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1. <u>Summary</u>. A nation's human resources may be underutilized not only because of unemployment in the usual sense but also because of what economists term "underemployment". Underemployment can be defined as the employment of persons at jobs that call for less than their highest current level of skill and at wages less than those to which their skills, if fully utilized, would normally entitle them. The earnings of an individual when he is employed at his highest level of skill may be called his "potential" earnings. The potential earnings of any individual is not observable, so one could put forth arguments for or against any particular definition of potential earnings. The absolute level of potential earnings will depend in part on adjustments made in current earnings for noncompetitiveness and for the structural-frictional aspects of the economy under consideration.

Basic to the methodology is a definition of a standard of potential earnings that is specific for subsets of the population, rather than for each individual separately; these population subsets are defined by socioeconomic factors such as sex, age, race, education, and region. The subsets with the same combination of these factors but with different occupations form a group. The average potential is the best average earnings the group can achieve and is defined to be the maximum average earnings over all subsets in the group.

Under ideal conditions of no (zero) underemployment, the current average earnings of the group will be equal to the average potential earnings of the group. The differences in the current earnings from the potential earnings provide the basis for an index of underemployment. Two index numbers were developed using two distinct statistical concepts of averages: "median" and "mean". These index numbers were respectively: (1) the number underemployed as a percent of group total, and (2) the loss of potential earnings due to underemployment as a percent of potential earnings.

A preliminary analysis was made using selected data on occupational class, sex, region, race, age, education and earnings from the five percent samples of the 1960 U. S. Census. This analysis indicated that underemployment among nonwhites was worse than among whites, and that the difference between the underemployment index values for nonwhites and whites was larger in the South than in the North and West. From a sample survey of selected North Carolina counties, estimates of these index numbers were obtained to illustrate their usefulness for regional comparisons.

Viewed as techniques for ranking population groups with respect to underemployment rather than as absolute measures of underemployment, the two indexes developed in this pilot study would appear to have considerable usefulness as guides to changes occurring over time and geographical regions. Census year data can be used to estimate the required potential earnings standards and base year indexes. Annual indexes on a regional basis can be calculated using data collected by the Bureau of the Census Current Population Surveys. Current indexes for populations confined to smaller areas such as counties or state economic areas may require surveys of sufficient size to estimate actual earnings and the weights (subset sizes) required by the method.

2. <u>Nature of the Problem</u>. There are a number of attempts to define and to measure underemployment in the literature. The President's Committee to Appraise Employment and Unemployment Statistics, <u>Measuring Employment and Unemployment</u> (Washington: U. S. Government Printing Office, 1962, p. 58) defines underemployment as follows:

"Part of a nation's human resources may be underutilized not because of unemployment in the usual sense but because of what economists term underemployment. Underemployment can be defined as the employment of persons at jobs that call for less than their highest current level of skill (and at wages less than those to which their skills, if fully utilized, would normally entitle them). We shall distinguish this from partial employment or involuntary part-time work, which can be defined as the employment of a person, whether or not at this highest level of skill, for fewer hours per week than he seeks to work. It is also to be distinguished from the losses resulting from the failure, for whatever reason, to train people for the highest skills that their innate abilities would permit them to achieve. Underemployment as here defined is like unemployment in that it results in a loss of income to the individual affected and a loss of output to society."

There have been other attempts to develop theories of underemployment of disguised unemployment as applied to persons whose marginal productivity is zero or negative. The latter term is usually restricted to persons who are not normally engaged in wage employment. The term as defined with reference to marginal productivity is not applied to wage labor, since presumably employers will not employ a laborer for wages unless his labor increases the total production (United Nations, 1951; Libenstein, 1957; Nurske, 1957). In this paper we will not consider the concept of disguised unemployment, but will confine our attention to the concept of underemployment as stated in the report by the President's Committee (1962).

The concept of underutilization of human resources that we are interested in can be explained as follows. If there are many persons seeking a particular type of job for which they are most efficient and the number of such jobs available is less than the number of individuals then some of them may remain unemployed or have only part-time jobs, or some of them may seek other jobs which do not make use of their full potential and consequently their earnings will be smaller; or there may even be persons who would accept similar (or identical) occupations at lower renumeration. Alternatively, there may be individuals who may remain in jobs with lower income in spite of the availability of jobs with higher earnings, for reasons of their own, such as climate, type of work, or leisure time. The underemployment resulting from these free choices corresponds to voluntary underemployment and not to the involuntary underemployment implied when usually referring to underemployment. There does not seem any easy way of separating these two types of underemployment and hence, such individuals will be considered underemployed by the definition.

The absolute level of underemployment will depend on what we define as the 'potential earnings' or 'ideal earnings' of a group of individuals. It is noted that the potential earnings of any individual is not observable and hence one could put forth arguments for or against any particular definition of potential earnings. The absolute level of potential earnings will depend in part on adjustments made in current earnings for noncompetitiveness and for the structural-frictional aspects of the economy under consideration.

It is obvious that the difficulties involved in defining and measuring the absolute level of underemployment are great. The attempt here will be to define a reasonably good relative measure, but no claims will be made for its merits as an absolute measure. In fact, the use of the maximum average earnings over all occupational subsets as the potential earnings for a population group, and also the inclusion of all those unemployed as underemployed, cause the absolute values of the measure to appear very high. However, the measure as defined is expected to be suitable for comparing various areas or regions or the same area or region over different time periods. It is possible that, like any other index number or aggregate measure, there will be biases in the indices that are defined. As time passes there will be a need, in particular, to change the base year of comparison and to otherwise improve the index.

3. <u>Definition of Potential Earnings</u>. The assumptions and postulates that we make in this section will be with respect to a group of individuals and as such will not be valid for each individual of the group. Any attempt to apply these to individuals in the group will be completely meaningless.

Suppose there is a group of individuals with a specified set of characteristics; for example, consider all white males residing in the North region of the United States, aged 24 years and with a high school education or less. Some of these may be clerks in offices, some may be sales workers in department stores, some may be machine operators in factories and others may have selected alternative occupations. Let those individuals of the group having similar jobs form a subset of the group. Data are available to find the median earnings or mean earnings of the individuals in each of the subsets.

In general, we consider a group of indiv-

iduals with characteristics x_1 , x_2 , ..., x_n such as sex, race, age, education, and then consider a subset of this group having a particular occupation with characteristics y_1 , y_2 , ..., y_m . Let the mean earnings of the individuals In the subset be $\overline{I}(X,Y)$ and the median earnings be $I^*(X,Y)$ where X and Y are vectors representing various characteristics of the individual and his occupation. With reference to the subsets described above we make the following two assumptions:

Assumption 1. The mean potential earnings of the group with characteristics X is equal to the maximum mean earnings over all subsets with the same X but having different occupations Y. Thus,

$$\overline{P}(X) = Max \overline{I}(X,Y)$$

Assumption 2. The potential median earnings of the group with characteristics X is equal to the maximum (median) earnings over all subsets with the same X but having different occupations Y. Thus,

$$P^{*}(X) = Max I^{*}(X,Y)$$
.
Y

The assumptions are implied from the fact that the potential is the best that the group "can" achieve and earnings is the criterion. Hence, the potential mean (median) earnings is the maximum mean (median) earnings for the group.

4. <u>Indexes of Underemployment</u>. In the previous section we have defined potential median and mean earnings. The potentials represent ideal levels of earnings for the group. Since existing conditions are different from the ideal, our interest is to measure the extent of departure from the ideal levels. The extent of departure from ideal earnings, for example, will represent the loss of output to society under prevailing conditions.

We define two such measures to represent departure from ideal conditions: (1) the number of individuals underemployed as a percentage (U) of the total number of individuals in the group and (2) the loss of earnings due to underemployment as a percentage (L) of the potential earnings of the group.

Let there be exactly k groups in the population with characteristics vectors X_1 , X_2 , ..., X_k . Further, let M_k be the number of individuals in the i-th group having earnings less than the potential median earnings $P^*(X_k)$. Under ideal conditions, the actual median earnings of the i-th group would also be $P^*(X_k)$ and we expect that only $(0.5)N_k$ in the group would have earnings below $P^*(X_k)$. Since the present conditions are not ideal, the number $M_k - 0.5N_k$ represents the excess number of individuals having earnings below the potential median earnings for the i-th group. By definition, these are the underemployed individuals. Hence, for the population, summing over groups, we find the number of underemployed is $\Sigma M_1 - (0.5) \Sigma N_1$. The percentage under-

employed (U) is then:

$$U = \left\{ \frac{\Sigma M_i}{\Sigma N_i} - 0.5 \right\} 100\%$$

We make use of the potential mean earnings to measure the loss of output to society. Under ideal conditions the mean earnings of all the individuals in the i-th group will be equal to $\overline{P}(X_{,})$. Since the actual mean earnings will be equal to $\overline{I}(X_{,})$, the loss of output to the society, due to underemployment in this group, is equal to $N_{,}\{\overline{P}(X_{,}) - \overline{I}(X_{,})\}$. Summing over all groups, we obtain the total loss of output to society as $\Sigma N_{,}\{\overline{P}(X_{,}) - \overline{I}(X_{,})\}$. Expressing this as a percent of the total potential $\Sigma N_{,}\overline{P}(X_{,})$, we obtain the percentage loss (L) of output to society as

$$L = \left\{ 1 - \frac{\Sigma N_{i} \overline{I}(X_{i})}{\Sigma N_{i} \overline{P}(X_{i})} \right\} 100\%$$

By comparing the measures U and L against the same measures for a standard population in a standard or base year, we can calculate the corresponding indexes of underemployment.

5. Application to United States Data. One of the main questions in the assumptions and measures defined in previous sections is concerned with what constitutes an appropriate set of characteristics X and Y. Any characteristic of an individual likely to have any effect on his earnings may be included in a study. However, there may be practical limitations in that we may not be able to obtain data on some of the characteristics or the cost of obtaining data on other characteristics may be prohibitively large. In some cases an additional characteristic may be highly correlated to the other characteristics already included. By adding such a characteristic we may not be adding much to the information we already have.

We may start our analysis with a limited number of characteristics, such as sex, race, region, age, education, occupational class, on which sufficient data are already available. It would amount to defeatism if we were to take the negative attitude that we cannot make any analysis because we do not have information on all the characteristics considered to have some relevance. If we take an optimistic view, we can argue that a reasonable subset of the relevant characteristics used as independent variables may still provide good estimates of mean or median earnings for the different subsets. There may be blases due to the characteristics that are ignored. However, these biases are likely to be smaller than the "estimates" obtained with the chosen set of characteristics. This will be particularly true in instances where the characteristics are highly correlated. For example, if we consider age and education only and ignore years of experience, in most cases we will not introduce large biases in the mean or the median earnings. In fact, the high multiple correlations in our results for U.S.

data in the next section indicate that the characteristics that are considered may be adequate.

It is true that we may need an extensive study to determine the optimum set of characteristics, but not having all the answers on this count does not destroy the validity of the concept or the measurements defined in previous sections.

A limited study was carried out based on the data available from the five percent sample of the 1960 census returns of the United States and also from the data on socioeconomic survey (Benrud, 1968) of some of the counties of the State of North Carolina. The results are presented in the next two sections.

The limitations on the availability of data resulted in using the rather restricted set of characteristics which were included in the Bureau of the Census subject report PC(2)-7B"Occupation by Earnings and Education" of the United States Census of Population 1960. The characteristics X include sex, race, region, age and education. We have analyzed data only for males. The main occupational classes were used as the characteristic Y. The complete details of these characteristics are given in Table I.

Based on the X characteristics, a total of 120 groups were created. Each of these was further divided into ten subsets based on occupational class. The first step was to obtain estimates of mean and median earnings for each of the 1,200 subsets. On studying the data, it was found that mean (median) earnings were not available for a large number of subsets. After omitting the South region and the 18-24 agegroup from the data, the remaining 480 cells had very few missing values. Imputed values were substituted for those that were missing by simple interpolation. A preliminary analysis of variance was performed (See Table II). From the results of this study it was concluded that all third and higher order interactions were insignificant. Furthermore, among the second-order interactions, those involving occupation were more significant than the others.

Hence, ten separate multivariate regressions were run, one for each occupational class to represent the effect of various factors on earnings for different occupations. These provided the main effects of all the factors as well as all the second-order interactions involving occupation. The multiple correlation was greater than .95 for most of these regressions and greater than .92 for all ten. The results which seem to provide reasonable estimates are given in Table III. A further check was made by substituting the regression estimates for the cells without any observations and then performing a complete analysis of variance. This analysis was used to derive the estimates of all main effects and interactions. From these regressions, the potential mean and median earnings for each of the 120 groups was estimated by taking the maximum over the ten occupational classes. The potential mean and median earnings along with the occupation class which yields the optimum earnings are presented in Tables IV and V.

Table VI presents three types of earnings:

actual, estimated, and potential earnings. The males in each occupational class were divided into subsets depending on their age, education, race, and region. The subsets were numbered 1, 2, ..., k . Define:

- N_i = the number of males in the i-th subset,
- A₁ = the actual observed mean earnings of the males in the i-th subset,
- E₁ = the estimated mean earnings based on regression and factorial analysis as outlined for the i-th subset. This estimate approximates actual mean earnings,
- P₁ = the potential mean earnings for the i-th subset as given in Table V. This is the maximum of the estimated mean earnings over 10 occupational classes.

The corresponding values for "total earnings" in Table VI were obtained by summing over subsets as follows:

Total Actual Earnings $= \begin{array}{c} k \\ \Sigma \\ i=1 \end{array} N_i A_i$, Total Estimated Earnings $= \begin{array}{c} k \\ \Sigma \\ i=1 \end{array} N_i E_i$, Total Potential Earnings $= \begin{array}{c} k \\ \Sigma \\ i=1 \end{array} N_i P_i$.

The results in Table VII were obtained similarly, by finding the number of males having earnings below the potential median earnings for each subset and then summing over all subsets.

From these results it can be concluded that underemployment is minimum in the occupation class of managers, officials, and proprietors, except farm (i.e., "other managers" in Tables VI and VII). The worst group with respect to underemployment is farm laborers. Furthermore, the differential in underemployment between whites and nonwhites is greater in the South than in the North and West.

6. Application to North Carolina Survey Data. A socioeconomic survey was conducted in twelve selected counties of North Carolina in 1965. The information obtained for the sample individuals included age, race, sex, education, occupation and income during 1964. However, the samples were insufficient to make reliable estimates of mean and median incomes for the various subsets of interest. A preliminary analysis revealed that the reported incomes in 1964 in these counties were comparable with estimated earnings for similar individuals in the South for 1959. Hence, further calculations were made using the potential mean and median earnings for subsets computed for the South for 1959. The results are given in Tables VIII and IX.

It should be borne in mind that the underemployment problem in these counties in 1964 may be more severe than indicated by the figures in Tables VIII and IX, since the potential earnings for the South should have been higher in 1964 than in 1959. However, comparisons between counties are still possible. Thus, the worst counties are Avery and Yancey and the best counties are Halifax and Richmond.

7. <u>Further Applications</u>. In view of the high multiple correlations observed with the U. S. data, it appears that the number of variables considered may be adequate. Since information on these characteristics is also collected in the Current Population Surveys (CPS), underemployment for intercensal years can be evaluated. For example, underemployment in 1967 relative to 1959 (census year) can be measured by:

1. Converting estimated 1967 actual earnings to 1959 dollars,

2. Computing estimated 1967 potential earnings using 1959 potential mean earnings with 1967 weights for the appropriate subsets defined by age, race, education, region and occupation,

3. Converting the resulting estimated percent loss of output to an index by computing the ratio $(L_{\rm B}/L_{\rm C}) \propto 100$, where $L_{\rm B}$ is the percent loss of output for the current year 1967 and L_{C} is the percent loss of output for the base year 1959. It is not essential that current actual earnings (or potential earnings) be converted to census year dollars; any other suitable base year can be chosen for this purpose. It is important, however, that the potential mean and median earnings for the age, race, education, region and occupation subsets be computed using data for the most recent year for which reliable estimates of these quantities are available. Periodic up-dating of the potential mean and median earnings for the subsets of interest is required to keep abreast with the effects of technological and social change, as reflected in the changing demand for specific occupational skills and in the removal of barriers to full employment. Sufficient data for up-dating potentials may only become available after each decennial census.

Although not carried out with the twelve North Carolina counties, a procedure similar to the above can be used for comparisons between communities, counties, state economic areas, or other areas of interest. Briefly, L, is computed using census data for the specific areas to determine the base year weights (age, race, education, occupation subset sizes), but using regional potential mean earnings. L is computed, using current survey data to estimate total earnings and to estimate the current weights, with the same base year regional potential means. This quality is the same as computed for the twelve North Carolina counties. Comparisons between areas are made using the standardized index $100L_C/L_B$ for each area.

The suggested underemployment indices will reflect the characteristics of economic cycles as well as the specific structural-frictional aspects of various communities. To distinguish structural underemployment from cyclical underemployment, it is necessary to standardize for the cyclical sensitivity of area underemployment. An approach similar to that used by Miller (1968) on area unemployment could be used. The proposed indices may be useful for testing economic theories and hypotheses concerning occupational wage differentials and their changes over the business cycle. Particular reference is made to the alternate hypotheses of Reder (1955) and 01 (1962). The comparison of indices of underemployment and unemployment may shed additional light on these hypotheses.

8. Conclusions. No claims are made concerning the merits of the proposed technique for measuring the "absolute" level of underemployment. It seems clear that the proposed approach overesti-mates the "absolute" level of underemployment particularly in that it ignores (a) certain aspects of the labor market, (b) differences in individual potential earnings associated with innate abilities or with special skills obtained in training programs, and (c) personal occupational preferences. These deficiencies should not greatly deter the usefulness of the index for comparing populations in different areas or the same population in different time periods as a relative measure. The method has the advantage of flexibility in that it may be used to establish a consistent set of indices of underemployment over time and space for rural or urban populations, for occupation groups, and for various social classes defined by race, education, age and sex. Further, the data required to compute the index may be relatively inexpensive to obtain.

Census year data are used to estimate the required potential earnings standards and base year indices. Annual indices on a regional basis could be calculated using data collected by the Bureau of the Census Current Population Surveys. Current indices for populations confined to smaller areas such as counties or state economic areas may require surveys of sufficient size to estimate actual earnings and the weights (subset sizes) required by the method. The extent to which secondary sources might provide the needed data on current earnings and on the weights on a routine basis has not been explored.

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TABLE I. List of characteristics with description

Factor A - Occupational class

- 1. Professional, Technical, and Kindred Workers
- 2. Farmers and Farm Managers
- 3. Managers, Officials and Proprietors, Except Farm
- 4. Clerical and Kindred Workers
- 5. Sales Workers
- 6. Craftsmen, Foremen and Kindred Workers
- 7. Operatives and Kindred Workers
- 8. Service Workers
- 9. Farm Laborers and Foremen
- 10. Laborers, Except Farm

Factor B - Séx

1. Male

Note: Females were not included in this analysis.

- Factor C Region (See Appendix D) 1. North and West United States
 - 2. South United States
- Factor D Race
- 1. White
- 2. Non-white

Factor E - Age

- 1. 18-24 years
- 2. 25-34 years
- 3. 35-44 years
- 4. 45-54 years
- 5. 55-64 years

Factor F - Education

1. Elementary School:	0-7	years
2. Elementary School:	8	years
3. High School:	1-3	years
4. High School:	4	years
5. College:	1-3	vears
6. College: 4 or	more	vears

		<u>M</u> e	an	Median		
Source	Degrees of Freedom	Sums of Squares	Mean Squares	Sums of Squares	Mean Squares	
Main Effects:						
Occupation	9	1395.6	155.1	820.8	91.2	
Race	1	57.3	57.3	58.6	58.6	
Age	3	87.2	29.1	37.3	12.4	
Education	5	738.7	147.7	364.7	72.9	
Second-Order Interactions						
with Occupation	81	421.2	5.2	127.2	1.6	
Error	357	133.7	0.4	30.7	0.1	
Total	479	2873.0		1458.5		

Note:

(1) This analysis does not include the South region and the age-group 18-24 years. (2) The sums of squares and mean squares are in the units of 10^6 .

TABLE III. Regression coefficients for the regressions of mean and median earnings for each occupational class

A. Mean Earnings

						Occupat	ion Cla	ISS			
Source		1	2	3	4	5	6	7	8	9	10
<u>Mean</u> Effects:		4423	3124	6379	4427	5721	4667	3992	3423	2023	3143
Race	(2)-(1) -	1746	- 752	-1396	- 372	-	- 720	- 479	- 456	- 146	- 270
Region	(2) - (1) -	465	- 127	- 569	- 176	- 474	- 477	- 473	- 315	- 352	- 480
Age	(2) - (1) -	821	143	-1159	- 114	- 252	67	45	168	122	158
0	(3) - (1)	1083	606	687	715	1188	709	609	635	301	521
	(4) - (1)	1878	550	2158	873	1468	676	532	486	261	418
	(5) - (1)	1872	12	3072	748	1141	373	222	204	47	136
Education	(2)-(1) -	1726	-1184	-2393	- 555	-1352	- 788	- 317	- 468	- 175	- 104
	(3)-(1) -	219	- 505	- 969	- 160	- 625	- 388	- 132	- 186	67	43
	(4) - (1)	339	- 24	85	144	156	10	146	156	415	380
	(5) - (1)	820	1343	1630	333	1088	294	330	147	222	131
	(6) - (1)	3297	1 9 32	4730	1275	3000	2041	659	1146	-	-
Multiple											
Correlat	ion.	9295	.9630	.9 252	.9661	.9650	.9 702	.9661	.9464	.9517	.9638
				в.	Median	Earning	s				

						Occupat	ion Cla	88			
Source		1	2	3	4	5	6	7	8	9	10
Mean		4383	2270	5045	4292	4749	4449	3820	3255	1782	3028
Effects:											
Race	(2)-(1)	-1054	- 461	- 927	- 292	-	- 695	- 442	- 404	- 87	- 214
Region	(2) - (1)	- 427	- 232	- 391	- 179	- 403	- 490	- 528	- 340	- 376	- 564
Age	(2) - (1)	- 257	229	- 363	63	187	155	123	290	166	218
0	(3) - (1)	1038	492	867	716	1099	723	604	665	318	522
	(4) - (1)	1222	300	1264	761	1005	620	501	473	301	447
	(5) - (1)	1141	- 99	1123	595	412	312	205	189	- 32	169
Education	(2) - (1)	-1119	- 748	-1488	- 393	- 908	- 690	- 233	- 417	- 148	- 57
	(3) - (1)	- 58	- 274	- 520	- 62	- 407	- 281	- 49	- 155	42	63
	(4) - (1)	511	60	154	203	273	104	220	179	332	373
	(5) - (1)	690	877	999	232	773	297	301	181	245	26
	(6)-(1)	1668	1155	2990	856	2031	1627	346	968	-	-
Multiple											
Correlat	ion	.9622	.9759	.9485	.9723	.9732	.9643	.9604	.9383	.9348	.9670

TABLE IV. Potential <u>Mean Earnings</u> (in dollars) and optimum occupation class for males 18 to 64 years old in the experienced civilian labor force with earnings in 1959, by race, region, years of school completed, and age for the United States

(a) White--North and West U. S.

				Age Groups		
Educa	ation	18 - 24	25 - 34	35 - 44	45 - 54	55 - 64
Elem	entary					
0-7	vears	3081(6)	4992(6)	5756(3)	7244(3)	8051(3)
8	vears	3252(6)	5259(6)	6550(3)	8112(3)	8998(3)
High	School				• • •	
1-3	years	3596(6)	6416(3)	8153(3)	9635(3)	10473(3)
4	years	3826(6)	7366(3)	9207 (3)	10585(3)	11496(3)
Colle	ege					
1-3	years	4385(3)	8668(3)	10589(3)	12174(3)	12907(3)
4	or more	7072(3)	11093(3)	13416(3)	15267(3)	15968(3)
(b)	NonwhiteNo	rth and W	est U. S.			
Elem	entary					
0-7	years	2327(7)	3785(5)	5019(5)	5390(5)	5276(3)
8	years	2478(7)	4562 (5)	5812(5)	6258(5)	6215(3)
High	School					
1-3	years	2628(7)	5074(5)	6454(5)	6819(5)	7611(3)
4	years	2858(5)	5615(5)	7099(5)	7569(3)	8611(3)
Coll	ege					
1-3	years	3544(5)	6698(5)	8263(5)	9275(3)	10140(3)
4	or more	5263(5)	8156(5)	10285(3)	12218(3)	13050(3)
(c)	WhiteSouth	v. s.				
Elem	entary					
0-7	years	2302(6)	3955(6)	4555(3)	5960(3)	6736(3)
8	years	2639(6)	4387(6)	5514(3)	6993 <u>(</u> 3)	7848(3)
High	School					
1-3	years	2955(6)	5426(3)	7091(3)	8488(3)	9296(3)
4	years	3306(6)	6498(3)	8266(3)	9561(3)	10440(3)
Coll	ege					
1-3	years	3955(3)	7980(3)	9829(3)	11330(3)	12032(3)
. 4	or more	6613(3)	10377(3)	12627(3)	14394(3)	15064(3)
(d)	NonwhiteSo	uth V. S.				
Elem	entary					
0-7	years	1375(7)	2658(4)	3777(5)	4064(5)	3729(3)
8	years	1691(7)	3557(5)	4736(5)	5097(5)	4834(3)
High	School		101015			(
1-3	years	1944(4)	4042(5)	5350(5)	5631(5)	6202(3)
4	years	2218(4)	4/05(5)	0111(2)	0313(3)	/324(3)
COTT	ege	2072(5)	5060/5	716915	9200(2)	0022(2)
1-3	years	30/3(3)	3909(3) 7309(F)	/402(3)	0200(3)	3033(3)
4	or more	4/03(3)	1330(3)	9292(3)	11114(3)	11312(3)

NOTE: Number in the bracket indicates optimum occupation group.

TABLE V. Potential <u>Median Earnings</u> (in dollars) and optimum occupation class for males 18 to 64 years old in the experienced civilian labor force with earnings in 1959, by race, region, years of school completed, and age for the United States

(a) White--North and West U. S.

		A	ge Groups		
Education	18 - 24	25 - 34	35 - 44	45 - 54	55 - 64
Elementary					
0-7 years	3246(6)	5108(6)	5475(6)	5214(1)	5435(3)
8 years	3363(6)	5321(6)	5733(6)	6170(3)	6542(3)
High School					
1-3 years	3607(6)	5733(1)	6985(1)	7460(3)	7766(3)
4 years	3894(6)	6317(1)	7650(1)	8049(3)	8419(3)
College					
1-3 years	3453(6)	7021(3)	8356(3)	9252(3)	9434(3)
4 or more	5253(3)	8635(3)	10265(3)	11341(3)	11432(3)
(b) Nonwhite	North and We	est U. S.			
Elementary					
0-7 years	1997(7)	3909(5)	4980(5)	5339(5)	4954(5)
8 years	2151(7)	4728(5)	5844(5)	6284(5)	5961(5)
High School			• •		•••
1-3 years	2435(5)	5177(5)	6376(5)	6737(5)	6869(3)
4 years	2933 (5)	5656(5)	6938(5)	7225(5)	7557 (3)
College					
1-3 years	3592(5)	6888(5)	8177(5)	8561(5)	8981(3)
4 or more	5390(5)	8122(5)	9705(5)	10783(3)	11151(3)
(c) WhiteSou	th U. S.				
Elementary					
0-7 years	2388(6)	3959(6)	4335(6)	4105(3)	4405(3)
8 years	2652(6)	4320(6)	4740(6)	5299(3)	5660(3)
High School					
1-3 years	2894(6)	4775(1)	6035(1)	6586(3)	6881(3)
4 vears	3356(6)	5535(1)	6876(1)	7352(3)	7710(3)
College					
1-3 years	3012(6)	6492(3)	7836(3)	8651(3)	8821(3)
4 or more	5201(3)	8293(3)	9932(3)	10927 (3)	11006(3)
(d) Nonwhite	South U. S.				
Elementary					
0-7 vears	915(4)	2694(5)	3774(5)	4052(5)	3656(5)
8 years	1353(4)	3661(5)	4786(5)	5145(5)	4811(5)
High School					
1-3 years	1656(5)	4107(5)	5316(5)	5595(5)	5716(3)
4 years	2330(5)	4763 (5)	6053 (5)	6259(5)	6579(3)
College			2		
1-3 years	3085(5)	6091(5)	7388(5)	7692(5)	8100(3)
4 or more	5070(5)	7511(5)	9103(5)	10100(3)	10457(3)

NOTE: Number in the bracket indicates optimum occupation group.

	Occupation	No. of Males (000's)	·1	Loss of Output L <u>in Percent</u>		
			Actual*	Estimated**	Potential	
1.	Professional	3215	27.4	28.4	35.3	22
2.	Farm Managers	1182	4.5	4.5	9.9	55
3.	Other Managers	3042	30.0	30.2	30.3	1
4.	Clerical	2157	10.8	10.8	17.7	40
5.	Sales	1836	12.6	12.6	16.7	25
6.	Craftsmen	6162	35.2	35.4	49.5	29
7.	Operatives	6204	29.5	29.6	44.5	34
8.	Service	1679	6.7	6.6	12.7	47
9.	Farm Labor	451	1.0	1.0	2.7	63
10.	Other Labor	1880	7.1	7.1	12.4	43
Ra	ce					
1.	White	26310	159.0	160.5	223.3	29
2.	Non-white	1498	5.8	5.7	8.4	31
Tot	al	27808	164.8	166.2	231.7	29

TABLE VI. Estimated 1959 loss of output as a percent of potential earnings for two regions of U. S.

A. North and West U. S.

B. South U.S.

Occupation	No. of Males (000's)	Total Earnings in Million Dollars			Loss of Output L in Percent	Estimate Based o Potential ings for N	s n Earn- orth
		<u>Actual*</u>	Estimated**	Potential		Potential	Loss
Professional	995	8.03	8.01	10.06	20	10.08	26
Farm Managers	666	1.76	1.86	4.18	58	4.93	64
Other Managers	1214	10.03	10.46	10.51	5	11.67	14
Clerical	679	3.13	3.18	4.87	36	5.47	43
Sales	688	3.92	4.03	5.38	27	6.00	35
Craftsmen	2285	10.42	10.38	14.54	28	16.88	38
Operatives	2416	8.59	8.62	12.79	33	15.25	44
Service	602	1.77	1.73	3.24	46	3.88	54
Farm Labor	409	0.52	0.49	1.69	70	2.13	76
Other Labor	971	2.32	2.32	4.28	46	5.33	57
ce							
White	9152	46.59	47.21	64.76	28	73.59	37
Non-white	1773	3.90	3.87	6.78	42	8.81	·56
al	10925	50.49	51.08	71.54	29	82.40	39
	Occupation Professional Farm Managers Other Managers Clerical Sales Craftsmen Operatives Service Farm Labor Other Labor other Labor ce White Non-white al	No. of Males Occupation (000's) Professional 995 Farm Managers 666 Other Managers 1214 Clerical 679 Sales 688 Craftsmen 2285 Operatives 2416 Service 602 Farm Labor 409 Other Labor 971 cce White 9152 Non-white 10925	No. of Males No. Males Occupation (000's) Image: Markowski (000's) Farm Managers 666 1.76 Other Managers 666 1.76 Other Managers 1214 10.03 Clerical 679 3.13 Sales 688 3.92 Craftsmen 2285 10.42 Operatives 2416 8.59 Service 602 1.77 Farm Labor 409 0.52 Other Labor 971 2.32 ce White 9152 46.59 Non-white 1773 3.90 al 10925 50.49	No. of Males Total Earning Males Occupation (000's) Million Doll. Actual* Estimated** Professional 995 8.03 8.01 Farm Managers 666 1.76 1.86 Other Managers 1214 10.03 10.46 Clerical 679 3.13 3.18 Sales 688 3.92 4.03 Craftsmen 2285 10.42 10.38 Operatives 2416 8.59 8.62 Service 602 1.77 1.73 Farm Labor 409 0.52 0.49 Other Labor 971 2.32 2.32 ce White 9152 46.59 47.21 Non-white 1773 3.90 3.87 al 10925 50.49 51.08	No. of Males Total Earnings Occupation (000's) Million Dollars Actual* Estimated** Potential Professional 995 8.03 8.01 10.06 Farm Managers 666 1.76 1.86 4.18 Other Managers 1214 10.03 10.46 10.51 Clerical 679 3.13 3.18 4.87 Sales 688 3.92 4.03 5.38 Craftsmen 2285 10.42 10.38 14.54 Operatives 2416 8.59 8.62 12.79 Service 602 1.77 1.73 3.24 Farm Labor 409 0.52 0.49 1.69 Other Labor 971 2.32 2.32 4.28 ce White 9152 46.59 47.21 64.76 Non-white 1773 3.90 3.87 6.78 al 10925 50.49 51.08 71.54	No. of Males Total Earnings in Loss of Output L Occupation (000's) Million Dollars in Percent Actual* Estimated** Potential in Percent Professional 995 8.03 8.01 10.06 20 Farm Managers 666 1.76 1.86 4.18 58 Other Managers 1214 10.03 10.46 10.51 5 Clerical 679 3.13 3.18 4.87 36 Sales 688 3.92 4.03 5.38 27 Craftsmen 2285 10.42 10.38 14.54 28 Operatives 2416 8.59 8.62 12.79 33 Service 602 1.77 1.73 3.24 46 Farm Labor 409 0.52 0.49 1.69 70 Other Labor 971 2.32 2.32 4.28 46 ce white 9152 46.59 47.21 </td <td>No. of Males Total Earnings in Loss of Output L Estimate Based of Output L Occupation (000's) Million Dollars in Percent ings for N Actual* Estimated** Potential In Percent Ings for N Potential Professional 995 8.03 8.01 10.06 20 10.08 Farm Managers 666 1.76 1.86 4.18 58 4.93 Other Managers 1214 10.03 10.46 10.51 5 11.67 Clerical 679 3.13 3.18 4.87 36 5.47 Sales 688 3.92 4.03 5.38 27 6.00 Craftsmen 2285 10.42 10.38 14.54 28 16.88 Operatives 2416 8.59 8.62 12.79 33 15.25 Service 602 1.77 1.73 3.24 46 3.33 Other Labor 971 2.32 2.32 4.28 46</td>	No. of Males Total Earnings in Loss of Output L Estimate Based of Output L Occupation (000's) Million Dollars in Percent ings for N Actual* Estimated** Potential In Percent Ings for N Potential Professional 995 8.03 8.01 10.06 20 10.08 Farm Managers 666 1.76 1.86 4.18 58 4.93 Other Managers 1214 10.03 10.46 10.51 5 11.67 Clerical 679 3.13 3.18 4.87 36 5.47 Sales 688 3.92 4.03 5.38 27 6.00 Craftsmen 2285 10.42 10.38 14.54 28 16.88 Operatives 2416 8.59 8.62 12.79 33 15.25 Service 602 1.77 1.73 3.24 46 3.33 Other Labor 971 2.32 2.32 4.28 46

* Actual refers to 1959 Census results.

** Estimated refers to results obtained using factorial analysis and regression equations.

TABLE VII. Estimated number of 1959 males with earnings below the potential median earnings and the percentage underemployed, by region, in the United States

North and West U. S.

Occupation	Total No. of Males (000's)	No. of Mal With Earni	es (000's) ngs Below	Percent Under- employed U	
		Estimated Median	Potential <u>Median</u>		
1. Professional	3215	1700	2077	15	
2. Farm Managers	1182	578	1033	37	
3. Other Managers	3042	1563	1639	4	
4. Clerical	2157	1086	1759	32	
5. Sales	1836	917	1241	18	
6. Craftsmen	6162	3154	4094	16	
7. Operatives	6204	3200	4685	26	
8. Service	1679	838	1490	39	
9. Farm Labor	451	259	439	47	
10. Other Labor	1880	9 54	1581	16	
Race					
1. White	26310	13533	18797	21	
2. Non-white	1498	716	1241	33	
Total	27808	14249	20038	28	

South U. S.

	Occupation	Total No. of Males _(000's)	No. of Mal With Earni	les (000's) ings Below	Percent Under- employed U	Estimates Based on Potential Medians for North		
			Estimated Median	Potential <u>Median</u>		Number (000's)	<u>u</u>	
1.	Professional	995	516	653	16	710	21	
2.	Farm Managers	666	348	602	40	623	43	
3.	Other Managers	1214	641	674	6	769	13	
4.	Clerical	679	355	517	26	586	36	
5.	Sales	688	351	477	19	530	27	
6.	Craftsmen	2285	1133	1473	14	1797	29	
7.	Operatives	2416	1247	1847	26	2166	40	
8.	Service	602	299	516	36	568	44	
9.	Farm Labor	409	191	395	46	407	49	
10.	Other Labor	971	488	814	34	914	44	
Ra	ce							
1.	White	9152	4727	6462	21	738	31	
2.	Non-white	1773	844	1506	35	169	45	
То	tal	10925	5571	7968	23	907	33	

County	Males in the Sample	Earnin	Earnings in Thousand Dollars				
		Actual* 	Estimated** Earnings	Potential** Earnings			
Bertie	130	467	462	755	38		
Halifax	136	527	471	721	27		
Hertford	140	497	535	826	40		
Northampton	125	366	438	691	47		
Macon	125	432	513	7 9 7	46		
Richmond	122	512	502	724	30		
Robeson	120	367	367	608	40		
Scotland	112	367	394	614	40		
Watauga	140	480	601	897	46		
Avery	72	206	294	445	54		
Mitchell	137	495	631	892	45		
Yancey	101	301	380	616	52		
Total	1460	5010	5012	857 9	42		

TABLE VIII. Estimated and potential earnings for twelve North Carolina counties

No. of

* Based on incomes reported in the survey rather than on earnings.

** Computed using 1959 mean earnings and potential mean earnings for the age, race, education and occupation subsets in the South.

TABLE IX. Estimated number of males having income (actual, 1964) below estimated and potential median earnings for twelve North Carolina counties

County	No. of Males in <u>the Sample</u>	The Nu With Inco	mber me Below	Percent Under- employed U
		Estimated Median Earnings*	Potential Median Earnings*	
Bertie	130	53	101	28
Halifax	136	54	87	14
Hertford	140	64	104	24
Northampton	125	67	105	34
Macon	125	74	99	29
Richmond	122	52	83	18
Robeson	120	58	95	29
Scotland	112	63	88	29
Watauga	140	84	110	29
Avery	72	55	62	36
Mitchell	137	84	108	29
Yancey	101	65	87	36
Total	1460	773	1129	27

* Computed using 1959 median earnings and potential median earnings for the age, race, education and occupation subsets in the South.