

EVALUATION OF CURRENT POPULATION SURVEY SIMULATIONS OF PAYROLL TAX CHANGES

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The Social Security Administration has extensively studied the tax-transfer system and its impact on income distribution. The major data source for this research has been the Census Bureau's March Current Population Survey (CPS). A large portion of this work has been concerned with the social security payroll tax and its proposed changes [1]. In order to evaluate the distribution of the payroll tax among major economic and demographic subgroups of the population, the Social Security Administration developed a Payroll Tax Algorithm (PTA). This algorithm has been employed to assign social security coverage to the earnings reported in the March CPS data file [2].

The coverage assignment formed the basis for a simulation of changes in the payroll tax structure designed to provide relief to low-income workers and their dependents. The Social Security cost estimates for payroll tax relief plans reflect the limitations of the CPS data base and of the coverage assignment. In general, the PTA estimates of the number of workers with taxable earnings and the aggregate amount of taxable earnings tend to be lower than the comparable Social Security Administration (SSA) program statistics. For example, in 1971, the number of workers identified as covered in the CPS represented 93 percent of the SSA total, and the CPS aggregate taxable earnings were 94 percent of the SSA aggregate. The effect of the differences in the aggregate taxable earnings on the cost estimates of payroll tax relief depends on the source of the 'missing' earnings. The 'missing' earnings may be due primarily to the 'missing' workers. They may also result from differences in the earnings reported to SSA and in the CPS by workers assigned CPS covered earnings. In this study, the latter type of disagreement is examined. The CPS and SSA wages for workers whose CPS wages are considered covered are compared using data from the March 1973 Current Population Survey - Summary Earnings Record Exact Match file [3,4]. An evaluation of the coverage assignment to CPS self-employment earnings is beyond the scope of this paper and will be the subject of a future report.

The paper is divided into four sections. The Payroll Tax Algorithm is briefly described and results of the coverage assignment for 1972 CPS wages and salaries are presented in section 1. ^{1/} The CPS and SSA covered wages of the primary coverage group, the 'other private' workers, are considered in section 2. Comparisons of the covered wages of workers in other coverage groups -- farm, household, government, and railroad workers -- are shown in section 3. Finally, in section 4, conclusions and recommendations concerning the coverage assignment are discussed.

1. BRIEF DESCRIPTION OF THE PAYROLL TAX ALGORITHM

CPS wages were assigned social security coverage

primarily on the basis of the characteristics of the worker's longest job in 1972 (e.g., class of worker, industry, and occupation). ^{2/} All CPS wages of a worker determined to be in covered employment are treated as covered; all CPS wages of a worker in noncovered employment are considered noncovered. Covered wages less than or equal to the statutory maximum (\$9000 in 1972) are considered taxable.

TABLE 1.--All persons aged 14 or over with 1972 CPS wages: Payroll tax algorithm employment class and coverage status

PTA employment class	Total	CPS wages and salaries	
		Covered	Noncovered
Total ^{1/}	90,585	79,909	10,676
Armed Forces.....	976	976	---
Government.....	15,471	8,343	7,128
State-local.....	11,947	8,225	3,721
Reported.....	2,519	1,811	708
Assigned ^{2/}	9,428	6,415	3,013
Federal.....	3,524	118	3,406
Reported.....	2,428	118	2,310
Assigned ^{2/}	1,096	---	1,096
Private.....	74,138	70,589	3,549
No workers in covered employment ^{3/}	959	---	959
Railroad.....	586	---	586
Clergy.....	132	---	132
Newsboys.....	64	---	64
Students.....	177	---	177
Some, but not all workers in covered employment.....	12,647	10,058	2,589
Farm.....	2,180	1,748	432
Household.....	2,786	857	1,929
Professional ^{4/} ..	7,681	7,453	228
All workers in covered employment ('other private' workers)	60,531	60,531	---

^{1/} Excludes 1.1 million workers whose employment class could not be ascertained.

^{2/} Workers who reported CPS class of worker "government" but did not specify level of government.

^{3/} Workers in industries or occupations which are legally excluded from OASDHI wage coverage.

^{4/} CPS industries: Medical, except hospitals, hospitals, educational services, welfare and religious, other professional services.

Under the Payroll Tax Algorithm, wage earners are first assigned to an employment class, such as government, farm, household, or 'other private'. They are then assigned social security coverage status on the basis of this employment class and either the legal restrictions on coverage or, in the case of the farm and household workers, SSA program data showing the number of workers in covered employment.

The PTA assigned covered wages to 79.9 million CPS workers. (See table 1.) About 8.3 million were government employees in 1972: 69 percent of the 11.9 million State and local workers and around 3 percent of the 3.5 million Federal employees. Private workers were separated into three groups. The first group, consisting of 1.0 million railroad employees, newsboys, clergy 3/, and students employed by their schools, was assigned noncovered wages. The second group consisted of 12.6 million farm, household, and professional workers, 80 percent of whom were assigned covered wages. The third group, 'other private' workers, was the largest employment class (60.5 million) and all were assigned covered wages under the PTA.

2. PRIMARY COVERAGE GROUP, 'OTHER PRIVATE' WORKERS

60.5 million, or 76 percent, of the workers assigned 1972 CPS covered wages were 'other private'. Included in this total were 12.9 million shown below whose CPS and SSA covered wage amounts could not be compared.

Table 2. Derivation of 'other private' worker group for CPS and SSA covered wage comparison

(in millions)	
'Other private' workers.....	60.5
Less: CPS and SSA records not matched...	6.5
Less: SSA covered earnings include self employment income.....	1.0
Less: CPS wages or work experience allocated.....	5.4
Equals: 'Other private' workers for comparison.....	47.6
With SSA covered wages.....	45.4
No SSA covered wages.....	2.3

45.4 million, or approximately 95 percent, of the remaining 'other private' workers had SSA covered wages. The CPS and SSA covered wages of these workers were compared after being coded into intervals of \$1000 in length. (Exceptions were made for \$1-499 and \$8500 and over.) Overall, as table 3 shows, 72 percent had their CPS and SSA covered wages in the same interval; 13 percent had their SSA covered wages in a higher interval; 15 percent had their CPS covered wages in a higher interval.

SSA covered wages of 'other private' workers can exceed their CPS covered wages only if the CPS wages were misreported or if the CPS and SSA records were mismatched. On the other hand, several factors could cause the CPS covered wages to exceed the SSA covered wages. In addition to the problems of misreported CPS wages and mismatched records, the worker's covered wages may have been incompletely reported to SSA or his CPS covered wages may have included wages earned in noncovered employment.

Rounding of CPS Wages.-- To minimize the effects on the comparison of misreporting in the CPS, the 45.4 million 'other private' workers with both CPS and SSA covered wages were separated into those with 'rounded' and 'nonrounded' CPS wages [5]. For purposes of this study, CPS wages of \$1-8499 which end in '000' or '500' were designated as rounded. All other CPS wage amounts were considered to be nonrounded. Workers with nonrounded CPS wages were much more likely to have their covered wages in the same interval than those with rounded CPS wages. As table 3 shows,

TABLE 3.--Summary of results of comparison of 1972 CPS and SSA covered wages of 'other private' workers by rounding and amount of CPS wages

Rounding and amount of CPS wages	Number (in millions)	Percent with CPS and SSA covered wages in same interval	Percent with SSA covered wages in higher interval	Percent with CPS covered wages in higher interval
Total.....	45.4	72.2	13.0	14.7
CPS wages rounded.....	7.3	42.1	28.8	29.0
CPS wages nonrounded....	38.1	78.0	10.0	12.0
\$1-8,499.....	22.7	69.1	16.8	14.1
8,500 or over.....	15.4	91.0	NA	9.0

78 percent of the 38.1 million 'other private' workers with nonrounded CPS wages had their covered wages in the same interval; only 42 percent of the 7.3 million with rounded CPS wages did. This large difference is due, in part, to the fact that the nonrounded group included all of the workers with CPS wages of \$8500 or over. A much larger proportion of these workers (91 percent) had their covered wages in the same interval than was so for workers with nonrounded CPS wages of \$1-8499 (69 percent). Of course, the inclusion of all workers with CPS wages of \$8500 or over in the nonrounded group does not account for the entire difference in the proportions. 69 percent of the workers with nonrounded CPS wages of \$1-8499 had their covered wages in the same interval. Only 42 percent of those with rounded CPS wages did.

Race-Sex Comparisons.--Comparisons between the CPS and SSA covered wages of the 'other private' workers with nonrounded CPS wages were prepared for three race-sex groups: white males, white

females, and nonwhites. (See table 4.) The white males were much more likely than either the white females or nonwhites to have their CPS and SSA covered wages in the same interval (81 percent vs. 76 percent and 62 percent, respectively). The nonwhites were especially notable in that a relatively large proportion (21 percent) had their SSA covered wages in a higher interval than their CPS covered wages. Only 7 percent of the white males and 12 percent of the white females with nonrounded CPS wages did.

TABLE 4.--Summary of results of comparison of 1972 CPS and SSA covered wages of 'other private' workers with 'nonrounded' CPS wages by race, sex, and amount of CPS wages

Item	Number (in millions)	Percent with CPS and SSA covered wages in same interval	Percent with SSA covered wages in higher interval	Percent with CPS covered wages in higher interval
White males...	23.2	81.4	7.3	11.3
\$1-8,499.....	9.5	66.0	17.9	16.1
8,500 or over.....	13.7	91.9	NA	8.1
White females...	11.7	75.5	12.4	12.1
\$1-8,499.....	10.9	75.1	13.4	11.6
8,500 or over.....	0.8	81.4	NA	18.6
Nonwhites.....	3.2	62.1	21.3	16.6
\$1-8,499.....	2.3	54.0	28.6	17.4
8,500 or over.....	0.8	85.7	NA	14.3

The CPS and SSA covered wages of the 'other private' workers in the three race-sex groups with nonrounded CPS wages were also examined within the age, industry, and work experience subgroups shown in table 5 and discussed below:

1. White Males.-- The white males aged 25-64 were much more likely than those under age 25 to have their covered wages in the same interval. Within the 25-64 year age group, manufacturing employees were more likely than trade workers and full-year/full-time workers were much more likely than those who worked part-year or part-time to have their covered wages in the same interval. The proportion of workers with CPS and SSA covered wages in the same interval may be considered as a linear combination of the proportions of workers in the two wage classes -- \$1-8499 and \$8500 or over -- weighted by the number of workers in each wage class. The two effects are clearly shown by the comparison for the two work experience groups of white males aged 25-64. Between the two groups there is a 16 percent difference in the proportions of workers with their covered wages in the same interval (88 percent less 72 percent). In each of the work experience groups, 63 percent of the workers with CPS wages of \$1-8499 had their covered wages in the same interval. 94 percent of the full-year/full-time workers and 85 percent of the part-year or part-time workers with CPS wages of \$8500 or over had their covered

TABLE 5.--'Other private' workers with 'nonrounded' CPS wages: Percent with CPS and SSA covered wages in the same interval by race, sex, age, industry, and work experience in 1972

Item	Percent of workers with CPS and SSA covered wages in the same interval		
	White males	White females	Nonwhites
Total.....	81.4	75.6	62.1
Manufacturing.....	84.3	74.5	64.3
Trade.....	76.9	76.1	60.0
Other.....	81.0	75.8	60.5
50-52 weeks full time.	86.0	73.6	66.3
Part year or part time.	70.6	76.8	56.7
Under age 25.....	69.0	75.2	55.6
Manufacturing.....	68.7	74.5	54.9
Trade.....	70.5	76.2	54.5
Other.....	67.4	74.0	58.0
50-52 weeks full time.	69.0	70.9	55.8
Part year or part time.	68.9	76.4	55.5
Age 25-64.....	86.4	75.4	64.6
Manufacturing.....	87.3	74.3	67.6
Trade.....	80.9	75.7	62.2
Other.....	85.3	76.4	61.4
50-52 weeks full time.	88.2	74.1	68.2
Part year or part time.	71.8	76.6	56.4

Note: Workers aged 65 or over are included in totals, but not shown separately.

wages in the same interval. Thus, at most, a 9 percent difference in the proportions between the two work experience groups was caused by differences in the proportions within the wage classes. The remaining difference, of at least 7 percent, was caused by differences in the weighting of the two wage classes. (About 82 percent of those who worked 50-52 weeks full-time reported CPS wages of \$8500 or over, but only 40 percent of the part-year or part-time workers did.)

2. White Females and Nonwhites.--The proportions of white females with CPS and SSA covered wages in the same interval differed only slightly by age, industry, or work experience. The differences for white females with regard to the two wage classes were not very large either. Moreover, since so few (7 percent) had CPS wages of \$8500 or over, their impact on the calculations of the overall proportions was also very slight. The results of the CPS-SSA covered wage comparisons for the nonwhites with nonrounded CPS wages were similar in pattern, although not in level, to those for the white males.

3. OTHER COVERAGE GROUPS

Some, but not all, of the farm, household, and State-local government workers were assigned covered wages under the Payroll Tax Algorithm. Almost all Federal employees and all railroad workers were assigned noncovered wages.

Farm and Household Workers.--CPS farm and household workers were assigned social security coverage on the basis of the amounts of their CPS wages. The probability of their having covered wages was derived from SSA program data which showed the distribution of farm (or household) workers by the amount of their covered wages. In general, farm and household workers with low CPS wages were less likely to have been assigned covered wages than workers with high CPS wages. For purposes of the derivation of the coverage probabilities, the SSA program data were adjusted for population and timing differences between CPS and SSA data and for late reporting of wages to the Social Security Administration. Late reporting is considered to be a more serious problem for the farm and household workers than for other wage earners. As a result, the adjustment for late reporting was rather large. (It is important to note that the matched CPS-SSA data used for this analysis has not yet been adjusted for late reporting.)

Table 6.--Farm Workers.

(in millions)

Farm workers with CPS covered wages.....	1.7
Farm workers with SSA covered wages	1.3
Farm workers with both CPS and SSA covered wages.....	1.2
Less: SSA covered earnings which include self-employment income.....	4/
Less: CPS wages or work experience allocated.....	0.1
Equals: Farm workers with both CPS and SSA covered wages for comparison...	1.0

1. Farm Workers.--Table 6 shows the effects of the late reporting adjustment very clearly. Although an estimated 1.7 million farm workers in the CPS were assigned covered wages, only 1.3 million had SSA wages. To test the accuracy of the coverage assignment, the farm workers whose CPS wages were considered covered and those with covered SSA wages were distributed by the amounts of their covered CPS or SSA wages. Since the PTA assignment of workers to be covered was based on the amount of their CPS wages, the distributions were very similar. As a further test of the coverage assignment to farm workers, the CPS and SSA covered wages of the those who had both CPS and SSA covered wages were

compared. 60 percent of the 1.0 million whose wages could be compared had their covered wages in the same interval; 20 percent had their SSA covered wages in a higher interval; and 20 percent had their SSA covered wages in a lower interval.

2. Household Workers.--Household workers assigned covered wages under the PTA were compared to those with covered SSA wages. As table 7 shows, there was only a small difference between the number of household workers assigned covered wages by the PTA and the number with SSA covered wages -- 0.9 million vs. 0.8 million, respectively. As with the farm workers, because the coverage assignment was based on the amount of the worker's CPS wages, the covered wage distributions of workers with covered CPS wages or with covered SSA wages were similar. Since the coverage assignment was based on a random process which did not consider the worker's SSA covered wages, very few of the household workers had both CPS and SSA covered wages. The covered wages of the 0.3 million household workers with comparable CPS and SSA covered wages were compared. 61 percent had their covered wages in the same interval; 13 percent had their SSA covered wages in a higher interval; and 26 percent had their CPS covered wages in a higher interval.

Table 7.--Household Workers.

(in millions)

Household workers with CPS covered wages.....	0.9
Household workers with SSA covered wages.....	0.8
Household workers with both CPS and SSA covered wages.....	0.4
Less: SSA covered earnings which include self-employment income.....	4/
Less: CPS wages or work experience allocated.....	0.1
Equals: Household workers with both CPS and SSA covered wages for comparison.....	0.3

Government Workers.--There were approximately 15.5 million government workers in the March 1973 CPS -- 2.4 million postal and Federal public administration (the 'reported' Federal), 2.5 million State-local, and 10.5 million not identified by level of government. According to the Payroll Tax Algorithm, 9.4 million of this latter group were assigned to be State-local, and 1.1 million were designated as Federal. This assignment was made by a random process on the basis of the worker's CPS industry and data from the 1970 Decennial Census, showing the proportion of workers, by industry, in each level of government. State-local workers, both reported and assigned, were determined to be covered on the

basis of their States of residence and data reported in the 1972 Census of Governments. The reported and assigned Federal workers were identified as covered, on the basis of their 1972 work experience. The 'reported' Federal workers who worked part-time or 1 - 13 weeks full-time were considered to be in covered employment. Those who worked full-time 14-52 weeks were considered noncovered. The government employees assigned as Federal were treated as being in noncovered employment, regardless of their 1972 work experience.

1. State-Local and All Assigned Government Employees.-- Since the PTA coverage assignment to all government workers (except postal and Federal public administration) was made, at least indirectly, by a random process, all of these workers are considered together. According to the SSA data, there were 8.6 million government employees with SSA covered wages. The PTA identified only 8.2 million. This result is due, in part, to the method of assigning coverage. The PTA may have chosen as State-local employees too many of the workers who lived in States in which the proportion of State-local workers covered under OASDHI was low and too few of the workers in States in which the proportion of covered workers was high. Moreover, the workers assigned to be Federal who worked part-time or 1 - 13 weeks full-time were not treated as having covered wages, even though reported postal and Federal public administration employees with these work experience characteristics were.

The covered wage distributions of these government workers with CPS or SSA covered wages were also compared. The workers with SSA covered wages were more heavily concentrated in the lower wage intervals than those with CPS covered wages. 22 percent of those in the former group had wages of \$1-8499, while only 18 percent of those assigned CPS covered wages did. Furthermore, only 29 percent of the workers with SSA covered wages had wages of \$8500 or over. 34 percent of the workers assigned CPS covered wages did. This is not really a surprising result. Since the coverage assignment was not based on the amount of wages which the person reported to the CPS, the wage distribution of workers with covered CPS wages was not constrained to be similar to the distribution of the workers with SSA covered wages.

There were 6.0 million government workers (excluding reported Federal) with both CPS and SSA covered wages in 1972. 5.5 million of them could be compared. 71 percent had their covered wages in the same interval; 12 percent had their SSA covered wages in a higher interval; and 17 percent had their CPS covered wages in a higher interval.

Table 8.--Government Workers, Except Postal and Federal Public Administration

(in millions)

Government workers with CPS covered wages....	8.2
Government workers with SSA covered wages ...	8.6
Government workers with both CPS and SSA covered wages.....	6.0
Less: SSA covered earnings which include self-employment income.....	4/
Less: CPS wages or work experience allocated.....	0.5
Equals: Government workers with both CPS and SSA covered wages for comparison.....	5.5

2. Full-year/Full-time Postal and Federal Public Administration Employees.--These workers are all assumed to be permanent Federal employees covered under the Civil Service Retirement System rather than under OASDHI. Of the 2.0 million employees in the March 1973 CPS, 366,000, or 18 percent, had SSA covered wages. 14,000 of these workers had their CPS work experience allocated and, so, may actually have worked in covered employment. The CPS wages and SSA covered wages of 280,000 of the remaining 352,000 workers were compared (excluding 28,000 whose CPS wage amounts were allocated and 43,000 whose SSA covered earnings included self-employment earnings). Of these 280,000 full-year/full-time postal and Federal public administration employees, 80 percent had their CPS wages in a higher interval than their SSA covered wages. In fact, 135,000, or 59.5 percent, of these persons had CPS wages of \$8500 or over and SSA covered

Table 9.--Full-time/Full-year Postal and Federal Public Administration Employees.

(in millions)

Federal government employees.....	2.0
Less: CPS records not matched.....	0.2
Less: No SSA covered wages.....	1.4
Equals: With SSA covered wages.....	0.4
Less: SSA covered earnings which include self-employment.....	4/
Less: CPS work experience or wages allocated.....	4/
Equals: With SSA covered wages only.....	0.3

wages of only \$1-2499. It is possible that these workers held second, smaller, jobs in 1972 which were in covered employment. About another 15 percent of the 280,000 employees with SSA covered wages had their wages from both sources in the same interval; and only 5 percent had their SSA covered wages in a higher interval.

Railroad Employees.--The PTA assigned noncovered CPS wages to all railroad employees, since they are covered under Railroad Retirement Insurance rather than under OASDHI. 498,000 of the 586,000 railroad workers in the March 1973 CPS had no SSA covered wages. 6,000 of the 88,000 with SSA covered wages had their CPS work experience allocated. The CPS wages and SSA covered wages of the remaining 82,000 (excluding 2,000 whose CPS wages were allocated) were compared. 92 percent had their CPS wages in a higher interval than their SSA covered wages. About two-fifths of these workers had CPS wages of \$8500 or over and SSA covered wages of \$1-2499. This result is not inconsistent with the possibility that the railroad workers with SSA covered wages held two or more jobs in 1972, at least one of which was in covered employment. Only 6 percent of the railroad employees with SSA covered wages had their CPS wages and SSA covered wages in the same interval; 2 percent had their SSA covered wages in a higher interval.

4. CONCLUSIONS AND RECOMMENDATIONS

The data presented in this paper suggest that the PTA coverage assignment of CPS wages and salaries is reasonably satisfactory on the whole. However, there appear to be a number of areas which warrant further study and where changes in the PTA should be considered.

The results of the CPS-SSA covered wage comparison for the 'other private' workers were much better for those with CPS wages of \$8500 or over -- who would not, in general, have been eligible for payroll tax relief. Furthermore, not surprisingly, the 'other private' workers who reported nonrounded CPS wages were more likely to have their covered wages in the same interval than those who reported rounded wages.

The results of the comparisons for the workers in other employment classes indicate that certain changes might be made to improve the method of assigning coverage to CPS wages and salaries. This is particularly true in the case of the government workers. For instance, the coverage determination of those assigned to be Federal perhaps should be made using the same rules as reported postal and Federal public administration employees. That is, part-time employees and those who worked only 1-13 weeks should be considered to be in covered employment. The State-local coverage assignment might be based, not only on the worker's State of residence, but also on the amount of his wages.

Other changes in the PTA assignment procedure may also be valuable. For example, the assignment of coverage to all classes of workers might be improved by allowing for the possibility that the worker earned both covered and noncovered wages.

FOOTNOTES

- 1/ All estimates in this paper are based on the March 1973 CPS labor force weight before adjusting the data for nonmatches and mismatches. The CPS-SER match rule was used. For an evaluation of this and other rules, see Fritz Scheuren and H. Lock Oh, "Fiddling Around with Nonmatches and Mismatches," 1975 Amer. Stat. Assn. Proc. Soc. Stat. Sec.
- 2/ In certain instances, a worker reported 1972 wages in the CPS, but no information concerning a wage or salary job. If he reported a wage or salary job for the week prior to the interview (in March 1973), the characteristics of that job were used to determine his coverage status.
- 3/ Clergy are treated as self-employed for purposes of social security taxation. The PTA assigned noncovered wages to the clergy and treated all of their earnings as self-employment income.
- 4/ Less than 0.05 million.

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