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Abstract

As labor markets tightened in the last half of the nineties, economic development and community leaders sought to identify more locally available workers than were indicated by published statistics. Using results from commissioned surveys, they pointed to large numbers of part-time workers who desired full-time work, and to full-time workers who were qualified for better jobs. These statistics were often used to negate low official unemployment rates that deterred firms, concerned by the ostensible shortage of workers, from locating in their counties. We have conducted a larger, statewide, survey of underemployment and linked it to the detailed demographic and labor force data from the 2000 Census. We used the results to identify variations in the number and type of underemployed persons around the state, with emphasis on the differences between urbanized and rural areas. Over a quarter of full-time workers reported underemployment, including a third of workers in exurban counties. However, forty to fifty percent of underemployment is reportedly by choice, with the highest rates in the small urban and exurban regions. Of those that are not underemployed by choice, over ninety percent of respondents in some regions cited lack of job opportunities. We find that between fourteen and forty percent of part-time workers prefer full-time work, with the highest rates in rural Appalachian counties. We provide some of the reasons underemployed people cite as constraints to better employment. Also, we used the survey results and the recent Census information to predict the number and type of underemployed persons in each county. The model can be used to update predictions as new local demographic and labor force estimates are released annually from the Census Bureau's forthcoming American Community Surveys.

Measuring Underemployment at the County Level

Introduction

In the last half of the 1990s local economic development officials around the United States faced an unprecedented challenge. Economic growth and business investment were very strong, and companies were shopping for places to build new manufacturing, distribution and office facilities. However, published estimates of unemployment rates were very low, in some cases one to three percent, leading many companies to fret that communities could not provide sufficient labor to staff the new sites[1]. Business and civic leaders in many communities, not wanting to miss a business siting and not convinced that the local labor market was as tight as the statistics suggested, responded by commissioning studies of 'underemployment'. These studies, typically relying on telephone surveys, attempted to measure the number of persons in the labor market area who would change jobs if they could be hired for more hours, at a higher wage, or for in a preferable position. Thus, local economic development officials used unofficial statistics on the underemployed to convince companies that there was still excess capacity in the labor market (Wirtz 2002).

These survey-based underemployment studies cost tens of thousands of dollars, well beyond the research budgets of most county governments or workforce organizations. We have conducted a statewide survey of households, stratified in such a way that inferences can be made about the differences in underemployment among county types. We examine the differences in underemployment between large urban/suburban, small urban, exurban, rural mountainous, and rural farm counties. The survey and modeling results may be useful to economic development and workforce agencies, as the range of county types considered apply to most counties in the US.

Economic conditions have changed significantly in the past few years, and few people are now talking about worker shortages. However, our view is that the issue of underemployment is here to stay. When the economy next accelerates, labor market tightening will induce concerns similar to those of the late-1990s. Local officials have learned to discount published unemployment rates, to be creative in their representations of their labor force, and to market information about underutilized human capital. There is little academic literature that addresses the subject of the amount and type of underemployment in a region. Our study adds to the emerging literature by describing the variations in underemployment across types of counties.

Literature

Most economists instinctively dismiss the term underemployment when they first encounter it. The conventional wisdom is that someone is either working, seeking work, or voluntarily out of the labor force (and possibly discouraged). If they do not like their job or the number of hours worked per week, they will pursue opportunities until they find a better fit. However, a bit of reflection suggests that the concept of underemployment is quite relevant and important. While people have wide and continuous preferences for hours worked per day or week, most jobs available still require thirty-five to forty hours per week spread over five days. Thus, given this fixed hours constraint, most people are either underemployed or overemployed. A classic case is the well-educated parent-homemaker with several years work experience, interested in part-time professional work at a high wage, but unable to find anything better than low wage retail employment. Indeed, there is a good theoretical and empirical literature on the underemployment and overemployment of individuals. Altonji and Paxson (1988) found that individuals require extra compensation to work more or less hours per week than they prefer, and therefore trade off improvements in

hours worked against wage gains when they change jobs, as a reflection of the prior mismatch between preferred and constrained hours. Ham (1982) found that twenty-eight percent of the labor force was either unemployed or underemployed in 1970. Feather and Shaw (2000) found evidence of both underemployment and overemployment in the presence of a fixed workweek, with the value of leisure time more sensitive for females than males to changes in family size, age and nonlabor income.

The distinction between voluntary and involuntary part-time work is also now well-recognized. In fact, the Labor Force Survey of the European Union includes questions to determine why respondents work part-time[2]. Among part-time working males in 1998, forty percent of those aged 25-49 reported they would prefer full-time work but could not find it. For women, the proportion is much lower, only around sixteen percent. The European survey also found that both men and women working part-time, but preferring full-time, were much more likely to be in a contract or other temporary job than those working in full-time jobs.

There are other related constraints that limit people's ability to match their skills and preferences to the extant labor market. Consider the so-called trailing spouse - one spouse finds a very satisfying job in a place where there is no market for the special skills of their partner. Others find that they would have to relocate or commute long distances to attain a job that matched their training and abilities, but they value certain lifestyle patterns or community amenities more than the expected gain in income. In both of these examples, the person's underemployment is voluntary. They could relocate and receive a wage commensurate with their human capital. Nevertheless, so long as they choose to live in a labor market that is too thin or sparse to provide them appropriate employment opportunity, they are underemployed and the local labor market has excess capacity. Spatial restrictions,

based upon one's place of residence, are explored in van Hamm et al (2001). They find, for example, that Dutch women become discouraged from participation in the labor market in places where underemployment is high.

Of interest here is the measurement of total underemployment in a particular place. Unlike other important labor market variables, there is no official US Bureau of Labor Statistics definition or measure of underemployment. Ideally, local analysts and policy makers would have regular (say annual) estimates of the number of underemployed persons in each county and region. We found that local officials are most interested in two types of underemployment: part-time workers who prefer full-time work, and full-time workers who would qualify for a better job if it existed in the region. We take these two categories as our working definition of underemployment[3].

Survey of households

The long form of the decennial census, administered to one in six households, asks detailed questions on demographic and economic characteristics, including workforce status, hours worked, education, occupation, commute time, and income by type. However, the questionnaire does not probe to see if the person is employed as fully as they would like. To measure this, we administered a phone survey to over 3,000 Kentucky households in 2001 that repeated the relevant census questions and additionally queried people about their underemployment (or lack of it). By repeating the census questions, we hoped to tie our findings on underemployment to socioeconomic variables that are measured for each local area and thus can be used to generate county-level estimates of underemployment[4]. We ran simple OLS regressions to find relationships between the types of underemployment reported by respondents and their age, gender, hours worked, education, and industry of employment. We used these regressions to predict underemployment by type in each county.

Nearly all socioeconomic questions from the 2000 Census long form were repeated in our questionnaire[5]. We did not repeat the questions about housing characteristics. At three points in the census questionnaire we inserted a series of new questions to probe for underemployment.

➢ If the person is employed, we asked if their primary position was temporary or permanent. If the response was 'temporary', we asked if the person would like to be employed in a more permanent job.

➢ If the respondent reported working less than 35 hours per week, we asked if they would rather have a full time job. And then we attempted to determine why the person was working part time. In particular, we offered the following reasons why the person was unable to work full time.

    ❑ lack of child care or dependent care

    ❑ geographic location

    ❑ lack of job opportunities

    ❑ lack of good income from available full time jobs

    ❑ disability

    ❑ lack of support from family

➢ If the respondent worked 35 or more hours at their primary job, they were considered to be working full time. We explained to these respondents that sometimes people are overqualified for their job because they have more training and experience than is required to perform the job, and ask if they feel they are underemployed in that sense. We also asked if their underemployment was by choice or whether they would rather have a better full time job. And, as with

underemployed part time workers, we ask if any of six factors (above) contribute to their underemployment.

➢ Finally, for all employed persons, we ask a series of questions about skills, experience, and training.

❑ Do you think your skills, education, and experience fit well with your current employment?

❑ Do you think you should have a better job than the one you have now?

❑ Do you think you are qualified for a better job than the one you have now?

❑ Why do you feel you are qualified for a better job? Does your education qualify you for a better job?

❑ Is it on the basis of your skills?

❑ Is it on the basis of your experience?

❑ Is it on the basis of your training?

❑ Do you feel you are qualified for a better job than the one you have now for some other reason? What is that reason?

❑ Do you feel that you are paid and compensated appropriately for the work which you do?

❑ If you worked somewhere else that was a better fit to your level of skills, education, and experience, about how much more do you think your wages would be (in percent)?

❑ What would have to be changed about your current job for you to feel that it matched your qualifications? Possibilities: additional

challenges/responsibilities, higher pay, better benefits, need a different job/job can't fit qualifications, other.

❑ What job do you desire that would be a better fit to your level of skills, education and training?

We hypothesized that underemployment patterns may differ by type of county. In particular, we suspected that workers in large urban counties (with thicker labor markets) would report less underemployment than those in remote rural counties. Based on population size and geographic location, we partitioned Kentucky's 120 counties into five types: large urban-suburban, small urban-suburban, exurban, rural Appalachia, and rural west-central. See Figure 1 and Table 1 for the designations. The large urban-suburban category includes the core counties of the Louisville, Cincinnati-Northern Kentucky, and Lexington labor markets. The small urban-suburban category includes the counties that contain a city of sufficient size to support such urban services as a daily newspaper, a hospital, a shopping mall, or an airport. Exurban counties are rural in character, but close enough to major urban centers that residents can commute to a broad range of employment opportunities. The rugged landscape, dependence on extraction industries, and distinct culture of rural eastern Kentucky induced us to treat it as a category separate from the other rural counties in the state. We used this classification to partition our sample.

Survey Results

In total there were 3,285 usable respondents in the survey, with over 600 from each of the five geographic types. Table 2 provides a summary of results most germane to the discussion of the labor force status of the population. Of those respondents 58 percent were employed, with nearly 15 percent of the employed working part time. While employment rates are lower in rural areas, the proportion of those working full time is slightly higher in

rural areas. Moonlighting is more prevalent in large urban areas. Commuting times are higher in rural areas, especially exurban areas where attractive job opportunities exist for those willing to drive to the larger regional cities. Unemployment rates are higher in rural Appalachia but so is the percentage of workers who say they could return to work next week. The percentage of workers in manufacturing is highest in exurban areas and in the rural west. Blue collar production employment is more prevalent in rural areas of the state. Between 86 and 90 percent of workers report that their skills, education and experience fit their current job.

Over a quarter of full-time workers residing in Kentucky reported underemployment, including a third of workers in exurban counties. However, 40 to 49 percent of underemployment is reportedly by choice, with the highest rates of underemployment by choice in the small urban and exurban regions. Of those that are not underemployed by choice, over 90 percent in some regions cited lack of job opportunities. Others cite low wages and geographic location. Depending on the region, child care issues are cited as a reason for underemployment by 12 to 29 percent of workers. Women are slightly more likely than men to cite child care issues as the reason for underemployment.

Between 63 and 71 percent of workers, whether full-time or part-time, say they have attempted to improve or increase their job skills through classes, seminars or training. And about a third of Kentucky's workers believe that they could find a better job in three months if they were willing to commute or relocate within a 200-mile region. The average amount of time workers thought it would take to find a better job in the region was 9 to 12 months.

Of those working part-time, 24 percent would prefer full-time work. Overall, this implies that approximately 2 percent of all respondents in the sample were part-time and would prefer full-time work. The rate of reported underemployment ranges from 14 to 40

percent of part-time workers, with the highest rate in rural Appalachia. Many of those working part-time report doing so because of family or child care considerations, with the rate varying between 16 percent in the rural west and 30 percent in rural Appalachia. In large urban areas the main reason cited by persons not wanting full-time work is that they are currently in school or some form of training. Nearly a quarter of those living in exurban areas report that they choose part-time work because they have retired from a career and/or want to stay under social security limitations for earned income. Finally, we find that 58 to 81 percent of temporary workers report that they would prefer permanent jobs.

Model to Predict Underemployment by County

The survey data are representative at only the regional level. That is, the statistical information from the sample of respondents is sufficient to make inferences about underemployment in the county type groupings, but the sample size is not sufficient to make statements about underemployment in individual counties. Hence, the survey data are used to estimate a model of underemployment by county type and this model is applied to county-specific socioeconomic data to predict underemployment in each county. The explanatory variables chosen are determined, in part, by the variables that are available from the 2000 Census (SF3) and the forthcoming American Community Surveys. The census data provide counts of people in each county by gender, age, race, industry, occupation and income category. Hence the estimation model is a simple linear regression model, where all variables are indicator variables. When we aggregate to county level, indicator variables become counts, as provided in the census. Since the dependent variable is also an indicator variable, it too provides a prediction of the total number of underemployed.

In order to arrive at a predictive model, a number of specifications were examined. The goal was to include variables which allowed prediction of the subpopulations of interest,

and to include important predictors of underemployment, while still preserving parsimony. Including irrelevant variables simply taxes the model, while excluding important variables reduces the predictive power.

We used ordinary least squares regressions where both the left and right hand side variables are included as dummy variables. We included fourteen indicator variables on the right hand side, including age, marital status, race, education, industry, and earnings, as well as the county types. The explanatory power is relatively low, as is typical for such cross sectional models. A few variables stand out in importance, however. The most important predictors include age, industry of employment, and income. In general, younger unmarried persons with lower incomes are more likely to be seeking better work or more hours. Females working part-time are less likely to consider themselves underemployed, as are married persons of either gender, regardless of hours worked per week. Blacks and other minorities were more likely than whites to report underemployment. Full-time employees with a baccalaureate degree, or those who are self-employed, were less likely to consider themselves underemployed. Interestingly, those working full-time for manufacturing companies are more likely to perceive themselves as underemployed, while those working in government are less likely. Part-time workers living in small urban and rural Appalachian counties were more significantly more likely to be seeking full-time work than in the large urban counties. Estimated coefficient values for the other two county types, and the constant term, were not significant; however, this is primarily because the county type differences are already captured in the socioeconomic variables. Regression results are provided in Table 3.

We also tested for a relationship between reported underemployment, estimated local unemployment, and local claims for state unemployment insurance benefits.

Surprisingly, we found no statistical relationship between unemployment and underemployment, suggesting the two represent distinct labor force characteristics. Also, we had hoped to find a strong relationship between UI claims and underemployment, as UI claims data are regularly available from the administrative system at the county level and thus could be an excellent indicator variable. The UI claims data are also the foundation of the Local Area Unemployment Statistics program, the BLS program that produces county-level estimates of unemployment. However, we found no significant statistical relationship between local UI claims and underemployment. Indeed, for companies looking for labor market slackness, our measure of underemployment may be a better measure than the published unemployment estimates. That is, taking account of local demographic and economic factors like age, marital status, industrial employment, income and the like may predict the level of excess labor supply better than official unemployment rates.

County-level estimates were generated using the regression model just described and the recently released SF3 detailed Census data by county. These are summarized in Figure 2, which displays the percentage of employed persons predicted to be underemployed versus the number of employed persons. Underemployment ranges from fourteen to thirty percent, with no positive or negative trend evident as the workforce gets larger. However, there are some interesting variations when the total underemployment is decomposed into its part-time and full-time components. Warren and Madison counties rank 3rd and 4th, respectively in the number of part-time workers seeking full-time jobs, but 5th and 10th in the number of full-time workers seeking better work. Presumably, this is because these counties are dominated by large regional public universities, where state workers are satisfied with their full-time jobs but other workers have trouble finding full-time jobs. Similarly, Pike County ranks 9th in the number of part-time workers seeking full-time jobs, but 23rd in the number

of full-time workers seeking better jobs. Pike has a core of highly paid full-time jobs in the coal mining industry, but the economy is not diversified. Thus part-time workers have few other local sources of satisfactory jobs.

Conclusions

We have used a household survey to characterize the degree and type of underemployment in counties of Kentucky, and linked that to economic and demographic findings from the 2000 Census. One-fourth of full-time workers reported that they were underemployed. However, up to one-half of all reported underemployment was voluntary. That is, workers knew they could work more hours, make more money, or find a better fit with their talents, but acknowledged making lifestyle or residential location decisions that effectively precluded a better job fit. We found a wide range of underemployment, varying by type of county. Very urbanized counties had the least reported underemployment among part-time workers, while those in the rural western counties reported the least underemployment among full-time workers. Full-time workers living in exurban counties were most likely to report that their underemployment was by choice. And part-time workers living in rural Appalachian counties were most likely to say they wanted full-time work.

We estimated a model to predict underemployment by type and county, and used that to make estimates of excess labor capacity around the state. We estimate that a total of 355,000 workers in the state consider themselves to be underemployed, or nearly 20 percent of those holding a job. The highest rates of predicted underemployment are in counties dominated by large pubic universities. The variables in the model will be measured at the county level between the decennial censuses in the forthcoming American Community Surveys, to be produced by the US Census Bureau. This will allow us to generate estimates

of local underemployment, taking account of the changes in age, income, marital status, race, and other key local determinants in intercensal years. In the statistical work we found no relationship between local underemployment and UI claims or published unemployment statistics. There appears to be something else at work than the traditional concept of unemployment - those unsuccessfully seeking work. Rather underemployed persons already have work, but would like more hours per week on the job, or another job that better matches their skills, education, and experience.

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Figure 1

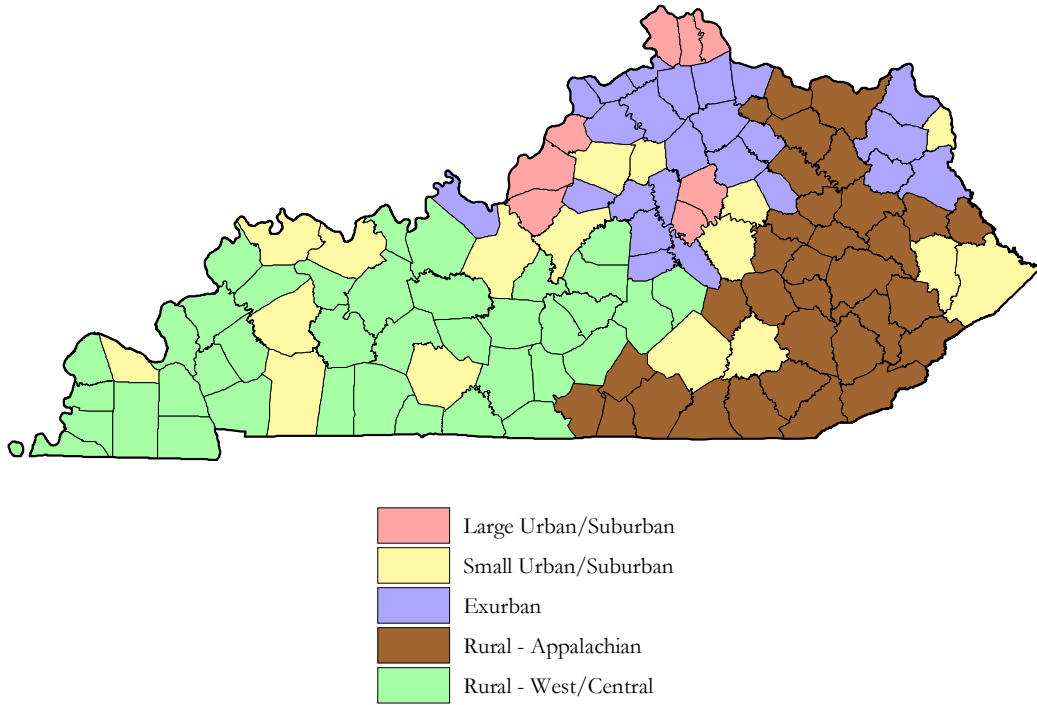**Classification of Kentucky Counties for Survey of Underemployment**

Large Urban/Suburban
Small Urban/Suburban
Exurban
Rural - Appalachian
Rural - West/Central

Table 1
Classification of Kentucky Counties for Labor Force Survey, with 2000 Population

Large		Small		Exurban		Rural - Applachian		Rural - West	
Boone	85,991	Boyd	49,752	Anderson	19,111	Bath	11,085	Adair	17,244
Bullitt	61,236	Christian	72,265	Bourbon	19,360	Bell	30,060	Allen	17,800
Campbell	88,616	Clark	33,144	Boyle	27,697	Breathitt	16,100	Ballard	8,286
Fayette	260,512	Daviess	91,545	Bracken	8,279	Clay	24,556	Barren	38,033
Jefferson	693,604	Floyd	42,441	Carroll	10,155	Clinton	9,634	Breckinridge	18,648
Jessamine	39,041	Franklin	47,687	Carter	26,889	Cumberland	7,147	Butler	13,010
Kenton	151,464	Hardin	94,174	Elliott	6,748	Estill	15,307	Caldwell	13,060
Oldham	46,178	Henderson	44,829	Gallatin	7,870	Fleming	13,792	Calloway	34,177
	1,426,642	Hopkins	46,519	Garrard	14,792	Harlan	33,202	Carlisle	5,351
		Laurel	52,715	Grant	22,384	Jackson	13,495	Casey	15,447
		McCracken	65,514	Greenup	36,891	Johnson	23,445	Crittenden	9,384
		Madison	70,872	Harrison	17,983	Knott	17,649	Edmonson	11,644
		Nelson	37,477	Henry	15,060	Knox	31,795	Fulton	7,752
		Pike	68,736	Lawrence	15,569	Lee	7,916	Graves	37,028
		Pulaski	56,217	Meade	26,349	Leslie	12,401	Grayson	24,053
		Shelby	33,337	Mercer	20,817	Letcher	25,277	Green	11,518
		Warren	92,522	Montgomery	22,554	Lewis	14,092	Hancock	8,392
			999,746	Nicholas	6,813	McCreary	17,080	Hart	17,445
				Owen	10,547	Magoffin	13,332	Hickman	5,262
				Pendleton	14,390	Martin	12,578	Larue	13,373
				Scott	33,061	Mason	16,800	Lincoln	23,361
				Spencer	11,766	Menifee	6,556	Livingston	9,804
				Trimble	8,125	Morgan	13,948	Logan	26,573
				Woodford	23,208	Owsley	4,858	Lyon	8,080
					426,418	Perry	29,390	McLean	9,938
						Powell	13,237	Marion	18,212
						Robertson	2,266	Marshall	30,125
						Rockcastle	16,582	Metcalfe	10,037
						Rowan	22,094	Monroe	11,756
						Russell	16,315	Muhlenberg	31,839
						Wayne	19,923	Ohio	22,916
						Whitley	35,865	Simpson	16,405
						Wolfe	7,065	Taylor	22,927
							554,842	Todd	11,971
								Trigg	12,597
								Union	15,637
								Washington	10,916
								Webster	14,120
									634,121
share of state	*35.3%*		*24.7%*		*10.6%*		*13.7%*		*15.7%*
State Total	4,041,769								

Source: US Census Bureau, 2000 Census of Population and Housing

|	Large Urban & Suburban	Small Urban & Suburban	Exurban	Rural Appalachian	Rural West
Employment					
Percent of adults that are working	64.8%	61.9%	59.5%	48.2%	56.5%
Full-time	83.8%	81.1%	88.1%	85.7%	85.6%
Part-time	16.2%	18.7%	11.9%	14.0%	14.2%
Primary job is					
Temporary	7.4%	7.4%	7.6%	8.8%	8.6%
Permanent	92.4%	92.4%	90.8%	90.3%	90.4%
Don't know	0.2%	0.2%	1.7%	0.9%	1.0%
Percent of workers with more than one job	9.4%	5.4%	5.4%	4.6%	4.5%
Averager commute time each way (minutes)	18.9	19.6	23.9	22.1	19.9
Average hourly wage of workers	$20.03	$17.68	$16.37	$15.96	$14.42
Percent of all workers for which skills, education, experience fit current job	89.9%	89.4%	89.0%	85.9%	87.8%
Underemployment					
Percent of those with full-time job who are underemployed	28.1%	31.1%	33.8%	29.3%	26.3%
Percent of underemployed with full-time job who are underemployed by choice	39.6%	47.1%	48.6%	40.7%	44.6%
Reasons cited for being involuntarily underemployed full-time					
lack of job opportunites	74.6%	92.6%	86.4%	91.7%	93.5%
low wages at available jobs	57.6%	72.2%	61.0%	79.2%	78.3%
geographic location	25.4%	46.3%	47.5%	56.3%	58.7%
child or dependent care responsibilities	11.9%	16.7%	20.3%	29.2%	26.1%
Percent of those with part-time job wanting full-time job	13.6%	32.0%	19.6%	40.0%	18.9%
Top reasons cited by part-time workers not wanting to work full-time					
in school or training	31.6%	19.6%	18.9%	18.5%	27.9%
family or personal obligations	17.5%	23.5%	24.3%	29.6%	16.3%
retired, or social security limitations	12.3%	15.7%	24.3%	14.8%	14.0%
child care responsiblities	14.0%	23.5%	13.5%	18.5%	16.3%
Percent of those in temporary job wanting permanent job	58.1%	73.3%	66.7%	80.6%	63.6%
Unemployment					
Percent of all adults who looked for work in past month	4.9%	4.7%	3.8%	6.6%	4.5%
Other characteristics					
Percent of respondents who were non-white	13.2%	9.1%	5.5%	2.8%	5.4%
Percent of all adults currently attending school or college	8.6%	9.9%	5.4%	6.6%	7.3%
Percent of respondents reporting physical or mental limitations	25.1%	33.7%	37.6%	54.1%	39.3%
Number of completed surveys	637	658	650	680	662
Response rate	40.9%	40.5%	41.5%	40.2%	43.8%

Table 3
Regression Model of Underemployed, by Type

Indicator Variables (1=true, 0=false)	Part-time worker seeking full-time work	Full-time worker seeking better job
age 18 to 24	0.0147 *	0.0460 ***
female	-0.0075	-0.0026
married	-0.0163 ***	-0.0221 **
black	0.0056	0.0739 ***
other minority	0.0192 *	0.04637 **
disabled	0.0044	0.0267 **
have bachelor's degree	0.0007	-0.0879 ***
works in manufacturing	-0.0069	0.0540 ***
government employee	0.0082	-0.0246 *
self-employed	0.0051	-0.0475 ***
work 35 hours or more weekly	0.0147 **	0.1682 ***
works 15 to 34 hours weekly	0.1740 ***	0.0499 ***
works less than 15 hours weekly	0.0933 ***	0.0681 *
annual earnings $25,000 or more	-0.0141 **	-0.0229 *
lives in small urban or suburban county	0.0121 ***	-0.0068
lives in exurban county	0.0044	-0.0026
lives in rural Appalachian county	0.0164 **	-0.0017
lives in rural western county	0.0037	-0.0110
constant	0.001	0.0014
R squared	0.13	0.10
F	26.4	19.2

Reference county of residence is large urban; 3,258 total observations.
* \significant at .10 ; ** at .05; **** at .01 level of confidence

Figure 2
Estimated Underemployment Rates in Kentucky's 120 Counties
part-time workers seeking full-time work plus full-time workers seeking better work
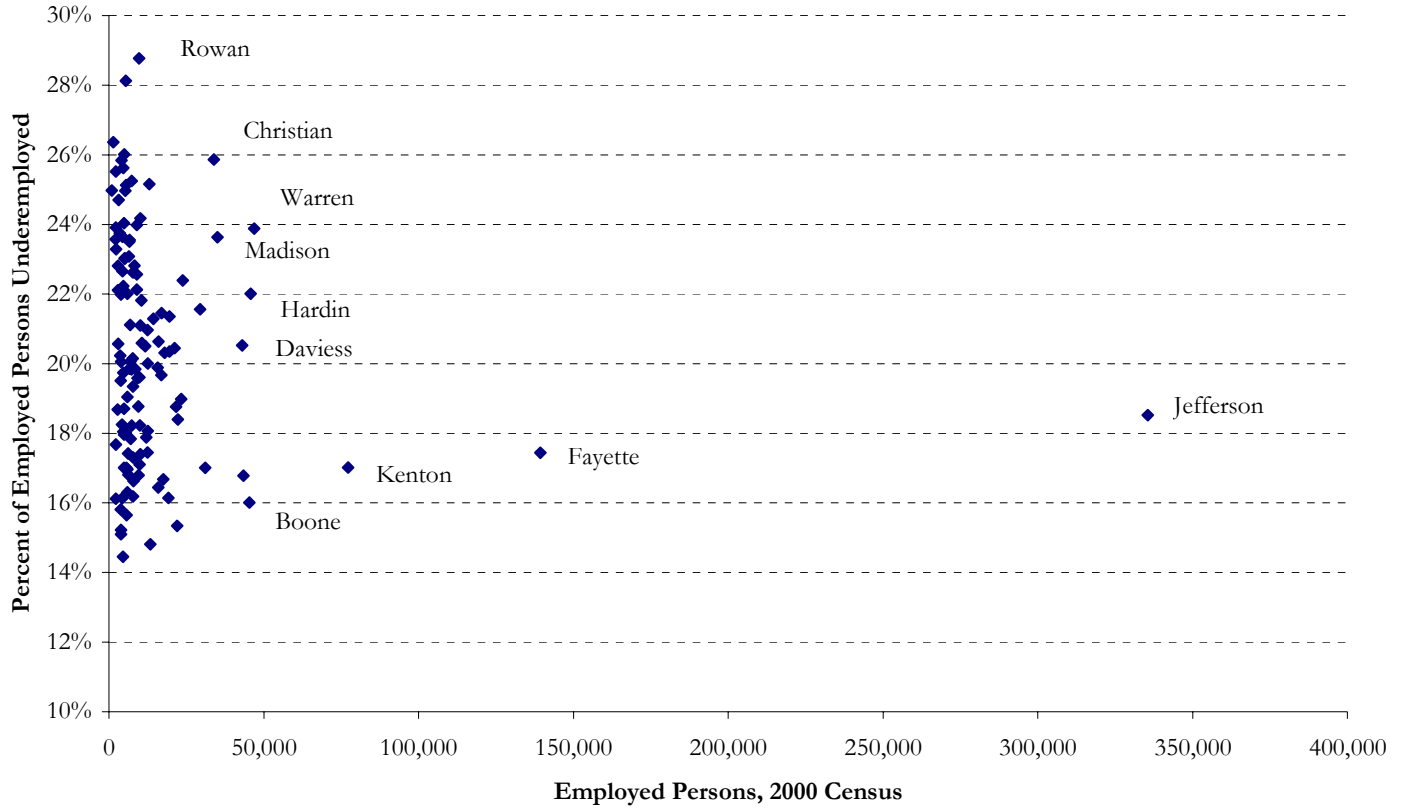
[1] The 2000 Census, however, reports much more unemployment around the United States than that previously published for March 2000. There were large discrepancies even for the most populated counties. For example, the Kentucky state workforce cabinet had estimated the unemployment rate in Fayette County to be 1.7 percent, whereas the Census estimate was 5.0 percent. The difference is presumably due to the lack of household-based workforce information available for the Local Area Unemployment Statistics (LAUS) program that is used to generate county and metro area labor force estimates monthly.

[2] See Employment in Europe 1999, pages 26-41, for a discussion.

[3] Alternatively, in the van Hamm et al study, the researchers defined underemployment to include persons having no job, having a job of less than twelve hours per week, or having a job that requires less qualifications than the jobholder possesses. They calculate the number of underemployed from the Dutch Labour Force Surveys, and exclude from the domain those over age 54, students, military personnel, self-employed, and the disabled. Using this definition, they find that 41 to 54 percent of the potential labor force in local areas of Holland are underemployed.

[4] The careful reader has no doubt noted that we conducted our survey in late 2001, a year and one-half after the 2000 Census was taken. This was unavoidable given the timing of our research contract, and we do not know how this affects our results. Presumably, there was little change in core socioeconomic variables, such as gender, race, and education levels. Perhaps more worrisome is that a national recession occurred during this period, certainly reducing growth in employment in Kentucky and raising the level of unemployment.

[5] See www.census.gov/dmd/www/pdf/d02p for a copy of the long form Census questionnaire. We repeated all questions through number 32, except for question 27 which asks the respondent to name his or her employer. The surveys were designed and administered by the University of Kentucky Survey Research Center during November and December of 2001. The questionnaire

was administered by telephone and was approximately 25 minutes in length. The sample was selected using a statewide Waksberg Random-Digit Dialing method. This gives every household in the sampled regions with a phone an equal probability of being selected. The sample was then pre-filtered for known non-working phone banks and known business numbers. Interviewers asked to talk to the person at each phone number who is age 18 or over and has had the most recent birthday. UK-SRC standard procedures are to attempt each number a minimum of 15 times as scheduled by computer to cover some attempts during all time windows – daytime, evening, and weekend. If an eligible respondent was reached who could not complete the interview at the time, UK-SRC schedules up to 7 callbacks to complete the interview. Finally, UK-SRC attempted one refusal conversion for those reached who initially refuse to participate. The plan was to obtain approximately 625 completed interviews in each of five regions in Kentucky. This provides a margin of error no more than $\pm$ 4% in each region at the 95% confidence level.