

## **CPS BRIDGE TEAM TECHNICAL REPORT 3**

Effect of Design Differences Between the  
Parallel Survey and the New CPS

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Executive Summary of  
CPS BRIDGE TEAM TECHNICAL REPORT 3  
Effects of Design Differences Between the  
Parallel Survey and the Redesigned Current Population Survey

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The official monthly labor force estimates from January 1994 onward will be based on data from a comprehensively redesigned Current Population Survey (CPS). The redesign incorporates changes in the basic questionnaire and collection methods. In addition, these estimates will be constructed using the 1990-census-based population controls rather than 1980-census-based population controls.

In order to gauge the effects of the CPS redesign on published estimates, a Parallel Survey (PS), intended to provide annual average laborforce estimates, was conducted from July 1992 to December 1993. The PS used a separate monthly sample of households approximately one-fifth the size of the regular CPS sample.

Annual average estimates from the PS were compared to the CPS for 1993. These comparisons provide estimates of the overall effect of switching to the new questionnaire and collection methods. This study showed an expected .45 (or rounded to .5) percentage point increase in the unemployment rate. (For a general discussion of these results, see the February 1994 issue of *Employment and Earnings*; for a more detailed discussion, see Polivka 1994). These results do not provide an estimate of the effect of switching from the old CPS to the redesigned CPS, because not all design differences were accounted for. We have known for some time that at least one design difference had a measurable effect on the estimated unemployment rate. That is, the change in the population controls resulted in an additional .10 percentage point increase in the unemployment rate; implying a total effect of .55 (or rounded to .6) on the unemployment rate. (See table D, *The Employment Situation: January 1994*.) With the completion of the PS, it became possible to estimate the effects of the design differences.

To better understand the effect of design differences between PS in 1993 and CPS in 1994, the CPS Bridge Team has obtained estimates of several design differences. Three design differences, present in January 1994, which we have examined are: 1) The redesigned CPS uses 1990-census-based population controls rather than the 1980-census-based controls; 2) The PS used fewer post-stratification controls than the CPS due to smaller sample sizes and different sample designs; and 3) About 18 percent of the PS sample was interviewed at centralized telephone facilities, as compared to 12.5 percent in the redesigned CPS.

Accounting for these design differences, the expected increase in the January 1994 unemployment rate is marginally greater-- .48 percentage point. This estimate, as well as each of the individual effects given below, are subject to sampling variance; thus, the actual effects will differ from the estimated effects. The specific estimated effects are:

- An increase of .10 percentage point on 1993 CPS due to the change to 1990-census-based population controls. (The actual increase in the PS was .12. This is a less accurate measure due to the smaller PS sample size.)
- An increase of .01 percentage point due to fewer post-stratification controls.
- A decrease of .08 percentage point due to less centralized interviewing in the new CPS.

Except for the .01 percentage point increase due to fewer post-stratification controls, the overall effects and the other individual effects are believed to be statistically significant; although the centralization effect was marginally significant.

After January 1994, two additional changes will occur. The composite estimator will be introduced in early 1994, and the proportion of centralized interviewing will equal the proportion present in the PS by June 1994. Increasing centralized interviewing removes the decrease of .08 percentage point present in January to give an expected increase of .56 percentage point on the unemployment rate. The effect of the composite estimator is much less certain. As the composite estimator is introduced, the expectation is that the unemployment rate may drop by as much as .06 percentage point, or it may increase by .02 percentage point.

Applying the 1993 CPS seasonal adjustment factors to the time series for the PS and the CPS showed no additional effects. This is primarily due to use of the same adjustment factors on both surveys. However, it will take some time before we know the seasonal pattern for the new CPS.

Additionally, the switch to using 1990-based population controls will increase the variance on many estimates. Overall the increases are expected to be small.

Our best estimate of the combined redesign effects on the annual average unemployment rate is an increase of .56 percentage point. This is before compositing or seasonal adjustment. It will be awhile before we can determine a more precise estimate of the effect of compositing or seasonal adjustment.

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## Introduction

The official monthly labor force estimates from January 1994 onward will be based on data from a comprehensively redesigned Current Population Survey (CPS). The redesign incorporates changes in the basic questionnaire and collection methodology. In addition, these estimates will be constructed using the 1990-census-based population controls rather than 1980-census-based controls.

In order to gauge the effects of the CPS redesign on published estimates, a Parallel Survey (PS), intended to provide annual average laborforce estimates, was conducted from July 1992 to December 1993. The PS used a separate monthly sample of households approximately one-fifth the size of the regular CPS sample.

Annual average estimates for 1993 from the PS have been compared to those from the CPS to give our best overall understanding about the effects of questionnaire redesign and change in collection procedures (Polivka 1994). The redesign analysis is limited to the extent that differences in centralized interviewing and the number of post-stratification controls used in the estimation could be contributing to the overall findings. Thus, these comparisons do *not* provide estimates of the effect of switching from the old CPS to the new CPS, because these two design differences are not accounted for. Furthermore, we still need to account for the effects of switching to 1990 census population controls, not using the composite estimator in January 1994, and using the old CPS seasonal adjustment factors.

To better understand the effect of design differences between the PS in 1993 and the CPS in 1994, this report presents information on five design differences--1990 census population controls, the number of post-stratification controls, the amount of centralized interviewing, composite estimation, and seasonal adjustment. Switching to 1990 census population controls also has an effect on the reliability of estimates. Information on how the variances are expected to change is included in this report as well.

This report, which is the product of joint work between the Bureau of Labor Statistics and the Bureau of the Census, is laid out as follows. The *Background* section provides an introduction to the Parallel Survey, as well as a discussion of the differences between the PS and the redesigned CPS. The *Results* section gives additional information on how laborforce characteristics are affected by the design differences. General conclusions about the effect of these design differences are given in the *Summary* section.

## Background

## **Redesign of the Current Population Survey**

The CPS is a national survey of approximately 60,000 households which provides a monthly picture of the nation's laborforce characteristics, including employment, unemployment, and those not in the laborforce. The CPS began in 1940, and the questionnaire has remained essentially unchanged since the last redesign in 1967. The current redesign was undertaken to reflect changes which have taken place in the workforce and structure of American society, as well as to take advantage of changes and improvements in survey methods, such as computer-assisted data collection and questionnaire methods based on the theories of cognitive psychology. Further discussion of the questionnaire and mode of collection changes incorporated into the CPS in January 1994 can be found in Bregger and Diplo (1993).

Although computer-assisted interviewing was used for all interviews in January 1994, the mix between centralized and decentralized interviewing will change during 1994. In January 1994, the amount of centralized interviewing increased to 12.5 percent from a previous level of 9 percent. During 1994, the amount of centralized interviewing will increase to 18 percent, the amount present in the Parallel Survey (PS).

In addition to the changes in data collection procedures incorporated into the CPS in January 1994, changes in estimation procedures have also taken place. In January 1994, the CPS began using post-stratification controls based on the 1990-census population adjusted for undercount. The composite estimator was not used. The seasonal adjustment factors applied to the January 1994 CPS estimates and to be applied to future months have been computed from the old CPS. Although estimates from the new CPS will be used in the mid-1994 revision of seasonal factors, it will be awhile before we can determine the seasonal patterns for the new CPS.

In order to better understand the effects of the CPS redesign upon published estimates, the Parallel Survey was conducted from July 1992 to December 1993 using a monthly sample of approximately 12,000 households.

## **Design Differences Between CPS and PS**

The design of the PS was basically that of the National Crime Victimization Survey. Like the CPS, the PS was a multistage probability sample in which large metropolitan areas are selected with certainty, and smaller primary sampling units are selected with probability proportional to size within strata. For the PS, strata were defined within region, rather than State, as in the CPS. Moreover, the CPS has a much larger sample,-- 60,000 households monthly, as compared to 12,000 in the PS. Sampled addresses in the CPS are interviewed for 4 consecutive months, are out of sample for 8 months, and are interviewed again for 4 additional months. Consequently, in any given month the sample is partitioned into 8 rotation groups, with one being interviewed for

the first time, one for the second time, etc. (See Miller 1994). The PS used this same sample rotation pattern; however, due to the amount of time needed to phase this rotation pattern in, the PS did not completely achieve the CPS rotation pattern until September 1993. Consequently, the effect of the PS rotation pattern could not be measured.

The estimation procedure for the PS was very similar to that used for the CPS, with the major difference being the number of post-stratification controls used. Post-stratification is used to benchmark survey data to population estimates and is accomplished by a 3-step iterative rake to: 1) State, 2) national Hispanic ethnicity by sex and age, and 3) national race by sex and age. In the CPS, the national steps use about 600 population estimates. For the PS, the control to State population estimates was excluded and the number of national age/sex/race ethnicity population controls was reduced to about 559. This difference is a direct consequence of the PS's smaller sample size and the fact that the PS did not use State strata. (The PS was never designed to produce State estimates like the CPS.) The population estimates used as controls in the post-stratification procedure are based on the Decennial Census and adjusted forward to reflect births, deaths, immigration, and emigration. In January 1994, the CPS switched to controls based on the 1990 census adjusted for undercount. Previously these controls were based on the 1980 census.

Another design difference between the PS and the CPS is the extent to which centralized interviewing was used. Approximately 18 percent of the PS sample was interviewed from a centralized facility, as compared to 9 percent for CPS during the same time frame. Statistical evidence about centralized interviewing effects was only recently obtained, even though centralized computer-assisted telephone interviewing (CATI) has been used in the CPS since January 1989. A computerized version of the then current, now old, questionnaire was developed and administered by a staff of telephone interviewers working out of a centralized facility in Hagerstown, Maryland. In order to minimize any potential effects on published CPS estimates, the percent of sample cases interviewed from CATI was purposely kept small. Over a period of 5 years, the percent of the CPS sample interviewed from CATI gradually increased to the 9 percent level used in the 1993 CPS.

In order to evaluate the effects of using CATI on CPS estimates, sample housing units were randomly assigned to be or not to be CATI eligible. Findings based on CPS data collected between January 1991 through December 1992 showed that CATI produced an unemployment rate 0.8 percentage point higher for the test group eligible for CATI than the control group not eligible for CATI. (Shoemaker 1993). The old paper and pencil questionnaire was just not administered from a centralized location, it was converted to and administered via a computerized version, and the wording of question 19 had been modified<sup>1</sup>. Thus, it was not possible to distinguish whether this difference was due to centralization, computerization, or a slightly modified questionnaire.

Cognizant of this CATI effect on CPS estimates, the PS was also designed to facilitate an evaluation of centralized interviewing. (For a discussion of these results, see Kostanich (1994)). The sample sizes for the centralization test in the PS were extremely small. The test group had

only 5,500 housing units per month, and the control group had only 600 housing units per month. These small sample sizes caused the variability to be too large to draw any conclusions until the test was complete in December 1993.

More details and background on these design differences are given in Miller (1994). The following table highlights these differences.

**Table 1. Design features of CPS and PS**

	CPS	PS
<b>Sample design:</b>		
Sample size (occupied housing units)	58,900	12,000
Primary strata	within State	within region
<b>Post-stratification:</b>		
Source of controls	1980 census*	1980 census
Number of controls	600 National 51 States	559 National No States
<b>Collection procedures:</b>		
Percent noncentralized	91 percent (paper and pencil)*	82 percent (computer)
Percent centralized	9 percent (computer)*	18 percent (computer)
*Changed for CPS beginning in January 1994		

<sup>1</sup> See Rothgeb (1994) for a more detailed discussion about question 19 and possible influences of computer assisted interviewing and centralization.

## Results

Section I gives more details on how each of these five design differences affect major laborforce estimates. Generally, results are presented for unemployment rates, employment-to-population ratios, and civilian laborforce participation rates for selected demographic groups. First, the

effects due to the two differences in the post-stratification procedure are discussed. How the source of the post-stratification controls (1980 vs. 1990-census-based population controls) affects laborforce estimates is given in part A, while the effect due to the number of post-stratification controls used is discussed in part B. Next, the effect due to differential mix of centralized interviewing is examined in part C. Effects due to composite estimation are given in part D, and seasonal adjustment is discussed in part E. Finally, information on variances for estimates from 1990-census-based population controls is included in Section II.

#### I. Effect on laborforce estimates

Included in the table below are some highlights from the questionnaire redesign and data collection effects found in Polivka (1994). These estimates serve as a basis for interpreting the effects discussed in this report. It should be noted that these are 1993 annual average estimates that use 1980-based census population controls and do not use compositing.

**Table 2. Unemployment Rates**

	PS	CPS	PS-CPS
Total	7.26	6.81	0.45*
Men	7.36	7.08	0.28
Women	7.14	6.48	0.66*
16-19	20.61	19.03	1.58*
Adult Men	6.58	6.35	0.23
Adult Women	6.34	5.83	0.51*
*Significant at the 10% Level			

A. Effect of 1990-based population controls

In January 1994, the CPS began controlling to the 1990-census-based population controls adjusted for undercount. To examine the effect of this change, monthly CPS data for 1993 were weighted using each set of controls--those based on the 1980 census and those based on the 1990 census. Results for the 1993 annual averages are presented.

The data showing the effect of the switch in population controls on CPS are given in tables A-1 through A-3. These results show:

- An increase in estimated levels for all major laborforce categories. Relatively speaking, the increase was largest for *unemployed* (over 2 percent) and smallest for *not in laborforce* (less than .2 percent). The other categories (employed, CLF, CNP16+) increased from .6 to .9 percent. (See table A-1.)
- The unemployment rates estimated using 1990-based controls were greater than the rates using 1980-based controls for most demographic groups. The overall increase was .1 percentage point. (See table A-2.)
- Using the 1990 controls tends to result in larger laborforce participation rates. Percentage point increases vary from .04 to 1.01, with an overall increase of .15 percentage point. These new controls did cause a slight decrease for white females and teenagers. (See table A-3.)
- Some comparable 1980-and 1990-based figures for the PS are given in table A-4. These results are consistent with those given in table A-1 for the CPS; however, the estimates given above for the CPS more accurately reflect the effect on CPS estimates and because of CPS's larger sample size, are considerably more reliable.

No formal statistical testing was conducted for any of the above comparisons. Because the same sample data were used to construct both sets of estimates, the variances on the differences are believed to be very small. Thus, most of these differences would likely be significant.

Additional information on the effect of the switch to 1990-based population controls is given in the February 1994 *Employment and Earnings* (Bureau of Labor Statistics, 1994, Vol. 41, No. 2). The data show that Hispanic estimates were affected the most by this change.

## B. Effect of fewer post-stratification controls

As noted above, the PS used fewer post-stratification controls than the CPS. The PS did *not* control to State population estimates and used fewer national race/sex/age ethnicity controls because of the much smaller sample size. Concerns over whether this could be contributing to differences attributed to the redesign, led us to reweight the CPS using the exact same post-stratification controls used for the PS. Thus, to examine the effect of these differences in estimation procedures, we compiled three sets of estimates, all using the 1990 census-based controls. Here we compare PS estimates with CPS estimates using the CPS post-stratification controls and with reweighted CPS (RCPS) estimates using the PS post-stratification controls.

Tables B-1 through B-3 contain 1993 annual average estimates of unemployment rates, employment to population ratios and civilian laborforce participation rates for each of the three methods. Some highlights:

- The differences in the unemployment rates do not change when CPS is reweighted with fewer post-stratification controls. All estimated differences are not significant, even the .10 increase for black men. (See table B-1.)
- Overall, the reweighting has no significant effect on the employment-to-population ratios. (See table B-2.)
- For the civilian laborforce, again we get no significant effect. (See table B-3.)

In conclusion, the difference in number of post-stratification controls does not have a significant effect on comparisons between the CPS and PS as documented by Polivka (1994).

Note: Use of 1990-based population controls give different results than those estimated by Polivka (1994) which used 1980-based population controls. For example, the .45 percentage point difference in the estimated unemployment rates using the 1980-based population controls is estimated as .47 when the 1990-based population controls are used. This is because the 1990-based population controls raise the CPS estimated unemployment rate by .10 percentage point, while raising the PS estimated unemployment rate by .12 percentage point, as shown in part A above.

### C. Effect of differential proportions of centralized interviewing

The estimated redesign effects discussed by Polivka (1994) are partially attributable to differences in the proportion interviewed from a central location. During 1993, approximately 9 percent of the CPS sample was interviewed from a centralized facility, while 18 percent of the PS sample was interviewed from a centralized facility. In January 1994, approximately 12.5 percent of the CPS sample was interviewed from a centralized telephone facility. To obtain a measure of how this affects January 1994 CPS data, we reweighted the PS to reflect the proportion of centralized interviewing that was to occur in the January 1994 CPS (12.5 percent). The reweighting of the PS involved adjusting base weights within test (eligible for centralized interviewing) and control (not eligible for centralized interviewing) panels, and then performing the usual post-stratification. Annual average estimates for 1993 from the reweighted PS were compared to those from the CPS. The 1990-based population controls were used for both surveys, resulting in estimated differences between the PS and the CPS which are not exactly the same as those estimated by Polivka (1994).

The data showing the estimated effect of different proportions of centralized interviewing are given in tables C-1, C-2, and C-3. These results show:

- The reweighted PS (RPS) gives an estimated unemployment rate of 7.29 compared to 7.37 in the PS. These unemployment rates were close to being significant at the 90 percent confidence level. The estimated increase of .47 percentage point on the unemployment rate is partially due to differences in the percent of centralized interviews. When the PS is reweighted to reflect the lower percent of centralized interviewing in January 1994, we estimate a difference of .39. These estimated differences between the RPS and the CPS give a more accurate estimate of the CPS change from December 1993 to January 1994. In general, for most demographic groups shown, we would expect the effects of the redesign and collection procedures on the estimated unemployment rate to be slightly less than previously estimated. (See table C-1.)
- Tables C-2 and C-3 give the results for employment-to-population ratios and the civilian laborforce participation rate. No significant differences between the PS and RPS were found for any of the figures in these tables. Thus, there is no evidence that the proportion of the sample interviewed from centralized facilities affects previously estimated redesign effects for employment and civilian labor force rates.

### D. Effect of composite estimator

The primary purpose of the composite estimator is to reduce the variance on estimates of month-to-month change, particularly for employment and civilian laborforce characteristics. The composite estimator changes the expected value of an estimate relative to the estimate after post-stratification (uncomposited). This is a result of the way the sample rotates; that is, in for 4 months, out for 8 and then in for 4 more months. It has been shown that the expected value of an estimate depends on the number of times its rotation group has been in the sample. Furthermore, these differences in expected value, commonly referred to as rotation group bias but are actually month-in-sample bias, are not necessarily constant over time. See Bailar (1975). The composite estimator changes the expected value by differentially weighting the rotation groups. The current composite estimator was selected based on variance reduction capabilities, its low bias (relative to the uncomposited estimate), and that it was not sensitive to changes in rotation group bias. See Kostanich and Bettin (1980).

In January 1994, no compositing is used with the CPS. The compositing will begin in the early months of 1994 but will take several months before becoming stable. To estimate the effect of compositing on the unemployment rate, PS and CPS estimates, using both 1980 and 1990-based population controls, were composited with the initial composited month being October 1992. The resulting 1993 annual averages are presented in table D-1. Major findings from the 1990 based estimates are:

- The 1993 annual average of composited monthly estimates of the unemployment rate from the PS is estimated to be .06 percentage point lower than the comparable uncomposited estimate from the PS. However, from CPS, we estimate an increase of .02 percentage point from the composite.
- The difference between PS and CPS diminishes slightly when the composite is used (.47 to .39 percentage point).

These results may not be indicative of the composite estimator's long term effect. As noted above, the expected value of the composite estimator is affected by the number of times the rotation group has been in the sample. Since the PS had a short phase-in, the historical month-in-sample pattern is not present in the PS data. Consequently, it is not surprising that a composite estimator developed for the CPS month-in-sample bias pattern has a different effect when used with the PS. In any event, the composite estimate has very little effect on the expected value of monthly estimates. This was examined extensively under a variety of bias and change assumptions. See Cantwell and Ernst (1994).

#### E. Seasonal adjustment procedure

A seasonally adjusted national unemployment rate for CPS is produced by aggregating 12 independently adjusted series. The component series are: agricultural employment, nonagricultural employment, and unemployment by four sex-age groups (men 20 years and over, women 20 years and over, men 16 to 19 years, and women 16 to 19 years). Eight of these series are seasonally adjusted using multiplicative factors; the other four use additive factors. The four additive series are nonagricultural men and women of age 16 to 19 years, and unemployed men and women of age 16 to 19 years. The seasonal adjustment factors are generated using X-11 ARIMA software and are given in January 1994 issue of *Employment and Earnings*. Each of these 12 series is separately adjusted for seasonal variation, and the resulting estimates are then aggregated to derive seasonally adjusted totals. The seasonally adjusted figure for the laborforce is a sum of eight seasonally adjusted civilian employment components and four seasonally adjusted unemployment components. The overall unemployment rate is derived by dividing the resulting estimate of total unemployment by the estimate of the laborforce.

As part of our research, we applied the same seasonal methods to both the CPS and the initial parallel survey estimates for each month of January 1993 to December 1993 data. Our results indicate that the monthly difference in the estimates of unemployment rate between the CPS and the initial parallel survey, after applying the seasonal adjustments was the same as before the seasonal adjustment. In other words, the seasonal adjustment moved the two series in the same direction by about the same absolute amount. It will, however, take several years before the seasonal pattern of the "new" CPS are formed.

## II. Variance effects from 1990-based population controls

In general, a standard error of an estimated level increases as the size of the estimate increases. Because the 1990-based population controls tend to increase the level of estimates, we expect the switch to the 1990-based population controls in January 1994 will increase the variability of estimates. Here we compare standard errors on estimates based on 1980 population controls with those based on 1990 population controls. The 1980-based standard errors (SE80) are estimated using current generalized variance functions that were derived from 1987 CPS replicate variances. The 1990-based standard errors were estimated directly using replication from 1993 CPS data post-stratified with

1990-based population controls. These results are summarized in tables E-1, E-2, and E-3. Some highlights are:

- For the total estimated unemployment rate, the estimated standard error is 9 percent larger when 1990-census-based population controls are used. See table E-1. For demographic groups, the relative increase on the estimated standard error of the unemployment rate varies from 2 to 6 percent. However, the increase for blacks is 12 percent, whereas the teenager standard error is lower by 7 percent.
- The estimated standard error on the employment-to-population ratio using 1990 controls is 11 percent higher than using 1980 controls. Increases in this standard error occur for men and women. The standard error for adult men is actually lower using 1990 controls. (See table E-2.)
- The estimated standard error on the laborforce participation rate is 13 percent higher. For all men, the standard error is 13 percent higher and for all women it is 11 percent higher. For adult men, however, the standard error is 11 percent lower, while for adult women it is only 3 percent higher. (See table E-3.)

## Summary

In general, the most important design difference not reflected in the questionnaire and redesign effects given in Polivka (1994) are those due to the 1990-based population controls. Switching to the 1990-based controls has the effect of increasing totals, unemployment rates and laborforce participation rates for most demographic groups.

The least important design difference is the use of fewer post-stratification controls in PS. All estimated effects on unemployment rates, employment-to-population ratios and civilian laborforce rates were not only small but were also found to be nonsignificant.

The differential proportion of centralized interviewing is probably contributing somewhat to the redesign effects discussed by Polivka (1994). We suspect that the redesign effects for unemployed are slightly overstated. However, there is no evidence that differential proportions of centralized interviewing has affected the redesign effects for employment and civilian laborforce.

The effects from compositing are expected to be anywhere from a decrease of .06 percentage point to an increase of .02 percentage point for unemployed. It will be awhile before we can more precisely estimate the effect of compositing.

The effects due to seasonal adjustment are a lot less clear. We would expect these effects to be small, but, until more data become available, we won't be able to tell.

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Table A-1

## EFFECT OF 1990-BASED CONTROLS - CPS

## Labor Force Characteristics

(CPS, 1993 Annual Averages) (Totals in thousands)			
	1990-Based Estimate	1980-Based Estimate	Difference 1990 - 1980
Employed	120,323	119,389	934
Unemployed	8,917	8,714	203
Civilian Labor Force	129,240	128,103	1,137
Not in Labor Force	65,565	65,447	118
Civilian Population 16+	194,804	193,550	1,254
Labor Force Participation Rate	66.34	66.19	0.15
Employment to Population Ratio	61.77	61.68	0.09
Unemployment Rate	6.90	6.80	0.10

Table A-2

## EFFECT OF 1990-BASED CONTROLS

## Unemployment Rate

(CPS, 1993 Annual Averages)			
	1990-Based Estimate	1980-Based Estimate	Difference 1990 - 1980
Total	6.90	6.80	0.10
Men	7.17	7.07	0.10
Women	6.57	6.48	0.09
White	6.03	5.96	0.07
Men	6.32	6.23	0.09
Women	5.69	5.62	0.07
Black	13.04	12.96	0.08
Men	13.92	13.89	0.03
Women	12.18	12.05	0.13
16-19	19.06	19.03	0.03
Adult Men	6.42	6.35	0.07
Adult Women	5.90	5.83	0.07

Table A-3

EFFECT OF 1990-BASED CONTROLS  
Civilian Labor Force Rate

(CPS, 1993 Annual Averages)			
	1990-Based Estimate	1980-Based Estimate	Difference 1990 - 1980
Total	66.34	66.19	0.15
Men	75.47	75.21	0.26
Women	57.95	57.91	0.04
White	66.80	66.74	0.06
Men	76.25	76.10	0.15
Women	57.97	58.03	-0.06
Black	63.20	62.51	0.69
Men	69.53	68.52	1.01
Women	58.07	57.56	0.51
16-19	51.60	51.62	-0.02
Adult Men	77.27	76.92	0.35
Adult Women	58.54	58.46	0.08

Table A-4

## EFFECT OF 1990-BASED CONTROLS - PS

## Labor Force Characteristics

(PS, 1993 Annual Averages)			
(Totals in thousands)			
	1990-Based Estimate	1980-Based Estimate	Difference 1990 - 1980
Employed	120,511	119,606	905
Unemployed	9,592	9,359	233
Civilian Labor Force	130,103	128,965	1,138
Not in Labor Force	64,702	64,585	117
Civilian Population 16+	194,805	193,549	1,256
Labor Force Participation Rate	66.79	66.63	0.16
Employment to Population Ratio	61.86	61.80	0.06
Unemployment Rate	7.37	7.26	0.11

Table B-1

## EFFECT OF FEWER POST-STRATIFICATION CONTROLS

## Unemployment Rate

(1990-Based Population Controls, 1993 Annual Averages) (RCPS is CPS Reweighted with Fewer Controls)					
	PS	CPS	RCPS	Differences	
				PS - CPS	PS - RCPS
Total	7.37	6.90	6.89	0.47	0.48
Men	7.47	7.17	7.16	0.30	0.31
Women	7.26	6.57	6.56	0.69	0.70
White	6.39	6.04	6.03	0.35	0.36
Men	6.54	6.32	6.31	0.22	0.23
Women	6.21	5.69	5.67	0.52	0.54
Black	14.38	13.04	12.98	1.34	1.40
Men	15.00	13.92	13.82	1.08	1.18
Women	13.80	12.18	12.16	1.62	1.64
16-19	20.60	19.06	19.08	1.54	1.52
Adult Men	6.66	6.42	6.40	0.24	0.26
Adult Women	6.44	5.90	5.90	0.54	0.55

No significant differences between CPS & RCPS were found.

Table B-2

## EFFECT OF FEWER POST-STRATIFICATION CONTROLS

## Employment Rate

(1990-Based Population Controls, 1993 Annual Averages) (RCPS is CPS Reweighted with Fewer Controls)					
	PS	CPS	RCPS	Differences	
				PS - CPS	PS - RCPS
Total	61.86	61.77	61.78	0.09	0.08
Men	69.47	70.05	70.07	-0.58	-0.59
Women	54.86	54.14	54.16	0.72	0.70
White	63.00	62.77	62.79	0.23	0.21
Men	70.89	71.43	71.44	-0.54	-0.55
Women	55.61	54.67	54.69	0.94	0.92
Black	53.91	54.96	54.99	-1.05	-1.08
Men	58.16	59.85	59.86	-1.69	-1.70
Women	50.46	51.00	51.03	-0.53	-0.57
16-19	42.84	41.76	41.70	1.08	1.15
Adult Men	71.65	72.32	72.34	-0.66	-0.69
Adult Women	55.75	55.09	55.11	0.66	0.64

Table B-3

EFFECT OF FEWER POST-STRATIFICATION CONTROLS  
Civilian Labor Force Rate

(1990-Based Population Controls, 1993 Annual Averages) (RCPS is CPS Reweighted with Fewer Controls)					
	PS	CPS	RCPS	Differences	
				PS - CPS	PS - RCPS
Total	66.79	66.34	66.35	0.45	0.44
Men	75.07	75.47	75.47	-0.40	-0.40
Women	59.16	57.95	57.96	1.21	1.20
White	67.30	66.80	66.81	0.50	0.49
Men	75.86	76.25	76.25	-0.39	-0.39
Women	59.29	57.97	57.98	1.32	1.31
Black	62.97	63.20	63.19	-0.23	-0.22
Men	68.43	69.53	69.47	-1.10	-1.04
Women	58.54	58.07	58.10	0.47	0.44
16-19	53.96	51.60	51.50	2.36	2.47
Adult Men	76.76	77.27	77.29	-0.51	-0.53
Adult Women	59.59	58.54	58.56	1.05	1.03

No significant differences between CPS & RCPS were found.

Table C-1

## EFFECT OF DIFFERENTIAL PROPORTIONS OF CENTRALIZED INTERVIEWING

## Unemployment Rate

(1990-Based Population Controls, 1993 Annual Averages) (RPS is PS Reweighted to 1/94 CPS Proportions)					
	PS	RPS	CPS	Differences	
				PS - CPS	RPS - CPS
Total	7.37	7.29	6.90	0.47	0.39
Men	7.47	7.42	7.17	0.30	0.25
Women*	7.26	7.14	6.57	0.69	0.57
White	6.39	6.34	6.04	0.35	0.30
Men	6.54	6.51	6.32	0.22	0.19
Women	6.21	6.15	5.69	0.52	0.46
Black	14.38	14.07	13.04	1.34	1.03
Men	15.00	15.00	13.92	1.08	1.08
Women*	13.80	13.19	12.18	1.62	1.01
16-19	20.60	20.69	19.06	1.54	1.63
Adult Men	6.66	6.64	6.42	0.24	0.22
Adult Women*	6.44	6.25	5.90	0.54	0.35

\* Differences between PS & RPS significant at the 10 % level.

Table C-2

## EFFECT OF DIFFERENTIAL PROPORTIONS OF CENTRALIZED INTERVIEWING

## Employment Rate

(1990-Based Population Controls, 1993 Annual Averages)					
(RPS is PS Reweighted to 1/94 CPS Proportions)					
	PS	RPS	CPS	Differences	
				PS - CPS	RPS - CPS
Total	61.86	61.97	61.77	0.09	0.20
Men	69.47	69.51	70.05	-0.58	-0.54
Women	54.86	55.02	54.14	0.72	0.88
White	63.00	63.11	62.77	0.23	0.34
Men	70.89	70.96	71.43	-0.54	-0.47
Women	55.61	55.76	54.67	0.94	1.09
Black	53.91	53.91	54.96	-1.05	-1.05
Men	58.16	57.81	59.85	-1.69	-2.04
Women	50.46	50.75	51.00	-0.54	-0.25
16-19	42.84	42.90	41.76	1.08	1.14
Adult Men	71.65	71.71	72.32	-0.67	-0.61
Adult Women	55.75	55.90	55.09	0.66	0.81

No significant differences between PS & RPS were found.

Table C-3

EFFECT OF DIFFERENTIAL PROPORTIONS OF CENTRALIZED INTERVIEWING  
Civilian Labor Force Rate

(1990-Based Population Controls, 1993 Annual Averages) (RPS is PS Reweighted to 1/94 CPS Proportions)					
	PS	RPS	CPS	Differences	
				PS - CPS	RPS - CPS
Total	66.79	66.84	66.34	0.45	0.50
Men	75.07	75.08	75.47	-0.40	-0.39
Women	59.16	59.25	57.95	1.21	1.30
White	67.30	67.38	66.80	0.50	0.58
Men	75.86	75.90	76.25	-0.39	-0.35
Women	59.29	59.41	57.97	1.32	1.44
Black	62.97	62.73	63.20	-0.23	-0.47
Men	68.43	68.01	69.53	-1.10	-1.52
Women	58.54	58.46	58.07	0.47	0.39
16-19	53.96	54.09	51.60	2.36	2.49
Adult Men	76.76	76.81	77.27	-0.51	-0.46
Adult Women	59.59	59.63	58.54	1.05	1.09

No significant differences between PS & RPS were found.

Table D-1

## EFFECT OF COMPOSITE ESTIMATOR

## Unemployment Rate

(1990-Based Population Controls, 1993 Annual Averages)						
	Uncomposited			Composited		
	PS	CPS	PS-CPS	PS	CPS	PS-CPS
Total	7.37	6.90	0.47	7.31	6.92	0.39
Men	7.47	7.17	0.30	7.42	7.18	0.24
Women	7.26	6.57	0.69	7.18	6.61	0.57
16-19	20.60	19.13	1.47	20.59	19.07	1.52
Adult Men	6.66	6.42	0.24	6.60	6.44	0.16
Adult Women	6.44	5.90	0.54	6.37	5.94	0.43

Table D-2

## EFFECT OF COMPOSITE ESTIMATOR

## Unemployment Rate

(1980-Based Population Controls, 1993 Annual Averages)						
	Uncomposited			Composited		
	PS	CPS	PS-CPS	PS	CPS	PS-CPS
Total	7.26	6.80	0.45	7.19	6.82	0.37
Men	7.36	7.08	0.28	7.31	7.09	0.22
Women	7.14	6.48	0.66	7.06	6.51	0.55
16-19	20.61	19.10	1.51	20.57	19.03	1.54
Adult Men	6.58	6.35	0.23	6.52	6.37	0.15
Adult Women	6.34	5.83	0.51	6.27	5.87	0.40

Table E-1

## EFFECT OF 1990-BASED CONTROLS ON STANDARD ERRORS

## Unemployment Rate

(CPS, 1993 Annual Averages)					
	1990-Based		1980-Based		Ratio of SEs
	Estimate	SE	Estimate	SE	1990 to 1980
Total	6.90	0.12	6.80	0.11	1.09
Men	7.17	0.16	7.07	0.16	1.01
Women	6.57	0.17	6.48	0.16	1.03
White	6.03	0.12	5.96	0.11	1.06
Men	6.32	0.16	6.23	0.16	1.02
Women	5.69	0.16	5.62	0.17	0.99
Black	13.04	0.50	12.96	0.45	1.12
Men	13.92	0.71	13.89	0.69	1.03
Women	12.18	0.64	12.05	0.63	1.02
16-19	19.06	0.74	19.03	0.79	0.93
Adult Men	6.42	0.15	6.35	0.15	1.02
Adult Women	5.90	0.16	5.83	0.16	1.01

Table E-2

## EFFECT OF 1990-BASED CONTROLS ON STANDARD ERRORS

## Employment Rate

(CPS, 1993 Annual Averages)					
	1990-Based		1980-Based		Ratio of SEs 1990 to 1980
	Estimate	SE	Estimate	SE	
Total	61.77	0.16	61.68	0.14	1.11
Men	70.05	0.19	69.88	0.18	1.07
Women	54.14	0.21	54.16	0.19	1.09
White	62.77	0.16	62.77	0.16	1.00
Men	71.43	0.20	71.36	0.21	0.98
Women	54.67	0.22	54.76	0.22	1.01
Black	54.96	0.55	54.40	0.55	1.00
Men	59.85	0.72	59.00	0.70	1.04
Women	51.00	0.69	50.62	0.69	1.00
16-19	41.76	0.61	41.80	0.62	0.98
Adult Men	72.32	0.19	72.04	0.21	0.93
Adult Women	55.09	0.22	55.06	0.21	1.03

Table E-3

## EFFECT OF 1990-BASED CONTROLS ON STANDARD ERRORS

## Civilian Labor Force Rate

(CPS, 1993 Annual Averages)					
	1990-Based		1980-Based		Ratio of SEs 1990 to 1980
	Estimate	SE	Estimate	SE	
Total	66.34	0.15	66.19	0.13	1.13
Men	75.47	0.17	75.21	0.15	1.13
Women	57.95	0.21	57.91	0.19	1.11
White	66.80	0.15	66.74	0.15	0.99
Men	76.25	0.18	76.10	0.19	0.95
Women	57.97	0.22	58.03	0.21	1.03
Black	63.20	0.52	62.51	0.54	0.97
Men	69.53	0.66	68.52	0.62	1.06
Women	58.07	0.66	57.56	0.69	0.96
16-19	51.60	0.64	51.62	0.63	1.02
Adult Men	77.27	0.17	76.92	0.19	0.89
Adult Women	58.54	0.21	58.46	0.21	1.03