THE HAMILTON PROJECT

Who's Missing from the Post-Pandemic Labor Force?

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Technical Appendix

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The analysis can be found at:
https://www.hamiltonproject.org/blog/whos_missing_from_the_post_pandemic_labor_force

The files to reproduce the backcast and the data for figures 1 and 2 can be found at:
https://github.com/TheHamiltonProjectResearch/CPS-Population-Adjustment-Backcast-2012-22

Backcasting Methodology

In January 2022, the Bureau of Labor Statistics and the US Census Bureau the population estimates in the Current Population Survey (CPS) to reflect results from the 2020 decennial census, but in keeping with long-term practice, they did not adjust estimates for prior months. In producing these new population estimates, the Census Bureau the challenges for enumeration in 2020. Despite these challenges, a general finding was that there were more working-age people than had previously been thought. The accompanying piece details how analyses of labor market recovery change when the updated population estimates are graduallxZy incorporated into historical CPS data by linearly backcasting 10 years, to the last time a decennial census revision was incorporated (2012). We describe this procedure below, but the end result is a set of adjustment factors that can be merged into CPS data and used as multipliers to adjust the existing sample weights. These reweighting adjustment files can be freely downloaded via Github.

The Bureau of Labor Statistics provided us with detailed population adjustment files that applied to the January 2022 and January 2023 CPS. Each of these files showed how the annual population adjustment affected the population and labor force totals from the preceding month (December 2021 and 2022, respectively) by combinations of gender, age group, and race/ethnicity.

We use these data to adjust the CPS population weights through the following "backcasting" approach. First, we collapse the CPS microdata to cells of total sample weights at the level of year by month by race/ethnic group by gender by age group at the level of detail provided by BLS:

- Sex: female, male
- Race/Ethnicity: white, Black, Hispanic, Asian, and other (a residual category)
- Age: 16–17, 18–19, 20–24, 25–34, 35–44, 45–54, 55–64, 65+

This step provides effective population estimates for each cell under the original weights.

Second, we use the population adjustments in the BLS files for each demographic combination to revise the effective population estimates for December of 2021 and December of 2022. This step provides effective population estimates for each cell under the *revised* weights for these two months.

Third, we calculate the ratio of the revised estimates to the original estimates for each demographic combination for the same two months. This step creates a multiplicative adjustment factor that can be applied to the original weights in the microdata, but only for the two December months.

Fourth, we backcast the adjustment factor to earlier months by linearly interpolating to an origin period. For the December 2021 adjustment we backcast 10 years, to January 2012, such that the latter month's weight is not adjusted at all, with the adjustment factor linearly increasing in each successive month until it reaches its full value in December 2021. For the December 2022 adjustment, we backcast one year, to January 2022.

The end product is a dataset at the level of year by month by race/ethnic group by gender by age group, each of which has a weight adjustment factor. These weight adjustments can be merged onto the CPS microdata after the requisite demographic groups have been created, and new sample weights can then be created by multiplying the old sample weights by the adjustment factors.

TABLE A–1.

Contributions of Population and Participation to Aggregate Decline in LFPR by Different Weights, 2019–February 2023 in Percentage Points

	Backcast 2019 Contribution of population, holding participation constant	Original Weight 2019 Contribution of population, holding participation constant
Men 16–24	-0.003	-0.008
Men 25–54	-0.050	-0.012
Men 55–64	-0.029	-0.016
Men 65+	-0.292	-0.242
Women 16–24	0.000	-0.006
Women 25–54	-0.093	-0.095
Women 55–64	0.015	0.015
Women 65+	-0.424	-0.273
Total Contribution	**-0.875**	**-0.637**
Aggregate Decline in LFPR	**-0.867**	**-0.653**

Source: Bureau of Labor Statistics (n.d.); authors' calculations.

Note: To calculate the contributions of these groups to the overall change in the labor force participation rate, we follow the decomposition method described in Aaronson et al. 2006.

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TABLE A-2.

Contributions of Population and Participation to Aggregate Decline in LFPR by Age, Sex, and Race/Ethnicity and Different Weights, 2019–February 2023 in Percentage Points

	Backcast 2019 Contribution of population, holding participation constant	Original Weight 2019 Contribution of population, holding participation constant
White women 25–54	-0.119	-0.119
Hispanic women 25–54	0.005	0.005
Other women 25–54	0.006	0.005
Black men 25–54	0.009	0.013
Hispanic women 55–64	-0.004	-0.004
Black women 25–54	-0.009	-0.009
Hispanic men 16–24	-0.005	-0.006
Black women 55–64	0.002	0.001
Black men 55–64	0.001	0.000
Other men 55–64	0.005	0.003
Hispanic women 16–24	-0.011	-0.013
Hispanic women 65+	-0.075	-0.064
Other women 55–64	-0.001	0.000
Other men 16–24	-0.007	-0.005
White women 16–24	0.007	0.004
Other men 25–54	0.040	0.032
Hispanic men 55–64	0.013	0.016
Black men 65+	-0.038	-0.034
Black women 16–24	-0.001	-0.002
Hispanic men 25–54	0.033	0.040
Black men 16–24	-0.002	-0.003
Other women 16–24	-0.006	-0.003
Black women 65+	-0.060	-0.047
Other women 65+	-0.032	-0.035
Hispanic men 65+	-0.054	-0.051
White women 55–64	0.012	0.012
Other men 65+	-0.019	-0.019
White men 16–24	0.005	0.002
White women 65+	-0.256	-0.127
White men 65+	-0.182	-0.139
White men 55–64	-0.043	-0.032
White men 25–54	-0.138	-0.102
Total Contribution	**-0.925**	**-0.683**
Aggregate Decline in LFPR	**-0.867**	**-0.653**

Source: Bureau of Labor Statistics (n.d.); authors' calculations.

Note: To calculate the contributions of these groups to the overall change in the labor force participation rate, we follow the decomposition method described in Aaronson et al. 2006.

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