



## A Hot Labor Market Won't Eliminate Racial and Ethnic Unemployment Gaps

By Stephanie Aaronson, Mitchell Barnes, and Wendy Edelberg

September 2021 | Technical Appendix

---

[This piece](#) extends the analysis of [Aaronson, Daly, Wascher, and Wilcox \(2019\)](#), published in the Spring 2019 edition of the Brookings Papers on Economic Activity, with updated data through the 2nd quarter of 2021. In this technical appendix, we describe our methodology and note where it differs from Aaronson et al. (2019).

We assess between-group gaps in unemployment rates during periods of hot labor markets, with the primary divergence in methodology being our focus on the prime-age cohort of 25–54 year-olds, rather than individuals aged 25–64. Unemployment rates for each of the gender-race and gender-education groups were calculated using Current Population Survey (CPS) microdata from 1980Q1 to 2021Q2, aggregated at a quarterly frequency and then seasonally adjusted. Hot and cold periods are based on historical series produced by the Congressional Budget Office (CBO) for the aggregate and non-cyclical rates of unemployment, with hot periods defined as quarters where the aggregate unemployment rate is below the non-cyclical rate or, in other words, when the aggregate gap is negative. We define cycles with quarterly break points according to NBER's Business Cycle Dating Committee, with the exception where we follow Aaronson et al. in consolidating the 1980–1981 period into the 1981–1990 cycle due to its abbreviated length and limited recovery in unemployment prior to the 1981 recession.

The empirical model underlying Figures 3 and 4 of the post follows the form of Equation 2 of Aaronson et al., which regresses group unemployment gaps against 1) the aggregate gap between the overall unemployment rate and the non-cyclical rate, and 2) an interaction term of this aggregate gap and a dummy indicator specifying hot periods. The blue line in Figures 3 and 4 corresponds to the resulting sensitivity to the first aggregate unemployment gap term, while the red line highlights the hot period sensitivity, calculated as the cold slope plus the incremental coefficient from the interaction term.

Different from in Aaronson et al., we control for cycle-specific fixed effects, which control for the different average unemployment rate gaps across the business cycles. These seem to be at least partly attributable to the downward trend in the unemployment rate over this period. The regression lines displayed in Figures 3 and 4 are constructed based on the fixed effect estimated for the 2008–2020 cycle.

Finally we note that the analysis of the CPS microdata and published unemployment rates in this report and the discussion thereof does not account for the likely [misclassification](#) of workers' employment status during the COVID-19 pandemic caused by the surge in reported workplace absences and temporary layoffs. In regard to our results presented here, this potential underestimate of the unemployed may [disproportionately affect](#) workers overrepresented in certain impacted industries, such as women, Black and Hispanic workers, and those with less education. In this case, the unemployment gaps discussed in our results may understate the true spike in joblessness for disadvantaged workers in 2020.

## References

- Aaronson, Stephanie, Mary Daly, William Wascher, and David Wilcox. 2019. "Okun Revisited: Who Benefits Most from a Strong Economy?" *Brookings Papers on Economic Activity* 2019, no 1 (March): 333-404. <https://www.brookings.edu/bpea-articles/okun-revisited-who-benefits-most-from-a-strong-economy/>
- Arum, Richard and Mitchell Stevens. 2020. "Building Tomorrow's Workforce Today: Twin Proposals for the Future of Learning, Opportunity, and Work." *The Hamilton Project*, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/building\\_tomorrows\\_workforce\\_today\\_twin\\_proposals\\_for\\_the\\_future\\_of\\_learning\\_opportunity\\_and\\_work](https://www.hamiltonproject.org/papers/building_tomorrows_workforce_today_twin_proposals_for_the_future_of_learning_opportunity_and_work)
- Barr, Michael. 2015. "Minority and Women Entrepreneurs: Building Capital, Networks, and Skills." *The Hamilton Project*, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/minority\\_and\\_women\\_entrepreneurs\\_building\\_capital\\_networks\\_and\\_skills](https://www.hamiltonproject.org/papers/minority_and_women_entrepreneurs_building_capital_networks_and_skills)
- Bauer, Lauren. 2021. "Mothers Are Being Left Behind in the Economic Recovery from COVID-19." *Up Front* (blog), Brookings Institution, Washington, DC. May 6, 2021. <https://www.brookings.edu/blog/up-front/2021/05/06/mothers-are-being-left-behind-in-the-economic-recovery-from-covid-19/>
- Bernstein, Jared. 2018. "The Importance of Strong Labor Demand." *The Hamilton Project*, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/the\\_importance\\_of\\_strong\\_labor\\_demand](https://www.hamiltonproject.org/papers/the_importance_of_strong_labor_demand)
- Blau, Francine, and Lawrence M. Kahn. 2013. "Female Labor Supply: Why Is the United States Falling Behind?" *American Economic Review*, 103 (3): 251-256.
- Brainard, Lael. 2021. "How Should We Think about Full Employment in the Federal Reserve's Dual Mandate?" *Speech*, Harvard University, Cambridge, MA., February 24, 2021. <https://www.federalreserve.gov/newsevents/speech/brainard20210224a.htm>
- Byker, Tanya and Elena Patel. 2021. "A Proposal for a Federal Paid Parental and Medical Leave Program." *The Hamilton Project*, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/a\\_proposal\\_for\\_a\\_federal\\_paid\\_parental\\_and\\_medical\\_leave\\_program](https://www.hamiltonproject.org/papers/a_proposal_for_a_federal_paid_parental_and_medical_leave_program)
- Cajner, Tomaz, Tyler Radler, David Ratner, and Ivan Vidangos. 2017. "Racial Gaps in Labor Market Outcomes in the Last Four Decades and over the Business Cycle." *Finance and Economics Discussion Series* 2017-071. Board of Governors of the Federal Reserve System, Washington, DC. <https://doi.org/10.17016/FEDS.2017.071>
- Cook, Lisa. 2020. "Policies to Broaden Participation in the Innovation Process." *The Hamilton Project*, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/policies\\_to\\_broaden\\_participation\\_in\\_the\\_innovation\\_process](https://www.hamiltonproject.org/papers/policies_to_broaden_participation_in_the_innovation_process)
- Congressional Budget Office (CBO). 2017. "The Budget and Economic Outlook: 2017 to 2027." Congressional Budget Office, Washington, DC. <https://www.cbo.gov/publication/52370>
- Congressional Budget Office (CBO). 2019. "The Budget and Economic Outlook: 2019 to 2029." Congressional Budget Office, Washington, DC. <https://www.cbo.gov/publication/55551>

- Davis, Elizabeth and Aaron Sojourner. 2021. "Increasing Federal Investment in Children's Early Care and Education to Raise Quality, Access, and Affordability." The Hamilton Project, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/increasing\\_federal\\_investment\\_in\\_childrens\\_early\\_care\\_and\\_education\\_to\\_raise\\_quality\\_access\\_and\\_affordability](https://www.hamiltonproject.org/papers/increasing_federal_investment_in_childrens_early_care_and_education_to_raise_quality_access_and_affordability)
- Federal Open Market Committee. 2020. "2020 Statement on Longer-Run Goals and Monetary Policy Strategy." Board of Governors of the Federal Reserve System. Last updated January 14, 2021. <https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications-statement-on-longer-run-goals-monetary-policy-strategy.htm>
- Federal Reserve Bank of Atlanta. 2021. "Wage Growth Tracker". Center for Human Capital Studies Data Tools. Accessed August 2021. <https://www.atlantafed.org/chcs/wage-growth-tracker>
- Fruttero, Anna, Daniel Gurara, Lisa Kolovich, Vivian Malta, Marina Tavares, Nino Tchelishvili, and Stefania Fabrizio. 2020. Women in the Labor Force: The Role of Fiscal Policies. International Monetary Fund. Staff Discussion Notes No. 20/03. <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2020/02/11/Women-in-the-Labor-Force-The-Role-of-Fiscal-Policies-46237>
- Goldin, Claudia. 2006. "The Quiet Revolution That Transformed Women's Employment, Education, and Family." *American Economic Review*, 96 (2): 1-21.
- Hardy, Bradley, and Trevon Logan. 2020. "Racial Economic Inequality Amid the COVID-19 Crisis." The Hamilton Project, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/racial\\_economic\\_inequality\\_amid\\_the\\_covid\\_19\\_crisis](https://www.hamiltonproject.org/papers/racial_economic_inequality_amid_the_covid_19_crisis)
- Hardy, Bradley, Trevon Logan, and John Parman. 2018. "The Historical Role of Race and Policy for Regional Inequality." The Hamilton Project, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/the\\_historical\\_role\\_of\\_race\\_and\\_policy\\_for\\_regional\\_inequality](https://www.hamiltonproject.org/papers/the_historical_role_of_race_and_policy_for_regional_inequality)
- Holzer, Harry. 2021. "After COVID-19: Building a More Coherent and Effective Workforce Development System in the United States." The Hamilton Project, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/after\\_covid\\_19\\_building\\_a\\_more\\_coherent\\_and\\_effective\\_workforce\\_development\\_system\\_in\\_the\\_united\\_states](https://www.hamiltonproject.org/papers/after_covid_19_building_a_more_coherent_and_effective_workforce_development_system_in_the_united_states)
- Hsieh, Chang-Tai, Erik Hurst, Charles Jones, and Peter Klenow. 2019. "The Allocation of Talent and U.S. Growth." *Econometrica Journal of the Econometric Society*. Vol. 87, No. 5: 1439-1474.
- Nunn, Ryan. 2018. "How Occupational Licensing Matters for Wages and Careers." The Hamilton Project, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/how\\_occupational\\_licensing\\_matters\\_for\\_wages\\_and\\_careers](https://www.hamiltonproject.org/papers/how_occupational_licensing_matters_for_wages_and_careers)
- Peterson, Dana. and Catherine Mann. 2020. "Closing the Racial Inequality Gaps: The Economic Cost of Black Inequality in the U.S." Citi Global Perspectives & Solutions, New York, NY. <https://www.citivelocity.com/citigps/closing-the-racial-inequality-gaps/>
- Shoag, Daniel. 2019. "Removing Barriers to Accessing High-Productivity Places." The Hamilton Project, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/removing\\_barriers\\_to\\_accessing\\_high\\_productivity\\_places](https://www.hamiltonproject.org/papers/removing_barriers_to_accessing_high_productivity_places)

Stevenson, Betsey. 2020. "The Initial Impact of COVID-19 on Labor Market Outcomes Across Groups and the Potential for Permanent Scarring." The Hamilton Project, Brookings Institution, Washington, DC. [https://www.hamiltonproject.org/papers/the\\_initial\\_impact\\_of\\_covid\\_19\\_on\\_labor\\_market\\_outcomes\\_across\\_groups\\_and\\_the\\_potential\\_for\\_permanent\\_scarring](https://www.hamiltonproject.org/papers/the_initial_impact_of_covid_19_on_labor_market_outcomes_across_groups_and_the_potential_for_permanent_scarring)

Trumka, Richard. 2019. "Trumka Highlights Importance of Federal Reserve Activism." Speech, Washington, DC, June, 25, 2019. American Federation of Labor and Congress of Industrial Organizations (AFL-CIO). <https://aflcio.org/speeches/trumka-highlights-importance-federal-reserve-activism>

Yellen, Janet. 2020. "The History of Women's Work and Wages and How it has Created Success for Us All." 19A Gender Equality Series. Brookings Institution. Washington, DC. <https://www.brookings.edu/essay/the-history-of-womens-work-and-wages-and-how-it-has-created-success-for-us-all/>