

# Maximum Employment and the Participation Cycle

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August 27, 2021

Handout prepared for the 2021 Jackson Hole Economic Policy Symposium

## Summary

- Maximum employment depends on both the natural rate of unemployment and the trend participation rate. Disagreement about and estimates of the latter have been large over the past 20 years. This has impeded the real-time assessment of cyclical deviations from maximum employment.
- We focus on the source, magnitude, and unevenness of the procyclical forces that shape *the participation cycle*. Isolating the participation cycle allows us to assess the importance of cyclical factors that affect participation without having to take a stand on long-run shifts in labor supply.
- The participation cycle is large and it lags the unemployment cycle. Most importantly, it is driven by improvements in *employment stability* (lower job-loss risk and easier job finding) rather than labor force *entry and exit*.
- While there are large differences in the magnitude of the participation cycle across groups in the earlier part of expansions, both and the aggregate the group-specific participation cycles tend to move together with their respective unemployment rates in the latter part of labor market expansions.
- A 1-percentage-point decline of the unemployment rate in a hot labor market results in cyclical upward pressure of 0.65 percentage point on the participation rate. We refer to this empirical regularity as the *Perry-Okun Rule*.
- Application of our methodology to COVID-19 recession shows that, bulk of the current shortfall in the labor force participation rate (LFPR) is cyclical and the recovery of the participation cycle will likely lag the recovery in unemployment.
- Our methodology allows policy makers to track the participation cycle in real time on a monthly basis without requiring an estimate of the trend participation rate.

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\*The views expressed in this paper are those of the authors and do not necessarily reflect those of the institutions that they are affiliated with.

## Large Disagreement about and Revisions of Trend Participation Rate

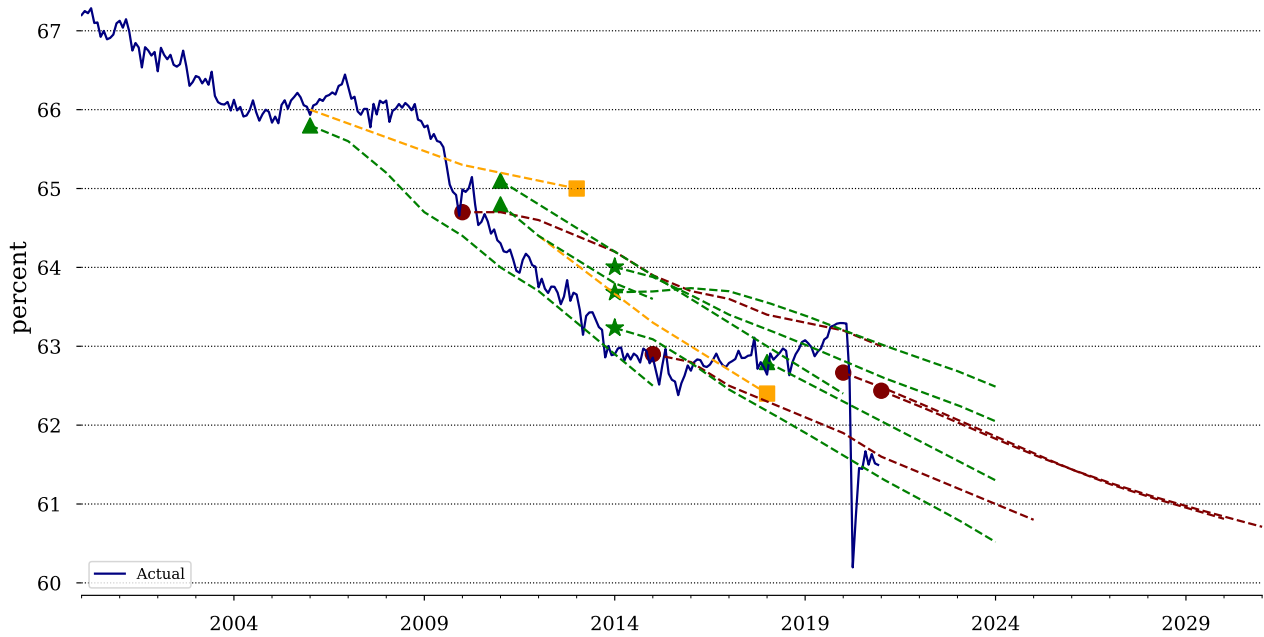


Figure 1: Actual LFPR and trend estimates by CBO, Fed, and academic studies

Source: Bureau of Labor Statistics (BLS) Labor Force Projections, CPS, and authors' calculations.

Note: Vintage of forecast is indicated by dot. Actual is seasonally adjusted monthly observations. Trend estimates in bottom panel by source: ●: Congressional Budget Office (CBO) trend estimates (2011,2015,2020,2021), ■: Tealbook estimates (backward-looking, Jan 2011 and Jan 2015), ★: Aaronson *et al.* (2014), and ▲: from Aaronson *et al.* (2006), Aaronson *et al.* (2012), Zandweghe (2012), and Hornstein *et al.* (2018).

- There has been large disagreement about the trend participation rate across projections and over time. Estimates tend to get revised upward or downward as the state of the economy evolves. For example, CBO’s 2015 estimate of the 2021 trend level of participation was about 0.8 percentage point lower than its 2020 estimate.
- This 0.8 percentage point revision is equivalent of a 1.3 percentage point revision in the natural rate of unemployment.
- That is because changes in the LFPR have about 1.6 times larger effect on the employment-to-population (EPOP) than changes in the unemployment rate ( $u$ ):

$$\Delta EPOP_t = \underbrace{-\overline{LFPR}_t \Delta u_t}_{\text{unemployment term}} + \underbrace{(1 - \bar{u}_t) \Delta LFPR_t}_{\text{participation term}}$$

- We examine the source and magnitude of the cyclical forces that shape the dynamics of labor supply directly instead of constructing real-time estimates of the trend participation rate and computing the cyclical component of participation as the gap between actual and trend participation rates.

## Job-Loss and Job-Finding Affect Attachment to the Labor Force

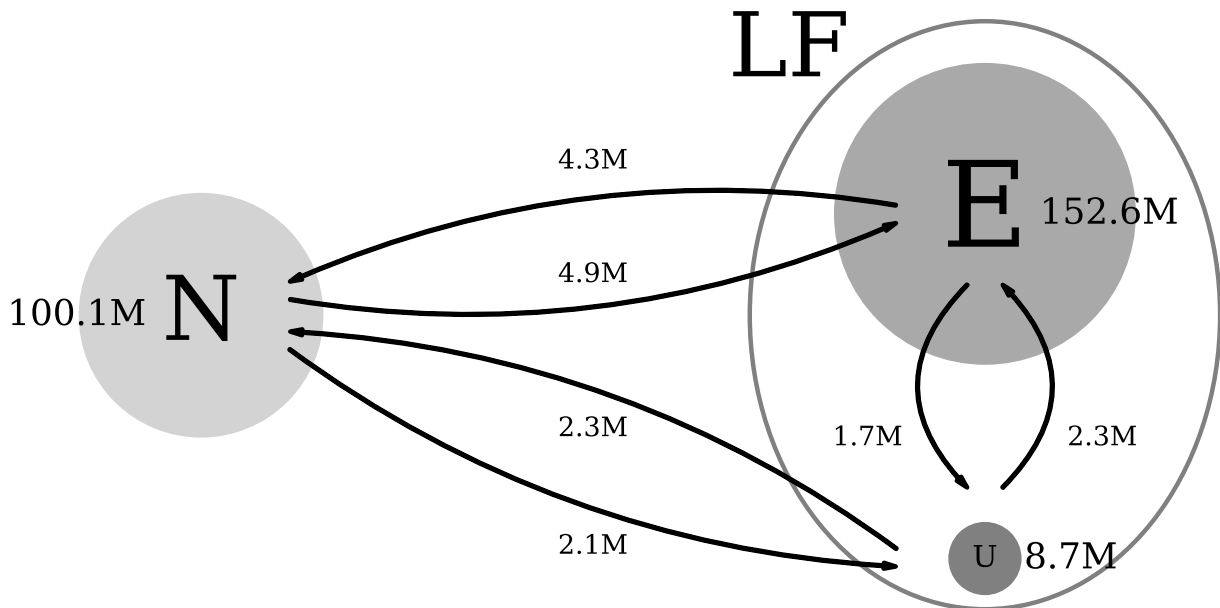


Figure 2: Labor force status flows, July 2021

Source: BLS Labor Force Status Flows.

Note:  $E$ : employed,  $U$ : unemployed, and  $N$ : nonparticipants. Seasonally adjusted stocks and monthly flows in July 2021.

Our starting point is the observation that the dynamics of the EPOP ratio, LFPR, and unemployment all are driven by the same six flows between the labor force states of employment ( $E$ ), unemployment ( $U$ ), and nonparticipation ( $N$ ).

- Flows between labor market states are much larger than net changes in the U.S. economy. For example, while the stock of nonparticipation changed little from June to July, 6.6 million people left the labor force and 7 million people entered the labor force.
- Even though the unemployed made up only 5.4% of the labor force in July, flows between unemployment and nonparticipation accounted for about a third of those across the participation margin.
- There exists a large *attachment wedge* between the employed and the unemployed: the unemployed are much more likely to drop out of the labor force.

**Key Intuition:** When someone finds a job and moves from unemployment to employment, they are more likely to remain in the labor force going forward. This simple mechanism is the driver of the *participation cycle*.

## The Participation Cycle is the Source of Procyclical Pressures on Participation

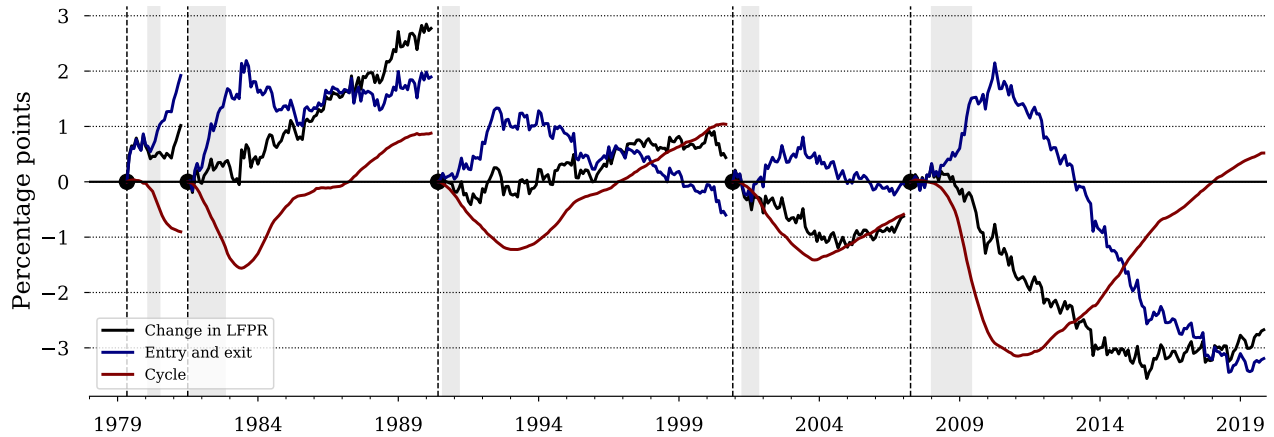


Figure 3: Changes in LFPR by business cycle decomposed into flow sources, 1979-2019

Source: BLS and author's calculations. Update of [Elsby et al. \(2019\)](#).

Note: Seasonally adjusted monthly data. Cumulative effect on LFPR from every trough in the unemployment rate (dashed vertical lines). Entry is contribution from  $P_{N,U}$  and  $P_{N,E}$ , exit is contribution from  $P_{U,N}$  and  $P_{E,N}$ , and cycle from flows between  $U$  and  $E$ , i.e.  $P_{E,U}$  and  $P_{U,E}$ .

We implement a stock-flow decomposition of the dynamics of the LFPR using monthly data and aggregate the results of our decomposition into two components: the *entry/exit* component and the *cycle* component.

Prevailing narrative focuses on *entry/exit* component:

- Discouraged workers leave the labor force during recessions  $\rightarrow$  *countercyclical* exits
- Sidelined workers enter as labor market conditions improve  $\rightarrow$  *procyclical* entry

Our flow-based decomposition reveals a very different mechanism:

- Procyclicality of the LFPR is driven by the *cycle* component—flows between unemployment and employment.
- Opposite role of entry and exit: Labor force exits are strongly *procyclical* and labor force entry is *acyclical*.

**Key Finding:** Procyclicality of LFPR is driven by improvements in employment stability (lower job-loss risk and easier job finding) not by labor force entry and exit.

## Unemployment and Participation Cycles

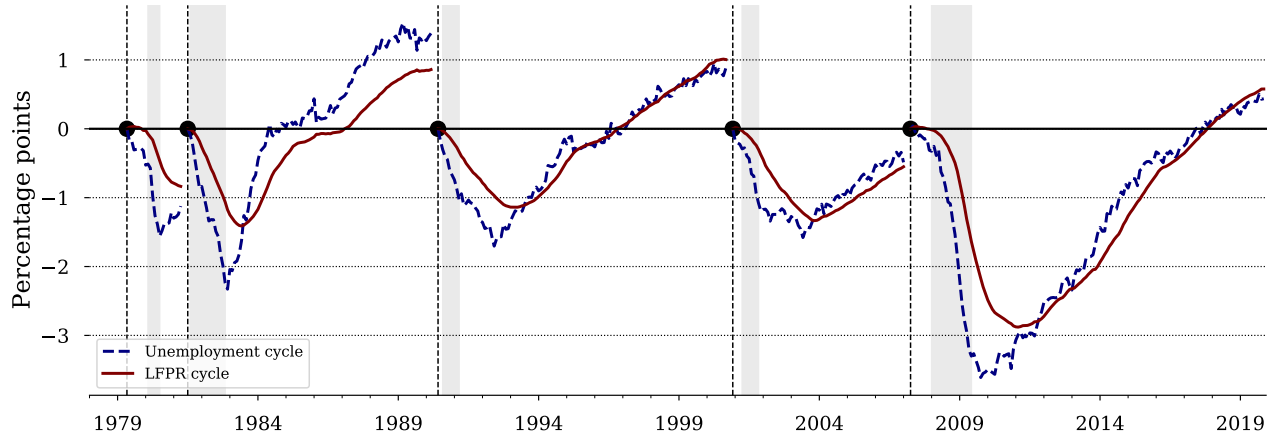


Figure 4: Cyclical pressures on EPOP ratio by cycle, 1979-2019

Source: BLS, CBO, and author's calculations.

Note: Seasonally adjusted monthly data. Cumulative effect on EPOP ratio from every trough in the unemployment rate (dashed vertical lines). Unemployment cycle is cumulative sum of  $-\overline{LFPR}_t \Delta u_t$  and LFPR cycle is cumulative sum of  $(1 - \bar{u}_t) \Delta LFPR_t^c$ .

The cyclical change in the employment-to-population ratio is the sum of unemployment and participation cycles:

$$\Delta EPOP_t^c = \underbrace{-\overline{LFPR}_t \Delta u_t}_{\text{unemployment cycle}} + \underbrace{(1 - \bar{u}_t) \Delta LFPR_t^c}_{\text{participation cycle}}.$$

We find that:

- The trough in the participation cycle is about two-thirds that of the unemployment cycle.
- The participation cycle lags the unemployment trough by about nine months.
- Cyclical pressures from participation and unemployment on the EPOP-ratio are about the same later in expansions.

*Perry-Okun Rule:* In a strong labor market, a 1-percentage-point decline in the unemployment rate results in cyclical upward pressure on the participation rate of 0.65 percentage point:

$$\Delta LFPR_t^c \approx -0.65 \Delta u_t.$$

**Key Distinction:** While Perry (1971) and Okun (1973) attributed the procyclicality of the participation rate to entry/exit of marginalized workers, our results establish that it is driven by the *employment stability* mechanism.

## Participation Cycle Amplifies Uneven Effects of Recessions

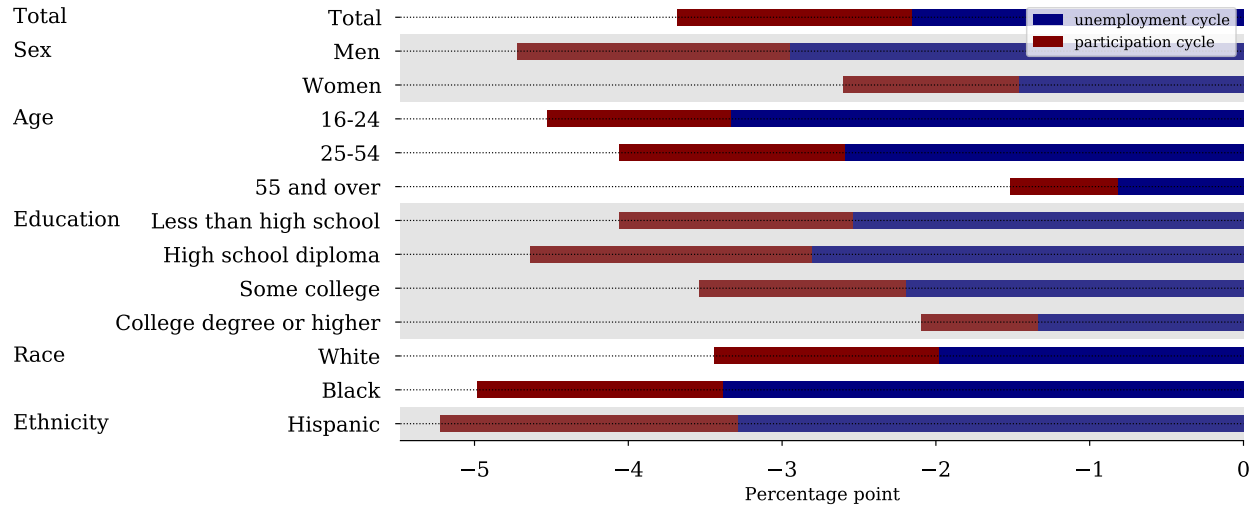


Figure 5: Average peak-trough decline in EPOP cycle across groups

Source: BLS, Current Population Survey (CPS), and authors' calculations.

Note: Average peak-trough change in EPOP cycle by group for across recessions (1980-2019), split up in unemployment and participation cycles.

- The participation cycle is large for all groups and it amplifies the unevenness in the unemployment cycle. Groups with a higher increase in the incidence of unemployment also have larger procyclical pressures on their participation rate.
- The groups hardest hit during recessions have the largest cyclical upward pressures on participation during recoveries and expansions. This includes low-skilled workers and workers who identify as Black, or African American, and Hispanic.
- *Perry-Okun Rule* holds for all groups: the improvements in the participation rate in expansions are not limited to the pool of discouraged workers.
- There is no trade-off between declining unemployment and rising participation since the mechanism is through employment stability.

**Policy Implication:** There is little need to shift the focus from unemployment cycles to participation cycles because they are driven by the same forces. Declines in unemployment naturally result in upward pressures on participation for all groups—including the marginalized ones.

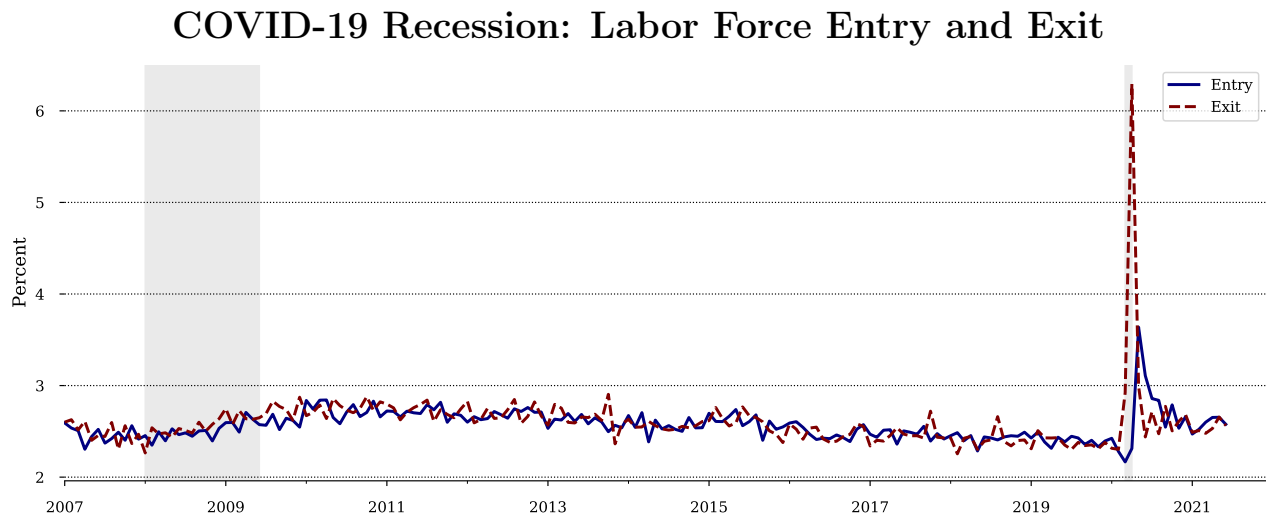


Figure 6: Labor force entry and exit rates

*Source:* BLS and author's calculations.

*Note:* Labor force entry and exit rates are defined as a percentage of the civilian noninstitutional population 16 years of age and older.

- The COVID-19 pandemic resulted in a short but deep recession, starting in March 2020 and ending in May 2020. It was characterized by unprecedented swings in labor demand and labor supply.
- The labor market dynamics in the United States during the six months after the start of the pandemic in 2020 were an enormous historical outlier: labor force exit rate more than tripled in April 2020—an unprecedented spike that brought flow steady-state participation rate to 29.6%.
- The swings in the flow steady-state stocks, especially EPOP ratio and LFPR between February 2020 and December 2020 are of an order of magnitude larger, making the results of our decomposition of the month-to-month changes in the LFPR hard to interpret during that period.
- Labor market dynamics normalized in 2021 bringing the labor market stocks close to their flow steady-state values. Therefore, the bulk of the changes in the labor market since the beginning of the pandemic can be captured by changes in the flow steady-state.
- We apply our decomposition to changes in the flow steady-state from February 2020 until June 2021 to assess the current state of the participation cycle.

### Most of Decline in Participation During Pandemic Cyclical

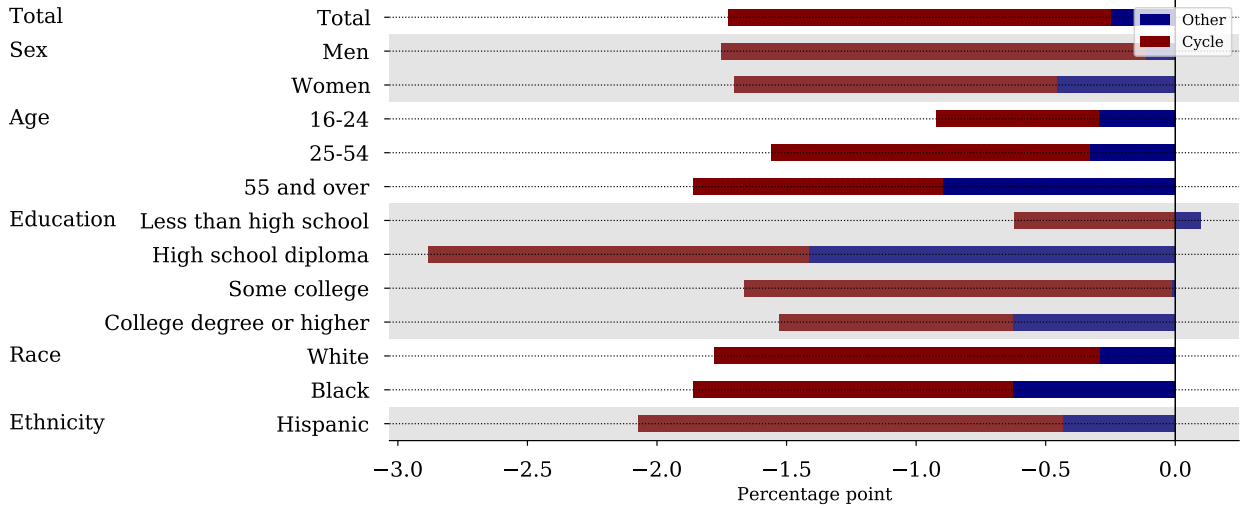


Figure 7: Change in LFPR from February 2020 to June 2021

Source: BLS, CPS, and authors' calculations.

Note: Percentage point change in the participation rate from 2/20-6/21 split up in cycle and other parts. Results for workers with less than high school education are different from the published statistics due to anonymization of the CPS micro data.

- Our decomposition reveals that the cycle component accounts for 1.5 percentage points of the 1.7 percentage points of the decline in the aggregate LFPR relative to its pre-pandemic level. The contribution of entry and exit is quantitatively negligible.
- The nature of the shock in the COVID recession affected several groups that typically are less affected by business cycle fluctuations at the onset of the recession, especially women and workers aged 55 and older.
- We find that for all groups, a bulk of the declines in participation is due to the participation cycle varying from at least 50 percent to almost 100 percent. For women, workers aged 55 and older, Black, and Hispanic workers, there is more weakness in excess of what we attribute to the cycle.
- Despite these differences, the main source of the decline in the participation rate since the onset of the pandemic is the deterioration of job-loss and job-finding rates, *not* labor force entry and exit rates.



### Cyclical Gains in Participation Since 2014 not Fully Erased

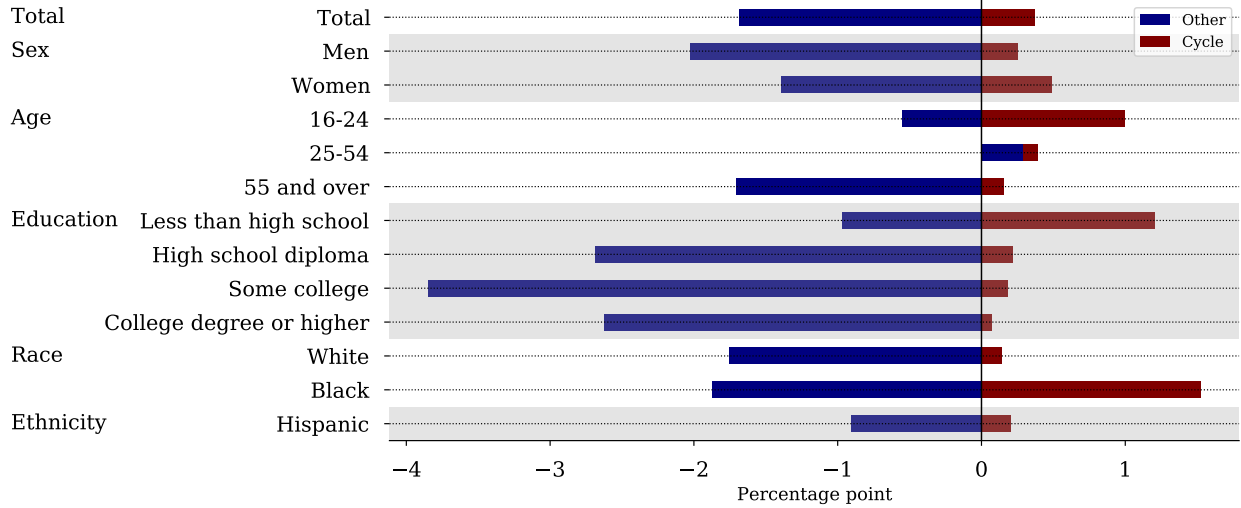


Figure 8: Change in LFPR from September 2014 through June 2021

Source: BLS, CPS, and authors' calculations.

Note: Percentage point change in the participation rate from 9/14-6/21 split up in cycle and other parts.

- A longer-run historical comparison reveals that the state of the labor market in June 2021 resembled that of September 2014. The main difference is that the participation rate is 1.2 percentage points lower now than in the fall of 2014.
- Comparing the early fall of 2014 and the first half of 2021 using our decomposition leads to some important observations:
  1. The cyclical downward pressures on participation in 2021 are close to in 2014.
  2. The 1.2 percentage points difference in the LFPR is due to the secular downward trend which implies an annual average decline in trend participation of about 0.17 percentage points a year in in the 2014-2020 period.
  3. The cyclical gains in participation that accumulated from 2014 through 2019 have not completely been erased by the COVID-19 Recession. Even though the COVID-19 shock brought the participation cycle to a similar point as in September 2014, especially young workers and Black workers still carried over part of the gains of the previous expansion.

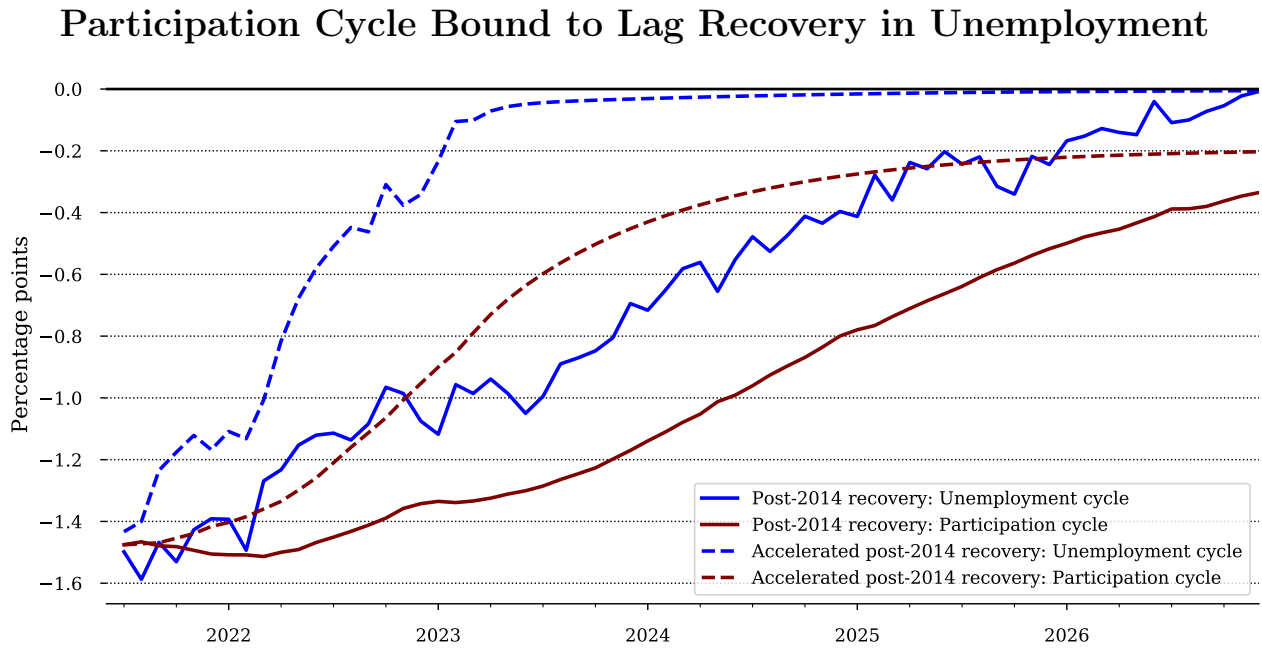


Figure 9: Projections of cyclical components of EPOP

Source: BLS and author’s calculations.

Note: Unemployment and participation cycles plotted in terms of percentage point cyclical pressures on the EPOP ratio. “Post-2014 recovery” based on path of flow rates from Sep 2014 - Feb 2020. In case of “Accelerated post-2014 recovery” path of flow rates is three times faster than the baseline case.

We use the state of the labor market as of June 2021 as the starting point and trace how the participation cycle would evolve as the unemployment rate reaches to 3.5% at different paces:

- Post-2014 recovery: the unemployment rate declines to 3.5% at the end of 2026.
- Accelerated post-2014 recovery: the unemployment rate declines to 3.8% at the end of 2022 and 3.5% at the end of 2023.

These projections are not meant as forecasts but to illustrate the potential labor market dynamics during the recovery going forward.

- The participation cycle lags the unemployment cycle in both cases but even more so if the recovery is faster consistent with [Cajner et al. \(2021\)](#).
- This reflects the fact that the adjustment dynamics of the participation rate in response to changes in flow rates are much slower than those of the unemployment rate.
- Our method allows policy makers to track the participation cycle in real time on a monthly basis without requiring an estimate of the trend participation rate.