

# Cointegration Insights on Age and Gender Disparities in the U.S. Labor Market

Victoria Tribone, Andrew B. Martinez, and Neil R. Ericsson\*

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The COVID-19 pandemic resulted in the most abrupt changes in U.S. labor force participation and unemployment since the Second World War, with marked differences by gender and age. To interpret the pandemic's effects, we first formulate dynamic cointegrated models of monthly disaggregated unemployment and labor force participation rates for 1980–2019 for age and gender subgroups, evaluating the appropriate level of data aggregation and assessing the invariance of cointegrating vectors to the information set.

For each age group examined (16-24 year olds, 25-54 year olds, and 55+ year olds), our analysis establishes three types of long-run relationships:

- persistent gaps between male and female labor force participation rates,
- persistent gaps between male and female unemployment rates, and
- discouraged-worker or added-worker effects that relate the labor force participation rate to the unemployment rate for a given age-group and gender.

Dynamic behavior is numerically, statistically, and economically highly significant and differs by demographics. Moreover, the phase of the economic business cycle has a substantial role in these relationships, highlighting the importance of monetary and fiscal policy for the labor market through the expansionary or contractionary effects of policy. Using this system-based cointegrated approach that incorporates key economic relationships, long-term trends, and dynamics, we document and interpret the highly uneven labor market outcomes that existed pre-pandemic across age and gender.

We then use these models to forecast 2020-2024 to understand the pandemic's labor-market consequences and subsequent recovery, treating those forecasts as being from an alternative scenario in which the pandemic didn't occur.

\*Contact information: Corresponding author ([ericsson@gwu.edu](mailto:ericsson@gwu.edu)); other authors ([andrew.martinez@treasury.gov](mailto:andrew.martinez@treasury.gov), [vtribone@gmail.com](mailto:vtribone@gmail.com)).

**Affiliations:** Paul H. Nitze School of Advanced International Studies, Johns Hopkins University, Washington, DC 20036 (VT, ABM, NRE); Office of Macroeconomic Analysis, U.S. Department of the Treasury, Washington, DC 20022 (ABM); H.O. Stekler Research Program on Forecasting, The George Washington University, Washington, DC 20052 (ABM, NRE); Department of Economics, The George Washington University, Washington, DC 20052 (ABM, NRE).

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