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The Economic Cost of Unemployment and Underemployment

Mervin J. Yetley

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THE ECONOMIC COST OF UNEMPLOYMENT AND UNDEREMPLOYMENT. By Mervin J. Yetley, Agriculture and Rural Economy Division, Economic Research Service, U.S. Department of Agriculture. ERS Staff Report No. 89-17.

ABSTRACT

Both underemployed and unemployed workers involuntarily forgo personal earnings. Those forgone earnings are viewed as a cost to the national economy. For nearly all workers, lost earnings from underemployment are larger than for unemployment. Rural workers lose relatively more earnings to underemployment than do urban workers. The procedure used to estimate the magnitude of lost earnings is described in this report.

Keywords: unemployment, underemployment, labor distress, lost wages, lost personal earnings, cost of labor distress.

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SUMMARY

The magnitude of lost earnings was estimated for workers experiencing labor distress: the unemployed and four categories of underemployment (discouraged workers, involuntarily part-time employed, the working poor, and those occupationally mismatched). The loss of personal earnings due to underemployment is greater than for unemployment, with the total loss exceeding $205 billion on an annual basis.

The unemployed in urban areas have the largest individual category loss, while this distinction is held by the working poor in rural areas. Females and blacks tend to be overrepresented in most categories in both rural and urban areas. This happens because they do not contribute proportionately to lost earnings due to lower wage scales. Rural black workers are especially affected.

Information by State indicates considerable variance in the percentage of total earnings lost by the unemployed. Comparative data for selected States suggest this percentage ranges from 27.5 to 50.7 percent. These findings show that reliance on unemployment statistics alone provides an incomplete indicator of the extent of labor distress in the Nation's economy and for the rural economy in particular.

The Economic Cost of Unemployment and Underemployment

Mervin J. Yetley

INTRODUCTION

Agriculture was the dominant rural industry and occupation in the United States during the 1950's, with 15 percent of the U.S. population living on farms. During this same period, rural America had widespread poverty and was viewed as economically disadvantaged. These problems were eventually recognized, and in the mid-1960's, President Johnson created the National Advisory Commission on Rural Poverty to address these issues.

Rural areas experienced economic revitalization during the late 1960's and into the 1970's. New jobs were created as rural communities successfully competed with urban areas for manufacturing plants. At the same time, agriculture experienced booming export markets and rising land values and incomes. The results were rural population growth and the hope of a bright future for rural America.

But, even as the population of most rural communities was steady or increasing in the 1970's, agriculture was declining in relative importance as non-agricultural jobs increasingly provided the major source of income. By the mid-1980's, approximately 40 percent of rural residents lived in counties primarily dependent on manufacturing for jobs and income (6, 9).[1]

The 1980's ushered in renewed economic stress in rural America. A number of conditions both internal and external to rural economies and communities brought about sharp declines in jobs and incomes from agriculture and related businesses, mining, energy, and manufacturing. Rural businesses and banks began to fail, and, in many areas, population started to decline. The optimism of the 1970's plunged as job opportunities disappeared (1).

These changed economic and structural conditions resulted in limited, or even declining, job opportunities in rural areas. Rural workers needed to upgrade their skills to maintain employability or learn new skills to move into new jobs. Achieving and sustaining a high-quality workforce capable of capitalizing on emerging job opportunities in a changing economy is an important element in successful rural development.

Adequate planning and appropriate implementation of remedial programs requires accurate and timely information about workers needing new job opportunities. Basic information includes age, education, sex, job skills, and the experience level of workers currently experiencing employment-related economic distress.

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[1] Underscored numbers in parentheses refer to items listed in the References.

Even more basic is the need to determine the extent of labor distress (that is, the number of people affected by limited job opportunities, and the economic magnitude of lost wages in various sectors of the economy). Measures of labor distress are important indicators of the strength of rural and urban economies. Recent evidence suggests labor distress in the 1980's is higher among rural workers than urban workers. Measures of labor distress, combined with information on the incidence by race, sex, age, and geographic groupings, would provide a basis for a fuller understanding of the overall economic problems in rural America (5).

This report describes a research methodology developed to estimate the magnitude of lost wages due to labor distress in the U.S. economy. The methodology estimates lost wages for workers within each labor-distress category. Aggregate results are presented for rural and urban, male and female, and white, black, and other workers.

THE ANALYTICAL FRAMEWORK

The basic assumption underlying this analysis is that it is beneficial to our society for individuals of working age who desire work to be able to obtain employment, including self-employment, that provides earnings commensurate with cohorts having similar skills who work full time. Thus, workers, whose earnings seriously lag behind the average earnings of workers with similar skills and experience, are defined as labor-distressed workers. The total cost to society of labor distress includes both social and economic costs. While the total costs are probably incalculable, the major economic costs are known. From the perspective of the whole economy, these include the value of forgone earnings and public welfare expenditures to assist those with poverty-level incomes. An argument can also be made to include the value-added to products not produced and, therefore, not available to consumers. This section of the report describes the analytical procedure used to estimate the dollar value of earnings lost due to labor distress. Personal and family financial problems associated with labor distress are undoubtedly contributing factors to many other social problems which also produce economic problems for the Nation. This report, however, does not attempt to measure these costs.

Previous work on unemployment and underemployment (2, 3, 4, 7) has identified five categories of labor-distressed workers:

1) The discouraged: workers who have become so discouraged they are no longer actively looking for a job, but who would work if an appropriate opportunity arose.
2) The unemployed: those officially out of work and actively looking for employment.
3) The part-time employed: those involuntarily working part-time (less than 35 hours per week for a majority of the weeks during the past year) because they cannot find full-time work.
4) The working poor: workers who earn less than 1.25 times the individual-level poverty threshold, even though they are employed full time.
5) The mismatched: workers whose job fails to fully use their skills because of an occupational mismatch.

These categories of labor distress are ranked on the basis of financial severity to the worker. In this analysis, a worker who fits two categories is classified into the more severe category.

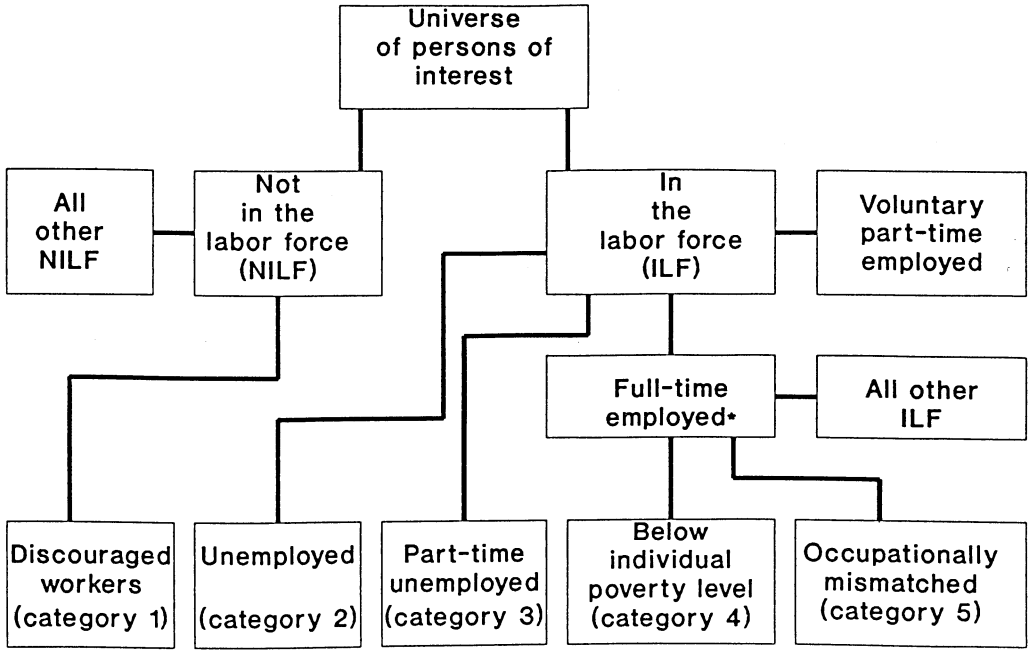
Lichter and Costanzo found labor distress is underestimated in official unemployment statistics, especially for rural areas (7, 8). Nevertheless, the rate of unemployment is the labor statistic used for allocating Federal funds to States for labor retraining or rural development programs (10).

While the number of workers in the various categories of labor distress is useful information, this report takes the next step and estimates the dollar value of lost earnings (11). The magnitude of lost earnings, when combined with information about the number and characteristics of persons experiencing labor distress, provides important information for understanding the total economic costs of failing to fully employ the Nation's workforce.

Estimating lost earnings due to labor distress is an empirically tedious task. Initially, the task was to define the universe of individuals to be investigated. This analysis, like most studies of labor markets, defines the universe of potential workers as noninstitutionalized civilians 16 years old or older. From this initial pool, individuals unable to work for reasons of disability, retirees, or people voluntarily out of the labor force (for example, housewives and full-time students) are defined as "not in the labor force" (NILF) (fig. 1). These individuals would be of no further interest, except that the NILF category includes discouraged workers who have given up looking for work, but who would work if appropriate employment were available (category 1, fig. 1). The empirical problem is to identify these individuals and estimate expected earnings based on their job-relevant characteristics.

A basic assumption of this study is that full-time employment is available for those desiring to work. While fundamental, this assumption does not imply that full employment is achievable. Rather, full employment is used as a

Figure 1--Labor distress categories



*This group was used to statistically estimate the parameters of the expected earnings equation.

benchmark in the same manner as used in the calculation and reporting of unemployment statistics. It is the fully employed workers who provided the parameter estimates from which expected earnings were derived for the unemployed and those employed part-time. To estimate an earnings equation requires a large pool of full-time workers, including self-employed, with the associated personal earned income and characteristics data.[2] Earnings should not include dividends and capital gains but should be derived directly from the employment of the individual's labor and skills. The list of job-relevant personal characteristics can be very long. The characteristics discussed are not exhaustive, and they anticipate the variables actually used in the analysis.

Educators and students of labor and labor markets have long been interested in the earnings that accrue to additional education and increased skills. Other variables of interest include sex, race, geographic region, metro versus nonmetro residence, ethnic origin, self-employment, and occupational activity within industry. In generic form, the earnings equation is:

personal earnings = f[(sex, race, ethnic origin, region, metro versus nonmetro, self-employed versus otherwise, industry, occupation), (age or experience level, education)].

This equation, statistically fit to full-time workers, provided parameter estimates for each variable. These parameter values were then used to derive an expected earnings value for workers not employed full-time.

The cost of labor distress, except as discussed below, is the difference between expected earnings and reported earnings on an annual basis. Reported earnings for discouraged workers will be zero because these persons are not and have not recently been in the workforce. Therefore, the cost of labor distress (CLD) for a worker in this category is CLD_i = (expected $earnings_i$ -0) = expected $earnings_i$ (fig. 2). For involuntary part-time workers (those unable to obtain full-time employment) reported earnings, y_i, are positive amounts so that CLD_i = (expected $earnings_i$ - y_i), where $y_i > 0$. For those few individuals whose reported part-time earnings are greater than the expected full-time earnings, CLD_i should be zero (that is, if $y_i >$ expected $earnings_i$, then $CLD_i = 0$. The CLD for unemployed persons is calculated the same way, where $y_i >$ or $= 0$, depending upon the duration of unemployment for the person in question (fig. 2).

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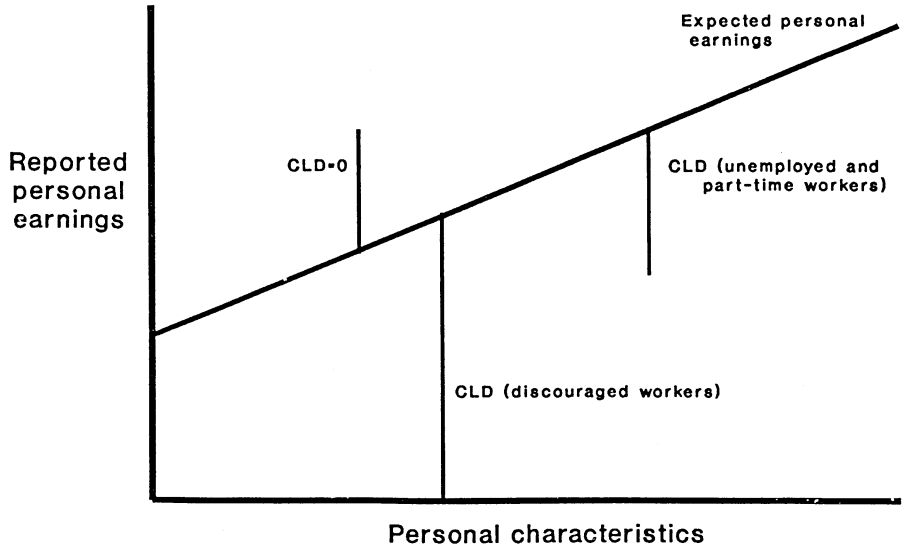
[2] This analysis attempts to follow the procedure of Clogg as closely as possible (2, 3, 4). The same categories of distressed workers are used based upon the same definitions, except as noted for the occupationally mismatched. Nevertheless, because this analysis is an extension of Clogg's previous work, there are issues of estimation open to debate. For example, the decision to include the working poor and the occupationally mismatched in the earnings estimation group can be questioned. Why include categories of distressed workers in the group that serves as the standard? The decision to include these distressed workers in the estimation group was made on the basis that the earnings equation should be based upon all full-time workers. This results in a more conservative measure of the cost of labor distress than if these labor distress groups had not been included in the earnings estimation equation.

Figure 2--Cost of labor distress

Discouraged, part-time, and unemployed workers



Two categories of full-time workers experience labor distress. The first of these is the working poor (category 4). The working poor may be thought of as persons working below their skill potential. This suggests society has failed to develop the inherent potential of these workers, such that they cannot earn a living at or above the poverty level. Building on this assumption, the CLD for the working poor is the difference between the individual poverty-income level and reported earnings, that is, CLD_i = (individual poverty-income level - reported $earnings_i$) (fig. 3). Because this does not involve the statistically estimated expected earnings equation, the calculation of the CLD for the working poor is primarily one of identification.[3]

The second category of full-time workers experiencing labor distress is the occupationally mismatched. Calculating the CLD for these workers is more involved, both conceptually and analytically. The procedure used in this analysis follows that developed by Clogg (4), with the addition of an economic criterion. It is important to understand that mismatched workers, like the working poor, are employed full-time. Thus, if an individual is involuntarily employed part-time the mismatch issue is not raised. This is because being forced to accept part-time employment is assumed to result in a worse financial state for the worker and a greater loss for the economy than full-time occupationally mismatched employment. This conforms to the ranking on severity of labor distress.

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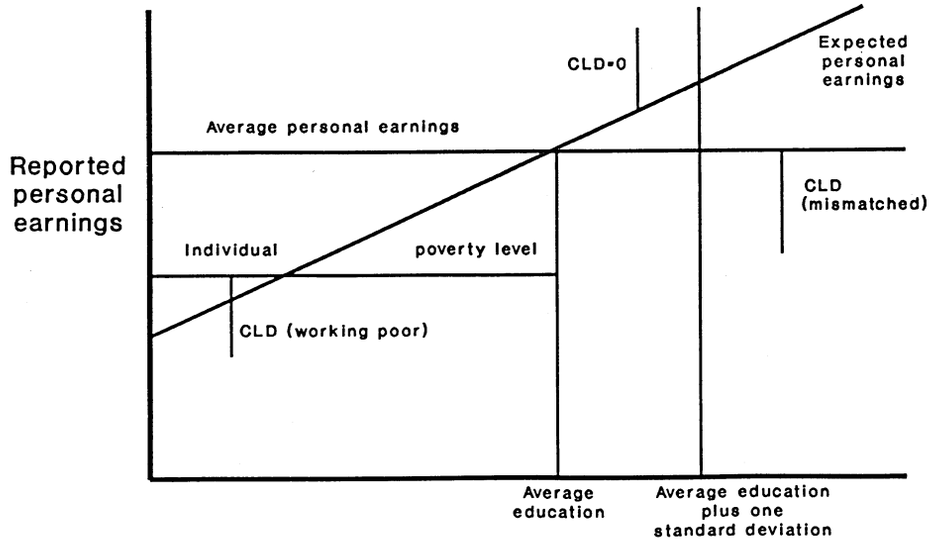
[3] An adjustment to the category CLD could be made to account for those with physical or mental handicaps that prevent them form achieving a poverty-level income.

Figure 3--Cost of labor distress

Working poor and mismatched



From among the full-time employees, including those self-employed, workers are classified as occupationally mismatched if their educational levels are one or more standard deviations above the average education and their reported earnings are below the mean for the same occupation/industry combination. This is a very restrictive definition because the dual criteria require the worker to be overeducated for, yet earning less than the average in, this presumably less demanding job. Diagrammatically, mismatched workers fall within the lower right-hand area of figure 3. Thus, $CLD_i = (\bar{y}$ - reported $earnings_i)$ for those classified as mismatched, and is zero otherwise (fig. 3).

THE DATA

The data used are the March 1986 Current Population Survey (CPS) taken by the Bureau of the Census. The CPS is carefully drawn to represent the U.S. population and is a major source of monthly data on the noninstitutionalized civilian labor force. The March CPS also contains information on employment status, occupation and industry association, weeks worked, hours worked per week, reason(s) for not working, and information on income and components of income, including welfare payments.[4] This information allows individuals in

[4] The CPS data are obtained monthly and are used to make the official U.S. Government estimates of unemployment. This report uses the March 1986 CPS data, which contains additional questions not included in other months. A CPS code exists for each person with respect to "in the labor force" versus "not in the labor force." Coding for full- versus part-time employment is based on the past year's work history. Information is also available to

the CPS sample to be classified into the five labor distress categories discussed above, or determined to be not under labor distress.

THE EMPIRICAL ANALYSIS

Operationally, the universe was defined as all civilian, noninstitutionalized persons 16 or more years old. The CPS data on each person's employment status were used to make the initial classification of "in the labor force" (ILF) vs "not in the labor force" (NILF). Workers classified as ILF were then further classified as full-time employed, voluntary part-time employed, involuntary part-time employed (less than 35 hours per week), and unemployed. The full-time employed workers were then screened for those with earnings below the individual poverty level, set at $7,250 per year, and those meeting the mismatch criteria.

Those classified as NILF were screened for discouraged workers, defined as those indicating they had looked for work last year, and those indicating the main reason they did not work last year was because they could not find work. Individuals giving either of these responses were classified as discouraged workers and were included in the cost of labor distress calculation (fig. 1).

The CPS data include information on each respondent's occupation and industry affiliation. This information was used to create nine occupational and eight industrial classifications. The cross-classification of these variables produces a table with 72 cells. All full-time workers were classified into a cell for purposes of calculating the educational and earnings criteria used to identify mismatched workers. This procedure ensures that an individual is compared only with workers in the same industry/occupation cell, thus preventing the comparison of a laborer with an executive in the mismatch income comparison procedure.

Those employed full time served as the group on which to estimate the statistical earnings equation. Preliminary statistical analysis indicated the need to modify the generic equation to fit separate estimates for male and female workers. The classification variable, sex, was therefore dropped from the estimated equation. After investigating numerous forms of the modified generic equation, including various combinations of the independent variables, second-order interaction effects, and transformations of both independent and dependent variables, equation 1 was found to give the most satisfactory statistical fit for both males and females. Equation 1 is specified below and was used to calculate expected earnings for involuntary part-time workers and the unemployed. A different equation was used for discouraged workers.

For those initially classified as NILF, any previous industry and occupational affiliation may well be irrelevant upon reentry, especially if considerable time has elapsed since they last worked. For those who have not yet had a job, there is no relevant industry or occupational experience upon which to

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discern voluntary versus involuntary unemployment and part-time employment, and to develop indicators for discouraged and occupationally mismatched workers. The data on personal earnings were accepted as coded in the CPS, including top-coding and estimates for missing data made by the Census Bureau. For details of the questions and code definitions, readers are referred to the Census Bureau's documentation of the March 1986 CPS.

base expected earnings. For these reasons, a second earnings equation was statistically estimated, again using the full-time workers (equation 2 below). The second equation differed from the first in that industry and occupational data were deleted. The separate parameter estimates from the second equation for both males and females were then used to calculate expected earnings for discouraged workers.

Reported personal earnings = f[(industry, occupation, race, region, metro/nonmetro, Hispanic, self-employed/otherwise, region by metro/nonmetro, industry by occupation), (age, age^2, yrs. el. ed., yrs. coll. ed., yrs. coll. ed.^{2}, age by yrs. el. ed., age by yrs. coll. ed.), error], [1]

Reported personal earnings = f[(race, region, metro/nonmetro, Hispanic, self-employed/otherwise, region by metro/nonmetro), (age, age^2, yrs. el. ed., yrs. coll. ed., yrs. coll. ed.^{2}, age by yrs. el. ed., age by yrs. coll. ed.), error]. [2]

Where:

Industry = 1) Farming, fishing, forestry, mining
2) Construction, durable and nondurable manufactured goods
3) Transportation and communication
4) Wholesale and retail trades
5) Finance, insurance, and specialty professionals
6) Repair and service businesses
7) Personal services and entertainment
8) Public administration

Occupation = 1) Executives, administration, managers
2) Professional specialties
3) Technicians, precision and crafts workers
4) Sales
5) Administrative support
6) Services
7) Farming, fishing, forestry, mining
8) Transportation
9) Laborers

Race = White
Black
Other

Region = Northeast
Midwest
South
West

Metro/nonmetro = (self-explanatory)

Hispanic origin = Yes, no

Self-employed	= Yes, no
Age	= Years old
Age^2	= $(Years\ old)^2$
Years of elementary education	= Highest grade completed 0-13 (high school)
Years of college education	= Years of college completed
Years of college $education^2$	= $(Years\ of\ college\ completed)^2$

and interaction terms as indicated.

THE ESTIMATION RESULTS

The results of the statistical fit of equation 1 for full-time male workers are provided in table 1. Note that by including the working poor and occupationally mismatched workers in the statistical estimation procedures, the results for expected earnings are very conservative (fig. 3). This is because the wages of the working poor and the occupationally mismatched are lower than the average of other workers.

To obtain the desired parameter estimates, the regression procedure had to incorporate classification variables and continuous variables, as well as interaction terms. When classification variables are used, the choice of the specific level within the classification to use as the standard for comparison is entirely arbitrary. Therefore, the estimated parameter values are not unique. However, the aggregate linear effect of the classification variables on the dependent variable is unique and unbiased. For this reason, estimated individual parameter values for the classification variables are not given in table 1. Statistical F values for each classification variable are presented.

The estimated parameters for continuous variables are both unique and unbiased. Table 1 indicates all variables in the estimated equation for men were statistically significant except for Hispanic origin, the interaction term of region by metro-nonmetro, and the interaction of age by years of elementary education. Of the significant variables, the variable accounting for the most observed variance in earnings was the square of age, where age is the surrogate measure for experience and skill. The second most important variable was (the statistical main effect of) age, followed closely by the interaction term of age X years of college education. Metro-nonmetro residence, years of college education, and race follow in statistical estimation importance.[5] The results for men indicate the overwhelming

[5] The inclusion of the metro-nonmetro and race classification variables, and the use of separate equations for male and female workers, means that white (black or other) rural male workers in labor distress are compared with their white (black or other) rural colleagues only, not with their white (black or other) urban counterparts, when calculating lost earnings. The same procedure was followed for women. This was done to control for differences in

Table 1--Regression estimation results for men

Type of variable and name	Parameter estimates			
	Equation 1			Equation 2
	F value	B	T value	F value
Classification variables:				
Occupation	68.03	NA	NA	NA
Industry	17.83	NA	NA	NA
Race	132.10	NA	NA	238.01
Region	7.10	NA	NA	1.54*
Metro versus nonmetro	336.83	NA	NA	436.28
Self-employed	291.59	NA	NA	414.42
Hispanic	.22*	NA	NA	.03*
Region X metro-nonmetro	1.31*	NA	NA	3.58
Continuous variables:				
Age	490.34	1,224.13	22.14	607.13
Age^2	1,372.26	-18.18	-37.04	1,742.14
Years--				
Elementary education	42.16	1,222.08	6.49	58.86
College education	173.92	-2,411.61	-13.19	62.63
College $education^2$	115.86	280.86	10.76	58.44*
Age X year--				
Elementary education	2.26*	6.14	-1.50*	1.36*
College education	481.15	75.10	21.94	465.44
	R^2 = .356		R^2 = 30.5	

NA = Not applicable. * = Not statistically significant.

importance of seniority and the experience and skill learned along the way. By comparison, education by itself, metro versus nonmetro, and race fare poorly in predictive power. Overall, the estimation equation accounted for 35.6 percent of the observed variance in workers' earnings.

The same estimation equation for women accounted for 31.9 percent of the observed variance in earnings (table 2). All variables, except the interaction term region by metro-nonmetro, were significant at the 0.05 level. The square of age for women was again the single most important variable, although less so than for men. Metro versus nonmetro residence and self-employed versus not self-employed were the second and third most important predictive variables. These results must, however, be interpreted with the understanding that when men and women are combined into the same sample and sex is included in the earnings estimation equation, sex is the strongest predictor variable. This derives from the discrepancy between male and female earnings across all groupings tried in this analysis.

RESULTS

The cost of unemployment at the national level is considerably less than half the grand total of labor distress cost. The cost to the economy in lost wages

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rural-urban labor markets and costs of living that affect earnings. The estimates of earnings lost due to labor distress would be considerably larger if this procedure had not been used.

Table 2--Regression estimation results for women

Type of variable and name	Parameter estimates			
	Equation 1			Equation 2
	F value	B	T value	F value
Classification variables:				
Occupation	56.52	NA	NA	NA
Industry	24.46	NA	NA	NA
Race	9.17	NA	NA	25.92
Region of residence	13.09	NA	NA	12.02
Metro versus nonmetro	302.86	NA	NA	364.49
Self-employed	223.09	NA	NA	415.63
Hispanic	17.16	NA	NA	10.77
Occupation X industry	8.58	NA	NA	NA
Region X metro-nonmetro	.58*	NA	NA	1.34*
Continuous variables:				
Age	139.99	600.01	11.83	80.50
Age^2	546.36	-8.39	-23.30	775.11
Years--				
Elementary education	27.88	943.71	5.28	39.83
College education	28.89	-719.64	-5.47	.13*
College $education^2$	111.81	200.59	10.57	79.58
Age X years--				
Elementary education	4.93	-8.68	-2.22	3.97
College education	81.37	23.92	9.20	60.99
	R^2 = 0.319		R^2 = 30.5	

NA = Not applicable. * = Not statistically significant.

due to involuntary part-time employment and the working poor is $90 billion, compared with less than $75 billion for the unemployed (table 3).

The national total estimated cost of labor distress exceeds $205 billion annually (table 3). The total for metro workers is in excess of $158.6 billion, while for nonmetro workers it is nearly $46.5 billion. Unemployment contributes most to total cost for metro workers ($59.6 billion), but the working poor contribute most for nonmetro workers ($16.4 billion versus $15.1 billion for the nonmetro unemployed). The total number of metro workers is approximately three times the number of nonmetro workers, and the total estimated cost of labor distress is also approximately three times greater. This pattern does not hold for all categories of labor distress. Among discouraged workers, metro workers are about three times more numerous than nonmetro workers but incur nearly five times the cost. A similar situation occurs for the unemployed, the part-time employed, and the working poor. For mismatched workers, both the incidence and cost are about five times higher in metro than in nonmetro areas.

Females predominate in both number and cost among discouraged workers and the working poor. There are more females than males among the part-time employed workers, but the estimated total cost for females is slightly lower. Males outnumber females by two to one in the mismatch category, while their cost to the economy is four times greater than for females. The total number of male and female workers experiencing labor distress is nearly equal, but males contribute nearly $112 billion to the grand total, compared with just over $93 billion for females (table 3).

Table 3--Residence, sex, and race: Incidence and cost of labor distress, March 1986

Item	Discouraged workers		Unemployed		Part-time employed	
	1,000 workers	Million dollars	1,000 workers	Million dollars	1,000 workers	Million dollars
Residence:						
Metro	1,134	15,746	6,458	59,609	3,805	28,343
Nonmetro	368	3,553	2,248	15,092	1,591	7,845
Total	1,520	19,299	8,706	74,701	5,396	36,188
Sex:						
Male	522	8,050	5,003	42,302	2,486	18,938
Female	998	11,249	3,703	32,399	2,910	17,249
Total	1,520	19,299	8,706	74,701	5,396	36,188
Race:						
White	997	13,974	6,593	57,585	4,381	30,299
Black	468	4,654	1,861	14,552	861	4,760
Other	55	671	252	2,564	153	1,129
Total	1,520	19,299	8,706	74,701	5,396	36,188

	Working poor		Mismatch		Total	
	1,000 workers	Million dollars	1,000 workers	Million dollars	1,000 workers	Million dollars
Residence:						
Metro	9,785	37,407	2,954	17,555	2,4136	158,659
Nonmetro	3,851	16,431	559	3,561	8,635	46,482
Total	13,636	53,838	3,512	21,115	32,771	205,141
Sex:						
Male	6,085	25,608	2,357	16,994	16,452	111,893
Female	7,552	28,230	1,155	4,121	16,319	93,248
Total	13,636	53,838	3,512	21,115	32,771	205,141
Race:						
White	11,446	45,815	3,019	18,648	26,436	166,321
Black	1,736	6,078	335	1,592	5,262	31,635
Other	454	1,946	159	875	1,073	7,184
Total	13,636	53,838	3,512	21,115	32,771	205,141

Results for whites, blacks, and others are also shown in table 3. The estimated number of black discouraged workers is roughly half that of whites, but they account for approximately 30 percent of all distressed workers. Labor distress cost of discouraged black workers is a third that of whites.

Table 4 presents the same basic information as table 3, but in finer detail. Cost estimates are presented for metro and nonmetro whites, blacks, and others by sex.

Estimates of labor distress costs by State are presented in table 5. Five States (New York, Pennsylvania, Illinois, Texas, and California) have total labor distress costs in excess of $10 billion annually. Only 12 States have total cost estimates of less than $1 billion. In only a few States, does the cost of unemployment approach 50 percent of the total estimated cost.

Tables 6 and 7 show comparisons of labor distress costs across worker categories. Table 6 shows the percentage each labor distress category contributes to the total cost of labor distress for individual categories of workers. The total of each worker category as a percentage of the grand total is also given. Females, blacks, and other males in nonmetro areas dominate the discouraged worker category. Unemployment costs are more evenly distributed, except for blacks (especially black females in nonmetro areas). Of the five labor distress categories, the costs associated with involuntary part-time employment are the most evenly distributed across worker categories. Costs associated with the working poor tend to fall most heavily on nonmetro and female workers. It is noteworthy that costs associated with blacks are underrepresented in the working poor category and are overrepresented in the unemployed category. White and other males dominate the costs associated with workers occupationally mismatched.

Table 7 presents information on labor distress costs per labor force participant. The labor distress cost per nonmetro worker ($1,885) is higher than for metro workers ($1,735). Similarly, the labor distress cost per female worker ($1,803) is higher than for males ($1,738). Per capita labor force participant costs by race indicate blacks are the most heavily affected ($2,547), followed by others ($2,197) and whites ($1,657).

Table 8 provides additional comparative labor distress cost data for selected States. Unemployment cost as a share of total labor distress cost for each State varies from 7.4 percent for Alaska to 50.7 percent for West Virginia. This variance across States indicates that unemployment is not a constant factor in the overall cost of labor distress. Table 8 also provides information on total labor distress cost for selected States, as estimated by using March 1986 data, as a percentage of each State's 1985 total budget expenditure. These data range from 14.8 percent for the District of Columbia to 47.8 percent for Mississippi.

DISCUSSION

The cost of labor distress to the U.S. economy is large. The estimates show the total of forgone wages to be approximately 1.25 times the current annual Federal budget deficit. But, even this large figure does not represent the whole burden of labor distress. At a minimum, public welfare payments made to workers experiencing labor distress must be included as a cost to the economy. A strong argument can also be made for including an estimate of the value

Table 4--Metro versus nonmetro: Incidence and cost of labor distress by race and sex, March 1986

Item	Discouraged workers		Unemployed		Part-time employed	
	1,000 workers	Million dollars	1,000 workers	Million dollars	1,000 workers	Million dollars
Metro:						
Whites--						
Males	237	4,976	2,805	27,085	1,455	12,765
Females	484	6,304	1,917	17,544	1,533	10,499
Total	721	11,279	4,722	44,630	2,988	23,264
Blacks--						
Males	138	1,462	826	5,646	312	1,789
Females	237	2,472	720	7,085	382	2,284
Total	375	3,935	1,547	12,731	695	4,074
Others--						
Males	15	[249]	106	1,175	54	477
Females	23	283**	85	1,073	68	529
Total	38	532	190	2,248	122	1,005
Nonmetro:						
Whites--						
Males	88	983	1,079	7,765	586	3,598
Females	187	1,712	792	5,191	808	3,438
Total	275	2,694	1,872	12,956	1,393	7,036
Blacks--						
Males	34	291*	150	500	65	267
Females	60	428	165	1,321	101	419
Total	94	719	315	1,821	167	686
Others--						
Males	10	[89]	37	131*	13	[43]
Females	7	[51]	25	185**	18	[81]
Total	17	140	62	316	31	123

Continued--

added to products not produced by those under labor distress. Including these values would add significantly to the overall cost.

The cost of labor distress per labor force worker is higher in nonmetro than metro areas, even though in estimating the costs, nonmetro workers are compared only with nonmetro (not metro) workers. This higher cost suggests a structural bias within the economy that operates against nonmetro residents.

Similarly, the per capita cost is higher for females than for males, despite the lower incomes of females. The per capita cost of labor distress for blacks and others is substantially higher than for whites. Also, the per capita cost of labor distress for blacks and others is substantially higher

Table 4--Metro versus nonmetro: Incidence and cost of labor distress by race and sex, March 1986--Continued

Item	Working poor		Mismatch		Total	
	1,000 workers	Million dollars	1,000 workers	Million dollars	1,000 workers	Millicn dollars
Metro:						
Whites--						
Males	3,384	13,409	1,736	12,535	9,616	70,771
Females	4,630	17,344	761	2,843	9,326	54,533
Total	8,014	30,753	2,497	15,378	18,942	125,304
Blacks--						
Males	604	2,328	147	891	2,028	12,118
Females	781	2,662	156	445	2,276	14,948
Total	1,385	4,990	303	1,336	4,304	27,065
Others--						
Males	169	658	99	669	442	3,227
Females	217	1,006	55	173	448	3,063
Total	386	1,664	154	841	890	6,290
Nonmetro:						
Whites--						
Males	1,741	8,566	352	2,649	3,847	23,561
Females	1,691	6,495	169	622	3,647	17,457
Total	3,432	15,061	522	3,271	7,494	41,018
Blacks--						
Males	159	552	19	218**	426	1,828
Females	193	536	13	38**	531	2,742
Total	351	1,088	32	256	958	4,570
Others--						
Males	28	94**	5	[32]	92	389
Females	41	187*	1	[2]	91	505
Total	68	281	5	34	183	894

* This information is based on a sample size that is too small to provide statistically reliable data, but may be used for general policy/program guidance.

** This information is based on a sample size that is too small to provide full statistical confidence in the data, but is sufficient for policy/program planning.

[] This information is based on a sample size that is too small for minimal reliability for the State. However, the data are included to maintain the integrity of the tables and for aggregation to the national level where sufficient reliability is achieved.

Table 5--Region and State: Incidence and cost of labor distress
March 1986

Item	Discouraged workers		Unemployed		Part-time employed	
	1,000 workers	Million dollars	1,000 workers	Million dollars	1,000 workers	Million dollars
Northeast:						
Connecticut	9	[91]	69	557	28	285
Maine	5	[64]	31	238	31	222
Massachusetts	22	368**	123	1,063	73	52
New Hampshire	2	[43]	25	183	15	102
New Jersey	32	340**	192	1,801	90	739
New York	103	1,280	600	5,346	238	1,564
Pennsylvania	84	1,179	448	4,357	270	1,961
Rhode Island	4	[48]	18	151	22	158
Vermont	2	[35]	15	83	9	46
Midwest:						
Indiana	48	581*	211	1,884	144	1,014
Illinois	93	1,396	505	4,497	254	1,847
Iowa	15	181**	128	1,229	86	550
Kansas	14	[211]	85	721	50	239
Michigan	100	1,475	420	4,349	203	1,401
Minnesota	24	317**	147	1,479	129	773
Missouri	28	393**	146	1,366	139	940
Nebraska	7	[81]	46	349	41	161
North Dakota	4	[53]	27	236	20	154
Ohio	64	910	413	3,935	266	1,891
South Dakota	4	[33]	21	178	26	158
Wisconsin	33	366**	179	1,372	115	752
South:						
Alabama	38	407*	198	1,657	118	610
Arkansas	20	142**	97	658	58	374
Delaware	2	[35]	15	72	21	100
District of Columbia	6	[80]	27	187	12	62
Florida	56	778	324	2,770	222	1,458
Georgia	41	356*	195	1,295	176	1,112
Kentucky	29	325**	182	1,151	104	593
Louisiana	39	327*	210	1,277	140	985
Maryland	14	[181]	102	833	72	569
Mississippi	18	130**	146	1,248	69	342
North Carolina	43	397*	181	1,355	136	836
Oklahoma	21	150**	136	1,100	100	556
South Carolina	28	291**	107	873	69	391
Tennessee	39	438*	219	1,653	133	779
Texas	94	1,211	676	5,043	412	2,773
Virginia	21	180**	130	974	103	534
West Virginia	17	187**	89	974	55	342

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Table 5--Region and State: Incidence and cost of labor distress, March 1986--Continued

Item	Working poor		Mismatch		Total	
	1,000 workers	Million dollars	1,000 workers	Million dollars	1,000 workers	Million dollars
Northeast:						
Connecticut	148	587	67	355	321	1,875
Maine	59	221	19	120*	145	864
Massachusetts	283	1,112	126	590	627	3,653
New Hampshire	51	198	22	118	114	644
New Jersey	342	1,332	120	667	776	4,878
New York	891	3,560	275	1,594	2,107	13,344
Pennsylvania	589	2,221	131	972	1,522	10,690
Rhode Island	51	210	15	106*	110	672
Vermont	39	154	13	97**	78	416
Midwest:						
Indiana	317	1,169	61	369	781	5,017
Illinois	578	2,375	139	846	1,569	10,961
Iowa	188	975	35	195	452	3,130
Kansas	162	935	32	191	344	2,297
Michigan	462	1,862	108	51	1,293	9,599
Minnesota	226	1,123	51	312	577	4,004
Missouri	304	1,223	6	466	679	4,389
Nebraska	120	561	19	135	233	1,286
North Dakota	44	210	8	46**	103	698
Ohio	481	1,745	138	761	1,361	9,242
South Dakota	64	345	12	84**	127	797
Wisconsin	243	1,072	47	240	618	3,802
South:						
Alabama	247	984	41	231	42	3,888
Arkansas	158	610	31	166	363	1,950
Delaware	41	143	11	59**	88	409
District of Columbia	35	148	16	88*	96	565
Florida	711	2,827	219	1,392	1,532	9,225
Georgia	395	1,447	74	457	880	4,667
Kentucky	208	832	49	360	572	3,261
Louisiana	268	1,025	60	374	718	3,988
Maryland	221	750	72	407	481	2,739
Mississippi	192	662	29	170	454	2,552
North Carolin	414	1,425	116	704	890	4,717
Oklahoma	262	1,177	59	355	578	3,338
South Carolina	202	611	56	325	461	2,491
Tennessee	308	1,066	73	455	772	4,391
Texas	1,012	4,068	189	1,328	2,382	14,422
Virginia	393	1,185	65	358	712	3,231
West Virginia	93	337	13	82**	266	1,921

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Table 5--Region and State: Incidence and cost of labor distress, March 1986--Continued

Item	Discouraged workers		Unemployed		Part-time employed	
	1,000 workers	Million dollars	1,000 workers	Million dollars	1,000 workers	Million dollars
West:						
Alaska	3	[30]	29	183	17	82
Arizona	5	[65]	90	767	73	463
California	184	2,599	939	8,988	577	4,345
Colorado	18	254**	134	1,100	82	658
Hawaii	4	[50]	30	279	34	260
Idaho	7	[87]	38	275	32	193
Montana	7	[104]	38	281	292	14
Nevada	6	[89]	31	269	32	292
New Mexico	14	[147]	61	463	33	187
Oregon	19	300**	145	1,313	66	579
Utah	7	[71]	43	336	34	272
Washington	24	428**	222	1,812	119	631
Wyoming	2	[17]	24	143	19	119
Total	1,520	19,299	8,706	74,701	5,396	36,188

* This information is based on a sample size that is too small to provide full statistical confidence in the data, but is sufficient for policy/program planning.

** This information is based on a sample size that is too small to provide statistically reliable data, but may be used for general policy/program guidance.

than for whites. These data suggest an additional structural bias within the economy.

The unemployed category is the best known of the five components of labor distress. The other four categories are virtually unrecognized outside the research community. However, the data show conclusively that underemployed workers are the largest contributors to the overall cost of labor distress. In fact, involuntary part-time workers and the working poor account for more of the total cost of labor distress than do the unemployed. Implications of this finding for Federal funding of various development programs are discussed in the next section.

Interpretation of the Results

This report lays the foundation for exploring the use of labor distress cost as an indicator of the magnitude of unemployment and underemployment in the economy. The value of wages lost by workers experiencing labor distress provides a method for aggregating losses across labor distress categories and for assessing the relative share of each category. As an indicator, these losses are measured as the difference between a worker's reported earnings and

Table 5--Region and State: Incidence and cost of labor distress, March 1986--Continued

Item	Working poor		Mismatch		Total	
	1,000 workers	Million dollars	1,000 workers	Million dollars	1,000 workers	Million dollars
West:						
Alaska	19	86	6	36**	74	415
Arizona	196	767	70	540	433	2,601
California	1,577	6,133	428	2,531	3,705	24,597
Colorado	183	718	64	367	480	3,095
Hawaii	52	234	25	186	146	1,010
Idaho	74	330	17	115*	167	1,000
Montana	59	289	10	40**	144	928
Nevada	71	265	11	69**	150	984
New Mexico	111	483	22	145	241	1,424
Oregon	132	556	55	248	417	2,995
Utah	77	294	28	160	189	1,133
Washington	253	1,081	98	547	715	4,499
Wyoming	32	117	7	51**	85	446
Total	13,636	53,838	3,512	21,115	32,771	205,141

[] This information is based on a sample size that is too small for minimal reliability for the State. However, the data are included to maintain the integrity of the tables and for aggregation to the national level where sufficient reliability is achieved.

a standard, generally defined in this report as the average wage earned by that worker's peers.

While this is a legitimate measure, it is easily misinterpreted. It should not be assumed that if all workers experiencing labor distress were to obtain an appropriate job, their earnings would rise to the level of the standard against which they were judged. Neither is it implied that the standard used will remain constant over time, nor that this standard will remain unchanged if all labor-distressed workers obtain work. There is the expectation that for small incremental reductions in the level of labor distress, the average earnings of workers emerging from distress will equal average earnings of their peers. To anticipate the direction and magnitude of earnings that would result from large reductions in labor distress would require a simulation model of the economy that is beyond the scope of this report.

In this report, no judgment is made or implied regarding the issue of full employment, defined as full-time employment in appropriate jobs of all workers experiencing labor distress. Such a full employment economy is probably impossible to achieve. Even under the best economic conditions, some level of structural unemployment and underemployment will exist to accommodate labor adjustments within the economy.

Table 6--Cost as a percentage of worker category total and category total as a percentage of total cost, March 1986

Item	Discouraged workers	Unemployed	Part-time workers	Working poor	Mismatch	Total
	Percent					Percent of total cost
Residence:						
Metro	10	38	18	24	11	77
Nonmetro	8	33	17	35	8	23
Sex:						
Males	7	38	17	23	15	55
Females	12	35	19	30	4	45
Race:						
Whites	8	35	18	28	11	81
Blacks	15	46	15	19	5	15
Others	9	36	16	27	12	4
Metro:						
White--						
Males	7	38	18	19	18	35
Females	12	32	19	32	5	27
Black--						
Males	12	47	15	19	7	6
Females	17	47	15	18	3	7
Other--						
Males	8	36	15	20	21	2
Females	9	35	17	33	6	2
Nonmetro:						
White--						
Males	4	33	15	36	11	12
Females	10	30	20	37	4	9
Black--						
Males	16	27	15	30	12	1
Females	16	48	15	20	1	1
Other--						
Males	23	34	11	24	8	--
Females	10	37	16	37	--	--
Total	9	36	18	26	10	100

-- = Negligible.

Table 7--Labor distress costs per labor force participant

Category	Labor distress costs	Category	Labor distress costs	Category	Labor distress costs
	Dollars		Dollars		Dollars
Residence:		Sex:		Race:	
Metro	1,735	Male	1,738	White	1,657
Nonmetro	1,885	Female	1,803	Black	2,547
				Other	2,197

Table 8--Unemployment cost as a share of total labor distress cost, and this cost as a share of 1985 State expenditures [1]

State	Unemployment cost as a share of total labor distress	Total labor distress cost as a share of 1985 State expenditures
	Percent	
Alaska	7.4	44.0
California	36.5	29.2
Colorado	33.5	32.9
District of Columbia	33.2	14.8
Georgia	27.8	32.1
Idaho	27.5	47.0
Iowa	39.3	41.6
Maine	27.5	31.4
Maryland	30.4	23.4
Massachusetts	29.1	21.1
Mississippi	48.9	47.8
North Dakota	33.8	35.1
Ohio	42.6	33.7
Pennsylvania	40.7	36.8
Tennesse	37.7	37.5
Texas	35.0	37.0
Washington	40.3	29.5
West Virginia	50.7	42.7
United States	36.4	31.2

[1] Estimates are derived from March 1986 data.

It is important not to extend the results beyond the data when using a new procedure. Understanding the implicit assumptions in the estimation procedure and measures used is very helpful in this regard.

The estimated earnings equation is based on full-time workers. Most of the personal characteristics available in the CPS individual file were used as independent variables in the regression equations to achieve the best possible estimated earnings. Even so, the R^2 values leave much room for improvement, raising the question of whether the critical variables have been included in the statistical equation. One may question whether there are unmeasured variables that predispose certain workers to fall into one of the labor distress categories. If such variables exist, then the estimation equations used are incorrectly specified and the reported cost estimates are biased upward.

Stated less technically, if workers in labor distress have any performance-inhibiting personal characteristics, which are not shared to the same extent by full-time workers, then, on average, distressed workers would not be expected to earn the same amount as their fully employed peers. This would result in an overestimate of the true amount of labor distress cost. Whether distressed workers are predisposed in this manner is not known. Nor are there national data to explore this question. Therefore, this report must essentially ignore the issue.

Another note of caution pertains to the working poor. To be classified into this category, a full-time worker's reported personal earnings had to fall below the individual poverty level. Presumably, an individual living alone in his/her own household would need this income as a minimum to avoid living in poverty. But, if the worker in question is part of a multiple wage-earner family, he/she will likely be able to share in the household income and, thus, avoid living in poverty. Whether or not these workers should be compared with a different standard is a matter for debate. Strong arguments can be made for both viewpoints.

One can argue that household income should be the critical factor in deciding whether a worker is classified as the working poor. If the household income is above poverty, no individual worker in that household would be classified as working poor regardless of the level of personal income because that individual is presumably not living in poverty. But, the implication of this line of reasoning is that the level of earnings of the second and succeeding wage earners is unimportant so long as the household income remains above the poverty line. Minorities, especially working wives, find this reasoning especially difficult to accept because it appears to sanction the existing lower earned incomes of women. In this report, no adjustments are made for workers classified as "working poor" who live in households with incomes above the poverty line.

Potential Uses of the Results

Underemployment, rather than unemployment, is the largest contributor to the total cost of labor distress, a finding that holds for nearly all labor distress categories, including State and national results. Current Federal assistance to States for programs addressing labor distress use formula funding with the unemployment rate as an important variable. Since States vary substantially in the percentage contribution the unemployed make to the

total cost of labor distress, changing the formula to make allocations on the basis of total labor distress cost would result in a quite different distribution of funds across the States.

The cost of labor distress, when compared with cost estimates of other social problems, provides important information for setting public policy and expenditures priorities. The metro-nonmetro comparisons, along with those of race and sex, provide insight into the nature, magnitude, and incidence of structural differences within the economy. Knowledge of these aspects of labor distress can be used to formulate and target appropriate State and Federal intervention policies and programs.

The analysis suggests several program needs. The fact that the rural-urban and regional variables are statistically significant suggests the existence of systematic structural variations in labor market wages along these geographic lines. This suggests a job placement service large enough to span both metro-nonmetro and regional areas would be of value by improving the prospects of matching workers to available jobs, thus reducing the magnitude of lost wages.

The success of such a job placement program assumes workers are willing to relocate. While this may be true for many workers and their families, it would not be true for all who could benefit by moving. Some will not wish to leave friends and relatives, while others will resist citing the cost of moving. Where the primary consideration is financial, public assistance to make a move could be economically justified for those workers with large individual costs of labor distress. Identifying these workers would involve calculating costs and benefits, where the cost is as derived above and the benefit estimated on the basis of anticipated earnings on the new job and any savings of welfare payments no longer needed.

The magnitude of the cost associated with the working poor suggests the continuing need for both basic education of new entrants and retraining of distressed workers. Given the estimate of labor distress costs associated with the working poor developed in this report, appropriate cost-benefit ratios can be calculated when estimates of the benefits are provided. Such information would be of significant value for policymaking at the State and national levels, where the economic impact of various programs is an important factor in the allocation of funds.

But who are the distressed? In addition to the aggregate categories presented in this report, more information (such as, the incidence of white/black, male/female, metro-nonmetro, and age groups within regions and States) is needed on the characteristics of workers within each labor distress category. Unfortunately, this information cannot be developed in this report. This is because the sample size for many of the geo-political categories of interest is too small to support the more detailed analysis. Along with the need for a larger or supplemental sample of workers, additional information on worker characteristics is also needed. Among the most critical information needed is a job skills inventory for distressed workers. Such data would be very useful for planning and implementing targeted intervention programs.

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