



THE CENTER FOR
APPLIED ECONOMICS

Supporting Regional Economic Development through Analysis and Education

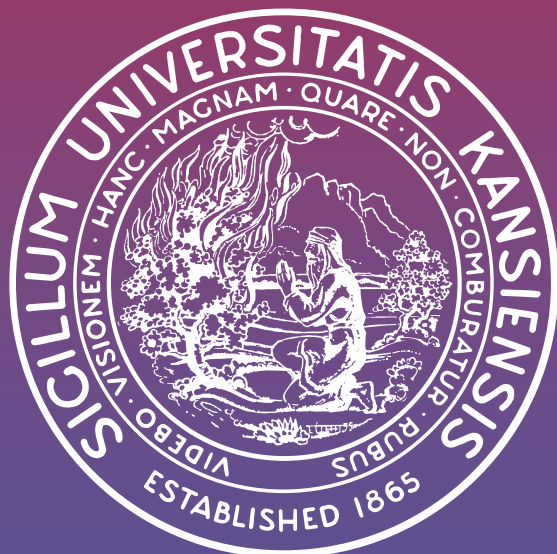
THE
KANSAS
PRODUCTIVITY
PUZZLE

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About The Center for Applied Economics

The KU School of Business established the Center for Applied Economics in February of 2004.

The mission of the Center for Applied Economics is to help advance the economic development of the state and region by offering economic analysis and economic education relevant for policy makers, community leaders, and other interested citizens.

The stakeholders in the Center want to increase the amount of credible economic analysis available to decision makers in both the state and region. When policy makers, community leaders, and citizens discuss issues that may have an impact on the economic development potential of the state or region, they can benefit from a wide array of perspectives. The Center focuses on the contributions that markets and economic institutions can make to economic development. Because credibility is, in part, a function of economic literacy, the Center also promotes economics education.

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THE KANSAS PRODUCTIVITY PUZZLE

The Kansas economy suffers from chronic low productivity growth. The 1990s included the longest economic expansion in the history of the United States. The expansion was credited in large part to a surge in labor productivity growth that started with the recovery from the 1982 recession. Workers now produce one-third more than they did in 1980—but not in Kansas. Labor productivity growth in the state has consistently lagged behind the nation for the past twenty years. As a consequence, Kansas ranks 37th of 50 states in economic growth since 1977.

Economic growth matters because firms cannot employ more people or raise the pay of their existing employees unless they are generating additional revenue. The evidence indicates that Kansas' slow output growth translated into slow employment, which lagged behind national levels by 20 percent. Compensation in Kansas grew at the same rate as compensation nationally. However, compensation in Kansas lagged 18 percent below national averages in 1977, so compensation remained 18 percent below the national averages in 2001. Also, compensation in Kansas has grown faster than labor productivity, meaning that labor costs in Kansas are rising relative to firm revenues. This situation threatens the future profitability (and viability) of firms operating in Kansas.

Kansas' slow population growth is a direct consequence of her relatively low wages and slow employment growth relative to other states. The U.S. population is very mobile and responsive to economic incentives. Popular perception seems to attribute this mobility mostly to retirees moving to the South and West. In fact, however, the majority of moves constitute young people seeking economic rewards. And this group moves in great numbers: almost half the U.S. population moves every five years with half the moves occurring across counties and one-fifth across states.

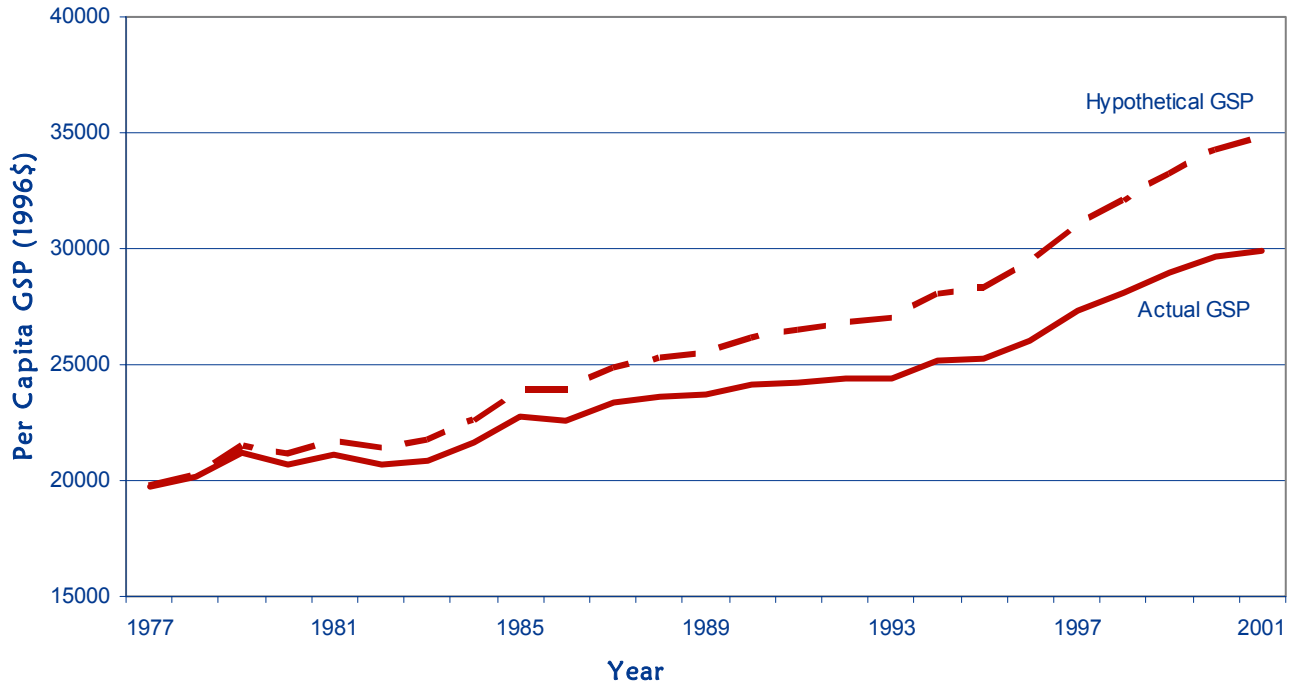
If Kansans want to improve their state's growth in output, wages, and population, they must first solve the slow-productivity-growth puzzle. Some of the problem is endemic among states in the Midwest: Oklahoma, Nebraska, Missouri and Iowa also lag the rest of the nation. Consequently, some clues to the Kansas puzzle must be found in a common weakness among her neighboring Prairie states.

The Kansas slow-productivity-growth puzzle is all the more puzzling, because Kansas ranks well (10th among states) in terms of having an educated labor force, leading all of its neighbors except Colorado in the proportion of the population with college degrees. The 1980s saw a doubling of earnings for college graduates relative to high school graduates. Further growth in the returns to a college degree occurred in the 1990s. Analysts have explained the rising returns to a college degree by appealing to a presumed complementarity between new technologies and skill. In fact, those who use computers or other information technologies on the job earn higher wages. Yet one cannot explain the relatively slow growth in labor productivity in Kansas by an underinvestment in human capital.

What may explain Kansas' inability to take advantage of her relatively educated workforce? The most promising economic clue suggests that Kansas has not fostered sufficient investment in the technologies necessary to fully utilize the skills of its educated workers. Unfortunately, from a research perspective, data on physical capital investments is scarce. However, some indirect evidence allows us to probe into the investment clue. Poor availability of high-speed Internet may be retarding access to information technologies in some areas of the state. Relatively low levels of innovative activity may also make educated workers less productive than their potential. These issues require more investigation. Kansas may lose her most educated citizens if the state cannot offer them the most productive outlets for their time.

Perhaps such an outcome is destiny--or perhaps not. Kansas, like other Prairie states, may inevitably drag down the average state economic growth rate due to its Midwest location, relatively rural composition, and relatively dispersed population. After all, Kansas' neighboring states have had similar growth in labor productivity and wages. Yet, maybe that result has occurred because of a common set of inferior policies and economic development strategies. Perhaps Kansas can implement new policies and strategies focused on productivity growth that will allow its economy's growth rate to accelerate past the national average so as to erase the lagging economic performance of the past two decades.

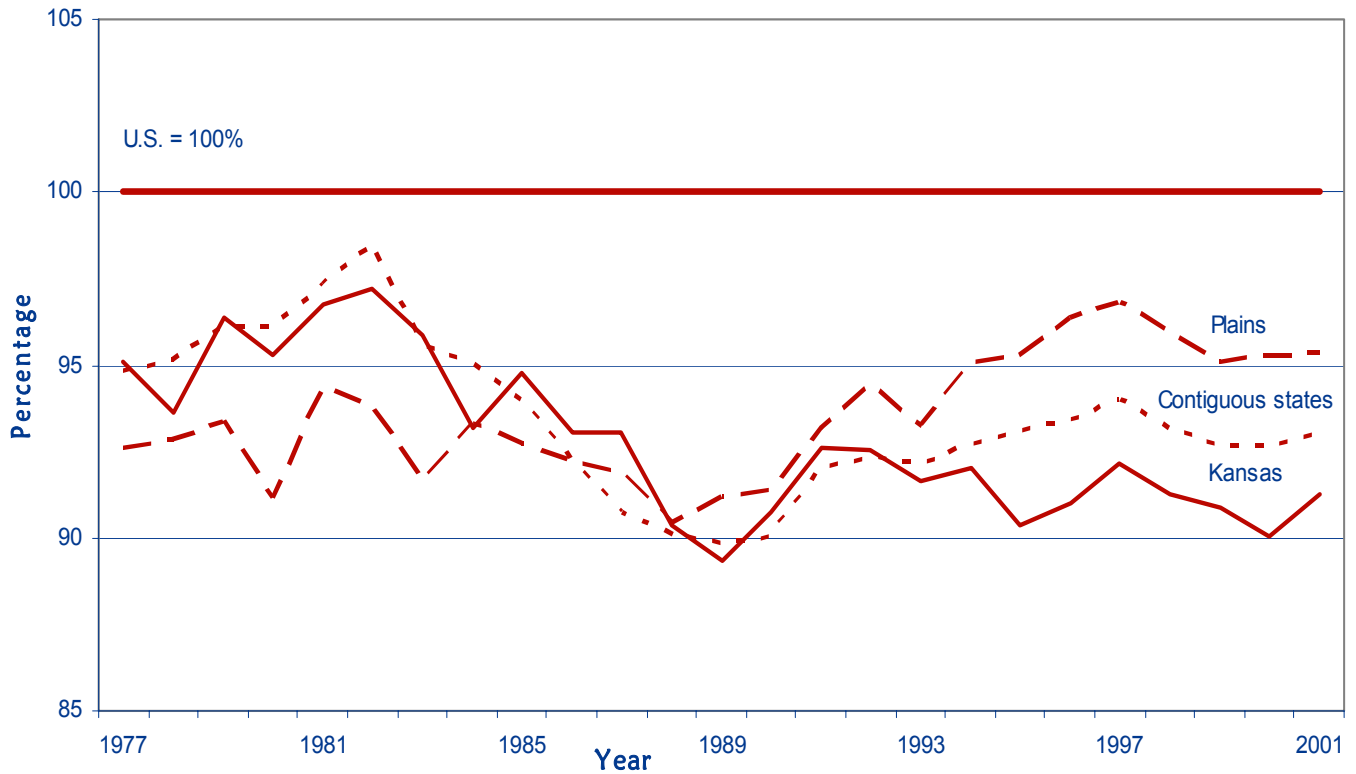
**Figure 1:
Small Differences in Economic Growth Rates Make a Big Difference Over Time**



Source: Authors' calculations based on data from the Bureau of Economic Analysis

- Plot shows actual vs. hypothetical growth of inflation-adjusted gross state product from 1977-2001 (the latest figures available). Gross state product, calculated by the U.S. Bureau of Economic Analysis, represents a measure of the value of the final goods and services produced in a state.
- The hypothetical growth curve reflects what Kansas gross state product would have been if the Kansas economy had grown at the national average (3.06%) rather than the actual rate of 2.42 percent.
- By 2001, the dollar value of the gap between actual and hypothetical production equals \$4,826 per person.

**Figure 2:
Kansas Per Capita Output is Falling Relative to Her Neighbors and to the Nation**

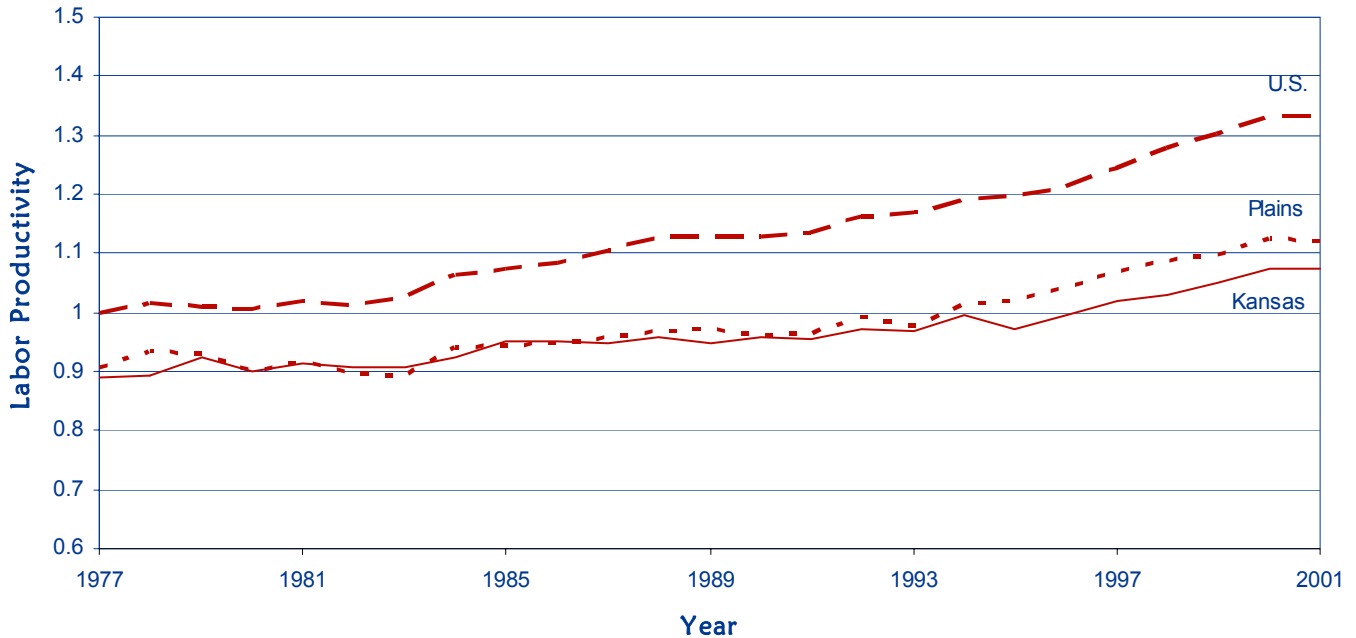


Source: Authors' calculations based on data from the Bureau of Economic Analysis

- The plot shows per capita gross state product for Kansas and the Kansas region as a percentage of the average per capita gross state product for the U.S. as a whole. A value of 100 means that per capita gross state product equals the national average.
- Per capita gross state product in Kansas is below the national average and below the average for the region.
- Kansas has slipped farther behind over time. In 1977, per capita GSP in Kansas was 5 percent below the national average. By 2001, Kansas per capita GSP had fallen to 8 percent below the national average. Meanwhile, other states in the region have been gaining ground relative to the nation.
- Gross state product is composed of income from all sources: that going to labor through wages and salaries, to proprietors or corporations through profits, and to the government through indirect business taxes.

Note: The Plains states include Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.

**Figure 3:
Kansas Productivity Growth Lags the Nation and the Region
(U.S. Average in 1977 = 1)**



Source: Authors' calculations based on data from the Bureau of Economic Analysis

- The graph shows the time paths of gross state product per worker for Kansas, the region and the nation as a whole. All values are corrected for inflation and normalized so that the U.S. average equals 1 in 1977. Both the Plains and Kansas levels of labor productivity in 1977 were about 10 percent below the U.S. average. By 2001, U.S. labor productivity was 33 percent higher than the 1977 U.S. average, whereas labor productivity in Kansas was just 7 percent above the 1977 U.S. average.
- Over the 1977-2001 period, Kansas labor productivity grew 21 percent, compared to 33 percent for the U.S. and 24 percent for the Plains states as a whole.
- In the first half of the 1990s when labor productivity was accelerating in the U.S. as a whole, it was stagnating in Kansas.

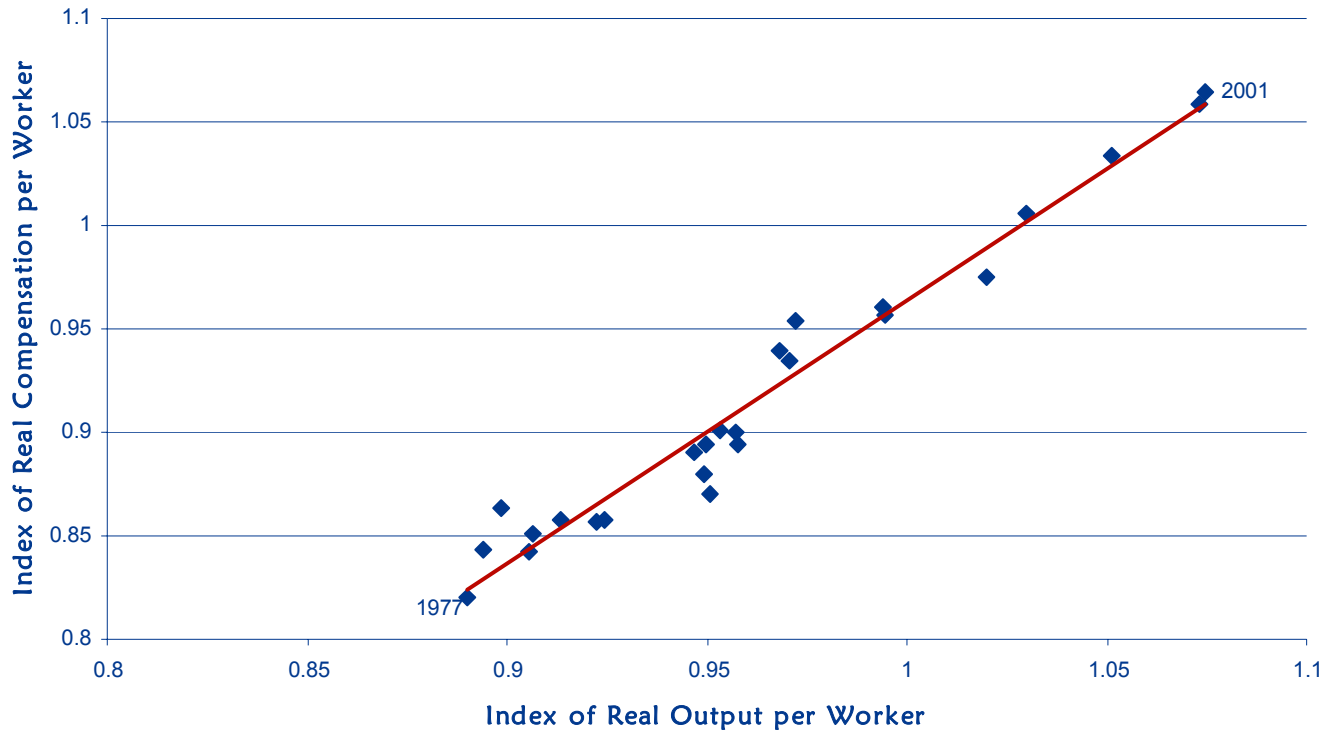
**Table 1:
Kansas Labor Productivity Growth Lags the U.S. in Most Sectors**

| Industry | <u>Employment shares, 2001</u> | | <u>Kansas growth in output per worker relative to the U.S.</u> | | |
|--|---------------------------------------|-------------|---|------------------|------------------|
| | Kansas | U.S. | 1977-2001 | 1980-1990 | 1990-2001 |
| Total Gross State Product | 1 | 1 | -0.125 | -0.058 | -0.057 |
| Private Industry | | | | | |
| <u>Agriculture, forestry, and fishing</u> | 0.057 | 0.031 | -0.197 | -0.065 | -0.149 |
| <u>Construction</u> | 0.052 | 0.058 | -0.01 | -0.11 | 0.06 |
| <u>Manufacturing</u> | 0.118 | 0.109 | -0.11 | -0.04 | -0.09 |
| Durable goods | 0.071 | 0.066 | 0 | -0.03 | -0.01 |
| Nondurable goods | 0.047 | 0.044 | -0.29 | -0.09 | -0.2 |
| <u>Transportation and public utilities</u> | 0.058 | 0.05 | 0.14 | 0.17 | -0.05 |
| <u>Wholesale trade</u> | 0.044 | 0.044 | -0.05 | -0.07 | 0.02 |
| <u>Retail trade</u> | 0.164 | 0.163 | -0.03 | -0.04 | -0.01 |
| <u>Finance, insurance, and real estate</u> | 0.066 | 0.079 | -0.2 | -0.17 | -0.09 |
| <u>Services</u> | 0.272 | 0.322 | -0.07 | -0.13 | -0.01 |
| Government | 0.158 | 0.139 | -0.05 | -0.04 | -0.01 |
| <u>State and local</u> | 0.129 | 0.11 | -0.06 | -0.07 | 0.01 |

Source: Authors' calculations based on Bureau of Economic Analysis data

- The productivity gap is not due to a different mix of industries in Kansas relative to the U.S. Kansas' share of employment by broad industry classification is similar to that of the U.S. as a whole.
- The productivity gap is not due to weakness in one or two sectors. Over the 1977-2001 period, Kansas lags the U.S. average labor productivity growth in every sector except transportation and utilities and durable manufacturing. Whatever the source of the lagging productivity growth in Kansas, it appears to be pervasive across most sectors of the Kansas economy.
- The productivity gap is not a temporary phenomenon. For most sectors, productivity lags in the 1980s and again in the 1990s, so the productivity lag is not due to temporary problems related to recession.

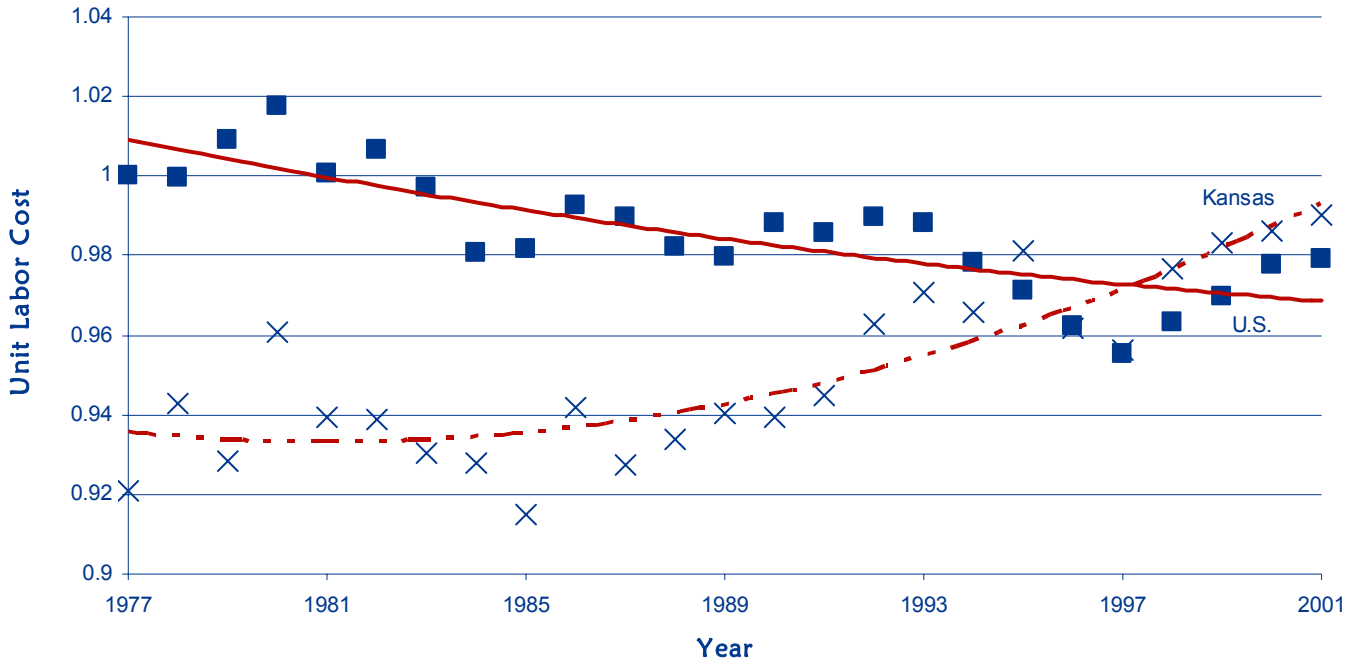
**Figure 4:
Labor Productivity Explains People's Compensation**



Source: Authors' calculations based on data from the Bureau of Economic Analysis

- Economists have long noted the relationship between labor productivity and wages, both in theory and in empirical data. As labor productivity has increased in Kansas, so have wages. This can be seen in Figure 4. The slope of the trend line is greater than one, implying that compensation is rising faster than productivity. In Kansas, compensation has risen \$0.75 for every \$1.00 increase in labor productivity. For the U.S. as a whole, compensation has been rising only \$0.51 for every dollar increase in productivity. In other words, Kansas labor has been getting more of the return from rising labor productivity over the past 25 years than have workers in other states. As a consequence, Kansas firms have less retained to fund new investments or growth, and profitability of operating in Kansas relative to other states has been slowly but steadily declining. Ultimately, this threatens the future profitability (and viability) of firms operating in Kansas.
- The horizontal axis of the chart measures output per worker in Kansas correcting for inflation. All figures are normalized so that average labor productivity in the U.S. in 1977 = 1. Over the period, labor productivity in Kansas rose 21 percent.
- The vertical axis measures compensation per worker in Kansas correcting for inflation. All values are normalized so that average compensation in the U.S. in 1977 = 1. Average real compensation in Kansas rose 30 percent over the period or 9 percentage points faster than did labor productivity.

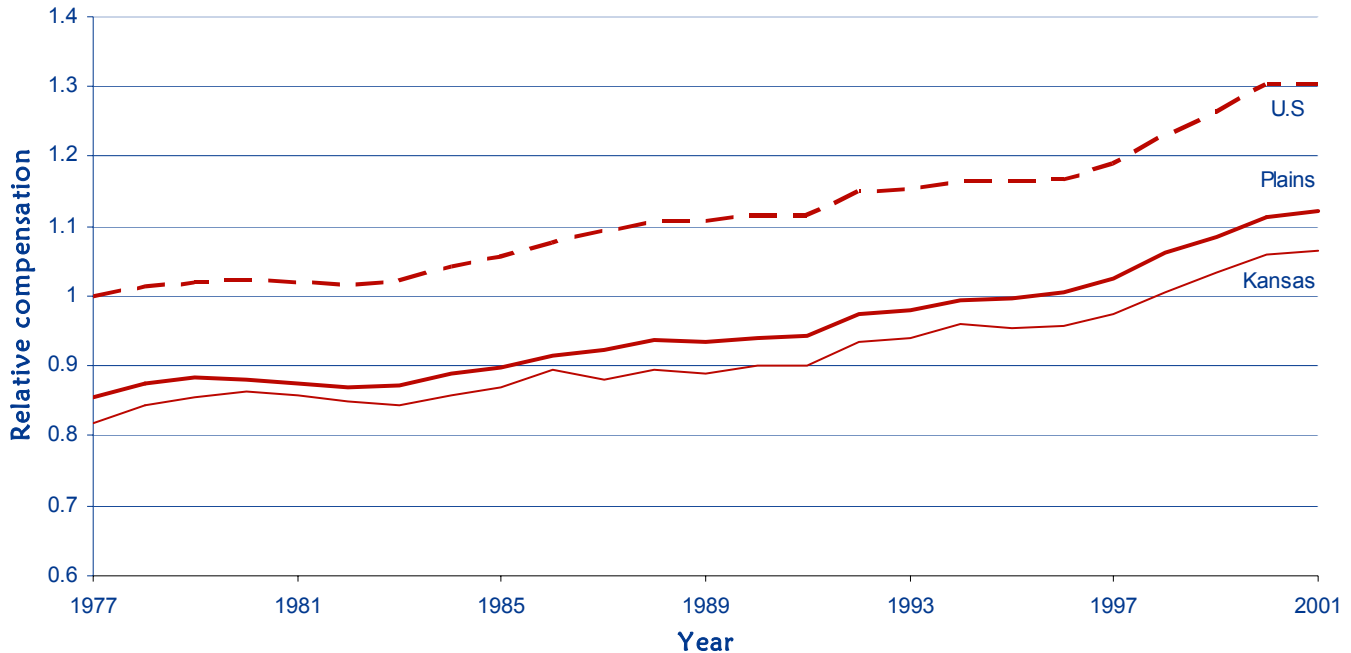
**Figure 5:
Kansas Has Lost Its Cost Advantage
(U.S. Average in 1977=1)**



Source: Authors' calculations based on data from the Bureau of Economic Analysis

- Unit labor cost, the ratio of compensation per worker relative to output per worker, is a measure of the average labor cost per dollar of production. Because compensation has risen more rapidly than labor productivity, unit labor costs in Kansas have risen. In 1977, Kansas had a significant advantage relative to average unit labor costs in the United States. By 2001, that advantage was gone, both because labor costs are rising in Kansas and because labor costs are falling elsewhere in the United States.
- Figure 5 shows the time path of unit labor cost in Kansas and in the United States. All values are relative to the 1977 average unit labor cost for the U.S. as a whole. The time path shows that unit labor cost in Kansas was about 8 percent less than the U.S. average in 1977. By 2001, unit labor cost in Kansas was about 1 percent more than the U.S. average. For the U.S. as a whole, labor productivity has grown faster than compensation, and so unit labor cost has decreased slightly relative to 1977. For Kansas, the opposite has happened.
- After two decades of slow increases in unit labor cost for Kansas and slow declines for the U.S. as a whole, Kansas finally lost her unit labor cost advantage in 1998. The lowest unit labor costs in the U.S. are in the South and Mountain West.

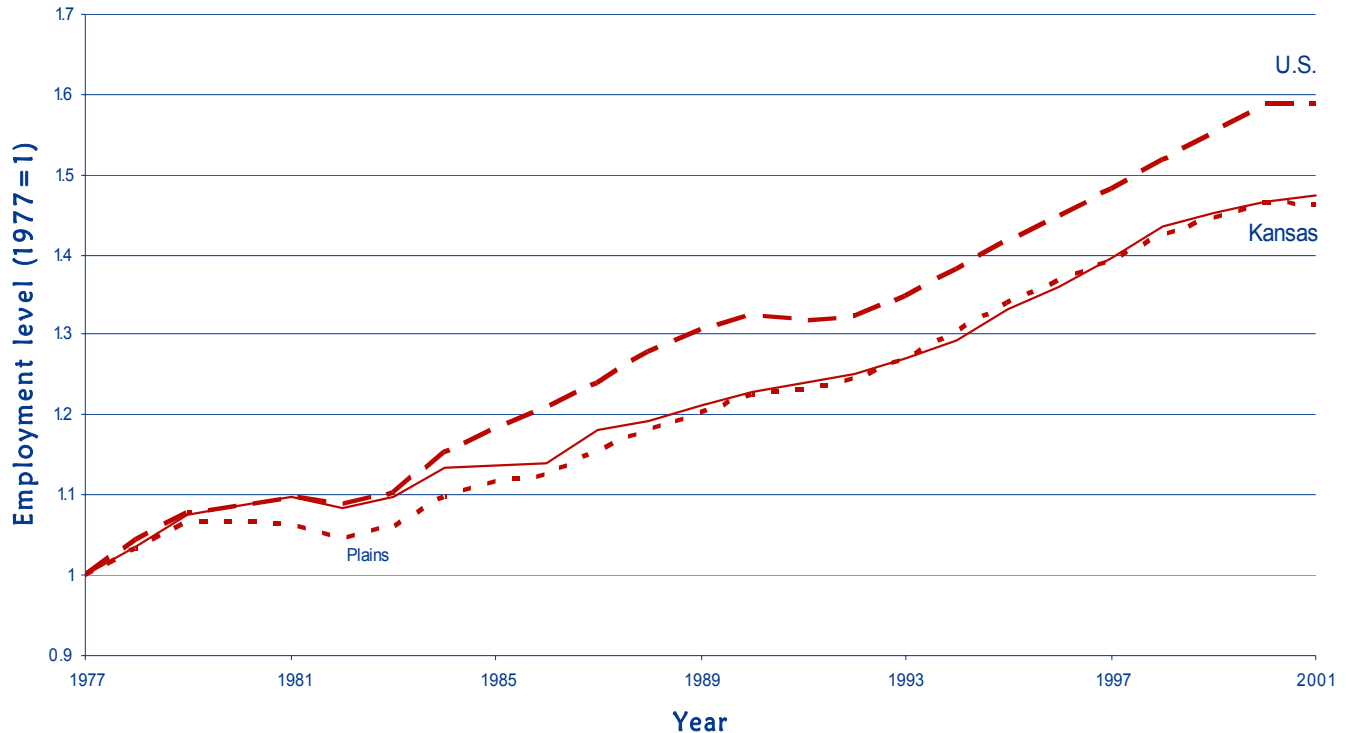
**Figure 6:
Compensation Lags the Nation and the Region
(U.S. Average Real Compensation in 1977 = 1)**



Source: Authors' calculations based on data from the Bureau of Economic Analysis

- Inflation-adjusted average compensation in Kansas lagged her Plains states neighbors by 5 percent and the nation by 18 percent for the 1977-2001 period.
- Inflation-adjusted average compensation in Kansas grew 29 percent over the period compared to 30 percent for the U.S. and 31 percent for the Plains states.
- Some of the 18 percent compensation gap relative to the U.S. average is due to Kansas' relatively low population density. Pay in Kansas is roughly in line with the average in states with similar proportions of rural populations (see Figure 13). High population density may raise productivity because of better access to customers, better proximity to suppliers, and better information networks.
- While compensation in Kansas lags the U.S. average by 18 percent, per capita income in Kansas only lags the national average by 5 percent. As is true of the Midwest generally, Kansas has an atypically high proportion of two earner households. Some of the disadvantage of low pay per job is made up by more jobs per household.

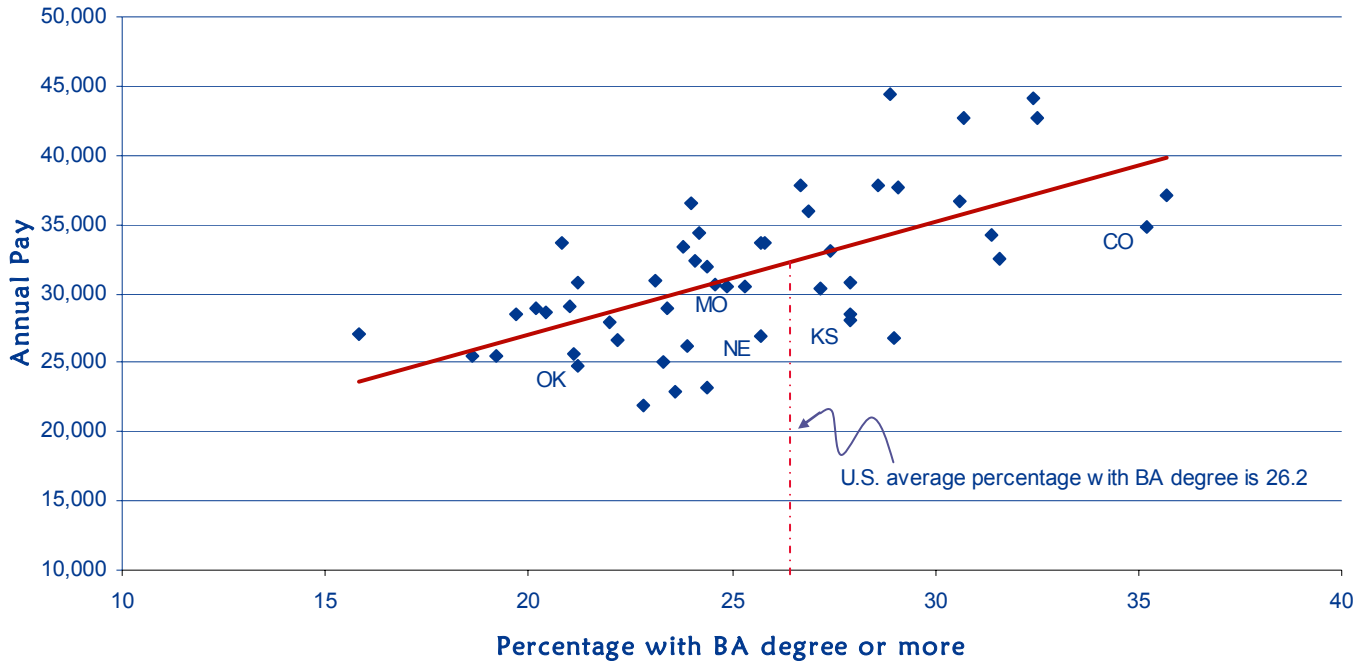
**Figure 7:
Employment Growth in Kansas Lags the U.S. but Tracks the Region**



Source: Authors' calculations based on data from the Bureau of Economic Analysis

- Other than a brief period in the early 1980s, employment growth in Kansas has mimicked that of the Plains states as a whole.
- Employment growth in the U.S. has outpaced that of the Plains states, particularly in the period following the 1982 recession when a weak farm economy slowed the recovery in the Midwest.
- Since 1977, employment in Kansas and in the Plains region has grown 47 percent compared to 59 percent for the U.S. as a whole. The relatively slow employment growth in Kansas over the past 25 years can be blamed on two periods. The Midwest recovered more slowly from the 1982 recession and it did not expand at the U.S. average in the latter half of the 1990s.
- All employment series in Figure 7 are divided by their levels in 1977. In Kansas, the 2001 value of 1.47 means that employment in Kansas was 47 percent higher than the level in 1977. The 2001 value of 1.59 for the U.S. means that employment in the U.S. was 59 percent higher than the U.S. employment level in 1977.

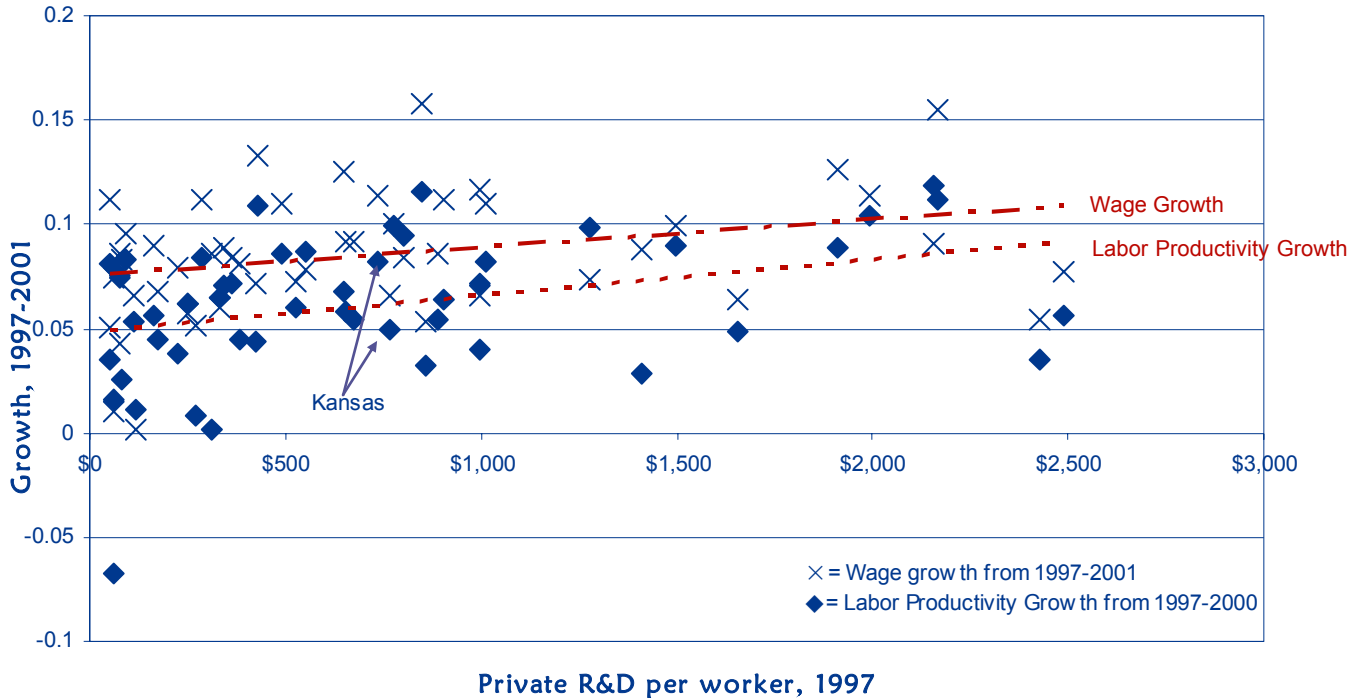
**Figure 8:
Education in Kansas Does Not Solve the Productivity Puzzle**



Source: Authors' calculations based on data from the U.S. Census Bureau and the Bureau of Economic Analysis

- Kansas is experiencing slow growth despite having a well-educated labor force. Kansas has an atypically high proportion of the population (31%) with a college degree compared to the U.S. average of 26.2 percent.
- As of 2002, Kansas had the 10th highest proportion of workers holding at least a Bachelor's degree.
- Average compensation in Kansas is atypically low for a state with its level of education. If Kansas workers were paid at the U.S. average, compensation would be over \$5,000 more per year. However, because labor productivity is also not in line with Kansas' level of education, compensation falls well below average.
- Figure 8 shows the plot of average compensation by state against the proportion of the population with at least a bachelor's degree. The best fitting line through the plot is also shown. The line can be interpreted as the average compensation level associated with each level of education. States that are above the line are paying more than average for the level of education of their populations while those below the line are paying less than average. With the exception of Missouri, Plains states tend to pay below average.

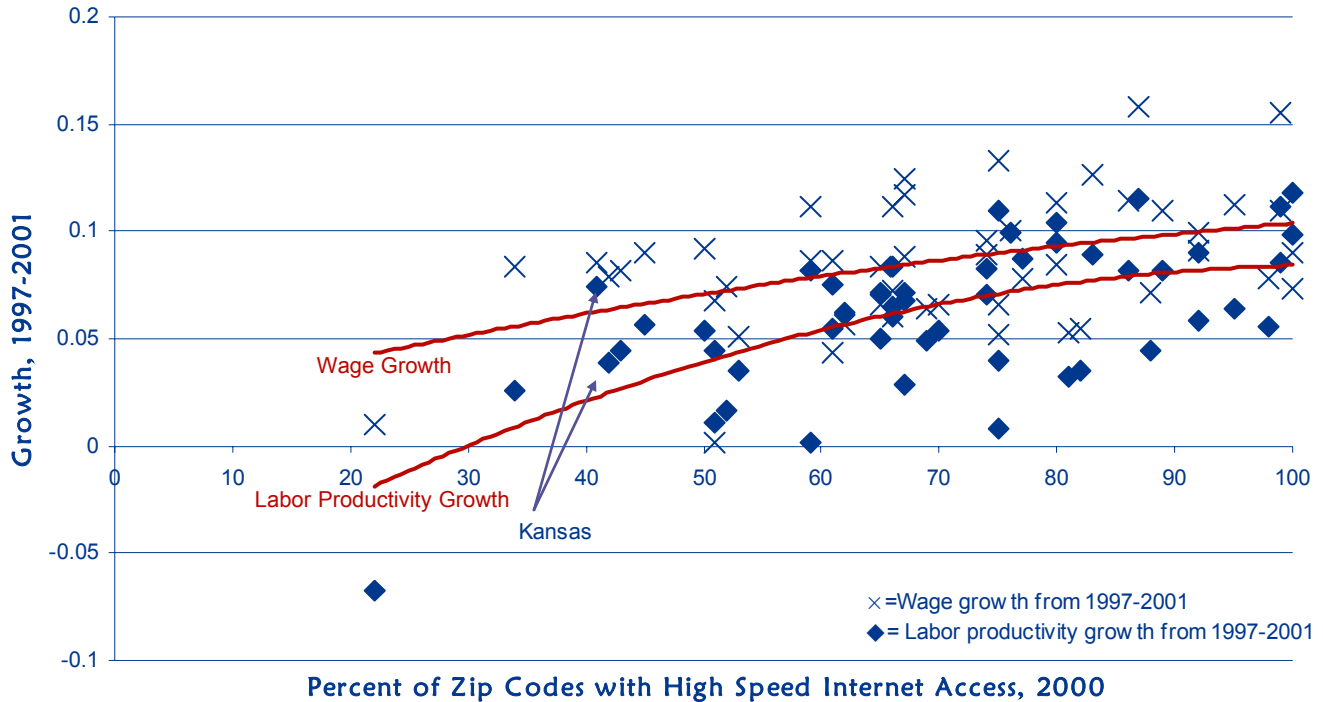
**Figure 9:
Private R&D Investment in Kansas Does Not Solve the Productivity Puzzle**



Source: Authors' calculations based on data from the NSF and the Bureau of Economic Analysis

- On average, as companies invest more in Research and Development (R&D) per worker, labor productivity and wages rise more rapidly. Kansas ranks 22nd in Private R&D per worker, and so Kansas does not have an atypically low level of R&D per worker. In fact, wage and productivity growth in Kansas are right in line with the level in R&D investment in the state.
- Figure 9 plots Private R&D expenditures per worker in 1997 on the horizontal axis against subsequent wage and labor productivity growth between 1997 and 2001 in the state. The best fitting line for each set of plots is also shown.
- The plotted labor productivity growth line shows that as R&D investment varies from a low of \$51 per worker in Mississippi to a high of \$2,490 per worker in New Jersey, labor productivity growth is expected to rise from 5 to 9 percent over a 4 year period. The relationship is not exact. States below the line are getting less productivity growth than average from the investment while those above the line are getting more growth. Kansas labor productivity growth is average for its level of R&D.
- The plotted wage growth line shows that as R&D investment rises, expected wage growth varies from 8 to 11 percent over a 4 year period. States below the line are getting less wage growth than average from the investment while those above the line are getting more growth. Wage growth in Kansas is average for its level of R&D.

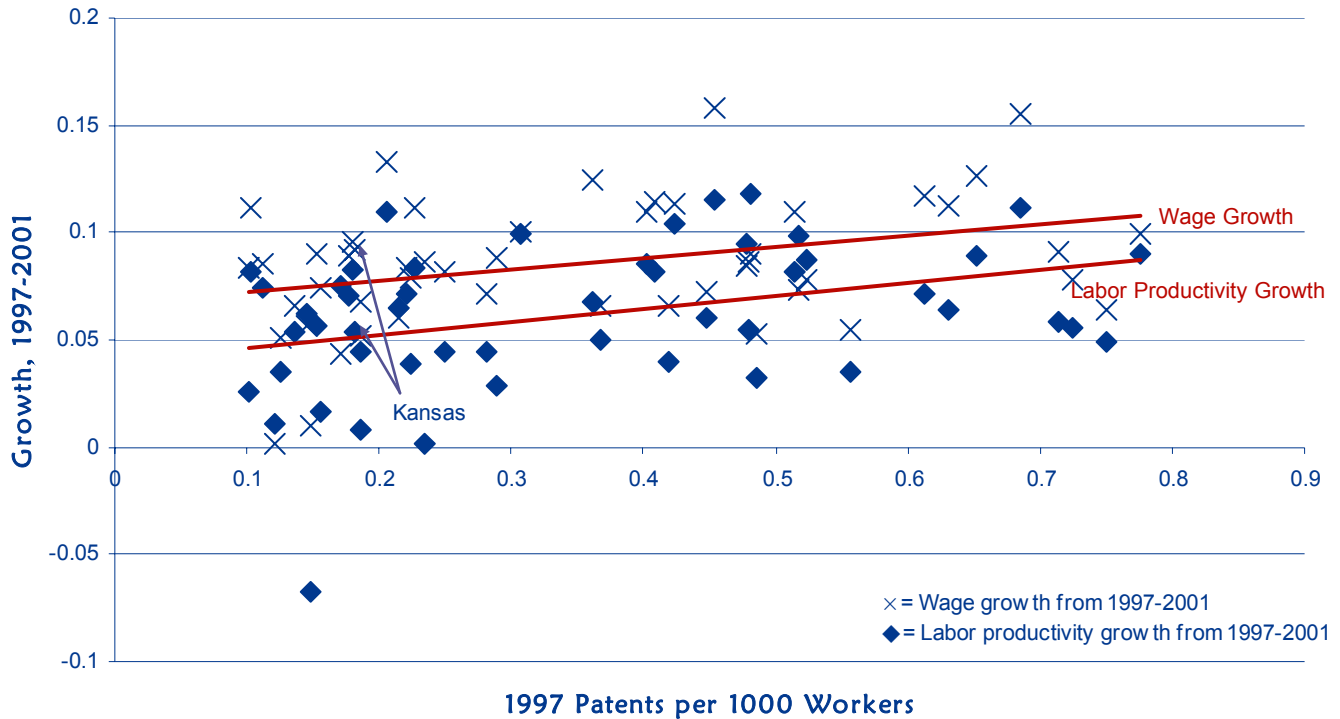
**Figure 10:
Telecommunications Infrastructure in Kansas
May Provide a Clue to the Productivity Puzzle**



Source: Authors' calculations based on data from the FCC and the Bureau of Economic Analysis

- As of 2000, Kansas ranked 44th in High-speed Internet access among the states, as measured by the proportion of zip codes with at least one provider of DSL or cable Internet service. While satellite access may be sufficient for recreational use for the Internet, firms require the reliability and uplink speed that have been only available through the use of DSL or cable. It is conceivable that Kansas was relatively slow in providing the infrastructure for firms to take advantage of new information technologies. Improvements in information technologies have been credited for at least part of the surge in labor productivity growth in the 1990s, so slow access to broadband service may have hindered full utilization of Kansas' educated workforce.
- The percent of zip codes with broadband Internet service (either DSL, cable, or both) is reported on the horizontal axis, while growth rates are on the vertical axis. The plotted lines show the best fitting relationships between High-speed access and, respectively, productivity growth and wage growth over the 1997-2001 period.
- The plotted productivity growth line shows that as High-speed access rises from a low of 22 percent in Alaska to a high of 100 percent in Rhode Island and Delaware, expected labor productivity grows from 0 to 8 percent over the 4 year period. Labor productivity growth in Kansas is roughly in line with the expected level given her broadband infrastructure.
- The plotted wage growth line shows that as High-speed access rises, expected wage growth rises from 4 to 10 percent. Wage growth in Kansas is above what would have been expected on the basis of broadband access in the state.
- Poor Internet access could be responsible for up to 2 percent slower growth in labor productivity per year.

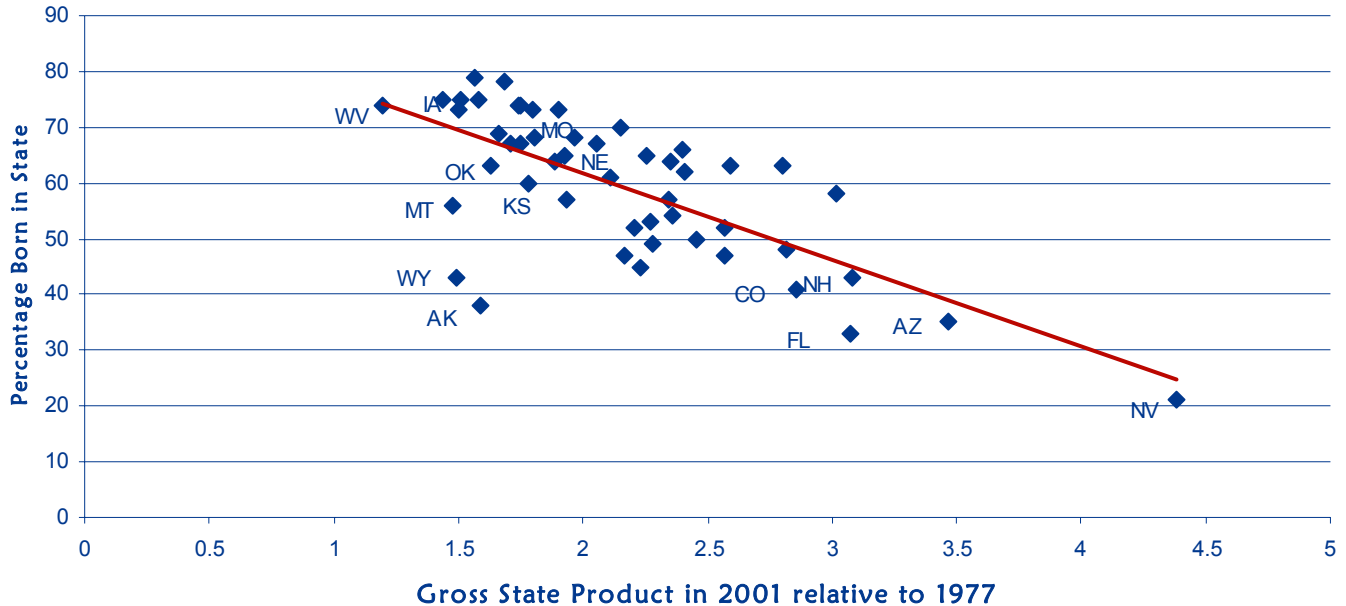
Figure 11:
Kansas Ranks Low on Patenting Activity



Source: Authors' calculations based on data from the U.S. Patent Office and the Bureau of Economic Analysis

- Despite having average levels of R&D per worker, Kansas has a relatively low level of patents originating in the state. There is a positive but inexact relationship between patents issued per worker and subsequent growth in wages and labor productivity. Kansas relatively low labor productivity growth is consistent with her rank of 35th in patents issued per worker.
- The horizontal axis reports the number of patents issued in 1997 by state divided by the number of employees in the state. Patents are often used as a measure of innovative activity.
- The plotted labor productivity growth line shows that as patents issued per worker rises, labor productivity growth rises from 5 to 9 percent over a four year period.
- The plotted wage growth line shows that as patents issued per worker rises, wage growth rises from 7 to 11 percent over a four year period.
- Patents could explain up to 1 percent slower growth in labor productivity per year.

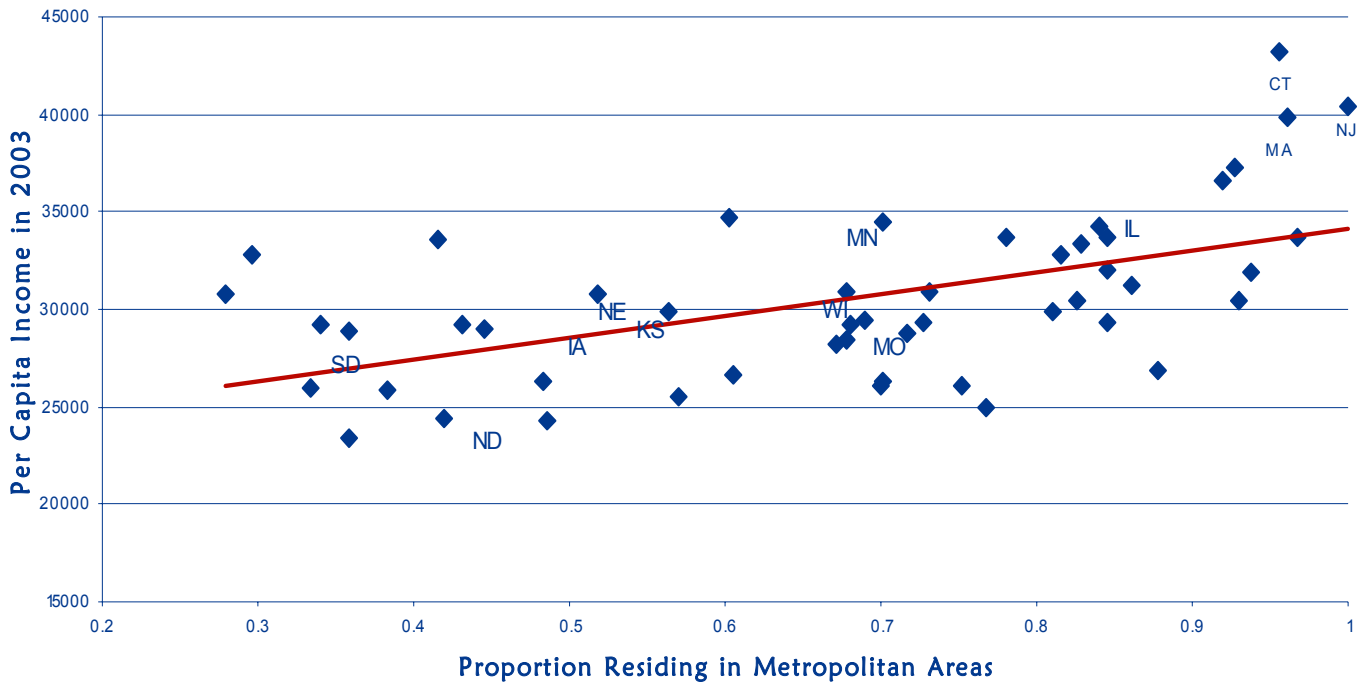
**Figure 12:
People Migrate to the Locations of Economic Opportunity**



Source: Authors' calculations based on data from the U.S. Census Bureau and the Bureau of Economic Analysis

- As output growth increases, states attract workers from other states. This can be demonstrated by the fact that, over time, the fastest growing states have smaller and smaller shares of their populations that are born in the state. The slowest growing states attract few workers from other states. The fastest growing states (Nevada, Colorado, Arizona, New Hampshire) attracted in-migration while the slowest growing (West Virginia, Iowa) experienced outmigration.
- Among the western states that were relatively underpopulated at the turn of the last century, the slowest growing (Montana, Wyoming) attracted the fewest immigrants compared to the fastest growing (Nevada, Arizona).
- Kansas, ranked 34th in overall growth over the period, has a percentage born in state that is equal to the national average of 60 percent.
- The horizontal axis reports the ratio of Gross State Product (a measure of the value of all production in the state, controlling for inflation) in 2001 relative to 1977. The values range from a low of 1.19 in West Virginia to a high of 4.38 in Nevada. That means that, correcting for inflation, West Virginia was only producing 19 percent more in 2001 than they were in 1977, whereas Nevada was producing 338 percent more than it produced in 1977. The trend line is the best fitting relationship between state output growth and the percentage of residents born in the state. States above the line have attracted fewer non-natives than expected, while those below the line have attracted more non-natives than expected. Kansas has attracted relatively more non-native born than would be expected from her output growth.

**Figure 13:
Income Levels in Kansas are Consistent with its Rural/Urban Mix**



Source: Authors' calculations based on data from the U.S. Census Bureau

- There is an upward trend in state average compensation levels as states become more metropolitan. Compensation in Kansas is roughly in line with its population density. Kansas has the 15th most rural population in the nation.
- In the U.S. as a whole, per capita incomes average \$38,423 in metropolitan areas and \$30,251 in nonmetropolitan areas. In Kansas, the averages are \$35,257 and \$25,092, respectively.

**Table 2:
2002 Population and Per Capita Income in Midwestern Cities
Relative to Comparable Cities in the U.S.**

| City | Population | <u>2002 Per capita Income</u> | | Rank ² | Percent of Predicted ³ |
|--------------------------------|------------|-------------------------------|------------------------|-------------------|-----------------------------------|
| | | Actual | Predicted ¹ | | |
| Boulder-Longmont, CO..... | 269,814 | 44,037 | 30,754 | 15 | 143% |
| Columbia, MO..... | 145,666 | 29,135 | 28,957 | 220 | 101% |
| Denver, CO..... | 2,179,240 | 42,133 | 37,718 | 21 | 112% |
| Fort Collins-Loveland, CO..... | 251,494 | 34,215 | 30,544 | 89 | 112% |
| Fort Smith, AR-OK..... | 273,170 | 27,075 | 30,791 | 278 | 88% |
| Greeley, CO..... | 180,926 | 31,104 | 29,577 | 164 | 105% |
| Joplin, MO..... | 157,322 | 26,594 | 29,175 | 288 | 91% |
| Kansas City, MO-KS..... | 1,836,038 | 36,731 | 37,091 | 49 | 99% |
| Lawrence, KS..... | 99,962 | 26,621 | 27,911 | 286 | 95% |
| Lawton, OK..... | 114,996 | 25,392 | 28,296 | 307 | 90% |
| Lincoln, NE..... | 266,787 | 30,614 | 30,720 | 177 | 100% |
| Oklahoma City, OK..... | 1,095,421 | 29,850 | 35,266 | 200 | 85% |
| Omaha, NE-IA..... | 767,041 | 33,107 | 34,059 | 110 | 97% |
| Pueblo, CO..... | 141,472 | 27,763 | 28,874 | 264 | 96% |
| St. Joseph, MO..... | 122,336 | 28,507 | 28,467 | 244 | 100% |
| St. Louis, MO-IL..... | 2,698,687 | 36,712 | 38,514 | 50 | 95% |
| Springfield, MO..... | 368,374 | 27,987 | 31,704 | 262 | 88% |
| Tulsa, OK..... | 859,532 | 32,241 | 34,440 | 134 | 94% |
| Wichita, KS..... | 571,166 | 33,429 | 33,092 | 104 | 101% |
| U.S. Metro Average..... | 763,304 | 38,423 | | | |

¹ Predicted income based on comparison with incomes at similarly sized cities

² Rank is of 320 Standard Metropolitan Statistical Areas in the United States

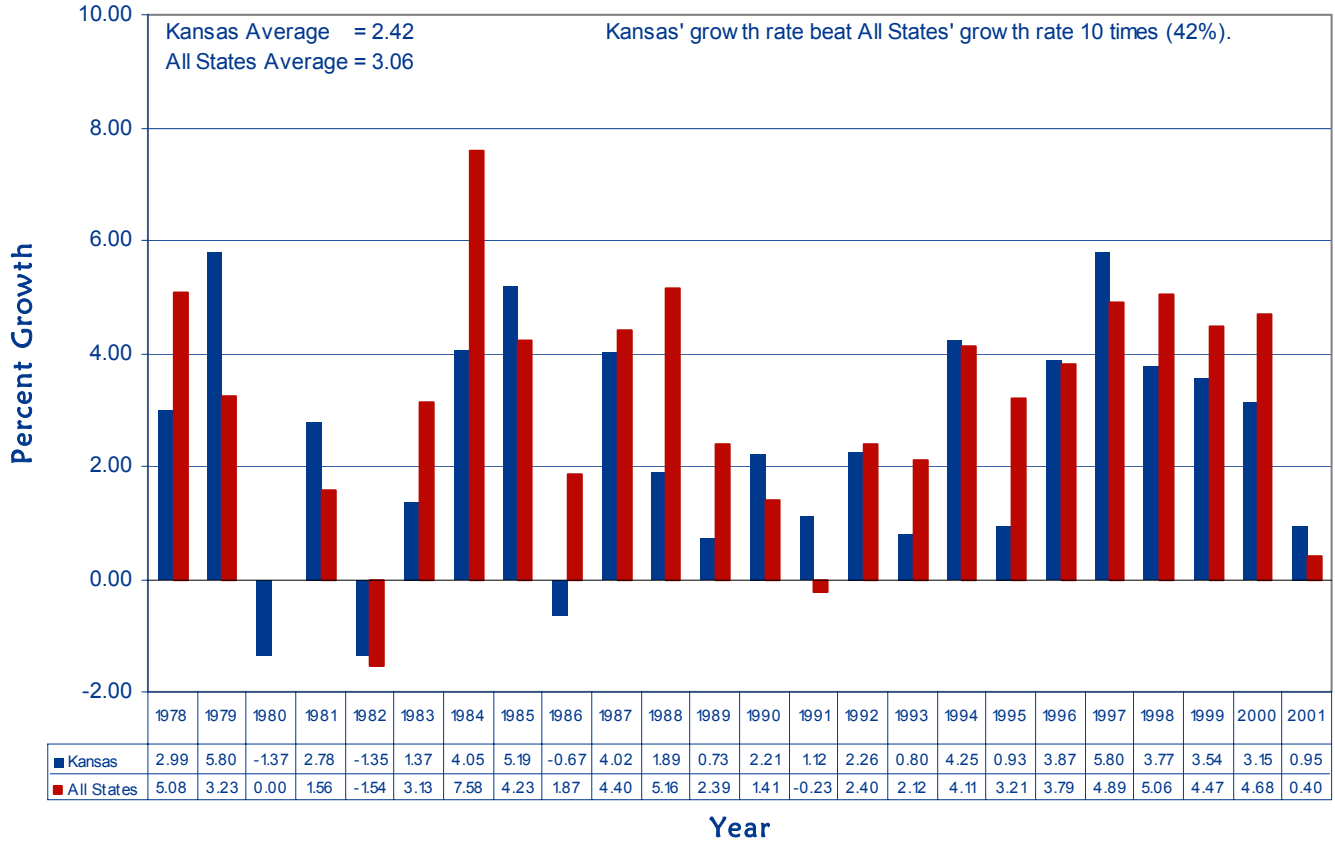
³ Actual income as a percentage of the predicted

Source: U.S. Census Bureau and authors' calculations

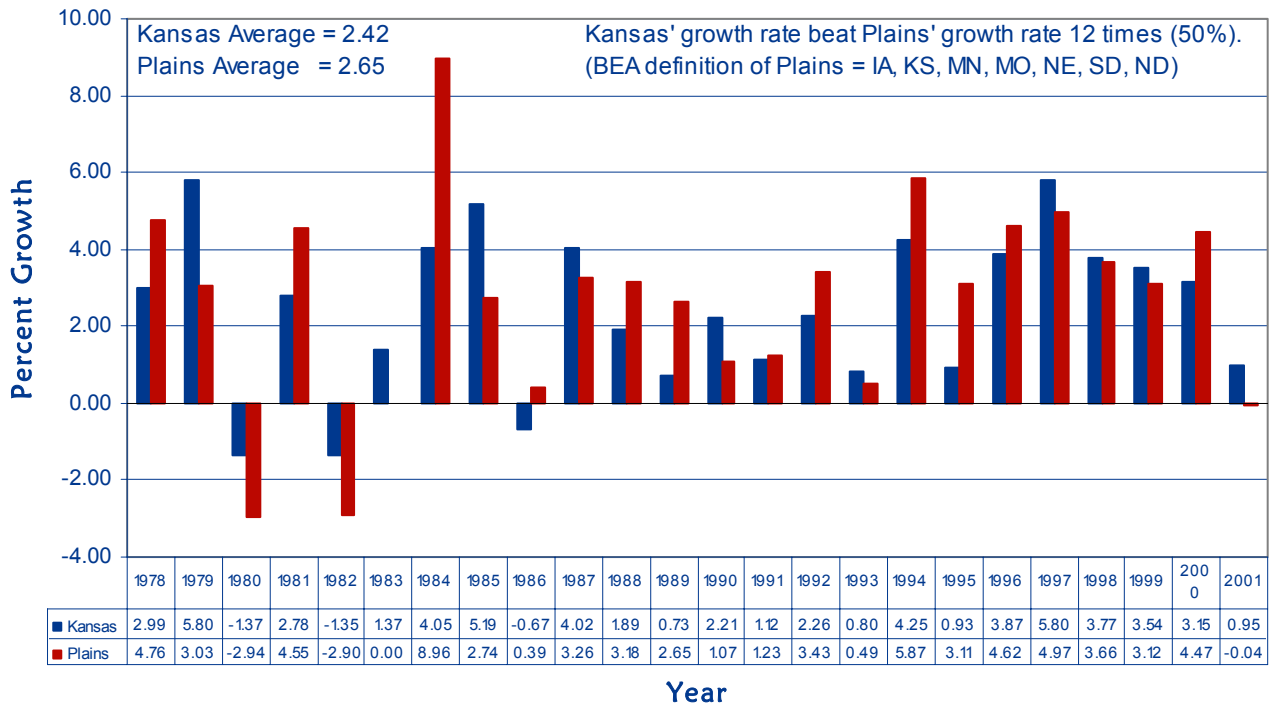
- Income levels in Kansas cities are consistent with population levels.
- A similar argument can be made with respect to cities. As shown in Table 2, average incomes in Kansas' 3 metropolitan areas are in line with cities of comparable size.

APPENDIX

Appendix 1: Year-Over-Year Growth of Inflation-Adjusted Gross State Product Kansas vs. All States



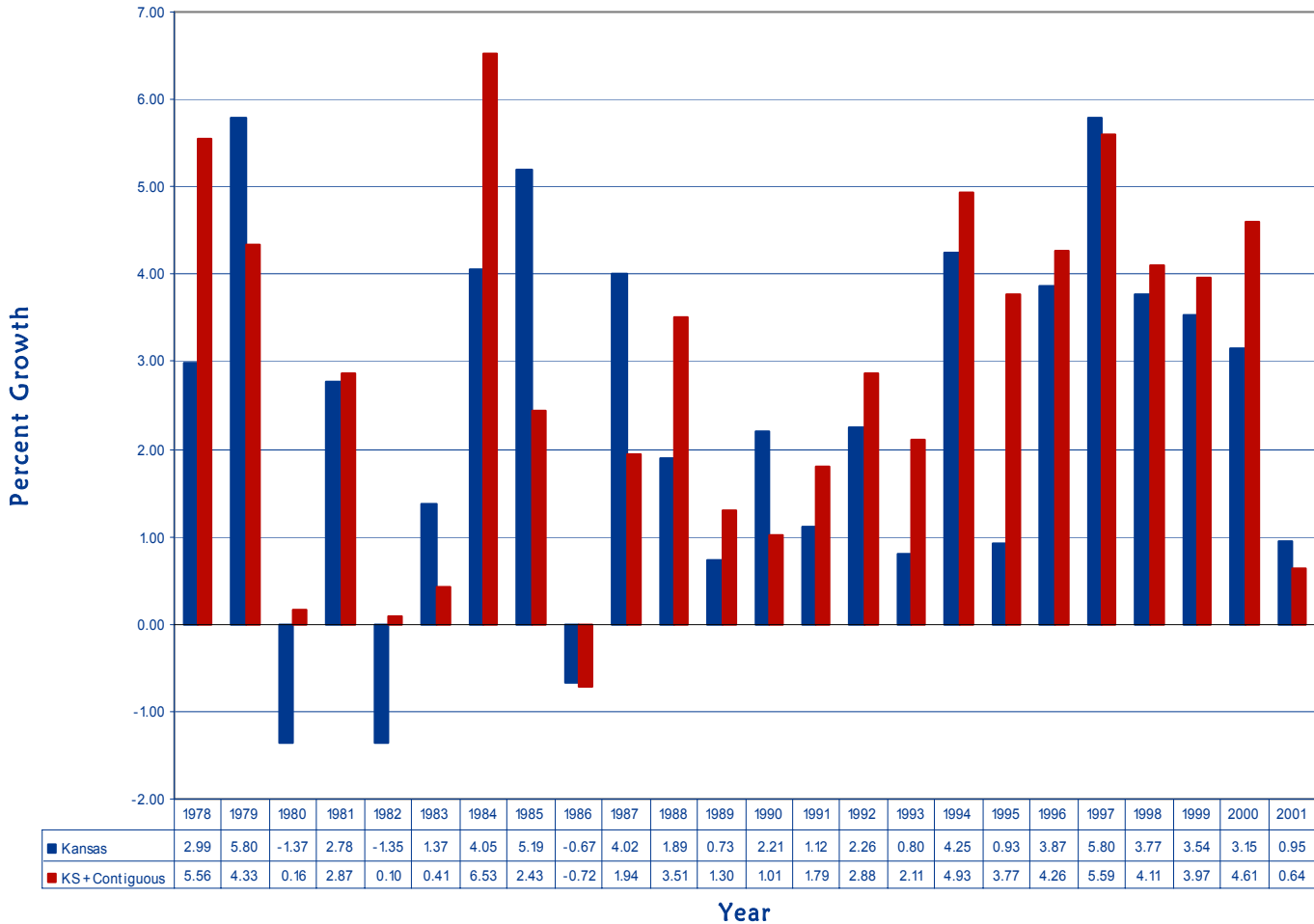
Appendix 2: Year-Over-Year Growth of Inflation-Adjusted Gross State Product Kansas vs. Plains States



Appendix 3: Year-Over-Year Growth of Inflation-Adjusted Gross State Product Kansas vs. Contiguous States

Kansas Average = 2.48
KS + Contiguous Average = 2.92

Kansas' growth rate beat KS + Contiguous growth rate 7 times (29%).



Appendix 4: Ranks of Average Growth Rates Among States (Including D.C.)

| State | 1977-2001 | | 1980-2000 | | 1990-2000 | |
|----------------------|-----------|------|-----------|------|-----------|------|
| | Avg. Rate | Rank | Avg. Rate | Rank | Avg. Rate | Rank |
| Alabama | 2.69 | 30 | 2.83 | 33 | 3.05 | 32 |
| Alaska | 1.88 | 46 | 0.89 | 51 | -1.09 | 51 |
| Arizona | 5.41 | 2 | 5.24 | 3 | 6.56 | 1 |
| Arkansas | 2.89 | 26 | 3.14 | 27 | 3.81 | 16 |
| California | 3.75 | 14 | 3.87 | 14 | 3.15 | 28 |
| Colorado | 4.29 | 6 | 4.17 | 8 | 6.18 | 5 |
| Connecticut | 3.38 | 22 | 3.50 | 22 | 2.66 | 40 |
| Delaware | 3.78 | 11 | 3.99 | 11 | 2.96 | 33 |
| District of Columbia | 1.17 | 51 | 1.05 | 50 | 0.64 | 49 |
| Florida | 4.46 | 5 | 4.17 | 9 | 3.75 | 17 |
| Georgia | 4.67 | 4 | 5.04 | 4 | 5.26 | 9 |

Appendix 4 Continued

| State | 1977-2001 | | 1980-2000 | | 1990-2000 | |
|----------------|-------------|-----------|-------------|-----------|-------------|-----------|
| | Avg. Rate | Rank | Avg. Rate | Rank | Avg. Rate | Rank |
| Hawaii | 2.13 | 40 | 1.95 | 44 | 0.20 | 50 |
| Idaho | 4.00 | 8 | 4.26 | 7 | 6.41 | 3 |
| Illinois | 2.34 | 38 | 2.73 | 35 | 3.36 | 23 |
| Indiana | 2.46 | 36 | 3.03 | 29 | 3.66 | 19 |
| Iowa | 2.13 | 39 | 2.29 | 42 | 3.29 | 26 |
| Kansas | 2.42 | 37 | 2.48 | 40 | 2.95 | 34 |
| Kentucky | 2.58 | 32 | 2.91 | 31 | 3.53 | 21 |
| Louisiana | 1.35 | 49 | 1.20 | 48 | 1.62 | 48 |
| Maine | 2.81 | 29 | 2.93 | 30 | 1.98 | 47 |
| Maryland | 3.06 | 25 | 3.21 | 25 | 2.24 | 44 |
| Massachusetts | 3.66 | 17 | 3.88 | 13 | 3.65 | 20 |
| Michigan | 1.78 | 47 | 2.60 | 38 | 3.17 | 27 |
| Minnesota | 3.48 | 21 | 3.69 | 18 | 4.27 | 12 |
| Mississippi | 2.47 | 35 | 2.78 | 34 | 3.34 | 24 |
| Missouri | 2.48 | 34 | 2.71 | 36 | 3.12 | 30 |
| Montana | 1.64 | 48 | 1.53 | 46 | 2.86 | 36 |
| Nebraska | 2.67 | 31 | 2.87 | 32 | 3.32 | 25 |
| Nevada | 5.70 | 1 | 5.64 | 1 | 6.29 | 4 |
| New Hampshire | 5.20 | 3 | 5.36 | 2 | 5.41 | 8 |
| New Jersey | 3.29 | 23 | 3.49 | 23 | 2.77 | 38 |
| New Mexico | 3.69 | 15 | 3.72 | 15 | 6.00 | 6 |
| New York | 2.52 | 33 | 2.66 | 37 | 2.49 | 43 |
| North Carolina | 3.77 | 13 | 4.11 | 10 | 4.40 | 11 |
| North Dakota | 2.06 | 43 | 1.97 | 43 | 3.09 | 31 |
| Ohio | 2.10 | 42 | 2.56 | 39 | 2.88 | 35 |
| Oklahoma | 2.01 | 45 | 1.70 | 45 | 2.56 | 41 |
| Oregon | 3.94 | 9 | 4.27 | 6 | 6.55 | 2 |
| Pennsylvania | 2.12 | 41 | 2.32 | 41 | 2.53 | 42 |
| Rhode Island | 2.83 | 28 | 3.15 | 26 | 2.77 | 37 |
| South Carolina | 3.78 | 12 | 3.92 | 12 | 3.40 | 22 |
| South Dakota | 3.18 | 24 | 3.41 | 24 | 4.27 | 13 |
| Tennessee | 3.53 | 19 | 3.70 | 16 | 4.20 | 14 |
| Texas | 3.56 | 18 | 3.58 | 20 | 4.60 | 10 |
| Utah | 4.26 | 7 | 4.35 | 5 | 5.78 | 7 |
| Vermont | 3.87 | 10 | 3.59 | 19 | 2.67 | 39 |
| Virginia | 3.51 | 20 | 3.57 | 21 | 3.12 | 29 |
| Washington | 3.68 | 16 | 3.70 | 17 | 4.05 | 15 |
| West Virginia | 1.21 | 50 | 1.29 | 47 | 2.00 | 46 |
| Wisconsin | 2.83 | 27 | 3.03 | 28 | 3.72 | 18 |
| Wyoming | 2.05 | 44 | 1.09 | 49 | 2.06 | 45 |



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