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Population Aging and the US Labor Force Participation Rate

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The labor force participation rate dropped sharply at the beginning of the pandemic, and as of November 2021 it had recovered only about half of its lost ground. The failure of the participation rate to get closer to its level immediately before the pandemic has puzzled many analysts. In this note, we show that the current participation rate is much less puzzling if one compares it with participation in November 2017 (the last time the unemployment rate was at its current level of 4.2 percent), rather than February 2020 (immediately before the pandemic). Since November 2017, population aging has continued to exert a strong downward pull on the participation rate, so that participation is now close to what one would expect, given the current unemployment rate and the current age structure of the population. In the future, rising educational attainment will offset the negative effect of aging on participation to some degree. But a complete recovery of the participation rate to its February 2020 level may be difficult to achieve without substantial further declines in the unemployment rate.

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The labor force participation rate (LFPR) dropped sharply at the beginning of the pandemic, and its behavior has puzzled many analysts since then. Despite an increase of 0.2 percentage point in the most recent jobs report, covering November 2021, the participation rate for individuals aged 16 and older has recovered only about half of the ground that it lost since the onset of the pandemic. Several unique features of the pandemic may be responsible for part of the participation decline. Potential workers may fear contracting the virus, or they may struggle with remote or unpredictable school schedules and limited childcare options. Even so, the resumption of in-person schooling across much of the country appears to have had only a small effect on participation. Moreover, claims that generous unemployment insurance payments have reduced individuals' willingness to work have been undermined by the sluggish recovery in participation after these payments ended.

In this note, we show that the behavior of the participation rate is much less puzzling if one compares the current situation with a period when the economy was in the same position in the business cycle, as measured by the unemployment rate. When this is done, the relevant decline in participation is shown to be nearly exclusively driven by the ongoing aging of the population, including the entry of the baby-boom generation into low-participation age groups. A countervailing, positive effect on participation arises from continued educational gains in the population, because college graduates have higher participation rates than individuals without college degrees. But the strong negative effects of aging on participation are likely to make attaining pre-pandemic rates of participation difficult, even after specific behavioral responses to the pandemic have passed.

Evaluating the Labor Force Participation Rate

Figure 1 shows the importance of comparing labor force participation in periods when the economy is in the same cyclical position (as measured by the unemployment rate). The top panel shows that participation declined by 1.5 percentage points from February 2020—just before the onset of the pandemic—to November 2021. Clearly, the long-run aging of

the population cannot explain a decline of that magnitude occurring in less than two years. However, the lower panel of Figure 1 shows that the unemployment rate in February 2020 was only 3.5 percent, 0.7 percentage point lower than the 4.2 percent unemployment rate in November 2021. Consequently, comparing participation in February 2020 with participation in November 2021 conflates the effect of the business cycle with behavioral responses to the pandemic and the long-run effects of demographics.

An apples-to-apples comparison can eliminate the effect of the business cycle on participation so that the effects of aging and the behavioral responses to the pandemic can be more accurately assessed. That is, we need to compare participation in November 2021 with participation in the most recent month during which the unemployment rate was also 4.2 percent, and as seen in the lower panel of Figure 1, this month is November 2017. Returning to the upper panel of Figure 1, we see that participation declined by 0.9 percentage point since that time. The relevant question then is whether population aging can explain a decline of nearly 1 percentage point in the LFPR in the four years since November 2017. As we will see, the answer to this question, broadly speaking, is yes.

The main takeaway from our analysis is that the current unemployment and participation rates are aligned, in the sense that the current participation rate (61.8 percent) is not surprising given the current unemployment rate (4.2 percent). Thus, further increases in participation would necessitate further declines in unemployment. Behavioral responses to the pandemic (fear of contracting the virus at work, irregular school schedules, etc.) may well be reducing participation. But if so, then these responses are probably increasing unemployment as well—by reducing the rate at which unemployed persons find jobs or by encouraging workers to quit jobs more quickly than they otherwise would. Consequently, if pandemic-related responses were to become less important, then participation might rise but unemployment might fall—perhaps to levels even lower than the unemployment rates experienced immediately before the pandemic began.

Participation Rates within Age Groups

For aging to explain the decline in participation over the last four years, participation rates within individual age groups must have been roughly stable during this period. Figure 2 presents recent age-specific participation rates that correspond to young individuals (ages 16–24), prime-age individuals (25–54), and older individuals (55+). For each group, separate panels show participation rates for men and women, and the dots in each panel correspond to the three months highlighted in Figure 1: November 2017, February 2020, and November 2021. The panels show that since November 2017, participation has risen for young persons of both genders (top panels) and for prime-age women (middle right panel). The increase in participation for prime-age women is especially noteworthy, given the disproportionate impact of the pandemic on the participation rate of women with children. Participation among prime-age men (middle left panel) is 0.3 percentage point lower relative to November 2017, but the bottom panels show that the biggest decline in within-group participation is among older persons of both genders.

At first glance, the large within-group declines in participation among older men and women would appear to be evidence against the hypothesis that aging alone can explain the participation decline since November 2017. In fact, participation among older individuals provides strong support in favor of the aging hypothesis. Table 1 analyzes recent participation among older persons after disaggregating this group into two sub-groups: individuals aged 55 to 64 and those aged 65 and older. The first column of numbers in the table shows that, as suggested by the lower row of panels in Figure 2, participation declined by 1.5 percentage points from November 2017 to November 2021 for the 55+ group as a whole. However, this decline stemmed almost exclusively from a shifting of population *between* the two sub-groups, not from changes in participation *within* the sub-groups themselves. Specifically, the second and third columns of numbers highlight that among the 55+ group, the population share of 55–64-year-olds declined by 3.1 percentage points, while the population share of the 65+ group (necessarily) rose by the same amount.

The last two columns show participation rates for the two sub-groups and convey two important lessons. First, participation rates for the 65+ group are around 45 percentage points lower than for 55–64-year-olds. Such behavior is consistent with the common retirement age of 65. Second, participation rates within the two sub-groups changed very little from November 2017 to November 2021. Because participation rates among the 65+ group are so much lower than participation among the 55–64 group, the 3.1 percentage point shift of population toward the 65+ group had substantial effects on the overall 55+ rate, causing it to decline by about 1.5 percentage points.

The Importance of Aging to Aggregate Participation

A broader look at labor force participation across all age groups reveals a similar pattern: Changes in the aggregate participation rate have been driven predominately by population shifts toward low-participation groups, not by within-group changes in participation. A common way of showing the importance of population shifts to labor force participation is to construct a counterfactual LFPR using constant population shares. As Table 1 illustrates, in any month the aggregate participation rate can be thought of as a weighted average of separate age-specific participation rates, with the population shares of the individual age groups serving as the weights for this average. Over time, the aggregate participation rate evolves because of changes in within-group participation rates and because of shifts in group-specific population shares. A comparison of the actual participation rate with a counterfactual rate constructed from population shares from a fixed point in time indicates how changing population shares are causing the overall participation rate to evolve.

The three panels of Figure 3 provide this type of comparison for the economy as a whole (top panel) as well as for men and women separately (bottom panels). The solid blue line in each panel is the seasonally adjusted rate for the given group of individuals as published by the Bureau of Labor Statistics (BLS). The dashed red line is a fixed-weight counterfactual

that uses actual within-group LFPRs and a fixed set of population weights.[1] Because our goal is to compare current participation with participation in November 2017, the fixed population weights for the counterfactuals come from that month. As a result, the actual rates and the fixed-weight counterfactuals are identical in November 2017, as highlighted by the black dots in each panel.[2]

There are two takeaways from Figure 3. First, the large gaps between the published and counterfactual rates from 2000 through 2017 show the large effect that aging has had on US participation rates during the 21st century. As numerous authors point out, the aging of the baby-boom generation—those born in the 1946–1964 period—has pushed increasing numbers of people into low-participation age groups. As an example, the blue line in the top panel shows that the overall participation rate exceeded 67 percent in January 2000. The red dashed line in the same panel shows that when population shares from November 2017 are applied to within-group participation rates from January 2000, participation is less than 64 percent. Hence, the aging of the population from early 2000 to late 2017 reduced US participation by more than 3 percentage points. This particular quantification of aging effects depends on the choice of population shares from November 2017 for the fixed-weight counterfactual. As a general matter, however, it is clear from the downward trend of actual participation depicted in all three panels that aging has had a powerful negative influence on labor force participation over the last two decades.

The second takeaway from Figure 3 concerns the recent behavior of participation, which is the focus of this note. In each of the three panels, the red dashed line in November 2021 is close to its value in November 2017. This fact indicates that, holding age shares constant,

[1]The population weights correspond to the following age groups: 16–17, 18–19, five-year age groups from 20–24 through 50–59, 60–61, 62–64, 65–69, 70–74, and 75+.

[2]The blue lines in Figure 3 depict the published seasonally adjusted participation rates from the BLS, but the participation rates for individual age groups that are published by the BLS and used to construct our counterfactuals are not seasonally adjusted. We therefore seasonally adjusted the age-specific rates ourselves using a simple ratio-moving-average method. We then verified that by weighting the resulting rates using actual population shares, not fixed shares, we obtained an overall participation rate that was very close to the BLS's seasonally adjusted rate for the overall population. This similarity gives us confidence that the differences between our counterfactual rates and the published rates are due to our use of fixed population shares, not from our seasonal-adjustment method.

participation changed little across those two months. To be sure, each of the red dashed lines is higher in early 2020 than it is in either November 2017 or November 2021. Yet as noted earlier, the unemployment rate was relatively low in early 2020, so comparisons of recent participation with participation immediately before the pandemic conflate aging's effects on participation with the effect of the business cycle. The fact that the blue line in each panel declines after November 2017 while the red dashed line returns to its November 2017 level indicates that population aging has largely driven the long-run participation decline during the past four years.

Table 2 quantifies the effect of aging versus within-group changes in participation for broad demographic groups. Column 1 shows actual participation rates in November 2017 for the population as a whole and for the three groups in Figure 2: young, prime-age, and older. Columns 2 and 3 show participation rates for November 2021 on an actual basis and a fixed-weight basis.[3] Subtracting column 1 from column 3 illustrates the importance of within-group changes in participation, since both of these columns are calculated using the same population weights—specifically, the weights from November 2017.[4] As seen in the last column of the table, this difference is usually positive, indicating that, *holding population shares constant*, participation today is higher than participation four years ago. The fact that actual participation is now lower than in November 2017 highlights the strong effect that aging has had on participation.[5]

[3]To construct the fixed-weight counterfactuals for these three age groups, we used the age designations specified in footnote 1 that are relevant for that group. For example, the fixed-weight participation rate for young persons in Table 2 holds constant the population shares of 16–17-year-olds, 18–19-year-olds, and 20–24-year-olds within the 16–24-year-old group.

[4]The data in Table 2 are not seasonally adjusted, but because the data in the first three columns come from the same month of the year (November), seasonal adjustment is not necessary.

[5]The largest negative difference in Table 2 corresponds to prime-age men, for whom within-group changes have reduced participation by 0.3 percentage point. This decline is consistent with the long-run decline in prime-age male participation, which has been taking place since at least the late 1960s. Note also that age adjustment has little effect in the prime-age group, due to the similarity of participation rates for individuals aged 25 to 54.

Educational Gains as a Countervailing Effect on Participation

Changes in the age distribution are not the only long-run factor affecting the US labor force participation rate. Individuals with college degrees tend to have higher LFPRs than individuals without them, so ongoing educational gains in the population should raise participation, holding constant other factors (such as aging). Illustrating the effects of education on participation, Figure 4 plots college and non-college LFPRs along with the college population share for prime-age persons, a group for which aging has little effect on participation due to the similarity of participation rates among those aged 25 to 54. As in Figure 2, the months November 2017, February 2020, and November 2021 are highlighted in the graph. The figure illustrates that the college/non-college participation gap among prime-age individuals is large and growing; as of November 2021, this gap stood at 10.9 percentage points. Additionally, in the four years after November 2017 the prime-age college share rose by 3.8 percentage points, from 37.6 percent to 41.4 percent. Going forward, the positive influence of education on participation will depend on the evolution of the participation gap between college and non-college persons, as well as the extent to which recent increases in college attainment can be sustained.[6]

A relevant question is, how much has the positive education effect offset the negative effect of aging on participation since November 2017? To answer this question, we construct another counterfactual LFPR that holds constant both age and education by splitting the cells used to hold age constant into college and non-college categories. The resulting LFPR fixes not only the share of (say) 25–29-year-olds at its November 2017 value, it also holds constant the shares of college- and non-college-educated 25–29-year-olds.

Our age-education counterfactual focuses on the population aged 25 and older, because most people who attend college have completed it by then. The first row of Table 3 shows that in November 2017, the participation rate for the 25+ population was 64.2 percent. The

[6]Among the 16+ population as a whole, the college population increased 2.9 percentage points in the four years since November 2017, from 31.0 percent to 33.9 percent. In November 2021, the LFPR of the 16+ population was 72.7 percent for individuals with a college degree and 56.3 percent for those without one.

second row shows that this rate had fallen to 63.0 percent four years later. If we hold the age distribution constant as of November 2017, then the November 2021 rate rises to 64.4 percent. The last row of the table holds both age and education constant, resulting in a participation rate of 64.0 percent. This is 0.4 percentage point lower than the counterfactual rate adjusted only with age, indicating that adjusting for education along with age offsets less than one-third of the effect of adjusting for age alone.[7] Even with this offset, adjusting for both education and age results in a participation rate that is only 0.2 percentage point below its November 2017 value, suggesting that changing population demographics can account for a large portion of the observed decline in the LRPR over the last four years.[8]

Conclusion

Over the next several quarters, the LFPR will likely be a closely watched piece of economic data to determine the response of labor supply to the ongoing high levels of labor demand. This note illustrates the importance of evaluating the participation rate in relation to similar previous points in the business cycle while recognizing the strong effect that population aging continues to have on participation. Rising educational levels will offset the negative effects of population aging to some degree. However, given the strong downward pull from aging, a complete recovery of the participation rate to pre-pandemic levels may be difficult to achieve without substantial further declines in the unemployment rate.

[7] Adjusting only for age for the 25-and-older age group raises the November 2021 participation rate by 1.4 percentage points (64.4 percent versus 63.0 percent). This adjustment is reduced by 0.4 percentage point (28 percent) when education is held constant as well.

[8] As explained in the notes to Table 3, we use somewhat broader age categories when holding both age and education constant than when holding only age constant. In practice, the use of broader age categories has virtually no effect on our results.

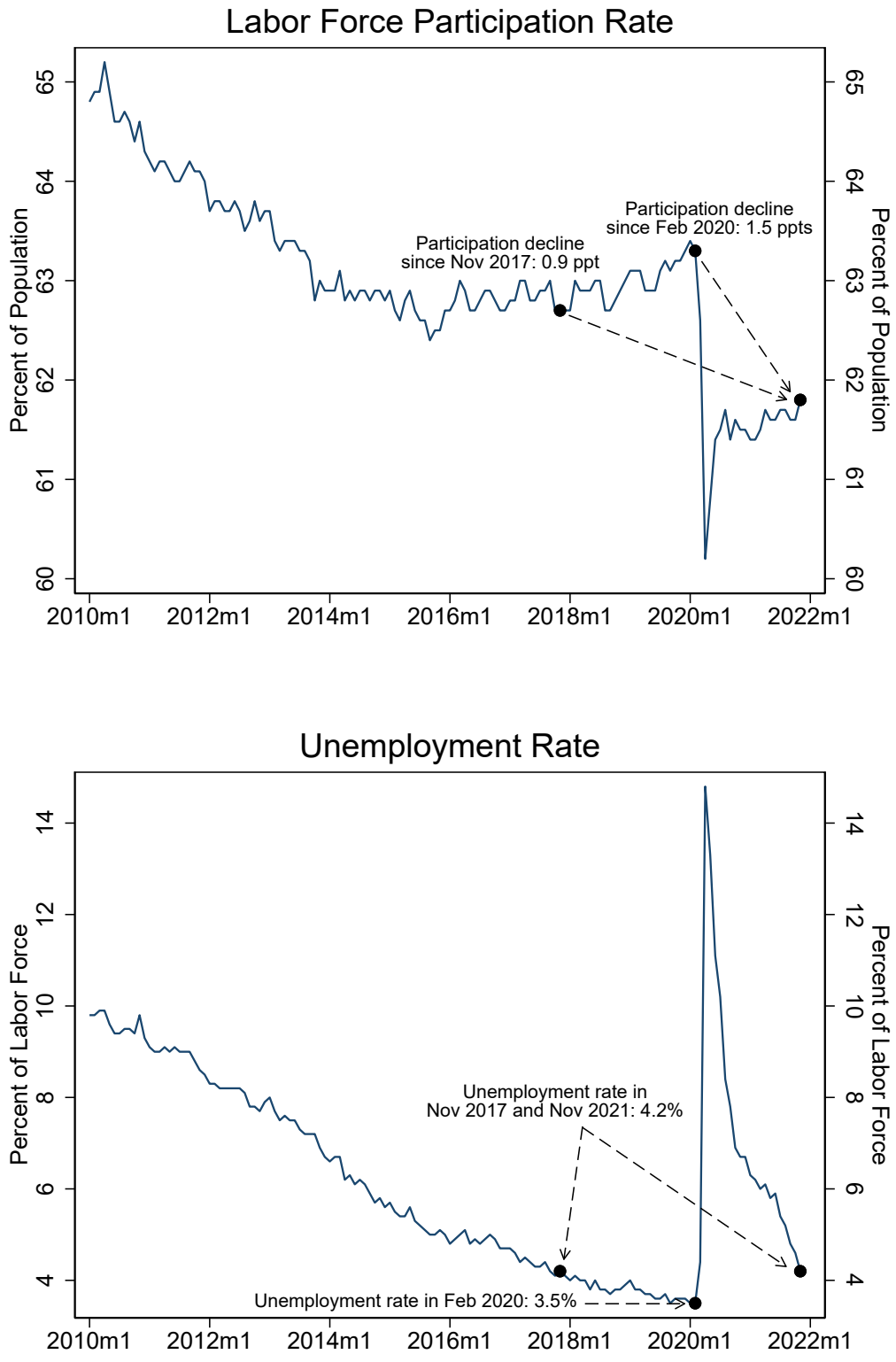

Figure 1. Labor Force Participation and Unemployment Rates: January 2010 to November 2021. *Note:* Data are seasonally adjusted.

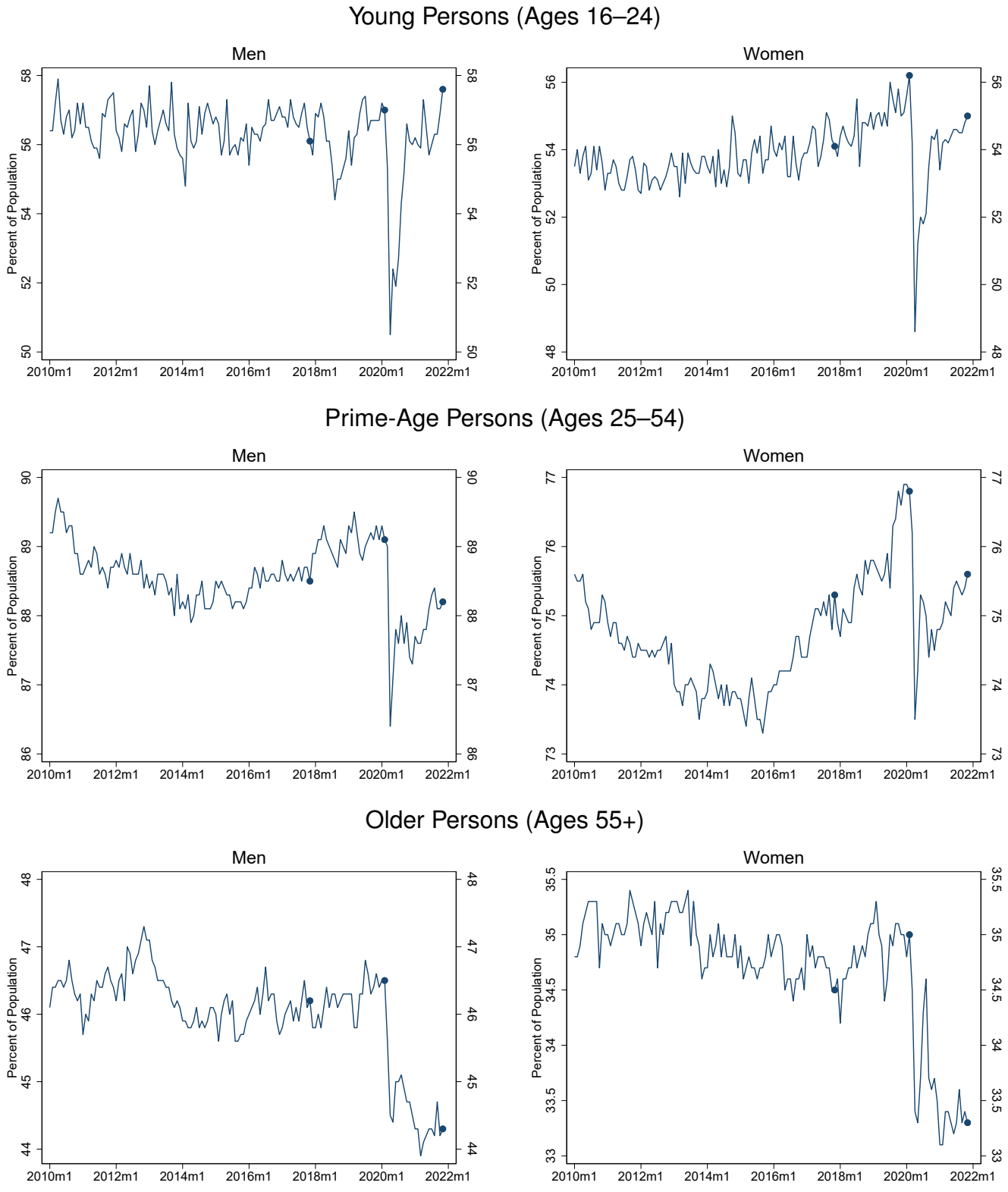

Figure 2. Labor Force Participation Rates by Age Group and Gender. *Note:* Data are seasonally adjusted. Dots correspond to November 2017, February 2020, and November 2021.

	LFPR: All Older Persons	Population Shares Among Older Persons		Age-Specific LFPRs	
		55-64	65+	55-64	65+
November 2017	40.0	45.5	54.5	64.9	19.3
February 2020	40.4	43.9	56.1	65.5	20.8
November 2021	38.5	42.3	57.7	64.7	19.3
Change: Nov 2017 to Nov 2021 (ppts)	–1.5	–3.1	3.1	–0.2	0.0

Table 1. Labor Force Participation Rates (LFPRs) and Population Shares Among Older Persons (Ages 55+). *Note:* Data are not seasonally adjusted. The change in population shares over time in the last row does not exactly equal the changes implied by the levels of these shares due to rounding.

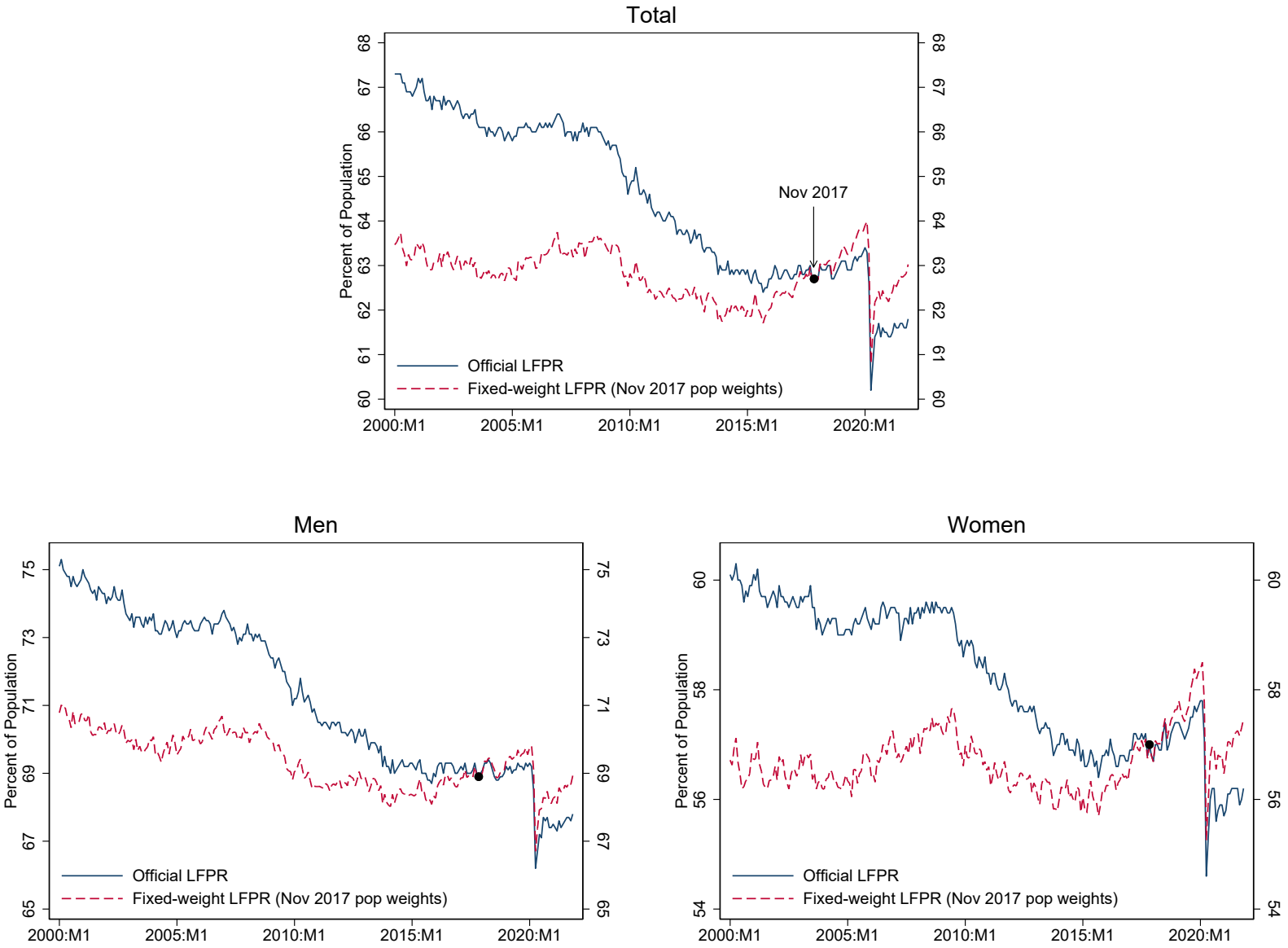

Figure 3. Labor Force Participation Rates and Fixed-Weight Counterfacutuals: All Persons (16+). *Note:* Data are seasonally adjusted. The dot in each panel corresponds to November 2017.

		(1)	(2)	(3)	(4)
		Labor Force Participation Rates			
		2017:11	2021:11		2021:11 Fixed-Weight
Age Group	Gender	Actual	Actual	Fixed-Weight	minus 2017:11 Actual
All Ages (16+)	Total	62.7	61.9	63.0	0.3
	Men	68.7	67.7	68.8	0.1
	Women	57.1	56.4	57.6	0.5
Older Persons (55+)	Total	40.0	38.5	40.1	0.1
	Men	46.2	44.3	46.1	–0.1
	Women	34.7	33.5	35.0	0.3
Prime-Age Persons (25–54)	Total	82.0	82.1	82.1	0.1
	Men	88.5	88.3	88.2	–0.3
	Women	75.6	76.1	76.1	0.5
Young Persons (16-24)	Total	53.8	55.2	55.2	1.4
	Men	54.5	56.1	56.1	1.6
	Women	53.2	54.2	54.4	1.2

Table 2. Labor Force Participation Rates and Fixed-Weight Counterfactuals. *Note:* Data are not seasonally adjusted. The Fixed-Weight series holds constant the age distribution at November 2017 values for the following age groups: 16–17, 18–19, five-year age groups from 20–24 through 50–59, 60–61, 62–64, 65–69, 70–74, and 75+.

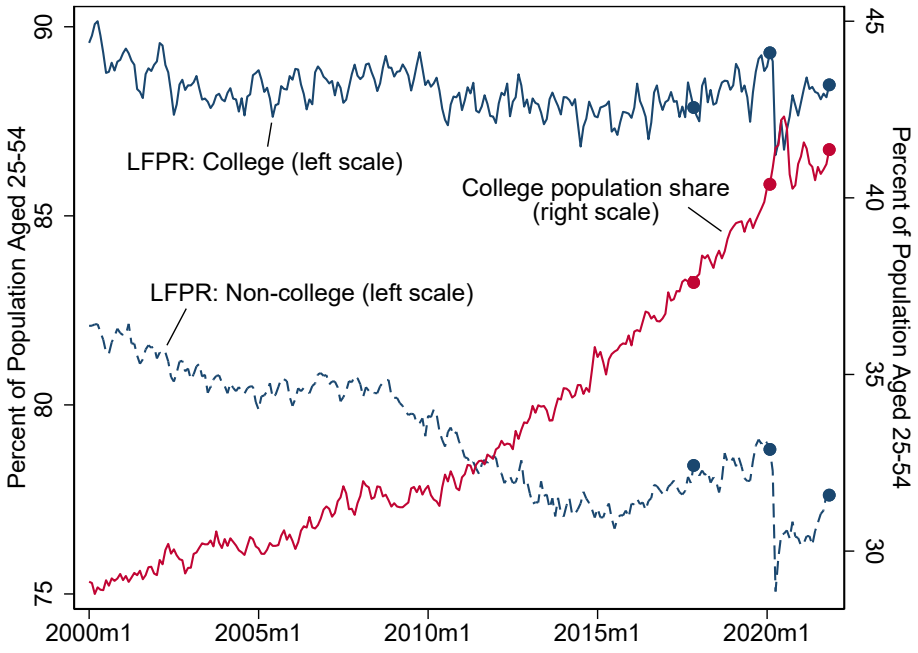

Figure 4. Labor Force Participation Rates (LFPRs) and the College Population Share for Prime-Age Persons (Ages 25–54). *Note:* Data are not seasonally adjusted. Dots corresponds to November 2017, February 2020, and November 2021.

Date	Method	LFPR Value	Difference from 2017:11 Actual
November 2017	Actual	64.2	—
November 2021	Actual	63.0	–1.2
November 2021	Fixed Age	64.4	0.2
November 2021	Fixed Age × Educ	64.0	–0.2

Table 3. Labor Force Participation Rates and Fixed-Weight Counterfactuals for Persons Aged 25 and Over. *Note:* Data are not seasonally adjusted. The Fixed Age method holds constant the age distribution at November 2017 values. The age distribution is defined by the following age groups: 25–29, 30–39, 40–49, 50–54, 55–59, 60–64, 65–69, 70–74, and 75+. The Fixed Age × Educ method also uses the age distribution from November 2017, but disaggregates the age-specific cells by interacting them with a college/non–college indicator.