

Mismeasurement of Usual Hours Worked In the Census and ACS

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ABSTRACT

Recent decennial censuses and the American Community Survey (ACS) collect data that permit construction of average hourly wage rates. However, reports concerning usual hours worked during the past year contain errors that create incredible implied wages for part-time workers.

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1. Introduction

In 1980, the census bureau introduced a new question on the long form. The question read, “During the weeks worked in 1979, how many hours did this person usually work each week?” If one is willing to treat responses to this question about usual hours worked as representing the average number of hours worked per week in the previous year, responses to questions on total annual wage and salary income, total weeks worked, and usual hours worked per week permit researchers to calculate an average hourly wage for every wage and salary employee who worked during the calendar years 1979, 1989, and 1999. However, the data on usual hours from long form respondents appear to contain significant and systematic errors that tend to inflate the implied hourly wages observed among part-time workers.

In the analyses that follow, we rely to a great extent on data from the March CPS to infer the severity of reporting errors for usual hours worked in various census and ACS files. There are good reasons, a priori, to believe that the CPS data provide a better source of information on hours worked than census or ACS data. Respondents complete census or ACS forms without an interviewer present. The CPS data are generated by telephone interviews, and interviewers attempt to make sure that respondents understand all questions and answer them in a consistent manner.¹

2. Patterns of Hours Misreporting

Table 1 reports the percentages of workers who report usual hours worked in different part-time ranges. We begin by noting that, compared to CPS respondents, workers in the census and ACS are more likely to answer that they work 7, 8, 9 or 10 hours per week. This pattern is most pronounced in the 1980 census data, but among black men, black women, and white men, noteworthy differences that fit this pattern occur in several other years as well. We conjecture

that these reports are often an artifact of the use of pencil and paper surveys in the census and ACS. Because there is no interviewer interaction in these surveys, respondents who mistakenly answer the question as if it referred to usual hours per day are less likely to catch such a mistake before completing the survey. Our conjecture is motivated, in part, by the fact that the census vs CPS differences in the numbers of persons reporting exactly 8 hours per week are typically even more pronounced than the differences we report concerning reported hours in the range 7-10.

The 1980 and 1990 census files also contain a question concerning hours worked during the survey week. Given the results in Table 1 concerning reported usual hours worked per week last year, it is noteworthy that the fractions reporting 7-10 hours worked during the prior week in different groups are quite similar in the census and the CPS. If there is no systematic classification error in the census hours worked last week variable, we can use it as a source of validation for the usual hours worked per week during the previous calendar year variable.

Table 2 presents the distribution of reported hours worked last week for those reporting 7-10 usual hours worked per week during the previous year. Table 2 shows that in 1980 census data, over 30 percent of men who report 7-10 usual hours worked per week last year also report working exactly five times their report of usual hours worked (35, 40, 45 or 50) when answering the question concerning hours worked last week. The corresponding fractions in CPS data are essentially zero. Similar but slightly less dramatic patterns are present among women in 1980 and among blacks in 1990. Note that significant fractions of those reporting 7-10 usual hours worked per week in the previous calendar year are not working at all in the previous calendar week. Thus, the fractions who report working exactly five times their reported usual hours worked per week last year are even more substantial as portions of the currently employed persons who reported usually working 7-10 hours per week in the previous year. Given the

common nature of five-day work weeks, Table 2 provides strong suggestive evidence that the discrepancies between the fractions answering 7-10 hours in the census and CPS result, at least in part, from census respondents actually reporting their usual hours worked per day.

3. Consequences of Hours Misreporting for Measured Wage Gaps

The census and ACS data appear to contain other false reports of part-time hours as well. Reports of 7, 8, 9, or 10 hours are not frequent enough to account for the extremely high wages that are implicitly reported among part-time workers in these data. Table 3 presents mean hourly wages calculated for four demographic groups split into part time and full-time workers from the census and ACS. The sample includes persons ages 25-54 who reported positive labor income, weeks worked, and usual hours with no self-employment income. Observations with allocated wage and salary, business and farm income, weeks worked, usual hours, age, sex or race are not included, nor are those with a calculated hourly wage of less than \$1.50 or greater than \$300 in 1999 dollars. We trim the samples in order to illustrate differences in implied wage rates that remain using sample selection rules similar to those used in empirical work on hourly wage distributions. We also eliminate workers who reported usually working less than five hours per week.

Even though we restrict our analyses of implied wages among part-time workers to samples that contain workers who report working between 5 and 34 hours per week and whose implied hourly wages are not obvious candidates for trimming, part-time wages in both the census and ACS files are often quite high relative to both wages reported by part-time workers in the CPS and full-time wages in the census and ACS. Among our four demographic groups, the results for white women stand out. Table 1 shows that the census and ACS data for white

women contain fewer “excess” reports of 7-10 hours work per week than other groups, and Table 3 shows that, compared to other groups, implied part-time wages among white women in the census and ACS are much more in line with those in the CPS. Thus, we expect that researchers who study wage gaps associated with race and gender while controlling for part-time versus full-time work status may reach quite different conclusions depending on whether they use census or ACS data versus CPS data for their analyses.

4. Conclusions

Our results are a cautionary note for those who would use information from other pencil and paper surveys to calculate implied hourly wage rates. Without an interviewer present, it appears that respondents often make reporting errors that imply inflated hourly wage rates. Some of these errors involve false reports of daily hours worked instead of usual weekly hours, but other errors that inflate implied wages also appear to be present.

References

Juster, F. Thomas and Frank P. Stafford, "The Allocation of Time: Empirical Findings, Behavioral Models, and Problems of Measurement," *Journal of Economic Literature* 29 (June 1991), 471-522.

¹See Juster and Stafford (1991) for discussion of the benefits of using time diary methods.

Table 1: Probability Distribution Functions of Reported Usual Hours

Year & Sample	White Men				Black Men				White Women				Black Women			
	1-6	7-10	11-19	20-34	1-6	7-10	11-19	20-34	1-6	7-10	11-19	20-34	1-6	7-10	11-19	20-34
Panel A: Census and ACS																
1980c	0.1	1.0	0.4	2.4	0.3	3.1	0.6	3.6	1.4	2.8	4.8	17.6	1.1	3.7	2.1	10.5
1990c	0.1	0.3	0.5	3.2	0.2	0.9	0.9	5.2	0.9	1.6	3.8	16.8	0.6	1.3	1.7	10.7
2000c	0.1	0.3	0.5	3.2	0.3	0.9	0.9	4.6	0.8	1.5	2.9	15.8	0.5	1.3	1.1	9.9
2000a	0.2	0.7	0.4	3.3	0.3	1.2	0.8	5.1	1.0	1.8	3.0	16.0	0.4	1.7	1.1	9.2
2001a	0.2	0.3	0.4	3.5	0.3	0.7	0.7	5.0	0.9	1.4	3.1	16.1	0.5	0.9	1.4	10.2
2002a	0.2	0.3	0.5	3.9	0.3	0.7	1.0	6.0	1.0	1.5	3.3	16.4	0.5	1.1	1.4	11.0
2003a	0.2	0.4	0.6	4.3	0.4	0.8	0.9	6.4	1.0	1.6	3.3	16.8	0.6	1.0	1.8	11.2
2004a	0.2	0.3	0.5	4.3	0.3	0.8	0.7	6.5	1.0	1.5	3.3	17.0	0.7	0.9	1.5	12.3
2005a	0.2	0.3	0.6	4.3	0.4	0.8	1.0	6.2	1.0	1.5	3.2	16.9	0.6	1.1	1.9	12.2
2006a	0.2	0.3	0.6	4.3	0.5	0.8	1.0	6.5	1.0	1.4	3.1	16.6	0.5	0.9	1.6	11.7
Panel B: CPS																
1980	0.1	0.2	0.4	2.3	0.2	0.3	0.6	3.5	1.9	2.4	5.4	16.4	0.8	1.4	2.9	11.1
1990	0.1	0.2	0.5	3.1	0.2	0.4	0.7	5.8	1.3	1.6	4.2	16.1	0.4	1.2	1.1	10.4
2000	0.1	0.2	0.5	2.4	0.1	0.1	0.4	5.1	1.0	1.6	3.0	15.5	0.5	0.5	1.6	8.9
2001	0.1	0.2	0.4	2.6	0.0	0.4	0.6	4.3	0.8	1.3	3.4	14.5	0.2	0.7	1.3	8.2
2002	0.1	0.2	0.4	3.0	0.4	0.2	0.4	4.5	1.0	1.6	2.9	15.1	0.4	0.6	1.5	9.7
2003	0.2	0.2	0.4	3.2	0.2	0.5	0.5	6.1	1.1	1.7	3.2	15.1	0.4	0.4	1.6	11.1
2004	0.1	0.3	0.5	3.6	0.1	0.2	0.6	4.6	1.1	1.6	3.1	15.6	0.2	0.9	1.6	11.0
2005	0.1	0.2	0.5	3.6	0.2	0.1	0.6	5.2	1.0	1.7	3.1	15.6	0.5	0.8	1.4	9.7
2006	0.2	0.2	0.4	3.3	0.1	0.5	0.3	5.4	0.9	1.5	2.8	15.3	0.1	0.6	1.3	11.0

Notes: Suffixes on years in Panel A refer to (c)ensus and (a)cs data sources. Bolded census and ACS entries are significantly different from the CPS at the 1 percent level. The sample includes whites and blacks ages 25-54. Persons with reported income and labor supply that imply a wage of less than \$1.50 (1999) per hour are not included. The sample is further restricted to those who report working in the previous calendar year and report no self employment income. CPS observations are weighted by the March supplemental weight. 2000 census and ACS observations are weighted by the person weight.

Table 2: The Relationship Between Usual Hours and Hours Last Week

Distribution of Hours Last Week for Usual Hours = 7-10

		Census					CPS				
		0	7-10	Other PT	5*(usl hrs)	Other FT	0	7-10	Other PT	5*(usl hrs)	Other FT
1980	White Men	0.21	0.07	0.11	0.32	0.29	0.43	0.06	0.28	0.03	0.19
	Black Men	0.26	0.11	0.12	0.34	0.17	0.42	0.19	0.00	0.00	0.40
	White Women	0.32	0.25	0.24	0.11	0.08	0.37	0.24	0.29	0.03	0.07
	Black Women	0.30	0.13	0.14	0.28	0.15	0.37	0.26	0.21	0.07	0.10
1990	White Men	0.33	0.15	0.27	0.09	0.16	0.31	0.32	0.23	0.05	0.09
	Black Men	0.41	0.10	0.17	0.18	0.14	0.88	0.00	0.12	0.00	0.00
	White Women	0.30	0.31	0.31	0.03	0.05	0.35	0.25	0.36	0.01	0.04
	Black Women	0.39	0.15	0.21	0.14	0.12	0.52	0.21	0.18	0.05	0.03

Notes: See notes below Table 2 for sample definition. The second column gives the fraction of those reporting x usual hours that also reported x hours last week, where x = 7, 8, 9 or 10. The fourth column gives the fraction of those reporting x usual hours reporting 5x hours last week. Bolded entries indicate that the census and CPS numbers are significantly different at the 1 percent level.

**Table 3: Calculated Hourly Wages
Usual Hours Worked >4 & Wage Trimmed at 300**

Panel A: Census/ACS

	Part Time				Full Time				All Workers			
	White		Black		White		Black		White		Black	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
1980c	39.54	14.51	40.82	22.26	20.15	12.78	16.14	12.75	20.91	13.23	17.97	14.37
1990c	20.37	12.92	17.76	14.29	19.41	14.18	15.57	13.51	19.45	13.89	15.73	13.62
2000c	22.20	15.17	20.33	16.05	20.61	16.21	16.66	15.36	20.67	15.99	16.91	15.45
2000a	27.72	15.80	24.68	18.32	20.05	15.72	16.16	14.02	20.39	15.73	16.77	14.54
2001a	20.71	14.87	16.58	14.06	20.56	16.20	16.06	14.52	20.56	15.92	16.09	14.46
2002a	20.15	15.17	17.29	13.40	20.54	16.49	16.32	14.47	20.52	16.20	16.39	14.32
2003a	20.04	15.21	16.11	13.68	21.10	16.81	16.33	14.92	21.05	16.45	16.31	14.75
2004a	19.90	15.09	16.24	13.42	21.78	17.15	16.83	15.18	21.68	16.69	16.78	14.91
2005a	19.77	15.31	17.87	13.66	21.74	17.32	16.63	14.97	21.63	16.88	16.74	14.77
2006a	18.16	14.88	15.62	13.14	20.58	16.63	15.83	14.59	20.46	16.25	15.81	14.38

Panel B: Census/ACS Minus CPS

	Part Time				Full Time				All Workers			
	White		Black		White		Black		White		Black	
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women
1980c	20.44	2.97	28.84	12.79	0.33	0.52	1.12	1.35	1.11	1.16	3.07	3.28
1990c	5.46	1.03	5.06	3.42	0.54	0.70	1.46	1.32	0.73	0.77	1.71	1.61
2000c	4.88	1.20	2.43	4.37	1.06	1.31	1.23	2.02	1.20	1.29	1.34	2.29
2000a	10.41	1.83	6.78	6.63	0.50	0.82	0.73	0.68	0.91	1.03	1.20	1.39
2001a	3.80	0.25	5.28	2.33	0.74	0.86	1.00	1.37	0.84	0.72	1.24	1.46
2002a	2.96	0.84	5.32	-0.62	0.62	0.88	0.82	1.01	0.70	0.85	1.08	0.79
2003a	4.30	-0.20	2.32	0.75	0.87	1.11	0.75	1.21	0.99	0.82	0.86	1.13
2004a	3.13	-0.56	2.79	2.05	1.76	1.03	1.34	1.33	1.81	0.67	1.41	1.40
2005a	2.05	0.68	3.30	2.32	1.78	1.50	1.39	1.31	1.77	1.31	1.53	1.39
2006a	2.47	-0.18	4.13	2.65	0.97	0.92	0.67	0.62	1.00	0.67	0.88	0.87

Notes: Sample is the same as that used for Table 2 excluding those reporting usual hours less than 5 and those with calculated hourly wages of more than 300 dollars. Wages are adjusted to 1999 dollars and topcoded according to the CPS rule in each year. CPS results are weighted using the March supplemental weight. Census and ACS results are weighted using the person weight. Bolded entries in Panel B represent statistically significant differences between the CPS and Census/ACS at the 1 percent level.