Studies on Unemployment and Underemployment in Rural Pennsylvania
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Determining Policy Options for Reducing Unemployment and Underemployment in Rural Pennsylvania

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Assessing Rural Underemployment and Unemployment in Pennsylvania

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Preface

Unemployment rates in rural Pennsylvania have surpassed urban rates since at least the 1970s, according to county-level data from the state Department of Labor and Industry. Over the 10-year period of 1996 to 2006, rural unemployment rates were, on average, about 1 percentage point higher than urban rates.

To get a deeper understanding of unemployment and take a look at the relatively unexplored problem of underemployment in rural Pennsylvania, the Center for Rural Pennsylvania sponsored two research projects in 2006.

One project, Determining Policy Options for Reducing Unemployment and Underemployment in Rural Pennsylvania, was conducted by researchers from Pennsylvania State University. This research documented unemployment trends and analyzed unemployment rates in Pennsylvania’s rural counties over a 30-year period. It also measured rates of underemployment for Pennsylvania and neighboring and nearby states with data from 1996 to 2006, and used more recent data from 2005-2006 to understand selected dimensions of underemployment, such as the age and education levels of the underemployed, in rural Pennsylvania.

The other project, Assessing Rural Underemployment and Unemployment in Pennsylvania, was conducted by researchers from Indiana University of Pennsylvania and focused on the forces causing unemployment, underemployment, or withdrawals from the labor market in rural Pennsylvania. The research assessed how labor markets in each rural Pennsylvania county were performing relative to each other, to urban Pennsylvania counties, and to carefully defined peer groups of similar counties nationwide. With this approach, the researchers could get a better sense of the strength, or weakness, of a county’s labor market along with a realistic forecast of what might be achievable.

Policy considerations for both research projects stress the importance of an educated workforce and the need for diversification in both economic strategy and occupation mix in rural Pennsylvania to possibly reduce both underemployment and unemployment.

More indepth results of the two projects are presented in the following pages. Copies of the full reports are available by contacting the Center for Rural Pennsylvania.
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EXECUTIVE SUMMARY

This research, conducted in 2006, assessed the problems of unemployment and underemployment in rural Pennsylvania. It documented unemployment trends and analyzed unemployment rates in Pennsylvania’s rural counties over the past 30 years. The research also measured rates of underemployment for Pennsylvania and nearby states with data from 1996 to 2006. The research used more recent data from 2005 and 2006 to understand selected dimensions of underemployment in rural Pennsylvania.

The study results indicated that a remarkably persistent “unemployment gap” has existed between Pennsylvania’s rural and urban counties since at least 1976. Over the past 30 years, Pennsylvania’s rural and urban unemployment trends have mirrored U.S. averages, with rural rates being consistently higher. The observed rural-urban unemployment gap is statistically significant, and there were no years in which the rural-urban rates were statistically equal. This suggests meaningful, long-term differences in Pennsylvania’s average rural and urban unemployment rates. The results also show that it is not simply a few counties that have inflated the (higher) average rate for rural Pennsylvania. Rather, rural unemployment was found to be a widespread problem across all rural counties.

The results also show that all persistent unemployment counties in Pennsylvania are rural. Fortunately, not all persistent unemployment counties were “pre-destined” with respect to their long-term relative standing as some improved over time.

The researchers used statistical models to estimate and provide additional understanding of the effects of social, demographic, political and economic factors on relative county unemployment rates (relative to the state average) and changes in the rates. Growth in local employment reduced relative unemployment, as did a more diversified economy. Results also highlight the importance of a better educated workforce. Finally, the results show that a one-time effort to stimulate local employment growth can reduce unemployment rates in the short term. However, this effect disappears over time. A one-time effort is not enough to counter the higher equilibrium unemployment rates that are characteristic of rural counties, so a long-term strategy is needed.

The research also analyzed underemployment in Pennsylvania. Underemployment was defined to include a variety of types of labor market or economic distress including “discouraged workers,” the unemployed, involuntary part-time workers, and workers whose earnings are very low (at or near the poverty level). The results show that more than one in five working-age Pennsylvanians was underemployed in the last decade. Pennsylvania residents had higher underemployment rates than U.S. residents in every year (1996-2006). Pennsylvania’s underemployment rates ranged from about 20 to 25 percent over this period, and diverged the most from U.S. rates during the early 2000s recession. This suggests that Pennsylvania residents are more likely to feel the effects of recession, as measured by their underemployment, than neighboring and nearby states.

An assessment of how Pennsylvania has been faring relative to neighboring and nearby states showed that, next to West Virginia, Pennsylvania had some of the highest underemployment rates overall and by type of underemployment. Regardless of state, nonmetro rates were found to be consistently higher than metro rates. Those at higher risk of underemployment included nonmetro residents, young adults, less educated residents, minorities, and women. Pennsylvania’s rates were holding constant even though underemployment rates were generally declining in neighboring and nearby states. At the state level, worker’s compensation was not found to contribute to the underemployment problem, but average state/local tax burden at the state level did.

Focusing on Pennsylvania’s rural counties, the results indicate that a higher degree of industry diversity and a better educated workforce contributed to lower rates of unemployment and fewer workers having to take part-time jobs when they really wanted full-time work. Residents of
Pennsylvania’s more remote rural counties were more likely to be underemployed, as were those living in service-dependent counties. However, industry diversity and service dependence were found to increase rates of multiple job-holding.

Finally, the results show that most underemployed rural Pennsylvania residents live in lower-income households, demonstrating that underemployment and poverty go hand-in-hand. Further, underemployment is not concentrated solely in counties that are dealing with persistent unemployment but is a more widespread problem. In many respects, the use of underemployment rather than unemployment as an indicator of labor market distress provides a deeper understanding of the labor market issues faced by Pennsylvania’s residents.

The study results support a development strategy of building industry diversity to reduce unemployment and underemployment. That is, a portfolio of smaller projects to enhance local employment is more likely to be more effective than a single larger project to create employment. Strategies to grow employment were shown to reduce unemployment and underemployment, but the impacts of a one-time effort to enhance local employment were found to be short-lived. Additionally, an educated workforce was strongly associated with lower unemployment and underemployment rates. Education was found to be a strong driver of reductions in unemployment and underemployment in Pennsylvania and selected neighboring and nearby states. The study results support the conclusion that to be competitive in the region, Pennsylvania’s rural counties must continue to build the skills of their workforce.

INTRODUCTION

Unemployment, a form of labor market distress, can pose significant challenges for individuals and families. People want jobs that provide enough hours of work and pay wages that, when taken together, offer a family-sustaining level of income. When this doesn’t occur, underemployment is typically the problem. Although many different forms of underemployment—including unemployment—exist, the result is usually the same: people find it difficult to earn enough to make ends meet. This report summarizes research findings to determine if unemployment and underemployment are worse in rural Pennsylvania than the rest of the state, and, if so, what could be done to address the issues.

Unemployment rate statistics show a remarkably persistent gap between Pennsylvania’s rural and urban counties since at least the mid-1970s. Although Pennsylvania’s rural and urban unemployment rates have tended to move in unison with national business cycles, unemployment rates in the state’s rural counties have always been higher than in Pennsylvania’s urban counties for at least the last 30 years. Further, underemployment has been worse in rural Pennsylvania. This means that there are higher rates of labor market distress—as measured by underemployment—in the state’s rural counties as compared to urban counties.

As high unemployment and underemployment are common and persistent problems in many parts of the commonwealth, one of the most pressing policy questions is how unemployment and underemployment can be reduced. Historically, Pennsylvania has promoted economic development programs designed to encourage job growth and retention. For example, the Pennsylvania Industrial Development Authority (PIDA) and Machinery and Equipment Loan Fund (MELF) are long-standing sources of low-interest loans issued to help Pennsylvania businesses invest in job growth and retention1. In addition, the state encourages job creation through a variety of tax incentives, such as Keystone Opportunity Zones, and workforce development initiatives, such as Job Ready PA. Although not typically designed for rural areas per se, these programs generally have targeted areas in distressed regions.

Given the importance of the unemployment and underemployment problems to the state, this research first compared unemployment rates across Pennsylvania’s rural and urban counties, examining county-level trends and variability in rates. Second, it identified rural counties that have

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experienced persistently high rates of unemployment and the impacts of selected social, demographic, political and economic factors on long-term unemployment rates. Third, it examined the prevalence of underemployment in Pennsylvania over the last decade, and compared Pennsylvania’s underemployment rates to those of neighboring and nearby states. Fourth, it compared rates of specific forms of underemployment between metro and nonmetro areas² in Pennsylvania. These forms included “discouraged workers,” the unemployed, involuntary part-time workers, and low-wage workers. Fifth, it assessed the influence of selected factors on the incidence of underemployment and its various forms in the commonwealth, testing if nonmetro residence in itself means higher rates. Finally, using 2005 and 2006 Pennsylvania county-level data, it measured selected types of labor market distress - specifically, involuntary part-time employment, and use of multiple job-holding to increase hours and income - for Pennsylvania’s rural counties to find if counties with persistently high rates of unemployment are the same places that face underemployment. Based on the results, the researchers offered policy considerations to address the issues of labor market distress.

Prior Research

Evidence that new jobs reduce unemployment rates is surprisingly inconclusive, even though state programs have long emphasized job creation. Advocates of proactive local economic development efforts have argued that newly created jobs will employ local residents, so that governments should make reasonable efforts to encourage local employment growth. Using data from 25 large Metropolitan Statistical Areas for the years 1972 to 1986, Bartik (1991) found that a permanent 1 percent increase in a metropolitan area’s employment rate reduced the area’s long run unemployment rate by 0.06 percent, leading to the conclusion that “state and local economic development policies can achieve their goal of significantly helping local workers and the local unemployed” (p. 207).

Although job growth seems, on its face, a certain way to lower unemployment, there has been a surprisingly large body of empirical work suggesting the contrary. Skeptics of job growth as a panacea argue that labor mobility overwhelms any impact local employment growth might have on current residents. Because the best workers are often mobile, the argument goes, nearly all jobs created by economic development programs go to outsiders, rather than those targeted by such programs, usually unemployed local residents. Since local residents often finance economic development programs, these programs end up being paid for by local residents, while providing little relief to the unemployed. Blanchard and Katz (1992) and Summers (1986) have provided empirical support for this view. Renkow (2003) has shown that new rural jobs “leak” to non-resident in-commuters.

To date, there have been relatively few studies focusing specifically on rural unemployment, with some notable exceptions, such as Partridge and Rickman (1996), Shields (2001), Shields and Novak (2002). Partridge and Rickman’s research differed from the work of Bartik (1991), Summers (1986), and Blanchard and Katz (1992) in several important ways. First, their model included a number of additional explanatory variables beyond employment growth to analyze structural causes of unemployment rate differences across counties. Second, they focused on unemployment rate levels rather than changes. While their work helped to answer the question of whether faster growing counties have lower unemployment rates, it did not address the key policy question of whether faster employment growth reduces the unemployment rate. When examining job creation as a policy for reducing unemployment, the latter question is important.

The unemployment rate is an obvious indicator of lagging economic performance in rural areas. But the labor market problems that people face are not limited to unemployment alone –

² Because of data limitations with the federal March Current Population Survey (CPS), the researchers had to use the definitions for “metro” and “nonmetro” as opposed to “urban” and “rural” for portions of the research.
underemployment can also have “detrimental impacts” on the underemployed (Wilkins 2007). The problem of underemployment, known to be a widespread problem in rural America (Findeis and Jensen, 1998), can be expected to be common and persistent in rural Pennsylvania. Unfortunately, the underemployment problem may remain hidden when policymakers focus attention on unemployment alone. Understanding the overall prevalence and dominant forms of underemployment can help policymakers see other options for improving the employment prospects of local residents.

The underemployed include workers facing a variety of employment-related problems. For example, some part-time workers want to work more hours in their jobs but their employers can’t provide the additional work. Some involuntary part-time workers take a second job, or even a third job, if they can find them, to work the equivalent of full-time. Holding multiple jobs often requires additional transportation costs, juggling of child care, and the stress of having two or more employers and two or more different jobs.

The underemployed can also include workers earning low or very low wages, putting them among the working poor. Some economists argue that low-wage workers who lack skills and therefore have low productivity in their jobs are not technically underemployed from an economic perspective. From a practical point-of-view, however, these are workers who could do better in the job market and earn higher wages if jobs existed for which they could be trained.

There also can be workers who earn a family-sustaining wage but not as much as their skills would command in another labor market. This type of underemployment, often called “job mismatch,” reflects workers with skills underused by their jobs (Clogg and Sullivan, 1983). This can happen when there are not enough family-sustaining jobs to go around.

Finally, the underemployed can include “discouraged workers,” such as those wanting to work but who have given up trying to find a job because local jobs are simply not available, and workers who have unstable or erratic employment, not by their own choice, but because of the job market they face (Ritz, 2001).

Studies also often have counted the underemployed, since underemployment clearly is an important form of labor market distress.

National and regional studies have shown that nonmetropolitan and rural areas tend to suffer higher rates of underemployment than metropolitan and urban areas, taking all forms of underemployment into account (Lichter and Costanzo, 1987; and Jensen and Slack, 2003). Findeis and Jensen (1998) and Findeis, Jensen and Wang (2000) showed that involuntary part-time employment and low-wage employment affect higher percentages of the workforce employed in the nonmetro U.S. Studies also have shown that once underemployed, residents of U.S. nonmetro areas appear to have more difficulty improving their employment prospects – that is, moving up the job ladder into better jobs (Jensen, Findeis, Hsu and Schachter, 1999).

Focusing on different demographic groups, underemployment has been shown to be especially common among the young and uneducated (Findeis, 1993). Since young adults remaining in rural areas have lower average levels of education than in urban areas, underemployment among this population is more likely (Findeis 1993; and Findeis and Jensen, 1998). The challenge, of course, is to ease the transition of young adults from school to work in rural areas, to avoid the underemployment trap or at least reduce its impacts.

Underemployment rates among racial/ethnic minorities also have tended to be higher, especially among African-Americans. Slack and Jensen (2002) concluded that minorities living in U.S. nonmetro areas are more likely to experience underemployment than either metro central city or suburban minorities, but also added that rates among African-Americans living in nonmetro areas have declined over time. Slack and Jensen (2007) also showed that the underemployment problem has tended to decline over

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3 Recent literature has also examined the issue of overemployment of the workforce, with the problem being defined as having to work more hours than preferred. Golden and Gebreselassie (2007) found that approximately 7 percent of the U.S. workforce preferred fewer hours of work even if less work resulted in less income.

4 Studies of underemployment vary in terms of defining exactly what constitutes “underemployment.” First, some frameworks and studies have included unemployment (Clogg and Sullivan, 1983; and Lichter and Costanzo, 1987) while others have not. Second, even when unemployment has not been included, there may be definitional differences: for example, OECD (2002) has divided underemployment into visible and invisible (http://stats.oecd.org/glossary/detail.asp?ID=3539).
successive generations of immigrant populations, with the first generation experiencing higher rates than either the second or third generations, which differ little with respect to each other. This is important given that more rural places across the U.S. have recently become home to Hispanic immigrants (Kandel, 2005).5

Finally, studies have shown differences in the forms of underemployment experienced by men and women (Findeis, 1993). In a 2001 study, Van Ham, Mulder and Hoosmeijer concluded that high levels of local underemployment have tended to deter women who are out of the labor force from searching for work even when they would prefer to be employed. Similarly, the study showed that for employed men, high rates of local underemployment tended to discourage them from searching for better jobs. Van Ham, et al. (2001) also observed that worker characteristics played an even stronger role than high levels of local underemployment in discouraging workers from looking for work or for better jobs.

GOALS AND OBJECTIVES
This study was designed to provide an analysis of unemployment and underemployment in Pennsylvania, paying particular attention to Pennsylvania’s rural counties. A clear understanding of unemployment and underemployment experienced by rural Pennsylvanians today may lead to better-targeted policies and programs to help those who participate in the labor force but continue to face often significant economic difficulties despite their willingness to engage in hard work. The research goals were to:
• Improve policymakers’ and the public’s understanding of unemployment dynamics in rural and urban Pennsylvania.
• Improve policymakers’ understanding of the extent and relevant dimensions of Pennsylvania’s rural underemployment problem.
• Enhance policymakers’ understanding of the magnitude of selected forms of underemployment in Pennsylvania’s rural counties.
• Determine the potential policy actions most likely to reduce high and persistent unemployment in rural Pennsylvania.

METHODOLOGY
To describe and understand unemployment in rural Pennsylvania, the researchers used county-level unemployment data from the U.S. Bureau of Labor Statistics (1976-2005). They measured year-to-year variation in unemployment rates, calculated for rural and urban counties over the 1976-2005 period, to provide an assessment of whether higher average annual unemployment rates have been widespread across Pennsylvania’s counties or if a few high unemployment rate counties have tended to inflate the averages that were observed.

To further describe the data, the researchers used persistent unemployment as an indicator to identify those counties that have been relatively hard hit by high unemployment for an extended period of time. Specifically, this indicator allowed a ranking of Pennsylvania counties over time with respect to high unemployment.

The researchers also were looking to determine if some counties were destined to always have high unemployment rates. To do so, they used another statistical analysis to determine if a county with high unemployment in a particular year would have high unemployment the next year and in subsequent years. If substantial movement or year-to-year mobility in a county’s relative unemployment rank was observed, then policy intervention may not be needed as time could remedy the problem. Conversely, if a county with relatively high unemployment in one year was likely to have it again the next year, then there could be structural problems in the economy and room for policy intervention6.

5 DeJong and Madamba (2001), testing for a potential “double disadvantage” of minority status and immigrant status, found that only Asians experienced this effect. They reported that Asian women were more likely to earn low incomes and be unemployed, and Asian men and women were more likely to experience mismatch of jobs to skills.
6 In a study of rural, non-adjacent U.S. counties, Shields (2001) found that a county in the highest unemployment quartile one year had an 83 percent chance of staying in that quartile the next year.
To determine the underlying factors that influence unemployment in rural Pennsylvania, the researchers developed models to understand differences in county unemployment rates, and annual changes in relative unemployment rates (county levels relative to the state rate) for the 1976-2005 period.

Specifically, the researchers were looking to understand if employment growth affected unemployment rates; if industry diversity affected unemployment rates; if population size mattered; what effect education has; and if spatial isolation mattered.

To determine underemployment rates in nonmetro Pennsylvania, the researchers measured the prevalence of underemployment using data from the March Current Population Survey (March CPS) and the Labor Utilization Framework or LUF (Lichter and Costanzo, 1987; Findeis, 1993; Findeis and Jensen, 1998; Jensen et al., 1999; Wang, 1999; Slack, 2000; and Ritz, 2001). LUF studies typically consider four types of underemployment, which, taken together, comprise “economic underemployment.” The types included in this study were:

1. Discouraged workers (also called the sub-unemployed). Adults who are not working, are not currently looking for work, but who would like to work if they could find a job.
2. Unemployed. Adults who are not working but are actively searching for work, and those who are currently on lay-off.
3. Involuntary part-time workers. Adults who are working less than full-time hours (35 hours per week) because they are unable to find full-time work.
4. Low-income workers (the “working poor”). Adults whose labor market earnings in the previous year (adjusted for hours and weeks worked) are less than 125 percent of the individual poverty threshold.

March CPS data for 1996-2006 were used to measure overall underemployment rates for Pennsylvania, nonmetro Pennsylvania, and selected neighboring and nearby states. The March CPS provided detailed data on the employment status of a large sample of U.S. households, families, and individuals. State-level analyses were possible by using multiple years of state data on individuals, with the limitation that only those individuals from survey rotations 1-4 were included in the data set.

Limitations of the March CPS are that nonmetro areas are differentiated not as rural areas per se, and multiple years of data must be used for state-level analyses. That is, while the use of “rural” rather than “nonmetro” would be preferable for this study, the CPS data precluded the use of strictly “rural.” Also, small U.S. states do not have enough observations to derive reasonable statistics and must be aggregated into state clusters for analysis.

The researchers also used the March CPS data to create models that would answer the following research questions:

- Are nonmetro residents of Pennsylvania more likely to be underemployed than residents in Pennsylvania’s metro central city and/or suburban (metro non-central city) areas?
- Does Pennsylvania have rates of economic underemployment comparable to neighboring and nearby states, such as New York, Ohio, West Virginia, Virginia, New Jersey and the New England cluster?
- Is the underemployment problem becoming worse over time?
- What social, demographic, political and economic factors influence underemployment and specific types of underemployment, such as discouraged workers and the unemployed, involuntary part-time workers, and workers earning poverty or near-poverty wages?

7 Economic underemployment” does not include skills mismatch. The term “mismatch” is used in the underemployment literature to refer to the underemployment of labor resources that occurs when workers take jobs that require lower skill levels than their formal training provides.

8 The reason for this limitation is that individuals surveyed for the CPS are surveyed for four consecutive months (rotations 1-4), then dropped from the sample for the next 8 months, and then resurveyed again for the next four months (rotations 5-8). For example, an individual first interviewed in March, 2007, is surveyed again in April, May and June of 2007. Then the individual is dropped from the data set for July 2007 through February 2008, but resurveyed in March, April, May and June of 2008. The limitation to the use of rotations 1-4 is to avoid double-counting of individuals between years. Thus, data from rotations 5-8 are dropped.

9 The term ‘suburban’ is used in the report to indicate places defined in the U.S. Current Population Survey (CPS) as metro non-central city. The CPS differentiates metro areas of the U.S. into two categories: central city and non-central city places. Non-metro areas represent a third category but are not differentiated further.

10 States, such as Delaware and Maryland, were considered for the analysis but their populations are primarily metropolitan, being strongly affected by the Washington, DC-Baltimore-New York corridor. So, states with nonmetro populations were selected for comparison to Pennsylvania. The only metro state included was New Jersey.
Selected Forms of Underemployment from the 2005 and 2006 RuralPA-CPS

To understand the underemployment problem in Pennsylvania’s rural counties, the researchers used the RuralPA-CPS 2005 and 2006 data sets, since the March CPS data cannot differentiate “rural.” The RuralPA-CPS data were especially suitable for analyzing types of labor market distress relating to part-time employment and particularly involuntary part-time employment and multiple job-holding. Therefore, the researchers developed a modified LUF, differentiating individuals into five categories: 1) unemployed, 2) involuntary part-time employed, 3) multiple job-holder, 4) voluntary part-time employed, and 5) full-time employed.

The individual worker’s underemployment in the form of earning a low or very low income cannot be measured for the individual worker with the RuralPA-CPS. This is because income in this data source was collected at the household level whereas the March CPS collects income data at multiple levels, including the individual level. However, the RuralPA-CPS household-level income data were used to assess poverty status, to determine if individuals who are underemployed live in poverty or near poverty households. “Discouraged workers” were also not measurable using the RuralPA-CPS.

The researchers analyzed three issues: the socio-economic characteristics of Pennsylvania’s rural workers who were employed part-time (voluntarily versus involuntarily), those who held multiple part-time jobs, and those employed full time; whether living in a “rural” county made a difference; and to what extent individual underemployment (of the forms analyzed here) was linked to poverty at the household level.

The researchers also measured the rates of particular types of underemployment and estimated the numbers of rural residents affected by each of the selected underemployment problems.

Finally, they measured underemployment statistics for different rural counties and county clusters in Pennsylvania. They developed GIS-based maps, which provided a visual comparison of county-level rates of selected types of underemployment. Underemployment rates also were calculated and compared for those counties identified in the report as among the top 10 persistent unemployment counties in the state.

RESULTS

Unemployment in Rural Pennsylvania

There has been a remarkably persistent “unemployment gap” between Pennsylvania’s rural and urban counties since at least 1976. Figure 1 shows that while Pennsylvania’s rural and urban unemployment trends mirrored U.S. averages, rural areas were persistently higher. Overall, the rural-urban unemployment gap averaged 1.5 percentage points, with a maximum gap of 4.0 points in 1983, and a minimum gap of 0.8 points in 2005. While the gap declined somewhat from 2000 to 2005, it still averaged 1.4 percentage points over this time.

The observed gap was statistically significant, and the results show strong evidence that there are meaningful, long-term differences in the average rural and urban unemployment rates for Pennsylvania.

Other evidence suggests that high unemployment has been more pervasive in the state’s rural counties. The research found that unemployment rates in rural counties are more concentrated around their (higher) mean compared to urban counties. This means that the higher average rural unemployment rate is not simply inflated by a few counties; rather, it is a seemingly widespread problem.

In addition, unemployment rates for rural versus urban counties have tended to experience the same gap over time, rather than converging to the state average. This provided some preliminary evidence that there are systematic differences in unemployment rates that are not mitigated or reduced by time.

Figure 2 shows average county unemployment rates for Pennsylvania for 2003 to 2005. Figure 3 on Page 14 also shows the top 10 Pennsylvania counties by persistence score rank and their average unemployment rates over time. Interestingly, all of the relatively “persistent unemployment counties” were rural. Within these counties, six had scores greater than 15, indicating relatively high unemployment for at least half of the years considered.

Over the last 10 years, Huntingdon, Forest, Fayette, Clearfield, 11 Average annual county unemployment rate data are from the Local Area Unemployment statistics, published by the U.S. Bureau of Labor Statistics.
Greene, and Cameron counties had relatively high unemployment rates for six or more years. Geographically, most of these counties are either in the central or southwestern parts of the state, and all are considered Appalachian counties. Over the period 1996 to 2005, nine of the top 10 persistent unemployment counties experienced rates that averaged above 7 percent, whereas the state average was 5 percent. Forest County had the highest average unemployment rate, which exceeded 11 percent for 1976 to 2005; the unemployment rate in Forest County increased to more than 12 percent on average over the period 2003 to 2005.

One of the interesting parts of Figure 3 is that Clinton County’s unemployment persistence score for the period 1976-2005 put the county in the top 10, yet it had relatively high unemployment only once in the past 10 years. This suggests that counties that initially had long periods of high unemployment can sometimes recover.

While the above discussion provides some information on overall trends over the past 10 years, it does not provide a picture of the individual county dynamics over this time frame. To understand the performances of particular counties, the researchers examined recent trends in average relative unemployment rates. Specifically, they identified the unemployment dynamics of counties with a three-year average unemployment rate at least 50 percent higher than Pennsylvania’s average rate for the years 1994-1996. Again, all of the counties were rural. During this time period, the average rural county’s unemployment rate was 1.23, or 23 percent higher than the state average: Pennsylvania’s unemployment rate was 7.0 percent and the rural average was 8.6 percent.

The counties with the most interesting dynamics were Armstrong, Cambria, Clearfield, Clinton, Fayette, Forest, Greene, Huntingdon, Indiana, Juniata, Monroe and Wayne. Wayne and Juniata counties saw their three-year average relative unemploy-
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Studies on Unemployment and Underemployment in Rural Pennsylvania

In rural Pennsylvania, unemployment rates decline from about 50 percent higher than the state rate to equal the state rate. By comparison, the average rural county unemployment rate was 14 percent higher than the state rate from 2003 to 2005; the state unemployment rate was 5.4 percent and the rural county average was 6.2 percent.

The researchers also examined recent dynamics of counties with the highest average relative unemployment rates for 2003-2005. Interestingly, the counties that ended up relatively high, for the most part, also began relatively high. Thus, there is no real evidence of any county getting remarkably worse over time. The only real stand-out was Forest County, which has long suffered from relatively high unemployment. Philadelphia County was the only urban county represented.

Taken together, the figures seem to tell the following story. Rural counties have had consistently higher average unemployment rates than urban counties. While the gap closed in more recent years, the average Pennsylvania rural county unemployment rate was significantly higher. Counties with the highest relative unemployment rates were all rural. Some rural counties with initially high relative unemployment had improved their ranking over time; however, most counties with high early unemployment remained with high relative unemployment, and most counties with high recent unemployment tended to have high early unemployment.

Therefore, there is strong observational support for rural counties having higher long-term unemployment rates than seen in urban counties, perhaps a major structural difference between rural and urban places more generally.

Next, the researchers analyzed the likelihood of a county with relatively high or low unemployment today having relatively high or low unemployment next year. The analysis suggested that, overall, there was notable stability in year-to-year relative unemployment rates at the county level. However, the results did not imply that counties are predestined with respect to their long-term relative standing.

Factors Influencing Unemployment Rates in Rural Pennsylvania

To identify the factors that may influence unemployment in rural Pennsylvania, the researchers developed a standard statistical model to estimate the rates. The results indicated that places with higher (current) employment growth rates tended to have lower relative unemployment rates, holding other factors constant. For example, a rural county with a 1 percentage point higher employment growth rate than the average (2.3 percent versus 1.3 percent) can be expected to have an unemployment rate about 0.1 percentage points lower than the average rural county (5.4 percent versus 5.5 percent). The estimates were not statistically significant, however, suggesting that the effect of employment growth on relative unemployment rates happens immediately rather than having some slowly unfolding effects.

The model showed that more diverse economies have lower relative unemployment rates. This suggests that local economic development strategies should include building a diverse economy. Still, the results also suggest that counties with a substantial share of employment in manufacturing actually had lower relative unemployment rates than non-specialized counties (the default comparison group), all else being equal. This contradicts many peoples’ perceptions that manufacturing-based economies are more susceptible to high unemployment. Also, in places where public enterprises (such as schools) dominate, local employment may be wanting of private sector opportunities. Therefore, while government employment tends to pay more, a concentration of government jobs may portend hard times.

College attainment was nega-
tively related to relative unemployment rates. This finding was consistent with nearly all previous studies suggesting the importance of education in reducing unemployment. Further, two central factors of importance here were “rural” and “rural non-adjacent.” Results show that, all else being equal, relative rural unemployment rates were higher than urban rates, and non-adjacent rural counties had even higher unemployment rates. For example, imagine two counties, one rural and one urban, with identical employment growth rates, percent of college educated workers, industrial diversity, etc. The results reported here suggest that rural counties will have a higher unemployment rate, and that it will be higher yet in rural counties not adjacent to urban areas. From a policy perspective, this suggests that rural places may have higher unemployment rates simply because they are rural. Thus, when thinking about measurable outcomes for rural development policies, the target may not necessarily be an unemployment rate equal to the state rate; rather, an achievable target may be 1 percentage point higher than the state rate.

Lastly, the researchers examined factors influencing current relative unemployment rates (levels), specifically, which factors are most likely to reduce local unemployment rates. Traditionally, the most common policy solution has been to “increase employment.” However, as Blanchard and Katz (1992) have argued, it cannot be said with certainty how effective job growth is in reducing unemployment.

Therefore, the researchers took a closer look at the assumption underlying many state development policies, namely that job growth reduces local unemployment. The goal was to examine the long-term effects of a one-time increase in employment growth (employment shock) to see how successful such a strategy would be for reducing long-run rural unemployment rates in Pennsylvania. In a nutshell, the research findings showed that an employment shock could reduce unemployment rates for both urban and rural counties, but only slightly. The researchers concluded that job generation policies might have an impact on rural unemployment rates, but the effect can be expected to be relatively small, and its long-term effects are likely to be negligible.

Underemployment in Rural Pennsylvania

Descriptive results, based on the Labor Utilization Framework (LUF), showed that more than one in five working-age residents of Pennsylvania experienced underemployment in any year over the past decade. This means more than 20 percent of the Pennsylvania labor force, specifically those who are 18 to 64 years old, has experienced labor market distress meaning they are unemployed, have given up looking for work, are not able to find enough hours of work, or are paid poverty or near poverty wages. The LUF measures of underemployment, while not inclusive of all forms of labor market distress, show that many labor markets in Pennsylvania have deficiencies and fall short for some of the state’s residents.

Comparing Pennsylvania’s situation to the U.S., the researchers noted that Pennsylvania residents experienced higher overall rates of underemployment than the nation. Looking over the last 10-year period (1996-2006), the annual average underemployment rate for Pennsylvania was about 22 percent compared to the U.S. rate of 20 percent. Figure 4 on Page 16 shows that Pennsylvania’s annual underemployment rate over the 1996-2006 period ranged from a low of about 20 percent to a high of around 25 percent. During this same period, U.S.-Pennsylvania underemployment rates have tended to move together over time but the gap in rates widened during the early 2000s recession. This suggests that Pennsylvania residents are more likely to feel the effects of recession, as measured by their underemployment.

Comparing U.S.-Pennsylvania underemployment rates for nonmetro areas shows that Pennsylvania’s nonmetro rates consistently exceeded those for the nonmetro U.S.: Pennsylvania’s average annual nonmetro underemployment rate was about 26 percent over 1996-2006, as compared to roughly 24 percent for the nonmetro U.S. In fact, the study results show that the U.S.-Pennsylvania gap was wider at the nonmetro level than overall.

When the researchers compared Pennsylvania’s nonmetro underemployment rates to the state’s metro rates, they found a higher percentage of Pennsylvania’s nonmetro labor force experienced underemployment. This finding points to inadequacies in the underlying employment in Pennsylvania’s nonmetro areas, a finding reflected in the unemployment results discussed earlier. Separating Pennsylvania’s
metro residents into suburban (metro non-central city) and metro central city residents shows that an annual average of about 20 percent of Pennsylvania’s suburban residents and 25 percent of central city residents were underemployed between 1996-2006. The comparison shows that underemployment rates for Pennsylvania’s nonmetro and metro central city residents are very similar, although the types of underemployment may differ, calling for different policies.

Comparing Pennsylvania to Neighboring States
So how does Pennsylvania fare, based on its underemployment rates, relative to nearby states in the region? Is the state doing better, worse or about the same as other states? To answer these questions, the researchers compared Pennsylvania’s rates to nearby states that also have nonmetro populations. They were New York, Ohio, West Virginia, Virginia, New Jersey and the New England cluster of Massachusetts, Connecticut, Vermont, New Hampshire, Maine and Rhode Island. New Jersey was added as a metropolitan example.

The results showed that the selected states, with the exception of West Virginia, had lower underemployment rates than those measured for Pennsylvania (Figure 5). This was also true for the nonmetro comparisons (Figure 6). New York, Ohio and Virginia, as well as New Jersey and the New England cluster all had lower average annual rates of economic underemployment over the last decade than Pennsylvania. However, it is worth noting that the underemployment rates for New York, Pennsylvania and Ohio were all within 1 percentage point of each other. Fortunately, over the last several years (2005 and 2006), Pennsylvania did somewhat better than its average, as did New York. This contrasted to Ohio’s rates, which, in 2005 and 2006, were worse than its longer term average (1996-2006).

Figure 6 focuses on nonmetro areas only. Comparing Pennsylvania’s nonmetro areas to those in surrounding states shows that – again with the exception of West Virginia – Pennsylvania had the highest nonmetro rate. Pennsylvania’s nonmetro underemployment rate averaged about 26 percent, and New York’s nonmetro rate was close to that of Pennsylvania’s (New York’s average rate was 97 percent of Pennsylvania’s). In comparison, Ohio’s was 91 percent of Pennsylvania’s, the New England cluster’s rate was 83 percent and Virginia’s was 73 percent of Pennsylvania’s nonmetro rate. Over the last 10-year period of 1996-2006, the average annual underemployment rates were consistently higher in nonmetro areas than
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at the state level, regardless of state. This implies that not only are rates of unemployment higher in Pennsylvania’s rural areas but that underemployment rates are as well, when nonmetro areas are compared to the state’s metro areas.

It is important to remember that the differences in underemployment rates across states may be due to differences in the underlying socio-demographic structure of the populations living there. For example, the age structure of a state’s population may be driving higher or lower rates than those found in other states with different age structures.

In fact, in a separate analysis, the researchers found that Pennsylvania’s rates of low-wage employment did not differ statistically from those of nearby states. This again suggests that socio-demographic characteristics of workers most influenced low-wage employment. The researchers also noted that state-level workers’ compensation, as a percent of total wages, did not influence underemployment rates overall or by type, but that state/local tax burden did. This indicates that higher state/local tax burdens were associated with higher rates of all types of underemployment.

Prevalence of Alternative Forms of Underemployment

The researchers found interesting results when comparing the prevalence of different types of underemployment across locations. Residents of Pennsylvania’s nonmetro areas had statistically significant higher rates of 1) involuntary part-time employment and 2) low-income employment (Figure 7). That is, the consistently higher rates of unemployment previously documented in this report are only part of the story — looking even deeper into other forms of labor market distress shows that other forms of underemployment also appear to be higher.

Further dividing Pennsylvania’s metro residents into central city residents and suburban residents (to provide a more balanced view) and comparing rates again showed that nonmetro residents appear more prone than either Pennsylvania’s central city or suburban residents to hold jobs that don’t provide enough hours of work or pay low incomes. Metro central city residents appear worse off in terms of unemployment and discouraged workers combined.

Figure 8 on Page 18 shows that about 5 percent of nonmetro residents reported working part-time but wanted to work more hours. In addition, another 15 percent earned incomes below 125 percent of the individual poverty threshold. Both of these labor market problems strain families. In the first case, workers typically try to hold multiple jobs to ensure enough hours of work.
This can mean higher transaction costs of working by having to travel between multiple jobs, sometimes using multiple child care providers, and, in some cases, still not receiving benefits. Taken together, in Pennsylvania’s nonmetro areas, about 20 percent of workers had jobs (in the time period studied) that failed to provide the wanted work hours or paid low wages, or both. In summary, the inadequacy of employment prospects in rural Pennsylvania compounded the nonmetro unemployment problem.

Finally, the researchers compared the rates of different types of underemployment between Pennsylvania and neighboring and nearby states.

When examining unemployment and discouraged workers combined, the researchers found that West Virginia and New York had higher rates than Pennsylvania, with nonmetro West Virginia, New York and Ohio having a worse problem – based on the measured average annual rates – than nonmetro Pennsylvania. Involuntary part-time employment rates were highest for West Virginia at the state level, followed by Pennsylvania. The nonmetro areas of Pennsylvania also appeared to fare better than West Virginia only. Finally, Pennsylvania’s rates of workers earning low incomes – already excluding those who want to work more hours – were close to the bottom.

Prevalence of Underemployment by Specific Indicators

To find out if younger residents, those with low levels of education, racial/ethnic minorities, and women were more likely to experience underemployment, the researchers developed additional models to determine answers.

According to the results, young workers entering the labor force were much more likely to be underemployed compared to any other age group. This was true for all types of underemployment in the region and for most types in Pennsylvania. The only exception was the “discouraged worker/unemployed” category in Pennsylvania where no difference was found in the likelihood of this form of underemployment between the state’s youngest and older workers. However, it could be that the youngest workers settle for part-time, low-wage jobs, or turn to schooling, housekeeping or other similar activities during these years. As a result, they may not claim to be searching for work or to have given up searching for a job. This result was only found for Pennsylvania: in the other states, being a young adult in the school-to-work transition years meant discouragement or unemployment at a higher rate than residents who are older.

In Pennsylvania and neighboring and nearby states, young workers found it more difficult to find enough hours of work and earn high enough wages to avoid being in poverty. The likelihood of being an involuntary part-time worker earning poverty or near poverty wages decreased with age but typically increased again near retirement age. The researchers concluded that younger workers and those nearing retirement are most at risk for these types of underemployment.

The models showed that education also made a difference. In Pennsylvania, having more education almost always paid off in terms of reducing the risk of underemployment. The effects in Pennsylvania and the regional models were consistent and statistically strong – higher levels of education were met with progressively lower risks of being underemployed. While the impacts of investment in education on underemployment were not studied directly, the study results for both unemployment and underemployment strongly suggest a key role for education.

African-Americans were less
likely to be “adequately employed.” Hispanic workers also appeared to be at higher risk of involuntary part-time employment as compared to the white, non-Hispanic population. The “other” race/ethnicity category—primarily the Asian population—was less likely than the white, non-Hispanic population to be unemployed or discouraged, but more likely to earn low incomes (poverty or near poverty wages).

Women were generally more likely to be underemployed than men, and were particularly likely to earn poverty or near poverty wages. Women of other races/ethnicities were more likely to earn low wages.

Finally, being married generally helped to reduce underemployment risk.

Pennsylvania Metro, Nonmetro Differences

The researchers found that residents of nonmetro Pennsylvania and those living in metro central cities were as likely to lack success in finding enough hours of work, all else being equal. However, central city residents were less likely than nonmetro residents in Pennsylvania to earn poverty or near poverty wages. Overall, the models showed that Pennsylvanians living in the state’s metro central cities were less likely to be underemployed, and therefore more likely to be “adequately employed,” than nonmetro Pennsylvanians.

Underemployment was distinctly less likely in suburban Pennsylvania than in nonmetro areas. Similar results were found across the region. The models showed that living in nonmetro areas, as compared to the central cities and the suburbs, was less likely to result in being adequately employed. The bottom line is that economic underemployment, taken overall, occurs at greater rates in nonmetro areas of Pennsylvania than observed in either suburban places or in the central cities. The models showed a consistent nonmetro underemployment disadvantage.

Determining If Underemployment Is Getting Better or Worse

For Pennsylvania, the results showed neither a time-trend increase nor decrease; in fact, other factors appeared to account for the variation in rates over time. In nearby states, however, the likelihood of residents being adequately employed was increasing, with corresponding decreases in the risk of underemployment of all forms.

Selected Forms of Underemployment in Rural Pennsylvania

Focusing on the rural counties in Pennsylvania, the researchers used the 2005-2006 RuralPA-CPS data to understand the magnitude of underemployment and the types of underemployment that exist. The profile of who is underemployed in Pennsylvania’s rural counties was found to mirror the profile of the underemployed for the state as a whole. By age group, the highest rates of underemployment were found among young adults. About one in five young adults, aged 18 to 24 years old, in the rural Pennsylvania labor force was unemployed in the past decade. Only about 36 percent held full-time jobs, meaning that about 45 percent of young adults living in Pennsylvania’s rural counties had part-time jobs and either wanted more work, cobbled together part-time jobs through multiple job-holding, or wanted to work part-time. In comparison, three out of four rural residents in the 25 to 34 age group in the labor force were employed full-time, although wages could be low. The risk of involuntary part-time work and unemployment tended to decline with age in rural Pennsylvania. Education played an important role. The highest rates of full-time employment (over 80 percent) were found among residents with a bachelor’s degree or more; inclusion of voluntary part-time workers raised the percentage to nearly 90 percent or more for the best educated who had jobs that matched their needs for hours of work.

The RuralPA-CPS data showed only small percentages of the rural population who are Hispanic or African-American, with rates of full-time employment for these groups being comparable to those for the white, non-Hispanic rural population.

Based on the percentages derived from low numbers of observations, African-Americans were somewhat more likely to be unemployed or to be involuntary part-time workers than the white, non-Hispanic population. Hispanic workers—again with low numbers of survey respondents—had the highest rate of full-time employment, the lowest rate of unemployment, and the lowest rate of involuntary part-time work, relative to the white, non-Hispanic and African-American population in Pennsylvania’s rural counties. But again, these results were based on low numbers of
observations, leading to caution over their interpretation.

Rural women were more likely to be voluntary part-time workers, involuntary part-time workers, unemployed, and hold multiple jobs than rural men in the past decade. The data show that about 82 percent of Pennsylvania’s rural men in the labor force were employed full-time as compared to 63 percent of rural women. When voluntary part-time employment was added to these figures, the total for rural men was about 88 percent as compared to 80 percent for rural women. Generally, women earned lower wages and were more likely to be in jobs that failed to provide full-time work hours.

Finally, while the researchers found a strong relationship between an individual’s underemployment and the household being in poverty, not all of the underemployed lived in households that qualified as poor or near poor. Results show that the underemployed were more heavily represented in lower income households but even some higher income households had family members who were underemployed. As expected, full-time employment consistently increased as household income increased, showing that most underemployed workers were in low income households, although some were middle and even high income. However, the percentages of the underemployed living in households at 200 percent or more of the household poverty threshold were really quite small. This comparison shows the strong association between underemployment and household poverty.

Determinants of Underemployment

Characteristics of the individual were found to be important indicators of being labor market “distressed” in Pennsylvania’s rural counties, as measured by unemployment or involuntary part-time work. Younger adults were more likely to be distressed. Programs aimed at easing the transition from school into the workforce as a young adult are worthwhile, if effective. By about the mid-thirties, the risk of being “distressed” declined consistently until retirement age. Education also was found to have a significant role in rural Pennsylvania. The study results show that all forms of education beyond high school reduced the likelihood of labor distress as measured by underemployment and involuntary part-time work.

Gender, other race/ethnicity, and marital status were again shown to be important, influencing the risk of unemployment and involuntary part-time employment. When the researchers analyzed the results for multiple job-holding, they found that relatively few worker characteristics matter when differentiating those who have multiple jobs from those with full-time employment. This means that other factors – quite outside of individual characteristics – influence multiple job-holding.

Also, growth in county-level employment reduced distress as measured by unemployment and involuntary part-time employment. Growth in local employment, while a community-level variable, may influence individual outcomes. Rural counties with more industry diversity are less likely to have residents either out of work or with only a part-time job and needing to work more hours. Lack of industry diversity also appears to leave workers without choices – it is harder to find a job and more difficult to cope economically by taking multiple part-time jobs. Holding multiple part-time jobs appears to be a characteristic of places that are adding jobs and where the employment base is diverse, perhaps allowing for better matches between (multiple) part-time jobs.

Service dependent counties were found to be places associated with higher distress as measured by unemployment and involuntary part-time employment combined, but also were places more likely to have multiple job-holding being undertaken as a strategy to create full-time hours of work. But again, the strategy of cobbling together multiple part-time jobs very often creates labor distress and higher transaction costs of participating in work. Cobbling together part-time service industry jobs very often creates labor distress and higher transaction costs of participating in work. Cobbling together part-time service industry jobs very often creates labor distress and higher transaction costs of participating in work. Cobbling together part-time service industry jobs very often creates labor distress and higher transaction costs of participating in work. Cobbling together part-time service industry jobs very often creates labor distress and higher transaction costs of participating in work.
Proximity of a rural county to an urban county reduced employment distress; a strong influence of urban proximity runs throughout the results of this study. The story seems to be that the farther from an urban area, the higher the rates of employment distress, with the exception of multiple job-holding, which appears to be more of an urban phenomenon or at least more likely in urban-adjacent rural counties, where the industrial base is diverse and where there is dependence on the service industry for jobs.

**Measuring Selected Forms of Underemployment in Pennsylvania Counties**

The researchers also looked at selected forms of underemployment by county, including involuntary part-time work, multiple job-holding, voluntary part-time work, and full-time employment, to find if counties with persistent unemployment rates were the same counties that had higher rates of specific underemployment. The researchers used the 2005-2006 RuralPA-CPS data and derived rates for all rural counties, excluding those that had fewer than 60 observations.

Basically, they found that not all persistent unemployment counties had high rates of the different forms of underemployment – that is, unemployment and the other forms of underemployment did not necessarily go hand-in-hand. Concentrating primarily on the rural counties with persistently high unemployment does not necessarily concentrate efforts on those counties with both persistently high unemployment and high rates of the other forms of employment distress.

**SUMMARY**

Results of the study show that Pennsylvania has experienced a remarkably persistent “unemployment gap” between the state’s rural and urban counties since at least 1976. Over the past 30 years, Pennsylvania’s rural and urban unemployment trends mirrored U.S. averages, with rural rates being consistently higher. The observed rural-urban unemployment gap is statistically significant, and there are no years in which the rural-urban rates are statistically equal. This suggests meaningful, long-term differences in Pennsylvania’s average rural and urban unemployment rates. The results also show that it is not simply a few counties that have inflated the (higher) average rate for rural Pennsylvania. Rather, rural unemployment was found to be a widespread problem in rural counties.

The results also show that all persistent unemployment counties in Pennsylvania are also rural. Fortunately, not all persistent unemployment counties were “pre-destined,” with respect to their long-term relative standing as some have improved over time.

Statistical models were estimated and provided additional understanding of the effects of social, demographic, political and economic factors on relative county unemployment rates (relative to the state average) and changes in the rates. Growth in local employment reduced relative unemployment, as did a more diversified economy. Results also highlighted the importance of a better educated workforce. Finally, the research showed that a one-time effort to stimulate local employment growth can reduce unemployment rates in the short term but that this effect disappears over time. A one-time effort is not enough to counter the higher equilibrium unemployment rates that are characteristic of rural counties – a longer-term strategy is needed.

The research also analyzed underemployment in Pennsylvania. Results show that more than one in five working-age Pennsylvanians was underemployed in the last decade. Pennsylvania residents had higher underemployment rates than U.S. residents in every year (1996-2006). Pennsylvania’s underemployment rates ranged from about 20 to 25 percent over this period, and diverged the most from U.S. rates during the early 2000s recession. This suggests that Pennsylvania residents are more likely to feel the effects of recession, as measured by their underemployment.

An assessment of how Pennsylvania has been faring relative to nearby states showed that, next to West Virginia, Pennsylvania had some of the highest underemployment rates – overall and by type of underemployment. Regardless of state, nonmetro rates were found to be consistently higher than metro rates. Statistical models confirmed that those at higher risk of underemployment included nonmetro residents, and also young adults, less educated residents, minorities, and women. Results also show that Pennsylvania’s rates are holding constant even though underemployment rates are generally declining in the region. At the state level, worker’s compensation was not found to contribute to the underemployment problem, but average state/local tax burden at the state level did.

Focusing on Pennsylvania’s rural counties, results show that a
higher degree of industry diversity and a better educated workforce contributed to lower rates of unemployment and fewer workers having to take part-time jobs when they really want full-time work. Residents of Pennsylvania’s more remote rural counties were more likely to be underemployed, as were those living in service-dependent counties. However, industry diversity and service dependence were found to increase rates of multiple job-holding.

Finally, the findings show that most underemployed rural Pennsylvania residents live in lower-income households. Further, underemployment is not concentrated solely in counties in the state that are dealing with persistent unemployment but is a more widespread problem. That is, while some of Pennsylvania’s highest unemployment counties had higher underemployment rates, not all do. In many respects, the use of underemployment rather than unemployment as an indicator of labor market distress provides a deeper understanding of the labor market issues faced by Pennsylvania’s residents.

POLICY CONSIDERATIONS

From a policy perspective, the researchers suggest the following.

- When rural Pennsylvania counties set unemployment rate targets, they should not expect to reach the state average; rather, their target should be at least 1 percentage point higher than the statewide average. Rural areas consistently were found to have higher unemployment rates that did not appear to match urban unemployment rates over time. This very likely represents a structural issue that will be difficult to remedy in terms of policy interventions.

- The use of unemployment as an indicator of “labor distress” is in many respects an incomplete indicator of the problem. When 20 to 25 percent of the state’s labor force experiences some form of economic underemployment, the limitation of targeting high unemployment counties misses the larger problem. Some of Pennsylvania’s rural counties experience persistent unemployment coupled with higher rates of selected forms of underemployment. Underemployment includes unemployment, is measurable and also provides a reliable indicator of “labor distress.”

- A one-time boost in employment growth should not be expected to have significant impacts on lowering long-term unemployment rates. This strategy tends to have impacts that are short-lived. Instead, a county with relatively high unemployment needs to have higher employment growth rates for at least several years for growth to have any real effect. This suggests an economic development strategy that relies on diversification: smaller investments in a portfolio of economic development projects may provide more long-term benefits than a single large project. Statewide development programs in Pennsylvania are in many instances already taking this approach. However, local communities across the state also need to change their approach to emphasize smaller diversified investments. Further, a diversification development strategy was shown to reduce the prevalence of involuntary part-time work. Diversification is likely to result in more multiple job-holding but this represents a less severe form of underemployment – preferred to not having enough hours of work and not finding a second or third job. Study results support the statement that investment in a variety of programs rather than reliance on the single large-scale project works better to reduce both unemployment and underemployment.

- Results also show the importance of an educated workforce for Pennsylvania for reducing unemployment and underemployment. Pennsylvania’s counties with higher levels of education were less likely to experience high rates of unemployment. And, higher levels of education reduced the likelihood of underemployment of almost all forms. Taken together, this evidence strongly suggests that strongly supporting education and knowledge-based skill development can help Pennsylvania reduce its underemployment problem. While the college-educated have the strongest possibility of avoiding unemployment and underemployment, associate vocational and associate academic degrees also make a difference, with associate vocational degree programs appearing to have the greater impact of the two options. The estimated models also showed that those who drop out of college sometimes are at higher risk than most other groups except those who have not finished high school. This points to the need to support programs that ensure that
students do not drop out prematurely.

- Easing the transition of young adults into the workplace should constitute a major policy goal for Pennsylvania. The study results confirm that young adults still continue to face difficulties in entering the labor market in jobs that provide enough hours of work and a family-sustaining income. Jobs that are part-time or low-paying can be coupled with schooling beyond high school, but there appear to be significant numbers of young adults in rural Pennsylvania who are underemployed in their jobs. Fortunately, this problem was shown to decline with age. This study also showed that Pennsylvania’s generation that is nearing retirement was less likely to be underemployed than typically has been the case, based on studies of underemployment in other regions of the U.S. Given this, a major focus of policy on young adults remaining in Pennsylvania’s rural areas makes sense.

- The research findings showed that a lower state/local tax burden is associated with a lower likelihood of underemployment of all types, when states in the region were compared. At the same time, workers’ compensation, sometimes believed to negatively influence employers and businesses in a state, did not appear to affect underemployment.

These results, coupled with a strong emphasis on diversification, education, and easing transitions into the labor force for young adults, point to strategies that the state can use to reduce Pennsylvania’s rural underemployment and unemployment rates in the future.

REFERENCES


EXECUTIVE SUMMARY

This 2006 research was conducted to better understand the forces causing unemployment, underemployment, or withdrawals from the labor market in rural Pennsylvania. It assessed how labor markets in each rural Pennsylvania county were performing relative to each other, to urban Pennsylvania counties, and to carefully defined peer groups of similar counties nationwide. By comparing each rural Pennsylvania county to its national peer group, the researchers could get a clearer sense of the strength, or weakness, of a county’s labor market along with a realistic forecast of what might be achievable.

The research analyzed the impact of both industrial structure and occupation mix on overall job growth in rural Pennsylvania since 2001 and on the fraction of jobs in a county likely to be available for college graduates versus jobs for those with high school diplomas only.

To complete the study, the researchers used county-level demographic data from the U.S. Census Bureau and labor market data from the U.S. Bureau of Labor Statistics.

After assessing employment to working-age population ratios, the researchers found that the largest impact on a county’s employment-to-population ratio was the percentage of adults with high school diplomas. Consequently, government programs aimed at reducing rural high school drop-out rates should be regarded as important components of a rural economic development strategy.

However, the research also revealed that, while rural counties within the state have relatively higher rates of educational attainment than their national peer group counties, Pennsylvania’s rural counties have, on average, higher unemployment rates than their peer groups. Lagging educational attainment alone does not explain the higher unemployment seen in the state’s rural counties.

In terms of underemployment, the researchers looked at unrealistic expectations concerning the percentage of the adult working-age population that could be pulled into a county’s labor force even under high labor demand conditions. They found that underemployment arises from more than just lagging education distributions; inadequate labor demand also was a relevant factor.

Another measure of underused labor was the county-specific underemployment rates computed for each of Pennsylvania’s 48 rural counties from estimates of links between underemployment and both the education and age distribution profiles of a county. For 2004, the estimated underemployment rates varied from almost 3 percent to more than 10 percent. A higher share of both younger and older workers was associated with higher county underemployment rates. More problematically, higher shares of college educated adults in a county also were associated with higher underemployment rates. And, an analysis of RuralPA-CPS data, which is collected by the Center for Rural Pennsylvania, found that having a college degree did not meaningfully lower the odds that a rural working person was working part-time only. Jointly, these results indicate that many college educated workers in rural Pennsylvania may regard themselves as underemployed.

The problem of underemployment for college graduates in rural Pennsylvania is caused, in part, by industry and occupation mixes skewed away from college graduate workers. This study created estimates, based on occupation mix, of the fraction of jobs in each county requiring a college degree and found that only one rural county in the state exceeded the national average for the percentage of jobs requiring a college degree. Moreover, 12 rural counties had estimated job shares for college graduates that were less than 75 percent of the national average.

The researchers concluded that any meaningful improvement in rural counties’ underemployment will need to include expanded labor demand in occupations favoring college-educated workers. This suggests that the state’s rural economic development funding programs give some priority to business expansions that may increase the share of jobs in a county requiring college graduates.
INTRODUCTION

Rural unemployment rates persistently have run higher than the national average for many years. Multiple studies also have established that rural underemployment remains a long-running problem. Studies by Isserman and Rephamm (1993), Hamrick (1997), and Jensen, Findeis, and Wang (1999), among others, have identified several contributing factors to higher rural unemployment and underemployment. These factors include the declining importance of manufacturing and natural resource sectors, lagging educational attainment in rural areas, lower levels of public service support than in urban areas, and geographic isolation.

State government programs to reduce rural unemployment and underemployment reflect the above determinates of poor labor market outcomes. State economic development programs aimed at attracting or retaining employers in the state’s rural counties are addressing the job demand side of rural labor markets. State support for education and skills training in rural areas is intended to increase the supply of higher skilled workers in these regions, thereby improving the quality of the labor supply in rural areas and hopefully stimulating greater demand for rural labor services. Lastly, there is a collection of government programs, such as child care assistance, disability assistance, and transportation services, which may eliminate barriers preventing potential workers from joining the labor force in rural areas.

It is not yet fully understood how the various factors contributing to rural unemployment and underemployment interact to adversely affect rural labor markets. This lack of understanding regarding the most important determinates of rural unemployment and underemployment, and their interactive effects, complicates the targeting of public tax dollars on programs most likely to improve rural labor markets.

This study used various estimates and models (Price and Wial, 2005; and Bollinger, Coomes, and Berger 2003) to explain variations across Pennsylvania counties in their estimated underemployment rates by county-level age distributions, educational attainment and urban/rural status.

It also analyzed Rural Pennsylvania Current Population Survey (RuralPA-CPS) data from the Center for Rural Pennsylvania and 2000 Census data to construct profiles of variables most closely linked to higher rural unemployment levels. Additionally, the study assessed the performance of each rural Pennsylvania county versus its national peer group on several labor market outcomes to provide estimates of the potential up-swing in employment for rural Pennsylvania counties if their labor market participation rates were to become among the best in their national peer group. The study’s findings provide guidance to policy makers on how public program dollars may be used to improve rural Pennsylvania labor markets. The study identified important causal factors driving unemployment and underemployment in rural Pennsylvania and identified those rural counties experiencing the largest underemployment rates and/or lowest employment to working-age population rates, thereby identifying regions most likely in need of greater assistance.

GOALS AND OBJECTIVES

The research was conducted to: better understand the forces causing unemployment, underemployment, or labor market withdrawals in rural Pennsylvania counties; assess how labor markets in each rural Pennsylvania county performed relative to their national peer group of similar counties, to each other, and to urban Pennsylvania counties; and assess the impact of both industrial structure and occupation mix on overall job growth and on the fraction of jobs in the county likely to be available for college graduates versus jobs for those with high school diplomas only in rural Pennsylvania.

“PEER GROUP” METHODOLOGY

The various methods used for the research are discussed along with their respective results. The “peer groups” in this study were generated by the researchers as a way of benchmarking the performance of rural Pennsylvania counties against the more than 3,100 counties in the contiguous United States.
United States. The peer groups were based on county classification codes designated by the U.S. Department of Agriculture’s Economic Research Service.

The researchers used two types of classification codes: Urban Influence Codes (UIC) and 2004 County Typology Codes (CTC). UIC is a measure of “population size, urbanization and access to larger communities,” and CTC is a measure of economic independence.

The researchers first sorted the national data based on UIC and then sorted the data by CTC so that the peer groups were based on similarities in the counties’ industrial structure and degree of rural versus urban characteristics. Each Pennsylvania county was placed in one of 20 different constructed peer groups, each containing from 53 to 222 counties.

RESULTS
Impact of Age on Rural Pennsylvania Counties’ Employment-to-Population Ratios

When compared against standard employment-to-population ratios for the rest of the nation, many rural Pennsylvania counties lag behind their counterparts in other states. The employment-to-population ratio is commonly used to gauge how well a regional economy is using its potential labor force. Higher county employment-to-population ratios are associated with healthier local labor markets and better job opportunities for area residents. To assess how much of the lagging employment-to-population ratio for rural Pennsylvania can be attributed to a higher fraction of retirement age adults in rural Pennsylvania than in many other regions, the researchers computed two different employment-to-population ratios. These measures were estimated for each of the 3,108 counties in the contiguous U.S. for each year from 1990 to 2004.

The standard reported employment-to-population ratio is county employment divided by the population age 15 years and over. The age-adjusted employment-to-population ratio is county employment divided by the population age 15 to 64 years old. Both county employment data, from the Bureau of Labor Statistics, and the population numbers, from the U.S. Census, are annual averages.

According to the analysis, there has been improvement in the employment-to-population ratios for rural Pennsylvania, after adjusting for age profiles, from 1990 to 2004. However, few rural Pennsylvania counties rank highly on this measure nationally. Figure 1 contains the 2004 age-adjusted measures for each Pennsylvania county ranked by their national percentile, where a 99th percentile value would mean the county’s age-adjusted employment-to-population ratio exceeds 99 of 100 counties in the country.

Only six rural Pennsylvania counties ranked above the 70th percentile nationally: Juniata, Franklin, Adams, Bradford, Elk and Perry. The poorer performing labor markets on this measure include eight counties ranking below the 30th percentile nationally: Union, Greene, Forest, Pike, Huntingdon, Fayette, Centre and Cambria. Of this group, Centre County’s results are skewed due to the large number of adult full-time college students residing in the county. Moreover, Greene, Huntingdon and Union counties contain correctional institutions contributing to their lower employment-to-population ratios.

Comparing rural Pennsylvania counties against their urban in-state counterparts also showed a lagging, but declining, gap in performance (Figure 2). Employment-to-population ratios for urban counties were level from 1990 to 2004 while there was improvement for rural counties on both the age-adjusted and unadjusted measures. A sense of the potential further gains in improving rural Pennsylvania labor market outcomes can be seen in the 2004 shortfall for rural versus urban counties. Had the average rural 2004 age-adjusted employment-to-population ratios equaled the 0.75 urban average, rural Pennsylvania employment would have been 108,153 larger than its actual 2004 employment of 1,597,871.

What accounts for the differences across rural and urban Pennsylvania counties in the employment-to-population ratio outcomes? Two likely forces include variations in educational attainment and age distributions across counties. The most important impacts on a county’s employment-to-population ratio are highlighted in Figure 3.

These results suggest a strong potential impact from lowering high school drop-out rates on rural Pennsylvania labor market outcomes. The estimates indicate that for every 1 percentage point increase in the share of a county’s adult population that is a high school graduate, there is a 0.6 percent higher employment-to-population ratio for the county. That is, if two counties are identical in all respects except that
County A has 1 percent more high school graduates than County B, County A would have a 0.6 percent larger employment-to-population ratio than County B. The impact from either younger (-0.6 percent) or older workers (-0.5 percent) is expected since increases in either age group lead to a reduction in the employment-to-population ratio. Note also that even after taking into account differences across counties in their age and education distributions, there is a strong negative effect on the employment-to-population ratio if a Pennsylvania county is rural (4 percentage point decline).

The estimated links between education and employment-to-population ratios from the analysis can provide a sense of the potential gains of improving education distribution for each rural Pennsylvania county; specifically, the share of adults attaining a high school diploma (or GED). The forecast shows the impact on a rural county of moving to the average for urban Pennsylvania counties. These results are presented in Figure 4 (Page 28) where rural counties are sorted on the basis of the forecasted change in their employment-to-population ratio outcome. For 10 of the 48 rural counties, the forecasted change is negative since the counties’ high school drop out rates were below the urban county average. For 16 rural counties, however, employment-to-population ratios would improve more than 2 percentage points by achieving the average urban county drop out rates. The potential gains are especially strong for Mifflin, Fayette, Greene, Juniata,
The analysis also demonstrated the impact on the employment-to-population ratio if a county’s share of both younger and older workers were the same as the average for urban counties (Figure 5). For eight rural counties, having the average urban county age distribution actually would slightly worsen their employment-to-population ratio. Only 10 counties would improve their employment-to-population ratio by at least 2 percentage points by reaching the urban average. Moreover, the three counties showing the largest potential gains reflect the unusually high concentration of college-age students in those counties relative to their population due to the presence of Clarion University, Indiana University of Pennsylvania, and Pennsylvania State University, respectively. Realistically, the counties most adversely impacted presently by their age distribution are Union, Snyder, Tioga, Sullivan, Columbia, Clinton and Forest.

### Impact of Educational Attainment on Unemployment Rates

The study next determined the impact of educational attainment distribution on rural Pennsylvania unemployment rates by comparing actual county-level unemployment rates against forecasted county-level unemployment rates based on educational attainment distribution. The forecasted rates were estimated for 1992-2004, based on data availability at the time of the analysis.

At the national level, unemployment rates were reported for four different educational attain-
ment groupings: less than a high school diploma, a high school diploma but no college, some college or an associate’s degree, and a bachelor’s degree or higher. The researchers calculated the educational-attainment adjusted unemployment rate forecast for each of the 3,108 counties in the contiguous 48 states by taking the weighted average of national unemployment rates by education cohort.

From the actual monthly data 1992-2004, the researchers computed the annual average values for each county nationally for both the actual unemployment rate and the forecasted educational-attainment adjusted unemployment rate. For each Pennsylvania county, the actual unemployment rate in each year was compared to the education-adjusted rate. If the actual rate was lower than the education-adjusted rate, the county’s labor market was performing better than expected given its educational distribution (Figure 6, Page 30).

While there has been some improvement in rural Pennsylvania counties’ actual unemployment rate outcomes as compared to the forecasted rates since the 2001 recession, only 10 rural counties have managed to do better than their forecasted rate at least one year since 2000. These counties are Adams (2002-2004), Centre (2002-2003), Franklin (2002-2004), Fulton (2004), Juniata (2002-2004), Montour (2002-2003), Perry (2002-2004), Snyder (2000-2004), Union (2003), and Wayne (2002-2003). The remaining 38 rural counties did not once match or fare better than their forecasted unemployment rates based on educational distribution since 2000.

### Figure 5: Estimated Impact of Worker Age in Rural PA Counties Moving to Average Worker Age in Urban Counties

<table>
<thead>
<tr>
<th>County</th>
<th>2004 Age Adj. Emp/Pop</th>
<th>Change in Emp/Pop if the County Had Urban Age Distribution Averages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perry</td>
<td>76%</td>
<td>-0.9%</td>
</tr>
<tr>
<td>Pike</td>
<td>64%</td>
<td>-0.8%</td>
</tr>
<tr>
<td>Montour</td>
<td>74%</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Schuylkill</td>
<td>68%</td>
<td>-0.6%</td>
</tr>
<tr>
<td>Elk</td>
<td>76%</td>
<td>-0.3%</td>
</tr>
<tr>
<td>Carbon</td>
<td>70%</td>
<td>-0.3%</td>
</tr>
<tr>
<td>Butler</td>
<td>74%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Armstrong</td>
<td>68%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Washington</td>
<td>71%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Somerset</td>
<td>71%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Clearfield</td>
<td>71%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Warren</td>
<td>73%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Wayne</td>
<td>72%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Northumberland</td>
<td>72%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Fayette</td>
<td>65%</td>
<td>0.2%</td>
</tr>
<tr>
<td>McKean</td>
<td>71%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Monroe</td>
<td>67%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Greene</td>
<td>59%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Franklin</td>
<td>82%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Bradford</td>
<td>76%</td>
<td>0.3%</td>
</tr>
<tr>
<td>Mifflin</td>
<td>73%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Bedford</td>
<td>69%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Venango</td>
<td>68%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Juniata</td>
<td>83%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Susquehanna</td>
<td>74%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Adams</td>
<td>77%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Wyoming</td>
<td>71%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Jefferson</td>
<td>71%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Fulton</td>
<td>75%</td>
<td>0.9%</td>
</tr>
<tr>
<td>Potter</td>
<td>71%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Blair</td>
<td>75%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Cameron</td>
<td>69%</td>
<td>1.0%</td>
</tr>
<tr>
<td>Cambria</td>
<td>65%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Huntingdon</td>
<td>65%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Lawrence</td>
<td>70%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Lycoming</td>
<td>73%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Mercer</td>
<td>68%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Crawford</td>
<td>68%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Union</td>
<td>55%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Snyder</td>
<td>74%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Tioga</td>
<td>73%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Sullivan</td>
<td>73%</td>
<td>3.9%</td>
</tr>
<tr>
<td>Columbia</td>
<td>71%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Clinton</td>
<td>71%</td>
<td>4.6%</td>
</tr>
<tr>
<td>Forest</td>
<td>62%</td>
<td>5.2%</td>
</tr>
<tr>
<td>Clarion</td>
<td>69%</td>
<td>5.7%</td>
</tr>
<tr>
<td>Indiana</td>
<td>68%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Centre</td>
<td>65%</td>
<td>10.0%</td>
</tr>
</tbody>
</table>
The Center for Rural Pennsylvania Studies on Unemployment and Underemployment in Rural Pennsylvania

One possible explanation for the scarcity of rural Pennsylvania counties that meet their expected unemployment rates given their educational distribution is that these counties tend to experience higher rates of unemployment given their degree of rural isolation and underlying industry sector profiles. This possibility is investigated by comparing each rural Pennsylvania county against all counties in its national peer grouping. For each of the 48 rural Pennsylvania counties, the researchers computed their percentile ranking within their national peer group for each year for both actual and educational-attainment based forecasts. This yielded the frequency of rural Pennsylvania counties landing in the top quarter, or top half, of their peer group ranking. Figure 7 reports the number of rural Pennsylvania counties that exceeded the 75th, 50th, and 25th percentiles, respectively, in their peer group rankings.

Based on the forecasted unemployment rates from educational distributions, rural Pennsylvania counties expected unemployment rates match up well with their respective peer group counties. For example, for the year 2004, 44 rural counties had forecasted rates above the 25th percentile, 32 were above the 50th percentile, and eight were above the 75th percentile of their respective peer group counties. Overall, rural Pennsylvania counties are relatively well educated when compared against their national peer-group counties.

When the researchers compared the actual unemployment rates of rural Pennsylvania counties with their national peer group counties, however, the results were much weaker. For the year 2004, only three counties exceeded the 75th percentile, 16 exceeded the 50th percentile, and 37 the 25th percentile. While rural Pennsylvania counties are well educated relative to their national peer groups, the improved educational outcomes are not leading to similar improved outcomes on actual unemployment rates.

Forecast of Pennsylvania County Employment

To better understand county employment, the researchers assessed the rural Pennsylvania county employment growth records from the first quarter of 2001 through the third quarter of 2005. The starting period coincided with the onset of the 2001 recession. The latter period was the most recently available data at the time of the analysis. While some minor seasonality differences might have existed when comparing the first and third quarter data, the researchers note...
that the primary concern was the structural changes in the national economy since the last recession, in particular, the impact of the large drop in manufacturing employment. The research model first estimated the local employment change if each North American Industry Classification (NAIC) sector in the local region grew at the national rate for that sector. This estimated employment change was compared against the actual employment change for the region. The difference between the actual and estimated change is known as the local competitiveness effect.

In this study, if a county’s actual current private sector employment exceeded or was less than this forecasted value, the county’s job growth was better or worse than expected given the county’s industry mix in March 2001. This estimate of the local competitiveness effect indicated the relative strength or weakness of rural Pennsylvania counties with regard to recent and likely near-term future employment growth, given the county’s industry mix.

The analysis results indicate both good and bad news for rural Pennsylvania. Of the 48 rural Pennsylvania counties, only 32 posted actual employment growth from March 2001 to September 2005, as measured in the BLS Quarterly Census of Employment and Wages. This was due, in large part, to an industry mix weighted more heavily toward sectors with contracting or lower employment growth, such as manufacturing and natural resources. What was more encouraging is 33 rural Pennsylvania counties had a positive local competitiveness effect over the March 2001 – September 2005 period, meaning the percent change in total employment was larger than expected based on their industry mix. Fifteen rural Pennsylvania counties had a negative local competitiveness effect, 14 of which also had negative employment growth. Only one county, Blair, had positive overall employment growth with a negative local competitiveness effect. Figure 8 classifies each of the 48 rural Pennsylvania counties into the positive local effect vs. negative local effect and total employment growth vs. loss.

The rural Pennsylvania counties with negative local effects are relatively concentrated in the southwest and northern-tier areas of the state. These regions of Pennsylvania appear to be experiencing employment growth challenges over and above their industry-specific difficulties.
An issue of potential concern over the next decade for Pennsylvania county labor markets is the impact of an aging population on the size of the county’s labor force. To get a sense of how this might affect Pennsylvania over the next decade, the researchers estimated county-level labor force forecasts to 2015 and the percentage change in the labor force by county from 2005 to 2015. These estimates assumed a constant rate of labor force participation within any given age group for a county over the entire sample. The estimates should be regarded as simulations showing what would happen to a county’s labor force based on its changing age profile if each age group maintained a steady labor force participation rate.

The researchers used U.S. Census data for 2000 and data estimates for 2005, 2010 and 2020. If each county’s labor force participation rates per age cohort were to hold constant, as assumed in this simulation, then only three rural counties would experience an increase in labor force size from 2005 to 2015: Monroe, Adams and Centre. Of the remaining 45 rural counties, 29 would experience at least a 2 percentage point decline in the size of their labor force. Somerset, Northumberland, Schuylkill, Cambria, Armstrong, Warren, Forest and Sullivan counties would be particularly hard hit with labor force declines of between 4 percent and 9 percent. The primary cause of the large labor-force participation rate declines is a higher rate of population exit from, than entry...
into, the 25 to 54 year old age cohort, since this cohort has higher labor-force participation rates than younger or older age cohorts in nearly every county.

Many of these counties could potentially offset the forecasted decline in labor force size with those who are underemployed. As noted earlier, the average rural county’s employment-to-population ratio was 70 percent in 2004 while the urban county average was 75 percent. Schuylkill, Cambria, Armstrong and Forest counties, in particular, seem likely to have a considerable upswing available in their labor force participation rates given their relatively low current age-adjusted employment-to-population ratios. Overall, across rural counties, it appears that modest increases in current labor force participation rates should be sufficient to offset much, if not all, of the departures from the labor force due to aging.

Also, keep in mind that these labor-force participation rates are based on place of residence rather than place of employment. Weak county labor demand may well lead to both a lower county labor-force participation rate and a higher fraction of residents commuting outside the county for work. If so, it may become easier for businesses in counties with low labor-force participation rates to replace retiring workers with an existing county resident, who may currently be commuting outside the county for employment.

**Underemployed Estimates by Rural County**

The researchers computed county-specific underemployment rates for each Pennsylvania county to estimate the link between unemployment rates and both educational and age distribution profiles of a county. The results indicated that underemployment rises as the share of the workforce that is less than 20 years old and as the share of those over age 55 rises. Rural underemployment rates also increase as the share of the population with some schooling.
beyond a bachelor’s degree rises. For 2004, rural county unemployment rates varied from about 3 percent to more than 10 percent, with the counties most likely to be suffering from substantial underemployment to be Sullivan, Forest, Union, Mifflin, Indiana, Cameron, Clarion, Bradford, Snyder, Columbia and Clinton. Each had estimated underemployment rates in excess of 6 percent (Figure 10, Page 33).

Estimates of the Number of Core Unemployable by Rural PA County

One concern when evaluating current rural labor market outcomes in Pennsylvania is the extent to which a lack of job skills, or a mismatch between job skills and job demand, has rendered a significant portion of the rural population essentially unemployable. While it would be quite useful to have accurate estimates of the size of these “core unemployable” cohorts in each county, there are many challenges in estimating such numbers.

To gauge the potential amount of labor that could be drawn into each rural counties’ labor force if sufficient demand existed, the researchers generated estimates of “Core Not Potential Workers” or “Core NPW.” Core NPW is the lowest ratio feasible for a county of its not-employed-working-age adults to its total-working-age population. Core NPW will be the sum of the true core unemployable, the minimum feasible unemployment rate, and the minimum that cannot be drawn into the labor force. The estimates were based on the upper range of labor market outcomes with the relevant national peer group for each rural Pennsylvania county. The results indicated that many rural Pennsylvania counties could expand their workforce considerably if the labor demand existed. The counties, in ascending order, with the most underused labor were Indiana, Mercer, Snyder, Fulton, Monroe, Jefferson, Wayne, Cameron, Cambria, Pike, McKeen, Union, Greene, Potter and Forest.

Factors Associated with Unemployed Workers in Rural Counties

The researchers analyzed 2005 RuralPA-CPS data for information on observable socio-demographic characteristics potentially associated with unemployment and several other labor market outcomes.

From the 2,053 household records, 4,159 individuals responded to a question about their labor force status. Those who worked then indicated if they worked full-time and/or part-time.

Figure 11 provides a demographic breakdown of these respondents by reported labor market outcome, educational attainment, age, gender, and marital status.

The labor market outcome “Not Working and Looking for Work”
is the definition of an unemployed worker, so the left data column contains socio-demographic profile information on unemployed rural Pennsylvania workers.

The researchers found that, consistent with national data, as educational attainment beyond high school increased, unemployment rates declined. Individuals with a bachelors’ degree or higher had unemployment rates less than half of those with high school diplomas only. With the exception of the 40-49 age range, the unemployment rate declined with age from the 20s until past 60 years of age, again consistent with national data.

The 40-49 age range unemployment rate spike may be a data anomaly arising from the relatively small sample of 180 self-reported unemployed individuals.

The male unemployment rate was 40 percent higher than the female rate. This outcome may largely reflect the higher labor force participation rates of males. In the survey, the male labor force participation rate was 82 percent while the female labor force participation rate was only about 70 percent. Married respondents had unemployment rates only two-thirds to less than half the unemployment rates for all other marital status categories (except widowed, which only had two responses). Overall, the RuralPA-CPS data suggest that rural counties with more of their workforce in the 30-60 year old range, a higher fraction of their workforce with more than a high school diploma, and higher rates of intact marital households were likely to have lower unemployment rates.

**Characteristics Associated with Various Labor Market Outcomes**

Several results from the above RuralPA-CPS analysis are also worth noting, especially for individuals not looking for work, out of the workforce due to disability, working part-time, and working full-time. First, among those who were not working and not looking for work, their movement into or out of this category occurred prior to and at the end of their prime working age years. Also, those in this category were more than twice as likely to be female than male.

For those who were out of the workforce due to disability, two results are noteworthy. First, there was a dramatic reduction in the share of this population as educational attainment increased beyond the high-school-diploma-only level. Also, there was a sharp jump in this population once the age cohort exceeded 50 years.

The working part-time versus working full-time results reveal several relationships relevant for understanding characteristics associated with part-time work in rural Pennsylvania. The most important survey outcome here suggests underemployment may be a meaningful problem for college graduates residing in rural Pennsylvania. For high-school-diploma-only individuals, almost 16 percent of workers were working part-time. For bachelors’ degree or higher individuals, about 15 percent were working part-time. This suggests that some college graduates in rural Pennsylvania are involuntarily working part-time.

The percent of part-time work-ers falls sharply after age 30 as about 32 percent of those aged 20-29 worked part-time while about 16 percent of those aged 30-39 worked part-time.

The percentage of those working part-time continues to decline with age until age 60: about 11 percent for 40-49 year olds, 10 percent for 50-59 year olds and 29 percent for 60-69 year olds. There are minimal differences in the percent of workers working part-time according to marital status, except for those who were never married, which included many younger individuals.

**Forecasts of County Employment by Educational Attainment**

One potential cause of underemployment for college graduates in rural Pennsylvania is that insufficient demand for college educated labor arises in part from the past and current occupational mix in rural counties. Historically, the main industry sectors, such as agriculture, natural resources, and manufacturing, for rural Pennsylvania would have had occupational demands skewed away from college graduates. While considerable change has occurred in recent decades in rural Pennsylvania’s industrial structure, it still may be the case that the existing occupational mix generates a smaller share of total jobs for college graduates.

The researchers merged BLS and U.S. Census data files to forecast a county’s share of jobs by educational attainment requirements, assuming that for each occupational category the county’s distribution of jobs by education within the category is the same as for national level.
data. When interpreting the results, however, the researchers recognized that the technique most likely is biased toward overestimating the demand for college-educated workers in rural areas, since even within occupations, rural areas are less likely than urban areas to have the most highly-educated workers.

The findings indicate that rural Pennsylvania does in fact suffer from a serious shortfall in occupations demanding college graduates.

Only one rural county, Centre, matched or exceeded the national average of about 29 percent of jobs for college graduate workers. Moreover, Centre County is not representative of most of rural Pennsylvania. Only five rural counties (Butler, Montour, Monroe, Pike, and Washington) had job demands for college graduates within 90 percent of the national average. Twenty-seven rural Pennsylvania counties had estimated job demands for college graduates that were less than 80 percent of the national average. These results show that for much of rural Pennsylvania, absent significant changes in the occupational mix, it is unlikely that there will be strong demand growth for college graduate workers.

### SUMMARY

#### Employment to Working-Age Population Outcomes

- Rural Pennsylvania’s employment-to-population ratio outcomes were clustered in the lower middle range of counties nationally. Even after adjusting for the share of adult populace of retirement age, few rural Pennsylvania counties were in the top 30 percent of counties nationally but only six were in the bottom quarter.
- Rural Pennsylvania counties have closed the gap with urban Pennsylvania counties on the age-adjusted employment-to-population ratio since 1990 but still lag by 5 percentage points.
- Even after controlling for differences in educational attainment and age profiles between urban and rural Pennsylvania counties, a substantial “rural penalty” on the age-adjusted employment-to-population ratio remained.
- The variable identified as having the largest positive impact on rural counties’ age-adjusted employment-to-population ratios was the percentage of adults with high school diplomas. Getting students to complete high school improves a county’s employment rates.

#### Impact of Educational Attainment on Rural Unemployment Rates

- Rural Pennsylvania counties have relatively higher rates of educational attainment than their peer group counties. However, these higher rates of educational attainment have not translated into lower unemployment rates, on average, than those of their peer group counties.
- In any given year between 1992 and 2004, only between two and nine rural Pennsylvania counties had actual unemployment rates as well as or better than forecasted, given their educational attainment distribution.
- Based on their educational attainment levels versus their national peer groups, eight rural Pennsylvania counties would be in the top quarter of their peer group and 32 would be in the top half.
- These findings suggest that neither lagging educational attainment nor underlying industry structure characteristics are sufficient to explain the higher average rates of unemployment for rural Pennsylvania counties.

#### Impact of Rural Industry Mix On Job Growth Since Last Recession

- From the start of the last recession in March 2001 through September 2005, only 32 rural Pennsylvania counties posted employment growth as measured in the BLS Quarterly Census of Employment and Wages. For many of these counties, this was due in part to their industry mix being more heavily weighted toward industry sectors experiencing contracting employment nationally. Even after control-
ling for industry mix, however, 14 rural counties with reduced employment did worse than forecast based on their industry mix.

Potential Changes in Rural Labor Force Size by 2015 From Aging Populations

- If there were no changes in each county’s labor force participation rates by age cohort from 2005 to 2015, the increasingly older population profiles for a number of rural counties would lead to declines in the total size of their labor force. These projected labor force declines, however, may well be offset by rising labor force participation rates in many of these counties as their overall employment to working-age population ratios are below the state average.

Estimates of Rural Underemployment and Key Determinants

- Underemployment rises as the share of the workforce that is less than 20 years old rises and as the share that is over 55 years old rises. Rural unemployment rates also increase as the share of the population with some schooling beyond a bachelor’s degree rises.

Estimating Size of “Not Potential Workers” for Rural Counties

- About 15 rural Pennsylvania counties within the state could expand their workforce considerably if the labor demand existed.

Key Factors Associated With Labor Market Outcomes in Rural Pennsylvania

- The analysis found appreciable declines in the unemployment rate as educational attainment extended beyond a high school diploma. For example, individuals holding a bachelor’s degree or higher had unemployment rates less than half of those with a high school diploma only.
- The level of education beyond high school, however, does not impact the odds that a person is working part-time rather than full-time. For high school diploma-only workers, about 16 percent were working part-time; for those with a bachelor’s degree or higher, about 15 percent were working part-time. This result suggests that some college graduates in rural areas of the state are involuntarily working part-time. It is consistent with earlier findings from the regression analysis of underemployment that found higher rates of college graduation were associated with higher rates of county underemployment.

Role of Occupation Mix in Labor Demand for College Graduates in Rural Counties

- The multiple findings of underemployment in rural counties for college graduates can be explained, at least in part, by the occupational mixes found in rural counties. The analysis estimated that, nationally, about 29 percent of jobs are associated with a bachelor’s degree or higher. Only one rural county exceeded the average, and 12 counties had estimated job shares for college graduates that were less than 75 percent of the national average.

POLICY CONSIDERATIONS

This study documented that rural Pennsylvania counties suffer from labor market outcomes inferior both to those of most urban Pennsylvania counties and to appropriately selected sets of peer group counties nationwide.

Some of the findings of this study suggest potential policy actions on both the supply and demand sides of rural labor markets.

For example, the findings found strong benefits to rural labor market outcomes from reducing the share of adults with less than a high school diploma. Therefore, efforts to increase high school graduation rates and increase GED completion rates for older individuals should be regarded as an economic development strategy.

Government programs aimed at increasing the level of post-high school education across rural residents, such as expanded student loans and related education or job training subsidies, appear to generate two different effects in rural labor markets. On the positive side, levels of education beyond high school
further reduce rural county unemployment rates and increase employment-to-population ratios. Unfortunately, rising shares of college educated adults in rural counties also was associated with higher reported rates of underemployment.

Government programs intended to reduce the degree of underemployment in rural counties will need to focus on labor demand issues. The current distribution of occupations across rural Pennsylvania is skewed away from those occupations that generate larger shares of jobs requiring bachelor’s degrees or more. This study clearly documents that the current occupation mix in many rural counties is not well suited for absorbing college graduates wishing to return to or remain in their home rural county. Since occupation mixes within a region tend to evolve slowly, this suggests a role for government intervention in supporting projects likely to increase the share of rural county jobs requiring college degrees.

This intervention could take several forms. Programs that provide support for entrepreneurial start-up firms, such as business incubator support or financial assistance, are one pathway for potentially increasing the ability of rural counties to retain or attract college graduates.

Another potential means of assistance would be giving modest preferences in the competitive bidding processes for state contracts to rural start-up firms that are more intensively using college graduates.

Lastly, the various rankings of rural counties against one another on the multiple measures of labor market outcomes can be used by policy makers to identify those counties most likely to benefit from the discussed government policy interventions. Should smaller-scale pilot projects be enacted, these rankings provide valuable guidance regarding where within rural Pennsylvania to first concentrate the proposed project’s resources.

REFERENCES
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