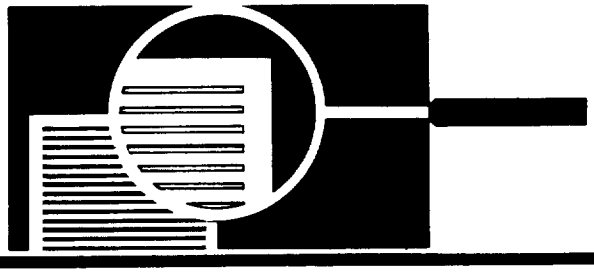
# Research summaries



## Estimating the number of minimum wage workers

Steven E. Haugen and Earl F. Mellor

Interest in the number and characteristics of minimum wage workers has intensified in recent years. For 1988, the Bureau of Labor Statistics, using data from the Current Population Survey (CPS), has estimated that 3.9 million workers paid hourly rates earned the prevailing Federal minimum wage of $3.35 or less; of those, 2.6 million earned exactly the minimum and 1.3 million earned less than $3.35.[1] All told, minimum wage workers (also referred to as "low-wage workers") have been estimated to account for 6.5 percent of all workers who were paid by the hour.

It is recognized that these estimates do not encompass all low-wage workers. For instance, because salaried and other workers not paid by the hour (who account for two-fifths of all wage and salary workers) are excluded from the universe used for the published estimate of minimum wage workers, the actual number at or below the minimum is undoubtedly understated. As reasoned, a number of these nonhourly paid workers may have earnings which, when translated into hourly rates, fall at or below the minimum wage level. Such low earnings may result from relatively low salaries, or very high weekly hours, or some combination of the two conditions.

Conversely, it is also recognized that, because the hourly earnings reported in the CPS do not include other types of remuneration, such as tips and commissions, they may often understate the true hourly earnings of some workers. This implies that the published count of low-wage workers may be too high.

This report examines how the number of workers with earnings at or below the Federal minimum wage varies, depending on how the hourly earnings measure is computed. Using data from the CPS, we estimate the extent to which supplemental forms of remuneration, such as tips and commissions, increase the hourly earnings of hourly paid workers who report that they earn the minimum wage or less.[2] This allows us to estimate the number of hourly workers who have low earnings when all such compensation is included. We also estimate the number of workers not paid hourly rates (mostly salaried) who have earnings that, when viewed on an hourly basis, are also at or below the minimum wage level. We find that alternative estimates of the number of low-wage workers based on these measures do differ somewhat from the published figures. However, as described below, the inherent imprecision of these estimates limits their use as substitutes for the hourly wage series.

It is important to note that while this study provides estimates of the number of workers with reported (as well as computed) hourly earnings of $3.35 or less, such workers may or may not actually be subject to the minimum wage provisions of the Fair Labor Standards Act.[3] The Federal law contains numerous exemptions from the minimum wage standard. First, some types of businesses are not covered by the law. For example, certain small retail or service establishments (based on annual sales) are exempt. Additionally, some workers, such as those in bona fide executive, administrative, and professional occupations, are excluded from the minimum wage provisions of the act through specific exemptions. Much of the information needed to determine the number of workers who must, by law, be paid the minimum cannot readily be obtained from household surveys such as the CPS. For example, few household respondents would know the annual sales volume of their employer. This type of information can only be reliably obtained from employers.

### Profile of low-wage workers

Before discussing different techniques that can be used to estimate the total number of minimum wage workers, salient demographic characteristics of those who are paid hourly rates should be examined. As shown in table 1:

- The typical minimum wage worker is young, female, and works part time. Of the 3.9 million hourly paid workers who were reported as receiving the minimum wage or less in 1988, 36 percent were teenagers and an additional 22 percent were young adults ages 20 to 24. Sixty-five percent of low-wage workers were women. Two-thirds of those reporting hourly wages of $3.35 or less usually worked part time.
- Six percent of all minimum wage workers were husbands. An additional 8 percent were persons who maintained their own families without a spouse present (mostly women). Wives made up 19 percent of the total, and the balance consisted largely of young, unmarried household members.
- Whites, blacks, and Hispanics were divided among the minimum wage population in about the same proportions as among all workers paid hourly rates.
- Although teenage workers were the most likely to be paid $3.35 or less, even for them, only 23 percent reported earnings at or below this number. The incidence declined with age to

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Table 1. **Employed wage and salary workers paid hourly rates with reported hourly earnings at or below the prevailing minimum wage, by selected characteristics, 1988 annual averages**

| Characteristic | Number of workers (in thousands) | | | | Percent distribution | | | | Percent of all workers paid hourly rates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total paid hourly rates | $3.35 or less | | | Total paid hourly rates | $3.35 or less | | | $3.35 or less | | |
| | | Total | $3.35 | Less than $3.35 | | Total | $3.35 | Less than $3.35 | Total | $3.35 | Less than $3.35 |
| Total, 16 years and over | 60,878 | 3,927 | 2,608 | 1,319 | 100.0 | 100.0 | 100.0 | 100.0 | 6.5 | 4.3 | 2.2 |
| 16 to 24 years | 15,770 | 2,281 | 1,612 | 669 | 25.9 | 58.1 | 61.8 | 50.7 | 14.5 | 10.2 | 4.2 |
| 16 to 19 years | 6,130 | 1,418 | 1,036 | 382 | 10.1 | 36.1 | 39.7 | 29.0 | 23.1 | 16.9 | 6.2 |
| 20 to 24 years | 9,640 | 863 | 577 | 287 | 15.8 | 22.0 | 22.1 | 21.8 | 9.0 | 6.0 | 3.0 |
| 25 years and over | 45,109 | 1,646 | 996 | 650 | 74.1 | 41.9 | 38.2 | 49.3 | 3.6 | 2.2 | 1.4 |
| 25 to 34 years | 18,000 | 701 | 400 | 300 | 29.6 | 17.9 | 15.3 | 22.7 | 3.9 | 2.2 | 1.7 |
| 35 to 44 years | 12,792 | 371 | 219 | 152 | 21.0 | 9.4 | 8.4 | 11.5 | 2.9 | 1.7 | 1.2 |
| 45 to 54 years | 8,057 | 236 | 150 | 86 | 13.2 | 6.0 | 5.8 | 6.5 | 2.9 | 1.9 | 1.1 |
| 55 to 64 years | 5,013 | 217 | 138 | 79 | 8.2 | 5.5 | 5.3 | 6.0 | 4.3 | 2.8 | 1.6 |
| 65 years and over | 1,246 | 122 | 89 | 33 | 2.0 | 3.1 | 3.4 | 2.5 | 9.8 | 7.1 | 2.6 |
| Men | 31,058 | 1,377 | 1,066 | 311 | 51.0 | 35.1 | 40.9 | 23.6 | 4.4 | 3.4 | 1.0 |
| Women | 29,820 | 2,550 | 1,542 | 1,008 | 49.0 | 64.9 | 59.1 | 76.4 | 8.6 | 5.2 | 3.4 |
| Husbands | 16,510 | 217 | 163 | 54 | 27.1 | 5.5 | 6.3 | 4.1 | 1.3 | 1.0 | .3 |
| Wives | 14,811 | 744 | 426 | 318 | 24.3 | 18.9 | 16.3 | 24.1 | 5.0 | 2.9 | 2.1 |
| Women who maintain families | 3,693 | 292 | 183 | 110 | 6.1 | 7.4 | 7.0 | 8.3 | 7.9 | 5.0 | 3.0 |
| Men who maintain families | 1,106 | 25 | 18 | 6 | 1.8 | .6 | .7 | .5 | 2.3 | 1.6 | .5 |
| Children[1] | 12,168 | 1,850 | 1,348 | 502 | 20.0 | 47.1 | 51.7 | 38.1 | 15.2 | 11.1 | 4.1 |
| Other persons in families | 1,902 | 174 | 130 | 43 | 3.1 | 4.4 | 5.0 | 3.3 | 9.1 | 6.8 | 2.3 |
| Persons not in families[2] | 10,688 | 625 | 340 | 285 | 17.6 | 15.9 | 13.0 | 21.6 | 5.8 | 3.2 | 2.7 |
| Full-time workers | 45,587 | 1,312 | 838 | 474 | 74.9 | 33.4 | 32.1 | 35.9 | 2.9 | 1.8 | 1.0 |
| Men | 26,331 | 482 | 358 | 124 | 43.3 | 12.3 | 13.7 | 9.4 | 1.8 | 1.4 | .5 |
| Women | 19,256 | 830 | 480 | 351 | 31.6 | 21.1 | 18.4 | 26.6 | 4.3 | 2.5 | 1.8 |
| Part-time workers | 15,291 | 2,614 | 1,770 | 845 | 25.1 | 66.6 | 67.9 | 64.1 | 17.1 | 11.6 | 5.5 |
| Men | 4,727 | 895 | 708 | 187 | 7.8 | 22.8 | 27.1 | 14.2 | 18.9 | 15.0 | 4.0 |
| Women | 10,564 | 1,720 | 1,062 | 657 | 17.4 | 43.8 | 40.7 | 49.8 | 16.3 | 10.1 | 6.2 |
| White | 51,239 | 3,235 | 2,047 | 1,189 | 84.2 | 82.4 | 78.5 | 90.1 | 6.3 | 4.0 | 2.3 |
| Black | 7,830 | 599 | 499 | 100 | 12.9 | 15.3 | 19.1 | 7.6 | 7.7 | 6.4 | 1.3 |
| Hispanic | 5,394 | 322 | 278 | 44 | 8.9 | 8.2 | 10.7 | 3.3 | 6.0 | 5.2 | .8 |

[1] Children 16 years of age or older.

[2] Includes a small number of persons in unrelated subfamilies and persons in families in which the person maintaining the family is in the Armed Forces.

a low of 3 percent for workers ages 35 to 54 but then rose for persons age 55 and over. Women were nearly twice as likely as men, and part-time workers were nearly six times as likely as full-timers, to be minimum wage workers in 1988.

## Estimation methods

BLS has been estimating the number of workers who earn the prevailing Federal minimum wage or less from data on the earnings of workers who report that they are paid hourly rates. When an hourly paid worker is reported in the CPS, the respondent is then asked: "How much does....earn per hour?" These data, which were collected once a year (in May) from 1973 to 1978, have been obtained monthly from one-fourth of the CPS sample since 1979 and have been used by BLS to construct annual averages. However, it is important to stress that, because only hourly paid workers are asked the question about hourly rates, the estimates exclude all those who are paid at other rates—such as a weekly or monthly salary, a daily rate, or a pay plan based solely on commissions or piecework.

This study presents a measure of hourly earnings, derived from CPS microdata, that extends beyond the universe of workers paid by the hour. Such a measure is derived by dividing responses to a CPS question on usual weekly earnings by the responses to a question on usual weekly hours.[4] This measure is referred to as "usual hourly earnings." Because the weekly earnings measure specifically encompasses all wage and salary earnings—including overtime, tips, and commissions—the resulting usual hourly earnings measure should be much more comprehensive.

The measure has its limitations, however, particularly as an estimate of the number of workers earning more than, less than, or precisely some specified level, because it is based on responses to two questions, each of which is subject to respondent rounding of data and other imprecision. Although the extent and direction of rounding are not fully known, there is some evidence that respondents tend to underreport total weekly earnings.[5] If this is in fact the case, then the resul-

tant usual hourly earnings figures for some workers may be lower than their true earnings. Thus, the *number* of low-wage workers based on the computed measure of usual hourly earnings may overstate the true count of such workers. It may be reasonable, then, to consider the estimated number of workers with *usual* hourly earnings of $3.35 or less a sort of upper bound to the actual figure.

*Findings.* The construction of this usual hourly earnings measure provides some additional insight into the existing BLS method for computing the number of minimum wage workers. As noted earlier, the two major concerns about the existing method are either that it overstates the number by not taking tips, commissions, and other incentives into account, or, alternatively, that it understates the number by not including salaried workers.

With regard to the first concern, we find that among hourly paid workers, the number whose *usual* hourly earnings (as derived from their weekly earnings) were $3.35 or less in 1988 was 3.3 million—600,000 fewer than the number whose reported hourly wages were at or below this level. This total constituted about 5.5 percent of all workers who were paid by the hour. (See table 2.)

It should be noted that the decline of 600,000 in the number of minimum wage workers is really the net result of two effects. Some 1.5 million hourly paid workers who reported wages of $3.35 or less in 1988 appeared to have supplemental compensation which raised their usual hourly earnings above this level. However, this figure is partially offset by some 900,000 hourly paid workers who reported wages above $3.35, yet whose usual hourly earnings compute to less than this level. The latter figure underscores the potential estimating problems inherent in the usual hourly earnings measure.

The data also provide support for the supposition that some salaried workers (and others not paid hourly) earn the minimum wage or less, when their earnings are translated into hourly figures. In 1988, some 1.5 million workers who were *not* paid at an hourly rate had usual hourly earnings of $3.35 or less.[6] Hence, with the use of this measure, the total number of workers (both hourly and nonhourly) with usual hourly earnings of $3.35 or less rose to 4.8 million. But even if this total is used, minimum wage workers would have accounted for only 4.7 percent of *all* wage and salary workers in 1988.

Finally, a "composite hourly earnings," which combines low-wage workers paid hourly rates (the published measure) with those salaried (and other) workers who also have low hourly earnings, yielded a total of 5.4 million persons, or about 5.3 percent of all workers. It is important to note that the latter two approaches (which include nonhourly workers) produce lower proportions of low-wage workers than does the hourly based estimate.

The demographic profile of minimum wage workers is not substantially altered when different methods are

Table 2. **Wage and salary workers with earnings of $3.35 per hour or less, calculated using alternative earnings measures, by selected characteristics, 1988 annual averages**
[Numbers in thousands]

| Characteristic | Workers paid hourly rates | | | | | Workers not paid hourly rates | | | All workers | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Reported hourly earnings | | Computed hourly earnings | | Total | Computed hourly earnings | | Total | Computed hourly earnings | | Composite hourly earnings | |
| | | $3.35 or less | Percent of total | $3.35 or less | Percent of total | | $3.35 or less | Percent of total | | $3.35 or less | Percent of total | $3.35 or less | Percent of total |
| Total, 16 years and over | 60,878 | 3,927 | 6.5 | 3,321 | 5.5 | 40,529 | 1,476 | 3.6 | 101,407 | 4,797 | 4.7 | 5,403 | 5.3 |
| 16 to 19 years | 6,130 | 1,418 | 23.1 | 1,217 | 19.9 | 541 | 158 | 29.2 | 6,671 | 1,375 | 20.6 | 1,576 | 23.6 |
| 20 to 24 years | 9,640 | 863 | 9.0 | 728 | 7.6 | 3,159 | 249 | 7.9 | 12,799 | 977 | 7.6 | 1,112 | 8.7 |
| 25 years and over | 45,109 | 1,646 | 3.6 | 1,376 | 3.1 | 36,829 | 1,069 | 2.9 | 81.938 | 2,445 | 3.0 | 2,715 | 3.3 |
| Men | 31,058 | 1,377 | 4.4 | 1,195 | 3.8 | 22,854 | 600 | 2.6 | 53.912 | 1,795 | 3.3 | 1,977 | 3.7 |
| Women | 29,820 | 2,550 | 8.6 | 2,126 | 7.1 | 17,675 | 877 | 5.0 | 47,495 | 3,003 | 6.3 | 3,427 | 7.2 |
| Husbands | 16,510 | 217 | 1.3 | 185 | 1.1 | 16,042 | 225 | 1.4 | 32,552 | 411 | 1.3 | 442 | 1.4 |
| Wives | 14,811 | 744 | 5.0 | 640 | 4.3 | 9,819 | 384 | 3.9 | 24,630 | 1,024 | 4.2 | 1,128 | 4.6 |
| Women who maintain families | 3,693 | 292 | 7.9 | 238 | 6.4 | 2,080 | 88 | 4.2 | 5,773 | 325 | 5.6 | 380 | 6.6 |
| Men who maintain families | 1,106 | 25 | 2.3 | 20 | 1.8 | 644 | 18 | 2.8 | 1,750 | 37 | 2.1 | 42 | 2.4 |
| Children[1] | 12,168 | 1,850 | 15.2 | 1,603 | 13.2 | 2,903 | 341 | 11.7 | 15,071 | 1,945 | 12.9 | 2,191 | 14.5 |
| Other persons in families | 1,902 | 174 | 9.1 | 151 | 7.9 | 663 | 54 | 8.1 | 2,566 | 204 | 8.0 | 228 | 8.9 |
| Persons not in families[2] | 10,688 | 625 | 5.8 | 484 | 4.5 | 8,377 | 367 | 4.4 | 19,066 | 850 | 4.5 | 992 | 5.2 |
| Full-time workers | 45,587 | 1,312 | 2.9 | 1,075 | 2.4 | 37,104 | 817 | 2.2 | 82,692 | 1,892 | 2.3 | 2,129 | 2.6 |
| Part-time workers | 15,291 | 2,614 | 17.1 | 2,246 | 14.7 | 3,425 | 660 | 19.3 | 18,716 | 2,905 | 15.5 | 3,274 | 17.5 |

[1] Children 16 years of age or older.

[2] Includes a small number of persons in unrelated subfamilies and persons in families in which the person maintaining the family is in the Armed Forces.

used to estimate hourly earnings. As shown in table 2, the likelihood of earning low wages remains greatest for teenagers and young adults, women, and part-time workers, regardless of which hourly earnings measure is used.

*How much do minimum wage workers make?* As discussed above, there is evidence that many workers whose hourly rate is equal to or below the minimum wage do receive other compensation, which, in effect, raises their hourly earnings above the stated wage level. In fact, as shown below, about two-fifths of all hourly paid workers reporting hourly wages at or below the minimum in 1988 earned more than $3.35 per hour on the basis of their weekly earnings and hours worked, with about one-fifth making $4.25 or more an hour, and roughly 1 in 20 making $8 or more:

| | *Total (thousands)* | *Percent of total* |
|---|---|---|
| Reported hourly wage equal to or less than $3.35 .... | 3,927 | 100.0 |
| Usual hourly earnings: | | |
| Less than $3.35 ... | 1,725 | 43.9 |
| Exactly $3.35 .... | 673 | 17.1 |
| More than $3.35 .. | 1,529 | 38.9 |
| $4.25 and above . | 717 | 18.3 |
| $4.55 and above . | 633 | 16.1 |
| $8.00 and above . | 212 | 5.4 |

The amount of the supplemental compensation varies according to a number of factors, the most important of which is a worker's occupation. For example, among food service workers such as waiters and waitresses, who commonly receive tips, about half of those reporting hourly wages at or below the minimum had total usual hourly earnings that exceeded the minimum wage. About a third of these workers had usual hourly earnings of $4.25 or more. In sales occupations, in which commissions are the most prevalent form of supplemental compensation, fewer workers received pay complements. Nevertheless, about a third of salesworkers reporting hourly earnings at or below the minimum were found to earn more than $3.35 an hour based on their weekly earnings, although fewer than 1 in 10 received $4.25 an hour or higher.

It is interesting to note that a larger proportion of the workers who reported hourly wages *below* the minimum of $3.35 actually had higher usual hourly earnings than was the case for those who made *exactly* the minimum. For example, about a third of all hourly paid workers who reported wages below the minimum in 1988 had usual hourly earnings of $4.25 or above, compared with roughly 1 out of 10 workers who reported the minimum. This may largely be explained by the treatment of tipped employees under the Fair Labor Standards Act. Under the provisions of the 1977 amendments to the law, employers may count tips received by their employees as part of wages (for all employees who regularly receive monthly tips in excess of $30), so long as this wage credit does not exceed 40 percent of the minimum. Thus, those employers who can use the maximum tip credit allowance need pay their employees a wage of only 60 percent of the minimum, or $2.01. Some workers, however, may receive substantial tips, thereby raising their hourly earnings significantly above their reported hourly wage. This is probably why about half of all food service workers who reported hourly rates below the minimum turned out to be earning $4.25 an hour or more on the basis of their weekly earnings and hours worked. However, among the food service workers who reported hourly earnings of exactly $3.35, the proportion who earned more was considerably smaller.

ESTIMATES OF THE NUMBER of workers with hourly earnings at or below the prevailing Federal minimum wage can vary depending on the types of pay included and the method of computation. In 1988, about two-fifths of the 3.9 million hourly paid workers who reported hourly wages of $3.35 or less appeared to have had supplemental compensation which raised their usual hourly earnings above $3.35. Among *all hourly paid* workers, the number with computed hourly earnings at or below $3.35 was some 600,000 fewer than the number whose hourly rate alone was at this level. (The net result takes into account those workers whose reported hourly earnings were above $3.35 but whose computed earnings fell below that amount.) However, when the usual hourly earnings of *nonhourly* paid workers are computed, some 1.5 million additional workers appeared to have had earnings that were $3.35 or less. In either case, the *proportion* of workers with low wages was less than the usually published estimate, which is based on the wages of persons paid on an hourly basis.

The usual hourly earnings estimates discussed in this report allow general inferences to be made regarding the total hourly earnings of workers. However, the sensitivity of the estimates to the rounding of both weekly hours and weekly earnings on the part of respondents severely limits their usefulness as a reliable measure of either the true hourly earnings of workers or of the actual number of workers with earnings at or below any particular level. □

## Footnotes

[1] The Federal minimum wage (currently $3.35 an hour) has been at this level since January 1981, when the last scheduled increase required by the 1977 amendments to the Fair Labor Standards Act of 1938 (FLSA) went into effect. Recent legislation, however, raises the minimum wage to $3.80 in April 1990, and $4.25 in April 1991. It should be noted that the presence of a sizable group of workers receiving wages less than the minimum does not necessarily indicate widespread violation of the FLSA, as there are numerous exemptions to its minimum wage provisions. For further information, see *The Fair Labor Standards Act of 1938, as Amended*, WH Publication 1318, November 1986 (U.S. Department of Labor, Employment Standards Administration).

[2] The Current Population Survey is a monthly survey of about 60,000 households nationwide conducted for BLS by the Bureau of the Census primarily to obtain data on the labor force status of individuals. The survey also includes four questions which gather information on the usual length of the workweek and the hourly and weekly earnings of employed workers. Responses to these questions are used to calculate the estimates of usual hourly earnings presented in this report. These questions are asked of one quarter of the sample households each month. The questions are:

25a. How many hours per week does . . USUALLY work at this job?
25b. Is . . . paid by the hour on this job?
25c. How much does . . . earn per hour?

25d. How much does . . . USUALLY earn per week at this job BEFORE deductions? Include any overtime pay, commissions, or tips usually received.

[3] See *The Fair Labor Standards Act of 1938, as Amended.*

[4] This technique for imputing an hourly earnings figure from the CPS microdata tapes has been used before. See, for example, Thomas J. Kniesner, "The Low-Wage Workers: Who Are They?" in Simon Rottenberg, ed., *The Economics of Legal Minimum Wages* (Washington, American Enterprise Institute for Public Policy Research, 1981), pp. 459–81.

[5] The apparent tendency for some respondents to understate usual weekly earnings may occur because "take-home pay," rather than gross weekly earnings, is reported. In addition, there is some concern that tips, commissions, and other pecuniary nonwage compensation may be underreported in the CPS. While it is difficult to document this effect for the weekly earnings data collected monthly in the CPS, there is evidence of such underreporting of nonwage income for the annual income data collected in the CPS's March income supplement. For further information on the underreporting of weekly earnings data in the monthly CPS, see Larry Carstensen and Henry Woltman, "Comparing earnings data from the CPS and employers records," *Proceedings of the Social Statistics Section, 1979* (Washington, American Statistical Association), pp. 168–73. For information on the underreporting of yearly income data in the March income supplement, see the appendix entitled "Underreporting of Income," in *Money Income and Poverty Status in the United States: 1988, Current Population Reports*, Series P–60, No. 166 (Bureau of the Census, 1989).

[6] Although nonhourly paid workers can include workers paid daily rates, commissions, or by piecework, it is likely that the vast majority of these workers are salaried.

## A note on communications

The *Monthly Labor Review* welcomes communications that supplement, challenge, or expand on research published in its pages. To be considered for publication, communications should be factual and analytical, not polemical in tone. Communications should be addressed to the Editor-in-Chief, *Monthly Labor Review,* Bureau of Labor Statistics, U.S. Department of Labor, Washington, DC 20212.