region. Higher payments from this program often represent higher poverty rates and lower rates of income. It must be kept in mind, though, that these payments may also reflect state-to-state differences in the level of support that is allowed in the state. Together, however, these suggest that higher payments may reflect the fact that an area relies more heavily on the federal and state government and that also lower income and higher poverty are more prevalent in that area.

Map 6 reveals that a majority of the counties with the highest per capita TANF payments are in the Kentucky coal producing counties, as represented by the darkest shading on the map. Many of the per capita payment levels in the Kentucky counties are more than twice as large as the payments in the northern and southern portions of the Appalachian region.

Further, Map 7, showing Food Stamp payments per capita, reinforces the notion that Kentucky coal producing counties are particularly dependent on federal and state support programs, particularly when compared to coal producing areas in the northern and southern portions of the ARC region.

**Map 6**

## TANF Payments per Capita by County in the ARC Region




## Conclusion

The importance of the coal mining industry in Appalachia varies from state to state and even county to county. In the coal producing Appalachian counties in Kentucky, the dependence on coal is particularly great. Relative to counties in other coal producing states in the region – particularly states in the northern and southern portions of the ARC Region –, Kentucky coal producing counties are often particularly more dependent on coal as is revealed by the high percentage of coal mining earnings and employment relative to total earnings and employment in those counties. The total economic impact, including both direct and indirect impacts, further reinforces this notion, with the earning impacts in two Kentucky counties exceeding 70% of total county earnings. In several more counties, the earnings impact exceeds 40%.

This heavy dependence on the coal industry in Kentucky coal producing counties often leaves these counties susceptible to changes in the fortunes of the industry. As a result, losses in coal mining earnings in these counties often leads to increased poverty and dependence on social welfare programs. The Kentucky coal producing counties are also relatively more dependent on social welfare programs, including TANF and Food Stamps, than other counties in the region. This is once again particularly true when comparing the Kentucky coal producing counties to those counties in the northern and southern portions of the region.

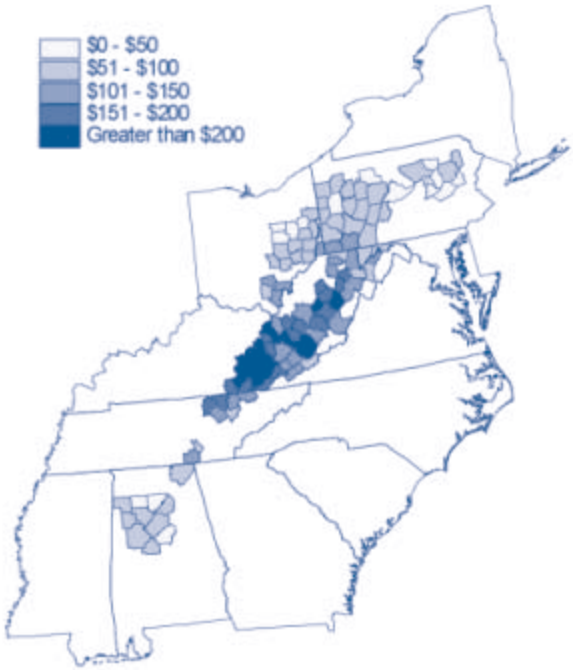
## Endnotes

1 Output was calculated by multiplying total coal production in tons by the average price Per ton.

2 Black, Dan, Kermit Daniel, and Seth Sanders, 1996. "How Much Does Local Economic Growth Help the Poor?" Working Paper (January). and Black, Dan, Terra McKinnish, and Seth Sanders, 1999. "How the Availability of High-Wage Jobs for Low-Skilled Men Affects AFDC Expenditures: Evidence from Shocks to the Coal and Steel Industries." Working Paper (June).

**Map 7**

## Food Stamp Payments per Capita by County in the ARC Region



# E-Commerce, Online Sales, and the Experiences of Kentucky Businesses in the New Economy

*Joseph Miller*

*The economic importance of e-commerce has been the focus of widespread debate, much of which has suffered from a paucity of tangible data. This article helps alleviate this deficit by reporting the results of recent survey of Kentucky businesses. Over one-quarter of large Kentucky businesses that responded to the survey indicate that they sell their product or service online, which is a sizeable increase over past survey years. This growth means that Kentucky firms are now selling online at a rate comparable to the national average, according to available estimates. The characteristics of Kentucky firms that sell their products online are addressed, as is online buying behavior among Kentucky businesses. Finally, firms' experiences with e-commerce are analyzed, including attributes of their online shoppers and the effects that online sales have had on revenues and profits.*

## Introduction

Despite the much-publicized difficulties faced by technology firms of late, the economic importance of the internet and "e-commerce" has continued to grow, and is widely expected to increase further over the next few years. The Census Bureau reported that US retail e-commerce sales in the second quarter of 2001 were valued at $7.5 billion, which implies year-to-year growth of 24.7%. In contrast, total retail sales for the same period grew by only 3.8%.[1] Moreover, Jupiter Media Metrix still predicts that online business-to-business (B2B) spending will surpass $5.4 trillion by 2006, despite the sluggish macroeconomic conditions faced throughout much of 2001.[2] Earlier in 2001, IDC Research predicted business-to-consumer (B2C) sales would top $700 billion by 2005.[3]

For present purposes, the precise level of such estimates is of less importance than their direction. The key insight is that the importance of e-commerce is still increasing, and with all likelihood will continue to do so for the foreseeable future. If Kentucky firms wish to remain competitive in this new business environment, they will need to understand and harness the potential benefits offered by technological advancement. The purpose of this paper is to examine the extent to which Kentucky firms have engaged these issues, and to look at some of the ways in which these technologies have affected state businesses.

## Description of Survey Data

The data used in this paper is primarily drawn from the 2001 Business Confidence Survey, conducted by the Center for Business and Economic Research (CBER) at the University of Kentucky in 2001. This was the fourth consecutive annual survey to ask participating firms a series of questions regarding their experiences with e-commerce.[4] This year's survey was distributed to two separate samples of Kentucky businesses: one containing 1,981 firms of any size, and another containing 951 firms with at least 100 employees. These businesses were selected at random and were dispersed geographically across the state. 181 surveys from the 'all business' sample and 40 from the 'large business' sample were returned as undeliverable. We received 181 responses from businesses in the all business sample and 164 responses from businesses in the large business sample. Examination of the two samples reveals that the characteristics of the businesses that completed surveys are very similar to the characteristics of businesses in the entire sample, which implies that the returned surveys can meaningfully be used to describe the experiences of Kentucky businesses in general.[5]

For the purposes of this paper, the large businesses have been dropped from the 'all business' sample, so that what remains is a random sample of small businesses in the State. This adjustment

only trims the sample size marginally, since just over 95% of the businesses in the full sample were small businesses (meaning that they employed fewer than 100 workers). Throughout this paper, this sample is therefore referred to as a 'small business' sample, and is used in conjunction with the 'large business' sample to contrast the e-commerce experiences of large and small businesses in Kentucky.

## Online Sales at Kentucky Businesses

As shown in Table 1, 25.2% of large businesses and 13.3% of small businesses in Kentucky report that they sell their products or services directly on the Internet. This represents a dramatic change since last year's survey, in which only 15.1% of large businesses and 9.8% of small businesses reported any direct online sales. This rapid growth is particularly surprising considering that 2001 has seen declining rates of technological investment at the national level compared to other survey years, and may suggest that Kentucky businesses are becoming more aware of the unique opportunities that e-commerce can offer them.

**TABLE 1**

**Percentage of Businesses that Sell their Products Directly on the Internet**

| | 1998 | 1999 | 2000 | 2001 |
|---|---|---|---|---|
| Large Businesses | 10.1% | 14.7% | 15.1% | 25.2% |
| Small Businesses | — | — | 9.8% | 13.3% |

In fact, the growth over the past year has made the level of e-commerce activity in Kentucky comparable to the national average, at least among small businesses. As of October 2001, CyberAtlas estimated that 12-13% of the nation's small businesses sold their products online.[6] The 13.3% of Kentucky's small firms that sell their goods online is very similar to this estimate. Considering that Kentucky lags behind the national trends measured by many economic indicators, this evidence that Kentucky businesses are as deeply immersed in e-commerce as those across the nation should be seen as a positive sign. If Internet commerce is indeed the wave of the future, then Kentucky firms may be well positioned to compete in the 21st Century economy.

## Characteristics of Kentucky's E-commerce Firms

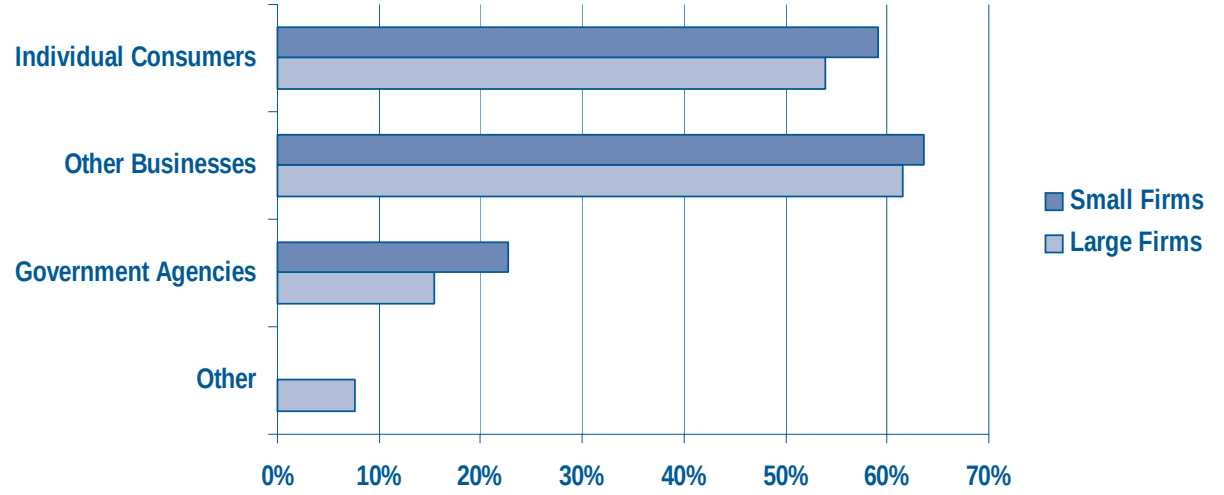
Although large businesses in Kentucky are generally more involved in e-commerce than small businesses, the profiles of large and small businesses that are involved in e-commerce are strikingly similar. Among both large and small businesses, the average length of time that they report having sold their products online is 1.9 years. Approximately 40% of the businesses (both large and small) that sell their products online report having begun to do so only within the last year. This implies that both large and small businesses in the state are expanding into e-commerce at a substantial rate, which explains the dramatic growth seen on Table 1. Businesses that have been selling their product online for more than one year have an average of 2.6 years of reported experience with e-commerce.

As might be expected, firms engaged in retail and wholesale trade sell their goods online more often than firms in manufacturing or service sector industries. 40.5% of large Kentucky firms and 17.6% of small Kentucky firms involved in trade report that they sell their product online. Holding constant firm size, businesses involved in trade are a statistically significant 17.4% more likely to sell their products online than manufacturing firms, and are a statistically significant 12.5% more likely to sell online than service-sector firms, based on the data gathered in our survey.

Kentucky businesses that sell their goods online are most likely to sell their goods to other businesses, as illustrated in Figure 1. Over 60% of large and small business respondents that sell their goods online indicate that they sell at least some of their products in this type of B2B commerce. A slightly lower 59.1% of small businesses and 53.9% of large businesses also indicate that they engage in B2C commerce, meaning that they sell some of their goods directly to individual consumers. These are the largest two categories of customers for Kentucky's online products, although over one-fifth of large firms also indicate that they sell some of their products directly to government agencies. 7.7% of large businesses also sell their products to other types of recipients, although no small businesses do likewise.

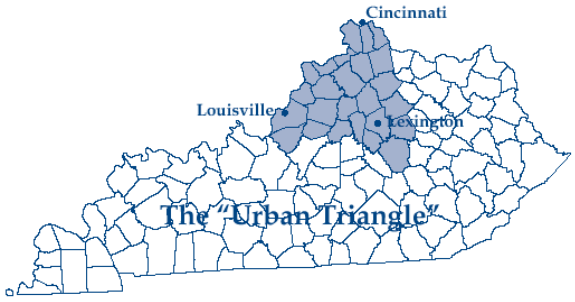
**FIGURE 1**

**Percentage of Kentucky's Online Merchants that Sell to:**




## Is There a 'Silicon Triangle' in Kentucky?

Businesses in the region of Kentucky known as the "Urban Triangle" have traditionally outperformed those in the rest of the state in economic terms. This region is composed of the 25 Kentucky counties which together roughly bound the Louisville, Lexington, and Cincinnati / Northern Kentucky metropolitan areas. This area contains many of the state's largest employers, including Toyota in Georgetown and United Parcel Service in Louisville.




It is therefore natural to ask whether businesses in this region of the state are more involved in e-commerce than are businesses in other areas. Perhaps surprisingly, the difference is rather small. About 14.0% of small businesses in the urban triangle sell their goods online, compared to 12.5% of those outside of it. Among large businesses, 28.4% of those inside the urban triangle sell their goods online, as do 21.1% of those outside of the urban triangle. The average length of time that firms have been selling their goods online is similar across different regions of the state (large businesses outside of the urban triangle have actually been selling online for slightly longer, on average, than have large businesses inside the urban triangle). Holding constant firm size and industry, there is no statistically significant gap in e-commerce utilization between firms inside and outside of the urban triangle present in our data. These statistics suggest that the development of e-commerce is fairly evenly distributed across Kentucky, and is not isolated in the most highly industrialized areas. Insofar as the application of e-commerce is an indication of economic development, therefore, the urban triangle region is not far ahead of the rest of the state.

## Online Purchases by Kentucky Businesses

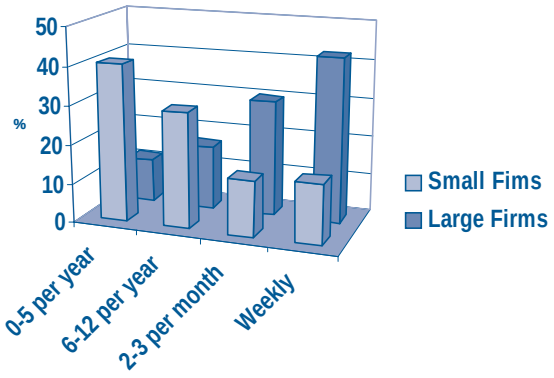
Not all of the potential gains from e-commerce come from selling goods or services online; many firm managers have been discovering the benefits of purchasing products for their businesses over the Internet. These transactions are often faster and less expensive than their offline counterparts, which can

result in substantial savings for the firm. In Kentucky, 49.7% of small businesses and 64.7% of large businesses report that they currently use the Internet to buy goods or services from other firms. This is dramatically higher than the percentage of firms that sell their goods online, which means that e-commerce actually has a much greater economic impact in Kentucky than the number of firms that sell online would suggest. Not only does on-line browsing generate some off-line sales, but clearly many companies that do not sell goods online still benefit from e-commerce by buying products online. Given that around half of Kentucky's businesses currently buy products or services online, it seems reasonable to conclude that these benefits are fairly widespread.

Businesses that buy goods online were also asked about the frequency with which they make these purchases. The results are shown in Figure 2. Clearly, large firms in Kentucky are taking advantage of Internet purchases more frequently than are small firms. 42.3% of large firms in our sample that buy products online do so weekly; only about 15.5% of small firms do the same. This suggests that many smaller firms are more sporadic in their online purchases, whereas larger firms as a whole have more systematically integrated online purchasing into their regular business patterns. This is perhaps the expected trend, considering that it mirrors the higher levels of e-commerce sales activity reported by larger firms.

**FIGURE 2**

**Frequency of Online Purchases by Firms**




## Kentucky's Experiences with E-Commerce

In this section we shift our focus and examine the experiences that Kentucky firms have had with their online transactions. We address such issues as business motivations for initiating e-commerce, the effects that e-commerce has had on firms' revenues, and the impact of e-commerce on companies' customer bases. Businesses' responses in these areas help us gain a better understanding of the ways in which e-commerce has affected Kentucky.

### Motivation for Initiating E-Commerce

Businesses initiate online commerce for a variety of different reasons. In Kentucky, the most common reason that large firms have for initiating e-commerce is to satisfy the demands of current customers, while the largest number of small firms are interested in reaching new customers (see Figure 3). These two responses are given by at least half of all firms, large and small, however, and are therefore obviously important reasons for the initiation of e-commerce. 40% of large firms and 45.5% of small firms also indicate that the reduced costs of e-commerce helped motivate them to begin sales over the Internet. 22.7% of small firms in the survey give other reasons for going online, while only 2.5% of large firms give any other reasons.

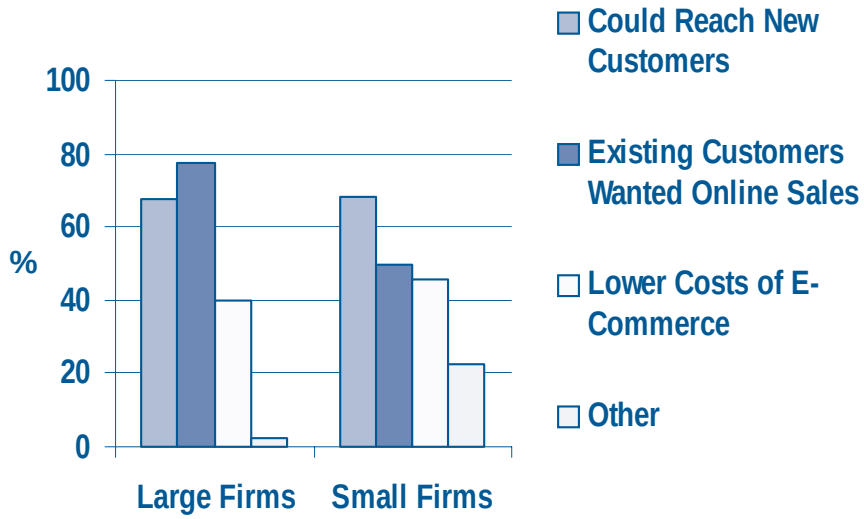
### Internet Sales

Firms were also asked what percentage of their total sales came from the Internet. Smaller firms on average derive a higher percentage of their total sales from e-commerce; the average among small firm is to sell 8.7% of their total online, while the average among large firm is to sell 5.8% of their total online. Among survey firms engaged in e-commerce, 50% of the small firms and 17.7 % of large firms derive 10% or more of their total sales from the Internet. These numbers probably underestimate the actual percentage of companies' sales that are derived from e-commerce, since "browsing" online may generate a significant amount of off-line sales for firms, especially among in-state customers.

One benefit of e-commerce is its ability to strip away at the geographic barriers faced by firms, and

**FIGURE 3**

**Reasons for Initiating Online Sales:**




allow them to sell their goods to distant consumers more easily. As shown in Figure 3, the ability to reach new customers is a major motivation for initiating online commerce for many companies. In an effort to determine the extent to which this has been successful, we asked firms what percent of their total Internet sales were to customers outside of the state of Kentucky. Perhaps surprisingly, small firms have been more successful in reaching high percentages of out-of-state consumers than have large firms, although overall e-commerce seems to have allowed businesses of all sizes to expand freely beyond the State's borders. According to our data, 81.7% of the Internet sales of an average small Kentucky firm are to customers outside of the State, while 68.3% of the Internet sales of an average large Kentucky firm reach customers outside of the State. Viewed from another angle, 79% of small Kentucky firms and 63% of large Kentucky firms sell more than 10% of their online goods to out-of-state customers. This indicates that e-commerce has allowed Kentucky firms to extend their economic reach quite significantly.

When only B2B commerce is considered, a slightly lower percentage of online transactions occur with out-of-state customers. Still, our survey indicates that a substantial portion of online B2B transactions cross state boundaries. An average of 71.8% of online B2B commerce involving small Kentucky businesses and 65.9% of online B2B commerce involving large Kentucky businesses is with clients outside of the Commonwealth.

## Characteristics of Online-Shoppers

Companies were also asked directly whether the majority of their online customers were new customers or were instead just previous offline customers. Given the high percentage of out-of-state consumers that firms reported serving, one would perhaps expect that a large portion of many companies' online customers would be new, web-only customers. As Table 2 shows, the majority of online customers at 40.9% of small firms and 13.2% of large firms are new.

**TABLE 2**

**Composition of Online Customers**

**Percentage of firms for which the majority of online customers are:**

| | Large Firms | Small Firms |
|---|---|---|
| Previous offline customers | 68.4% | 45.5% |
| New customers | 13.2% | 40.9% |
| Do not know | 18.4% | 13.6% |

This has two important implications. First, it means that firms are reaching a significant body of new customers with their online commerce, which is encouraging considering the importance that firms placed on this goal. Secondly, when combined with the above data on the percentage of web-sales that are to out-of-state clients, this implies that many Kentucky firms (especially large ones) were already doing a significant amount of business with out-of-state consumers before they initiated their e-commerce services. Due to the logistical requirements of such a task, and to the Internet's ability to cheaply transport large amounts of information between distant geographic areas, it is

quite probable that the initiation of e-commerce has made transactions with these consumers significantly more simple and less costly than it had been previously. Indeed, it should be remembered that an important reason why online sales were originally initiated, especially among large firms, is because existing customers had desired them.

**TABLE 3**

**Purchasing Habits of Online Customers**

**Percentage of firms whose online customers purchase products or services:**

| | Large Firms | Small Firms |
|---|---|---|
| More frequently than offline customers | 12.8% | 18.2% |
| The same amount as offline customers | 43.6% | 31.8% |
| Less frequently than offline customers | 7.7% | 36.4% |
| Do not know | 35.9% | 13.6% |

Companies were also asked to compare the purchasing habits of their Internet customers with those of their offline customers. These results are listed in Table 3. 18.2% of small firms' and 12.8% of large firms' online customers purchase goods or services more frequently than do those firms' offline customers. Considering that the general public is as new to e-commerce as are the firms, and has still has reservations of its own concerning Internet purchasing, these results should be considered encouraging. 36.4% of small firms, however, report that their online customers make fewer purchases than their offline counterparts. This statistic is relatively high, especially when compared to the fact that only 7.7% of large firms report the same problem.

## Revenues and E-Commerce

Firms expanding into e-commerce are undoubtedly doing so in hope of increasing their sales revenues and, ultimately, their profits. We asked businesses in our survey to evaluate how their sales and revenues have changed since they began selling their products online. Figure 4 contains a breakdown of their responses. As this graph illustrates, most firms have either not experienced any net revenue changes or have had their revenues increase somewhat since they began selling online. These responses are very similar to those that have been reported in past years.

Holding constant in our data the variables of firm size, industry type, and location inside or outside of the urban triangle, whether or not a firm is engaged in e-commerce has no statistically significant effect on the likelihood that either profits or sales rose in the past year, or on the expectation of rising profits or sales for the upcoming year. It is worth noting, however, that in our data the presence of e-commerce programs does increase the likelihood that profits and sales have risen in the past year, and that firms expect them to do so in the coming year, it just fails to increase these chances either very dramatically or to a statistically significant degree.

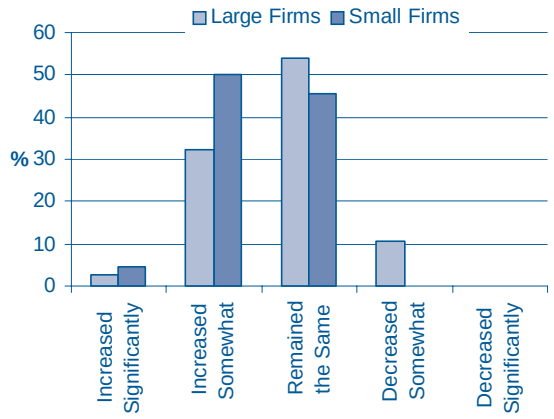
While many firms may view investments in e-commerce as strategies that will pay off more in the future than in the short-term, it is worth remembering that according to our data revenues have only increased thus far for about 55% of small firms and about 35% of large firms that have initiated online sales. For the majority of firms, therefore, Internet sales are not the instant recipe for large profits that many people once believed them to be. Nevertheless, it is encouraging that very few firms have actually experienced decreased revenues since they began selling their goods online.

## What Concerns are holding back the Initiation of E-Commerce?

Most companies in the State (and across the nation) do not yet sell their goods or services over

**FIGURE 4**

**Revenue Changes Since the Initiation of E-Commerce:**



the Internet. With so much media emphasis having been placed on e-commerce over the last several years, this fact may seem somewhat deflating. Yet many firm managers still have legitimate concerns over the benefits of e-commerce, its applicability to their businesses, and its safety. We asked Kentucky firms who are not yet selling their products online to tell us why this was so. Their answers provide insights into the challenges that e-commerce will have to overcome before it will be adopted on a more widespread basis.

According to a Forrester Research report, the biggest obstacle that firms face nationally when selling online is the inability of consumers to touch and feel the goods before purchasing them.[7] This is closely related to the primary reason why Kentucky firms in our survey have yet to initiate e-commerce: the difficulty of conducting online sales for certain types of goods. 84.2% of large firms and 77.5% of small firms cite the difficulty of conducting online sales for their goods or services as a barrier to their entry into the online marketplace. This concern far out shadows all other concerns given by firms, and suggests that many companies will remain offline until more creative applications of technology make sales of a broader array of products online more feasible.

Companies in our survey have a variety of other concerns with regard to e-commerce. 11.6% of small firms and 5.4% of large firms believe that online commerce requires too large an initial investment to make it worth their while. 6.5% of small firms and 8.9% of large firms are concerned about the security of online operations. Significantly, these numbers were about twice as high in last year's survey, which suggests that companies' confidence in the safety of online commerce may be rising with time. Lastly, about 5.8% of small firms and 4.5% of large firms are unsure how to go about initiating online commerce.

Firms not engaged in online sales were also asked whether their businesses planned to use the Internet for online sales in the future. Table 4 shows these results. Only 19.8% of large firms and 11.3% of small firms that do not currently sell online have any plans to begin doing so. This percentage has been falling over the past three years of this survey, presumably both because the firms for which e-commerce may be most advantageous have already initiated online sales, and because the high levels of enthusiasm that surrounded e-commerce throughout the late 1990s have faded away. Overall, large businesses in our survey express more interest in expanding into online sales than do small businesses.

## Conclusion

Thanks in part to an expansion of around 40% over the past year, Kentucky firms are now involved in e-commerce on a scale comparable with national trends (at least among small firms in our data). Based on the results of our survey, 25.2% of large Kentucky firms and 13.3% of small Kentucky firms are engaged in direct online sales. These firms are selling significant amounts of their total output online, and more often than not are doing so to out-of-state customers. At 40.9% of small firms and 13.2% of large firms, the majority of online sales are to new customers, rather than to previous offline customers. Furthermore, an even greater 49.7% of small Kentucky firms and 64.7% of large Kentucky firms report that they use the Internet to buy products for their businesses, and many firms have made this a regular part of their business practice.

Despite this, revenue growth among most Kentucky firms engaged in e-commerce has been only marginal, and most companies who do not currently sell their products online have no plans to begin doing so. The largest concern that these firms have regarding e-commerce is the inherent difficulty involved in selling some types of products over an electronic medium. These statistics suggest a more broad adoption of online sales may ultimately depend on the ability of firms engaged in e-commerce to significantly expand their revenues and on the ability of technological advances to make e-commerce more broadly applicable.

## Endnotes

1 U.S. Department of Commerce, http://www.census.gov/mrts/www/current.html.

2 This estimate, released in late September 2001, represents a downward revision of the company's earlier forecast that B2B spending would reach $6.3 trillion by 2005. NUA Internet Surveys, http://www.nua.com/surveys/index.cgi.

3 Ibid.

4 Firms are also asked a series of questions designed to evaluate the level of general economic confidence among Kentucky businesses. Results of this study for 2001 were reported in the *Kentucky Business and Economic Outlook: Volume 5, Number 1*, Center for Business and Economic Research, University of Kentucky, Fall 2001.

5 For more information, see the "Survey Methodology" section of the 2001 *Business Confidence Survey. Kentucky Business and Economic Outlook: Volume 5, Number 1.*

6 Reported on the "NUA Internet Surveys" website. No comparable statistic was available for large businesses.

7 EpayNews.com, http://www.epaynews.com/statistics/purchases.html.

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