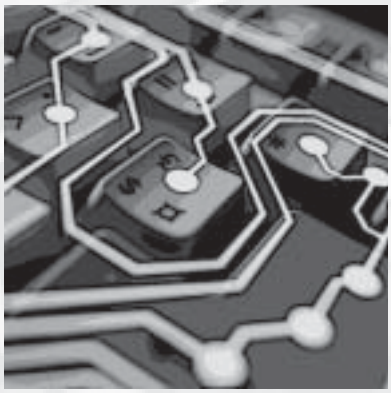
Rural Pennsylvania in the



NEW ECONOMY

Identifying the causes of growth and developing new opportunities

THE CENTER FOR

Rural Pennsylvania

A Legislative Agency of the Pennsylvania General Assembly

RURAL PENNSYLVANIA IN THE NEW ECONOMY
Identifying the causes of growth and developing new opportunities

A report by

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The Center for Rural Pennsylvania is a bipartisan, bicameral legislative agency that serves as a resource for rural policy within the Pennsylvania General Assembly. It was created in 1987 under Act 16, the Rural Revitalization Act, to promote and sustain the vitality of Pennsylvania's rural and small communities.

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INTRODUCTION

Pennsylvania, like the United States, experienced a remarkable economic expansion through the late 1990s. The significant growth and change of this decade, however, did not equally touch all regions and all industries. Traditional sectors continued to decline, while growth in what has been dubbed the "new economy," considered to be the emerging service- and technology-based sectors, helped fuel the boom. Regional growth patterns also varied. The state's growth was centered in the southeast, while many northern tier and western counties grew slowly.

These trends reflect an increased economic disparity between rural and urban Pennsylvania. Job creation has not remedied this disparity. Although annual employment growth rates since 1985 have been higher in rural counties than in urban ones, there is a growing gap between rural and urban per-worker earnings. The rural-urban wage gap, adjusted for inflation, grew from $4,400 per worker in 1979 to more than $9,450 per worker in 1999. Simply put, rural Pennsylvanians were faring worse in the new economy than they were 20 years earlier.

If rural areas are adapting relatively slowly to the new economy, policy makers wanting to close the earnings gap need to understand rural growth trends, the causes of industry growth at the county level, and opportunities for growth in rural counties. This study investigates these issues by looking at the change in the number of jobs and business establishments and the average annual wages in rural and urban Pennsylvania, and in comparison states and their rural areas.

> THE "NEW ECONOMY" IS "BUSINESSES COMPETING IN A WORLDWIDE MARKETPLACE WHERE HIGH-TECHNOLOGY AND INFORMATION-BASED GOODS AND SERVICES ARE INCREASINGLY IMPORTANT, AND KNOWLEDGE AND INFORMATION HAVE INCREASED VALUE."

Definitions

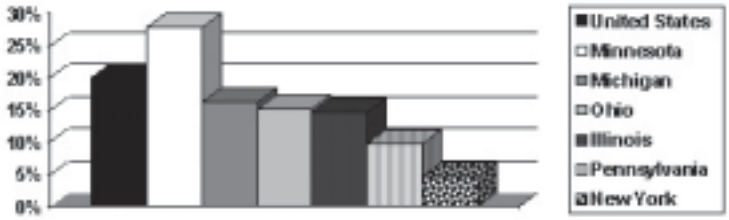
Rural/Urban: This report uses the Center for Rural Pennsylvania's 1990 rural/urban definition, with one exception: Where data are noted as originating from the U.S. Department of Agriculture, the federal Office of Management and Budget metropolitan/non-metropolitan classification is used as a proxy for urban and rural.

Sector/Industry/Sub-industry: Depending on the system of classification, the words "sector," "industry" and "sub-industry" can be used to refer to different levels of specific economic activity. The system of classification currently used by the United States, NAICS (North American Industry Classification System), is compared in the chart below to the previous system of classification, SIC (Standard Industrial Classification). Because SIC was the standard of use in 1990, the beginning period of study for this report, each industry contained herein is referenced to its appropriate SIC number.
For ease of language, this report uses the words "industry," "sector" and "sub-sector" in text to reference specific levels of economic activity. The chart below clarifies the use of these terms.

Term used in this report	SIC equivalent	NAICS equivalent	Example of economic activity at this level
Sector	Division	2-digit level	Retail Trade
Industry	2-digit level	3-digit level	General Merchandise Stores
Sub-Industry	3 digit level	4-digit level	Department Stores

UNDERSTANDING RURAL ECONOMIC GROWTH TRENDS

Figure 1: Change in the number of employed persons 1990-2000



Pennsylvania, and particularly its rural counties, experienced relatively humble economic growth in the 1990s. Rural Pennsylvania was struggling economically when compared to the United States overall and to similar rural parts of other states. The Pennsylvania employment growth rate from 1990 to 2000 was behind the U.S. as a whole and was also behind four of five comparison states that are similar to Pennsylvania on such economic and demographic indicators as total population, rural population, per capita income, and total employment.

Employment in rural Pennsylvania from 1990 to 2000, however, grew by a net of 98,762 jobs, or 12 percent faster than the 9 percent growth of urban Pennsylvania. Health services was the leading job generator in rural Pennsylvania, adding more than 16,000 jobs in the decade for 21 percent growth since 1990. The six industries that added the most jobs were all in the service and retail sectors, which is evidence of the shift from a manufacturing-based to a service-based

Table 1: Industries with the Largest Increase in Jobs in Rural PA, 1990-2000

Rural rank (by # new jobs)	*Industry (SIC)*	Average per-worker earnings in rural PA	2000 Employment in rural PA	Change in jobs: Rural PA	Change in jobs: Urban PA	Change in jobs: Rural areas of comparison states	Change in jobs: United States
1	Health Services (80)	$17,563	93,719	21%	15%	27%	29%
2	Educational Services (82)	$21,618	73,106	17%	19%	24%	30%
3	Eating and Drinking Places (58)	$12,658	57,309	21%	17%	22%	24%
4	Social Services (83)	$17,644	26,818	51%	46%	50%	64%
5	General Merchandise Stores (53)	$18,168	25,057	50%	-8%	35%	14%
6	Business Services (73)	$18,967	17,909	51%	50%	94%	89%
7	Fabricated Metal Products (34)	$26,408	25,111	31%	-5%	24%	8%
8	Lumber and Wood Products (24)	$26,822	23,912	26%	19%	24%	12%
9	Construction Special Trade Contractors (17)	$27,264	22,804	27%	18%	42%	40%
10	Electrical and Electronic Equipment (36)	$31,098	14,937	48%	-8%	-2%	2%

economy. In Table 1, the 10 industries that added the most jobs in rural Pennsylvania since 1990 are ranked, and change in employment in rural Pennsylvania is compared to that of urban Pennsylvania, rural areas of comparison states, and the whole United States.

SERVICES AND RETAIL DOMINATED RURAL EMPLOYMENT GROWTH.

The study also found industries of greatest strength—those that saw a higher growth rate in rural Pennsylvania than in both the U.S. overall and in similar rural places. It can be inferred from the success of these industries that Pennsylvania may have some advantage compared to the entire country. All but two of the industries of greatest strength for rural Pennsylvania are typically exporting industries, meaning that the industry sells most of the goods and services it produces outside the state. Exporting industries, according to economic theory, are particularly good drivers of local and regional growth. With the exception of one, all of the greatest-strength exporting industries have greater per-worker earnings than the rural average. Primary regions of activity for each exporting industry are noted in Table 2.

Exceptional Growth Industries

An in-depth look reveals more specific sub-industries that have experienced exceptional growth in rural Pennsylvania. Since 1990, the Eating and Drinking Places category has added the most jobs (10,035). Cable and Other Pay TV Services saw the most dramatic change (296 percent growth), although this may be primarily attributed to the growth of Adelphia Cable, which was headquartered in Coudersport, Potter County. The company moved to Colorado in 2003.

Services and retail dominated rural employment growth. However, several manufacturing sub-industries did well over the decade, as seen in Table 3 on the next page.

How Rural Pennsylvania Fared in the New Economy

To discover how rural Pennsylvania has fared in the new economy, two key industry groupings were investigated: High-Technology Manufacturing and Producer Services, as seen in Table 4. The USDA Economic Research Service compiled these groupings from across various sectors to represent the driving forces of recent economic expansion.

Rural Pennsylvania is faring relatively well in High-Tech Manufacturing. There was a 10 percent increase in jobs from 1990 to 2000, with 6,711 jobs added. This is better than the 7 percent increase in comparison states and significantly better than the 7 percent overall decline nationally.

In Producer Services, however, rural Pennsylvania is

Table 2: Industries of Greatest Strength for Rural PA

Industry (SIC)	**Exporting or importing**	**Primary regions in PA for the industry**
General Merchandise Stores (53)	Importing	
Fabricated Metal Products (34)	Exporting	Northwest
Lumber and Wood Products (24)	Exporting	North and Central
Electrical and Electronic Equipment (36)	Exporting	Widespread
Industrial Machinery and Equipment (35)	Exporting	Northwest and Southcentral
Rubber and Misc. Plastics Products (30)	Exporting	Northwest
Food Stores (54)	Importing	
Engineering and Management Services (87) *(per-worker earnings in this industry are lower than rural average)*	Exporting	Monroe, Butler, Fayette, and Indiana counties

Table 3: Exceptional Growth Sub-Industries in Rural PA

Rank	Sector	Sub-Industry (SIC)	Change in jobs, 1990-2000	Number of jobs	Job growth rate, 1990-2000
1	Retail	Eating & Drinking Places (581)	10,035	57,309	21%
2	Retail	Department Stores (531)	8,520	21,596	65%
3	Services	Nursing and Personal Care Facilities (805)	6,083	25,125	32%
4	Manu-facturing	Misc. Fabricated Metals (349)	4,943	9,100	119%
5	Services	Residential Care (836)	4,346	10,409	72%
6	Services	Misc. Amusement & Recreational Services (799)	3,133	10,521	42%
7	Services	Personnel Supply Services (736)	2,790	5,157	118%
8	Services	Offices & Clinics of Medical Doctors (801)	2,760	10,070	38%
9	Manu-facturing	Misc. Plastics Products (305)	2,714	9,537	40%
10	Retail	Grocery Stores (541)	2,591	32,335	9%
11	TCPU*	Cable and Other Pay TV Services (484)	2,539	3,396	296%
12	Services	Child Day Care Services (835)	2,376	4,600	107%
13	Manu-facturing	Electronic Components and Accessories (367)	2,296	5,166	80%
14	Services	Hospitals (806)	2,016	41,215	5%
15	Services	Individual and Family Services (832)	2,003	7,886	34%

** Transportation, Communication, and Public Utilities*

falling behind. Employment in the last decade grew by 24 percent, which trails the 27 percent growth of rural areas of comparison states. More significantly, however, Producer Services grew in rural Pennsylvania by half as much as it grew nationally. Rural areas, particularly in Pennsylvania, missed out on the national growth in Producer Services in the last decade.

Per-Worker Earnings: Change in Pennsylvania and Comparison States

Average per-worker earnings is another important indicator of economic health. Low wages have negative ripple effects on other aspects of the economy, such as greater dependence on social services and less money available for higher education, home construc-

Table 4: Employment Performance of "New Economy" Industries

Industry (SIC)	Number of rural PA jobs 2000	Change in rural PA jobs, 1990-2000	Growth rate: rural PA	Growth rate: comparison states	Growth rate: U.S.
High-Technology Manufacturing					
Petroleum Refining and Related Industries (29)	2,254	-1,113	-33%	1%	-20%
Printing Publishing and Allied Industries (27)	9,972	-1,220	-11%	4%	-2%
Chemicals and Allied Products (28)	5,367	-399	-7%	-2%	-6%
Measuring, Analyzing and Controlling Instruments (38)	5,398	-247	-4%	10%	-16%
Transportation Equipment (37) (excluding motor vehicles SIC 371)	7,247	786	12%	33%	-29%
Industrial Machinery and Equipment (35)	28,642	4,090	17%	2%	1%
Electrical and Electronic Equipment (36)	14,937	4,814	48%	-2%	2%
Subtotal	73,817	6,711	10%	7%	-7%
Producer Services					
Insurance Carriers (63)	2,845	-219	-7%	7%	5%
Depository Institutions (60)	13,876	-829	-6%	0%	-10%
Legal Services (81)	2,939	183	7%	3%	10%
Insurance Agents, Brokers and Services (64)	3,760	406	12%	11%	14%
Holding and Other Investment Offices (67)	369	58	19%	73%	29%
Nondepository Credit Institutions (61)	1,125	347	45%	55%	83%
Communications (48)	7,598	2,359	45%	-6%	26%
Engineering and Management Services (87)	8,346	2,696	48%	25%	36%
Business Services (73)	17,909	6,076	51%	94%	89%
Security, Commodity Brokers and Services (62)	565	408	260%	55%	78%
Subtotal	59,332	11,485	24%	27%	55%
New Economy	206,966	24,907	12%	15%	12%
Overall	834,030	95,096	12%	20%	21%

tion, recreation and travel, and retail sales. Conversely, if workers are paid higher wages, the ripple effect is positive because workers have more money available and may have a greater propensity to spend it in the ways suggested above. Calculated as the total payroll divided by the number of workers, per-worker average earnings is a proxy for median per-worker income.

From 1990 to 2000, rural counties in Pennsylvania added more jobs than urban counties, but the average per-worker earnings of those rural jobs was significantly lower. Overall, rural per-worker earnings grew 36 percent from 1990 to 2000. By comparison, urban per-worker earnings grew 48 percent.

Nationally, the average per-worker earnings, adjusted for inflation, went up 21 percent over the last decade. Statewide, the inflation-adjusted average rose by 16 percent in the same period, which was trailed only by Illinois. Rural counties in Pennsylvania and the comparison states had lower earnings growth than their urban counterparts.

When Pennsylvania is combined with its comparison states, overall rural growth was 38 percent per worker, while urban growth was 52 percent per worker.

In short, there is a growing per-worker earnings gap between rural and urban places. In 1990 the average rural per-worker earnings in Pennsylvania was 74

percent of the urban average, but in 2000, it had shrunk to 68 percent of the urban average. Therefore, while rural employment growth exceeded urban employment growth, the additional rural jobs were relatively low paying. Pennsylvania does, however, have the second-highest rural average earnings as a share of the urban average among the comparison states; only Ohio is higher.

To identify sources of the increasing rural-urban earnings gap in Pennsylvania, the researchers compared employment growth in four income brackets. The "high" bracket contains annual incomes greater than the urban average (above $32,649). "Medium-high" incomes include earnings above the state average but below the urban average (between $30,909 and $32,649). "Medium-low" incomes include earnings above the rural average but below the state average (between $22,254 and $30,909). Finally, the "low" annual income bracket includes earnings below the rural average (less than $22,254).

IN SHORT, THERE IS A GROWING PER-WORKER EARNINGS GAP BETWEEN RURAL AND URBAN PLACES.

Urban growth was concentrated in the medium-high range, with about 270,000 jobs added. In rural counties about 20,000 jobs were added in the medium-high category. Rural growth was instead concentrated in the low category with about 80,000 new jobs, while rural areas suffered a net loss in jobs in the high income bracket.

Part of the growing gulf between rural and urban per-worker earnings is the loss of high-paying jobs in rural areas. About 74 percent of new urban jobs were in the medium-low category, while 80 percent of new rural jobs were in the low category. Therefore, while both rural and urban counties added a significant number of jobs with below-average earnings, the change was more pronounced in rural counties. Compounding this stagnation, rural areas saw a net loss of jobs in the high category.

Earnings may be less equally distributed in rural areas than in urban areas. Fifty percent of all urban jobs have industry per-worker earnings in the high category. By comparison, only 12 percent of rural employment was in industries with per-worker earnings in the high category. Only 14

Figure 2: Change in the Number of Jobs by Earnings Category 1990-2000

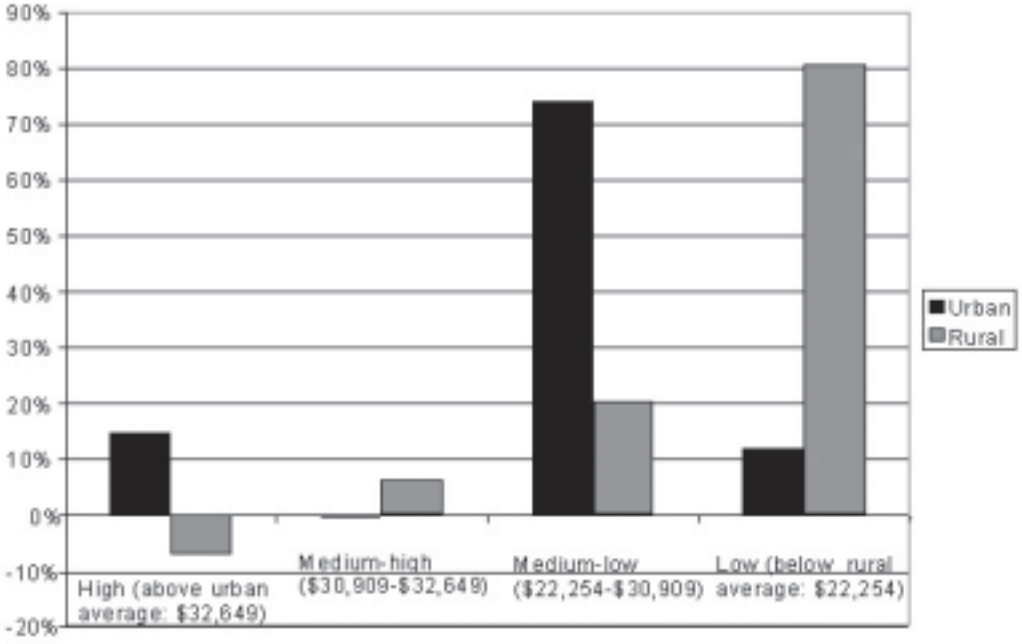
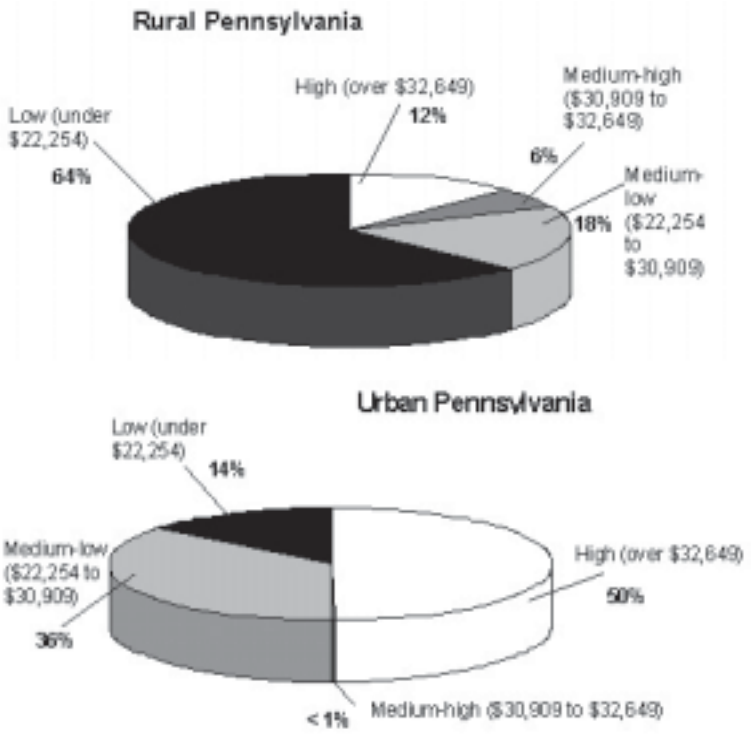


Figure 3: Distribution of Jobs by Per-Worker Earnings Category, 2000



percent of urban jobs paid less than rural average earnings and only 36 percent of urban jobs were in the medium-low category.

The distribution of jobs by the four per-worker earnings categories is shown in Figure 3.

In Table 5, rural-urban earnings comparisons are provided for 10 leading rural growth industries. Health Services, a leading source of employment for many rural counties, added more jobs in rural counties than did any other industry, but rural Health Services workers earned just 52 percent of the average for urban Health Services workers.

To sum up why the rural-urban earnings gap widened in the last decade, first, in rural areas, there was rather substantial employment growth in industries with earnings in the low category. Thirteen of the top 20 industries had lower-than-rural-average earnings, yet these industries supplied 81 percent of the

Table 5: Per-Worker Earnings of the Top 10 Industries for Rural Job Growth

	Rural			Urban		
Industry (SIC)	**Job growth rank among rural industries**	**Per-worker earnings, 2000**	**Change in per worker earnings, 1990-2000**	**Job growth rank among urban industries**	**Per-worker earnings, 2000**	**Change in per-worker earnings, 1990-2000**
Health Services (80)	1	$17,563	41%	2	$33,683	36%
Educational Services (82)	2	$21,618	46%	3	$29,891	44%
Eating and Drinking Places (58)	3	$12,658	37%	5	$17,899	44%
Social Services (83)	4	$17,644	39%	4	$22,594	42%
General Merchandise Stores (53)	5	$18,168	53%	68	$18,007	39%
Business Services (73)	6	$18,967	56%	1	$24,129	49%
Fabricated Metal Products (34)	7	$26,408	14%	60	$39,888	40%
Lumber and Wood Products (24)	8	$26,822	60%	32	$26,792	33%
Construction Special Trade Contractors (17)	9	$27,264	37%	8	$38,743	36%
Electrical and Electronic Equipment (36)	10	$31,098	31%	64	$44,606	45%

net rural employment growth. These industries are pulling down the average per-worker earnings. Within the same 20 industries, per-worker earnings in the rural counties were almost always lower than in the urban counties. Additionally, there has been a decline in employment in rural industries with high per-worker earnings. Finally, per-worker earnings grew faster in urban areas than in rural areas.

What are some potential reasons for these trends? A tighter job market in rural counties than in urban counties might have affected the labor market; in 2000, unemployment was 1.1 percentage points higher in rural counties. The labor force participation rate (the number of people 16 and older working or actively seeking a job) was 3.1 percentage points lower in rural counties than in urban counties, suggesting that more people have dropped out of the active job search. Economic theory predicts that these forces would place a downward pressure on wages.

Change in the Number of Business Establishments

Between 1990 and 2000, there was a 10 percent increase in the number of business establishments in rural Pennsylvania, up to 59,191. Meanwhile, the number of urban Pennsylvania establishments grew 18 percent to 211,642. Pennsylvania ranked fifth out of six states in growth of business establishments, trailed only by New York.

Most establishment growth was in the service and retail industries, a finding that is mirrored in employment growth statistics.

Table 6: Industries with the Largest Increases in Business Establishments in Rural PA, 1990-2000

Industry (SIC)	Change in establishments, 1990-2000	Percent change, 1990-2000	Establishments, 2000
Social Services (83)	902	109%	1,730
Educational Services (82)	718	140%	1,231
Health Services (80)	551	18%	3,681
Business Services (73)	550	49%	1,665
Engineering and Management Services (87)	485	53%	1,406
Eating and Drinking Places (58)	461	12%	4,309
Miscellaneous Retail (59)	353	14%	2,886
Automotive Repair Services and Parking (75)	302	21%	1,709
Depository Institutions (60)	299	36%	1,137
Food Stores (54)	190	13%	1,636

Table 7: Industries with Declining Numbers of Establishments in Rural PA, 1990-2000

Industry (SIC)	Change in establishments, 1990-2000	Percent change, 1990-2000	Establishments, 2000
Food and Kindred Products (20)	-27	-10%	252
Oil and Gas Extraction (13)	-77	-30%	176
Apparel and Other Finished Products Made From Fabrics (23)	-124	-46%	145
Coal Mining (12)	-176	-40%	266
Apparel and Accessory Stores (56)	-253	-31%	571

CAUSES OF INDUSTRY GROWTH AT THE COUNTY LEVEL

Many economic booms are merely the result of right-place, right-time circumstances. Strategic economic planners must go beyond hoping for such luck and instead ask what local factors can positively influence the area's prospects for long-term economic growth.

For this part of the study, the researchers measured industry growth by looking at the changes in the number of persons employed, per-worker earnings, and the number of establishments from 1990 to 2000.* Econometric models look at industry growth as influenced by a number of potentially important local and state factors. Using an econometric analysis, the researchers estimated how county conditions in 1990 affected growth over the following decade. Overall, the results suggested some key factors influencing growth and new directions for local efforts. Notably, college education, industry agglomeration, and highway infrastructure are significant to economic growth.

These findings are drawn from a series of statistical models that tested for the importance of a number of factors that have been related to growth. A family of basic county-level economic growth models was produced, based on an extensive review of previous studies that looked at correlates of economic growth.

NOTABLY, COLLEGE EDUCATION, INDUSTRY AGGLOMERATION, AND HIGHWAY INFRASTRUCTURE ARE SIGNIFICANT TO ECONOMIC GROWTH.

Explanatory Variables

Founded on the premise that businesses maximize profits and households maximize utility, regional growth theory and previous empirical work suggest that a number of factors influence local economic performance. Table 8 describes the conceptual basis for the influence of each factor on regional economic activity.

Table 8: Expected Impacts of Influential Factors

Factor Measured	*Expected Impact on Regional Economy*
Local Wages	Firms are drawn to counties with relatively low wage costs.
Local Taxes	High taxes discourage business location and slow economic growth.
Public Services	Higher quality services are attractive to businesses and may offset the cost of higher taxes.
Market Access	Locations with easy access to suppliers and consumers draw firms to the lower transportation costs and increased convenience.
Labor Market Characteristics	Firms will prefer locations with an adequate labor supply.
Labor Quality	High quality labor spurs growth; educational attainment is a proxy for this measure. However, some industries prefer a less-educated workforce because they can pay workers less.
Industry Agglomeration	Industry clusters (groups of related industries) are drivers of local growth. Growth will be stronger when local industries have greater linkages. This is not the same as industry concentration (many firms in one industry dominating a local economy).
Industry Strength	If an industry employs a larger share of the population locally than it does nationally, the industry will have a competitive advantage.
Natural Amenities	Environmental quality of life enhances a location's attractiveness as a place to live and work.
State Policies	Some states are more attractive than others to relocating firms.

* Note: In this section, the federal Office of Management and Budget's metropolitan/non-metropolitan classification is used as a proxy for urban and rural.

Appendix A provides an overview of the variables used, including the data source.

Statewide Employment Growth

The 54 industries for which employment data were available yielded the following results:

• Agglomeration (the presence of interrelated local industries) is important in many industries. When there are networks of local businesses making purchases from one another, employment growth is generally greater. This suggests that economic development efforts should pay attention to potential synergies between existing firms and new ones.

• Conversely, industries that dominate a local economy tend to have slower employment growth.

• Population growth is important for employment, especially in service and retail industries.

• Average industry per-worker earnings do not seem to drive employment growth, suggesting that established industries are not all that sensitive to wages.

• Neither per capita government expenditures nor government revenues have particularly strong impacts, suggesting that local taxes are not necessarily a detriment to employment growth.

• The percent of the population with at least a college degree has a strong influence on employment growth, particularly in the retail and service sectors. This measure may actually be capturing income effects (higher education leads to higher incomes and more discretionary spending), not worker productivity.

• State and interstate highway miles are related to growth in employment in 14 industries.

• Rural counties, all other things held equal, are at a disadvantage relative to urban counties for employment growth.

• Pennsylvania's performance relative to its comparison states suggests that the Commonwealth is performing better than New York, is relatively similar to Illinois, Michigan and Ohio, and is trailing Minnesota.

Earnings Growth Rates

The 61 industries for which earnings growth data were available yielded the following results:

• Employment growth was related to a growth in per-worker earnings in 31 industries, consistent with the expectation that an increase in demand for labor will drive up wages, all other things held constant.

• Higher per-worker earnings in 1990 led to slower earnings growth rates over the following decade. This is consistent with the prediction that places with lower initial values will grow faster, as mobile production factors seek regions with the highest return.

MOST RURAL INDUSTRIES EXPERIENCED LESS GROWTH IN PER-WORKER EARNINGS THAN DID THEIR URBAN COUNTERPARTS, ALL ELSE EQUAL. THIS WAS EVEN MORE PRONOUNCED IN RURAL COUNTIES THAT WERE NOT ADJACENT TO AN URBAN COUNTY.

• Earnings growth decreased as the percentage of the population with only a high school degree increased; at the same time, places with a college-educated population had greater earnings growth. This is consistent with the notion that education is driving the increasing rural-urban earnings gap, as rural populations tend to be less educated than urban populations.

• Higher poverty in 1990 was linked to lower earnings growth over the decade.

• Increased natural amenities were tied to higher per-worker earnings in a number of industries. This counters the belief that workers are willing to accept lower salaries in exchange for amenities.

• Most rural industries experienced less growth in per-worker earnings than did their urban counterparts, all else equal. This was even more pronounced in rural counties that were not adjacent to an urban county.

This earnings gap is growing even after accounting for differences in education. (One potential reason for this result is that there may have been a slower cost-of-living growth in rural areas; another is that there may be an excess labor supply).

• Comparison states have generally witnessed greater per-worker earnings growth on an industry-by-industry basis than has Pennsylvania.

Establishment Growth

The final model was establishment growth by county in 55 industries, estimated only for counties where an industry existed in 1990. Results include:

• The number of existing establishments had a positive effect on the number of new establishments in 10 industries and a negative effect in 38 industries. This suggests that counties with more established industry presences for a large number of industries might be less likely to add new businesses in the same industry.

• Agglomeration is important in many industries. When there are networks of local businesses making purchases from one another, establishment growth is generally greater.

• Industries that dominate an economy tend not to add as many new establishments in the same industry.

• Population growth is important for establishment growth, especially in service and retail.

• New establishments are not necessarily deterred by higher wages; in 10 industries, higher per-worker earnings corresponded with the addition of more new business establishments.

• Government revenues and taxes were linked to less establishment growth in nine industries, but had no strong influence overall.

• College degree saturation (the percent of the population with at least a college degree) has a strong influence on establishment growth, mostly in the retail and service sectors. Again, this measure may be capturing income effects rather than worker productivity.

• The number of highway miles has a positive influence on new establishment growth for 30 industries. The presence of an interstate highway exchange impacts establishment growth in seven industries.

• For establishment growth, rural areas, all other things held equal, are at a disadvantage relative to urban counties.

• Pennsylvania performed better than Minnesota, New York and Ohio in establishment growth, but fell behind Illinois and Michigan.

Looking closer at the factors fueling new economy growth, establishment growth in high-technology manufacturing was driven by agglomeration, population growth and highway mileage. College education, agglomeration and population growth were important factors for producer services. No compelling factor could be found to explain employment growth in high-technology manufacturing; the needs of each industry appear to be unique, so high-tech manufacturing development efforts should focus on the needs of individual businesses.

IDENTIFYING OPPORTUNITIES FOR RURAL COMMUNITIES

Using an "existence analysis," the researchers were able to predict the existence of certain industries in a county and examine their prospects in counties where they do not exist. The models were fairly accurate in predicting the existence of an industry; 85 percent of predictions for the 22 industries analyzed were correct.

Once again, the importance of agglomeration effects was noted for nearly all industries for which the model was estimated. Highway miles, the presence of an interstate exchange, and college education each had a significant positive impact in five industries. High-school-only education negatively affected five industries, and local taxes negatively affected four industries.

EMPLOYMENT GROWTH OPPORTUNITIES IN A NUMBER OF "NON-BASIC" INDUSTRIES . . . SUGGEST THAT THERE MAY BE SUBSTANTIAL UNMET DEMAND FOR LOCAL GOODS AND SERVICE PROVISION IN A NUMBER OF INDUSTRIES . . .

For economic developers, what may be most helpful about these models are their incorrect predictions. That is, when an industry that does not exist somewhere is predicted to exist, it appears that local conditions might be favorable to support that industry—a new opportunity arises. Appendix B identifies industries that were predicted to exist in each county but did not, in fact, actually exist there, providing a lead for possible development efforts. When using this information, however, communities should examine other data, such as national trends for industry stability. These suggestions should be viewed as a starting point for more thorough analysis.

New Opportunities for Employment Growth

The examination of employment growth trends in the last decade identified 11 industries that may offer new opportunities in rural Pennsylvania. There were three criteria for inclusion:

1. The industry showed job growth nationally from 1990 to 2000.
2. The industry grew more in the rural counties of comparison states than it grew nationally.
3. The industry grew more nationally than it did in rural Pennsylvania.

This helped to identify rural Pennsylvania industries that are being greatly outperformed by both the rural comparison places and the whole country. These industries, identified in Table 9, might offer new opportunities for rural Pennsylvania; however, they should be seen as a starting point for further investigation, not a target.

Of the 11 industries identified, four (Miscellaneous Manufacturing Industries; Hotels, et al; Food and Kindred Products; and Insurance Carriers) are export-oriented, meaning they may offer untapped opportunities to bring new dollars into the state's rural areas.

Employment growth opportunities in a number of "non-basic" industries (such as those meeting mainly local needs) suggest that there may be substantial unmet demand for local goods and service provision in a number of industries, especially Holding and Other Investment Offices, and Business Services. In these cases, rural consumers and businesses may be purchasing services from outside their local economy, resulting in a "leakage" of money.

Table 9: Select Rural Pennsylvania Industries that Offer Growth Potential

Industry (SIC)	Job growth rate in rural PA, 1990-2000	Job growth rate in comparison rural areas, 1990-2000	Job growth rate in U.S., 1990-2000	Earnings per worker in rural PA, 2000	Earnings as percent of rural PA average
Amusement and Recreation Services (79)	43%	103%	57%	$14,332	64%
Holding and Other Investment Offices (67)	19%	73%	29%	$24,469	110%
Business Services (73)	51%	94%	89%	$18,967	85%
Home Furniture, Furnishings and Equipment Stores (57)	9%	40%	37%	$16,299	73%
Misc. Manufacturing Industries (39)	-2%	20%	4%	$23,313	105%
Hotels, Rooming Houses, Camps and Other Lodging Places (70)	-4%	16%	14%	$17,475	79%
Food and Kindred Products (20)	-9%	8%	1%	$31,606	142%
Heavy Construction (Other Than Building Construction) (16)	10%	26%	17%	$29,737	134%
Construction Special Trade Contractors (17)	27%	42%	40%	$27,264	123%
Insurance Carriers (63)	-7%	7%	5%	$80,656	362%
Automotive Dealers and Service Stations (55)	13%	26%	16%	$17,750	80%
All Rural PA Industries	12%	20%	21%	$22,254	

SUMMARY OF THE FINDINGS

Earnings Gap. There is an increasing gap between urban and rural Pennsylvania in average per-worker earnings, even though employment growth rates have been fairly similar over time. The three forces fueling this gap are growth in industries with below-rural-average earnings; a declining number of rural jobs that pay higher than the urban average; and urban employment growth in industries paying higher than the rural averages. These trends show that it is the quality, not the quantity, of jobs that matters most for future rural economic development.

INDUSTRIES THAT SERVE AS LOCAL SUPPLIERS TO OTHER BUSINESSES TEND TO DO BETTER THAN THOSE NOT LINKED TO LOCAL BUSINESSES.

Higher Education. One of the most striking findings, the importance of higher education on growth, manifests itself in several ways. First, higher education levels generally lend themselves to higher earnings, so one way to shrink the earnings gap is to increase the number of jobs in rural areas that require a college degree. Second, these higher earnings mean more disposable income, which grows the service industry. Third, higher education is an indictor of a general investment in human capital, and workforces with greater skills get paid more and attract greater growth.

Agglomeration Economies. Industries that serve as local suppliers to other businesses tend to do better than those not linked to local businesses. While some specialized places do well, the research suggests that when a local economy depends very heavily on one industry alone, it tends to impede growth. A local economy that relies on networks of interdependent businesses holds more promise.

Road Infrastructure. Highways are an important correlate with employment growth, as is interstate access in some cases. Of course, costs, impacts and local willingness to accept policies of new road construction must be carefully assessed.

Population Growth. Population growth is an important correlate in employment and establishment growth for a number of industries. Slow or declining population growth particularly impedes economic growth in the service and retail sectors.

Local Taxes. The research results about high local taxes are mixed. While some industries show that higher government revenues per capita and growth curb economic growth, in most cases this effect is not statistically significant.

Industry Wages. Low industry wages do not seem to spur economic growth within an industry. Thus, rural places that seek to attract jobs by offering a low wage workforce may not be successful in generating jobs. When they are successful, it will only end up further increasing the earnings gap.

Comparison States. While Pennsylvania is on par with most comparison states for employment growth, the state's industry-by-industry per-worker earnings growth trails other states substantially.

Rural Places. The research shows that rural places have a strong tendency to under-perform urban places. This suggests real structural and spatial market-driven differences between the two types of regions. While there are no policies that can correct this inherent trait of rural places, development proponents need to understand that these differences are very real.

POLICY CONSIDERATIONS

The following policy considerations for improving the quality of jobs and the economy in rural Pennsylvania were offered by the researchers based on the findings of this study.

• Efforts like the "Stay, Invent the Future" campaign should focus on rural counties in order to decelerate the rural brain drain.

• Economic development efforts should not focus on attracting jobs by offering a low-wage workforce, but rather on supplying a high-quality workforce and recruiting high-paying jobs.

• To increase the supply of educated workers, investigate and pursue ways to make college more affordable through increased and prioritized funding and scholarships, particularly for new economy careers.

• Strengthen the community college system, especially in rural counties. Currently, only two of the state's fourteen community colleges are located in rural counties (although other rural counties are served by branch campuses of urban-based community colleges).

• Ensure that rural Workforce Investment Boards are adequately funded, because education and training can increase worker productivity, which has great impacts on both earnings and employment growth.

• Local economic development efforts should look at industry clusters in terms of supply chain; in other words, growth efforts should not only focus on specific industries, but at complementary "support industries" of that industry as well.

• From a policy perspective, state and rural regions should look less at the traditional strategy of recruitment, and instead focus on developing and strengthening local clusters and cooperation among firms. State economic development programs should move toward a model that encourages the participation of multiple, related businesses rather than serving businesses individually. For example, creative loan programs might offer larger awards to companies that provide joint proposals.

• Further investigation into the disparity between Pennsylvania and the comparison states is needed, as evidence from the comparison states may offer guidance for Pennsylvania.

• Further investigation into development policies that specifically address the unique challenges of rural areas may be in order if political leaders desire to encourage development in rural places.

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APPENDIX A: VARIABLES AND THEIR DATA SOURCES

Variable Name	How Measured	Data Source
1990 Employment	Number of industry jobs in 1990	IMPLAN
Airport	Dummy variable that takes on value of 1 if there is a commercial airport in the county; else 0	Bureau of Transportation Statistics, U.S. Department of Transportation, Special request
High School Diploma	Percent of population 25 years old and older with at least a high school degree in 1990	US Census Bureau Census of Population
College Degree	Percent of population 25 years old and older with at least a college degree in 1990	US Census Bureau Census of Population
Level of Change	Level of change in the number of industry employment, 1990 to 2000	IMPLAN
Per-Worker Earnings	Total industry earnings divided by total employment	IMPLAN
Tax per Capita	Per capita local tax revenue, fiscal year 1992	US Census Bureau Census of Government
Expenditures per Capita	Per capita public expenditures, fiscal year 1992	US Census Bureau Census of Government
Education Expenditure Per Capita	Per capita education expenditures, fiscal year 1992	US Census Bureau Census of Government
Highway Expenditure Per Capita	Highway expenditures per capita, fiscal year 1992	US Census Bureau Census of Government
Highways	Miles (or kilometers) of interstates, freeways, expressways, principal arterials, and rural minor arterials	Federal Highway Administration, Special Request
Natural Amenities Index	It includes measures of (1) average January temperature, (2) average January days of sun, (3) low winter – summer temperature gap, (4) low average July humidity, (5) variation in topography, and (6) water area as a proportion of total county area	USDA
Metro	1 if county is metropolitan, 0 if not	Office of Management and Budget
Rural County (not metro adjacent)	1 if non-metro county is not adjacent to metro county	Office of Management and Budget
Poverty Rate 1990	Percentage of population below poverty level, 1989, among whom poverty status is determined	US Census Bureau Census of Population
Location Quotient 1990	A calculated ratio between the local economy and the economy of US. This ratio is calculated for all industries to determine whether or not the local economy has a greater share of that industry than expected	Researcher Calculation
School Dropout 1990	Percentage of residents ages 16 to 24 without high school diploma and not enrolled in school, 1990	US Census Bureau Census of Population

APPENDIX B: PREDICTED INDUSTRY OPPORTUNITIES FOR RURAL PENNSYLVANIA COUNTIES

County	Industry (SIC)
Adams	Security and Commodity Brokers, Dealers, Exchanges (62)
Armstrong	Paper and Allied Products (26); Miscellaneous Manufacturing Industries (39)
Bedford	Paper and Allied Products (26)
Bradford	Transportation Equipment (37); Security and Commodity Brokers, Dealers, Exchanges (62)
Clearfield	Textile Mill Products (22); Chemicals and Allied Products (28)
Clinton	Rubber and Miscellaneous Plastics Products (30); Transportation Equipment (37)
Columbia	Apparel and Other Finished Products Made From Fabrics (23) Security and Commodity Brokers, Dealers, Exchanges (62)
Crawford	Apparel and Other Finished Products Made From Fabrics (23)
Elk	Furniture and Fixtures (25); Miscellaneous Manufacturing Industries (39)
Fayette	Electrical and Electronic Equipment (36)
Franklin	Paper and Allied Products (26); Chemicals and Allied Products (28)
Huntingdon	Chemicals and Allied Products (28); Transportation Equipment (37); Miscellaneous Manufacturing Industries (39)
Indiana	Paper and Allied Products (26)
Jefferson	Paper and Allied Products (26); Primary Metal Industries (33); Transportation Services (47); Nondepository Credit Institutions (61); Security and Commodity Brokers, Dealers, Exchanges (62)
Juniata	Fabricated Metal Products (34); Furniture and Fixtures (25)
Lawrence	Paper and Allied Products (26)
Lebanon	Petroleum Refining and Related Industries (29)
McKean	Primary Metal Industries (33)
Mifflin	Electrical and Electronic Equipment (36)
Monroe	Furniture and Fixtures (25); Petroleum Refining and Related Industries (29); Measuring, Analyzing and Controlling Instruments (38); Holding and Other Investment Offices (67)
Montour	Chemicals and Allied Products (28); Rubber and Miscellaneous Plastics Products (30); Fabricated Metal Products (34); Measuring, Analyzing and Controlling Instruments (38); Miscellaneous Manufacturing Industries (39)
Northumberland	Holding and Other Investment Offices (67)
Perry	Fabricated Metal Products (34); Nondepository Credit Institutions (61)
Pike	Rubber and Miscellaneous Plastics Products (30); Transportation Equipment (37)
Schuylkill	Petroleum Refining and Related Industries (29); Measuring, Analyzing and Controlling Instruments (38); Holding and Other Investment Offices (67)
Snyder	Miscellaneous Manufacturing Industries (39); Nondepository Credit Institutions (61)
Somerset	Textile Mill Products (22); Paper and Allied Products (26)
Susquehanna	Rubber and Miscellaneous Plastics Products (30); Fabricated Metal Products (34); Transportation Equipment (37)
Union	Chemicals and Allied Products (28); Rubber and Miscellaneous Plastics Products (30); Electrical and Electronic Equipment (36); Transportation Services (47)
Venango	Transportation Services (47)
Wayne	Rubber and Miscellaneous Plastics Products (30)

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