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Research Article

The power of inclusive labor force participation for mitigating population aging: Closing gaps at the intersection between race/ethnicity and gender in the United States

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Abstract

BACKGROUND
The US labor force and economic dependency ratios are projected to change significantly through 2060, driven by demographic shifts and persistent inequalities across race, ethnicity, and gender. The United States has lower participation rates than other industrialized countries and large participation gaps between population groups.

METHODS
We use a dynamic microsimulation model, incorporating US population projections, to project labor force participation and economic dependency ratios. We assess multiple scenarios, simulating the effects of reducing inequalities in education and health and equalizing participation across demographic groups.

RESULTS
Baseline projections indicate a labor force increase of approximately 27 million people by 2060, driven primarily by population growth. Reducing health and educational disparities could increase the baseline labor force projection by about 10%, adding 2.6 million people. The projected effects of closing gender and racial/ethnic participation gaps are substantial: equalizing participation rates between demographic groups could add up to 14.3 million people to the labor force.

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CONCLUSIONS
Eliminating disparities in labor force participation has the potential to offset the impact of demographic aging on the economic dependency ratio, highlighting the importance of targeted policies to enhance labor force resilience by addressing inequalities and improving inclusion across population groups.

CONTRIBUTION
We quantify the long-term effects of closing labor market disparities on labor force growth and economic dependency in the United States. We provide evidence-based projections to inform policies aimed at mitigating the economic challenges posed by an aging population.

1. Introduction

Industrialized countries face considerable pressure from demographic aging, which will reduce the size of the labor force and increase the economically dependent share of the population. Although all OECD countries are affected by aging, the demographic dynamics differ considerably. In the United States, the aging process is less advanced than in other major economies, and the old-age dependency ratio – which expresses the number of individuals aged 65 or older per 100 people of working age (defined here as those aged 20 to 64) – is expected to increase more modestly over the coming decades. In the United States, this ratio is projected to increase from 30.4 in 2022 to 40.4 in 2050, compared to an increase from 40.5 to 58.1 in Germany, from 54.0 to 80.7 in Japan, and from 19.4 to 47.5 in China (OECD 2023).

However, the economic impact of demographic aging ultimately depends on the actual number of economically active people in a country, which in turn is influenced by non-demographic factors such as the education system, population health, the structure of social security systems, and, more generally, the propensity of different population groups to participate in the labor market. In this respect, the picture in the United States is less favorable. Over the past two decades the labor force participation rate (LFPR) has stagnated or even declined at times, while it increased significantly in most other OECD countries (OECD 2024). As a result, in 2023 the US LFPR of 25- to 64-year-old persons was below the average of industrialized countries (79.0% vs. 82.2%). This modest aggregate performance also reflects large inequalities between population groups. There are large differences in employment and income between racial/ethnic groups, between genders, and between people with and without disabilities (Collins and Michael 2017; Baumberg Geiger, Böheim, and Leoni 2019; Daly, Hobijn, and Pedtke 2020), as well as striking differences in education, health, and longevity (Berger et al. 2022; Berkman and

Truesdale 2023). Recent studies have examined how race/ethnicity and gender intersect or interact to influence labor market outcomes (Autor et al. 2019; Chavez, Weisshaar, and Cabello-Hutt 2022; Moen, Flood, and Wang 2022). These differences will impact labor force developments because the size of various population groups is expected to change in the next decades (Johnson 2020).

While demographic aging poses challenges, policies that reduce disparities and increase participation among inactive groups can help mitigate its economic effects (Juhn and Potter 2006; Perez-Arce and Prados 2021). To identify the appropriate policy fields and assess the potential of measures to reduce barriers to labor force participation and promote activation requires a better understanding of labor force dynamics and their possible future development paths.

We contribute to this goal by applying dynamic microsimulation to project the future labor force in the United States, taking the large inequalities between population groups into account.[5] We focus on changes in labor force participation rates and disparities at the intersection of race/ethnicity and gender in order to contrast different scenarios and show the potential impact that closing the gaps between population sub-groups can have on increasing the US labor force.

This study builds on previous work comparing labor force developments in the United States and Germany (Böheim et al. 2023), and expands it in several respects. We analyze US labor force dynamics with greater granularity, extending the dynamic microsimulation model microWELT-US to differentiate explicitly between population groups (defined by their self-reported race/ethnicity). This allows us to examine the intersection of race/ethnicity and gender, and to design policy scenarios that address differences in labor force participation between individuals with similar personal characteristics who belong to different population groups. To gauge the economic impact of different scenarios, we also project the development of various economic dependency indicators. We contrast the effects of changes in important individual characteristics of labor force participation, i.e., education and health status, and the effects of changes in the participation propensities associated with these characteristics for different population groups by gender and race/ethnicity. Our projections are consistent with the demographic assumptions of the US Bureau of the Census (2017).

[5] We use the term 'dynamic' in 'dynamic microsimulation' to denote a microsimulation model that projects a society over time, in contrast to static models without a time dimension (as is typical for tax-benefit models, e.g., EUROMOD). Alternatively, we could distinguish models by the way states are updated over time, i.e., static versus dynamic simulations. In this distinction, static is used for cross-sectional imputation models, which update states over time without considering individual histories, and dynamic refers to transition processes, such as Markov or event history models. (Static microsimulations generally do not aim at longitudinal consistency of individual life courses.) In this sense, our microsimulation is hybrid, as it combines dynamic processes with periodic updates. In particular, labour force characteristics are based on cross-sectional imputations on a monthly basis and are thus static according to the latter definition.

The labor force participation rates of specific groups can change significantly over relatively short periods of time. In the United States, for example, women's participation rate increased by 20 percentage points between 1960 and 1990, while the participation rate of men aged 55 to 64 fell by 20 percentage points over the same period (Fullerton 1999). International data provide numerous examples of similarly large changes and at the same time show great variance between countries (ILO 2024). While these diverse trajectories in labor force participation need to be interpreted in the context of economic shifts, changes in family and gender relations, and technological advances, they highlight the potential for changes in policies and institutions to influence participation behavior.

Like any microsimulation, our approach simplifies reality. It does not fully capture institutional dynamics or employer behavior. The complex processes behind convergence in participation rates and health and education are modeled in stylized form. However, as discussed in the Methods section, we believe that for our purpose these limitations are not critical, and the scenarios are compared to highlight the relative importance of reducing disparities rather than providing forecasts. In this respect, the model delivers robust qualitative insights: closing gaps at the intersection of gender and race/ethnicity has considerable potential to cushion the negative economic consequences of demographic aging. Reducing gaps in the participation rates of individuals with similar characteristics who belong to different population subgroups has a much stronger effect on their participation in the labor force than improvements in education or health (while keeping propensities to participate in the labor market constant).

2. Background

Participation in the labor force is influenced by personal attributes (such as health and skill levels), societal dynamics (including cultural norms around gender and work), and institutional settings (such as retirement rules). We use a highly stylized dynamic microsimulation model, which allows us to focus on the major determinants of labor force participation. Using scenarios, we can quantify changes in aggregate outcomes resulting from changes in single parameters. With our estimations we aim to both highlight the role played by education and health as determinants of labor force participation and investigate the impact of gaps that exist between individuals of different gender and race/ethnicity but with otherwise similar characteristics. The labor force consists of people who currently work for pay or profit or who are seeking employment while unemployed. This includes all forms of part-time work as well as temporary absences from work such as being on sick leave.

There is a strong and well-documented positive relationship between labor force participation and both education and health.[6] According to OECD data for 2021, the labor force participation rate of individuals who have completed tertiary education in the United States is 26.1 percentage points greater than the rate for individuals who have not completed high school (OECD.Stat 2023). This gap is slightly wider than the OECD average of 24.6 percentage points. The difference in participation rates by education is much larger for women (36.0 percentage points) than for men (19.3 percentage points).

Measuring health inequalities in labor market participation poses greater challenges, as there are a variety of different health indicators. However, there is ample evidence that poor health strongly limits the participation of working-age people in the labor market (García-Gómez et al. 2013; Baumberg Geiger, Böheim, and Leoni 2019; Perez-Arce and Prados 2021). Annual Social and Economic Supplement (ASEC) data from the Current Population Survey (CPS) for 2017 show that the gap between the participation rates of persons aged 50 to 69 who are in poor health and those in good health varies between 23 and 30 percentage points, depending on gender and age group (Böheim et al. 2023). These health gaps are large when compared to those in a set of European countries comprising Sweden, Switzerland, the Netherlands, and Germany, and the labor force participation rates of people in poor health are also low. This might be partly explained by differences in health status among those in poor health, as studies show that adults in the United States have worse health than adults in Europe and other high-income countries and there are indications that the difference is particularly pronounced among socioeconomically disadvantaged groups (Avendano et al. 2009; Wahrendorf, Reinhardt, and Siegrist 2013; Woolf and Aron 2013; Atella et al. 2021).

However, the influence of health on labor market participation also depends on labor market institutions and policies. In response to rising disability benefit enrolment and population aging, many countries have carried out reforms and strengthened existing policies to prevent health-related work incapacity and to improve the labor market integration of individuals with health problems. Comparative studies indicate that the United States has lacked substantial reform in this area and that policies to support the labor market integration of people with health limitations are underdeveloped (OECD 2003, 2010; Morris 2016; Böheim and Leoni 2018). Berkman and Truesdale (2023) argue that the standard US policy approach to population aging – working longer – is in jeopardy because a large fraction of Americans struggles to work into their late 50s, let alone into their 60s and 70s. Working longer is thus not a straightforward response to population aging, but needs to be facilitated by adequate policies.

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[6] However, McKeever and Wolfinger (2011) show that never-married mothers in the USA "continue to languish in poverty despite impressive gains in education and other personal and vocational characteristics that should have resulted in greater economic progress" (p. 74), a result which is consistent with characteristics that would have led to poor economic outcomes even had they not had children.

Measures to increase labor force participation must take into account that people with otherwise similar characteristics but different gender and ethno-racial identity face different social conditions, experience different disadvantages and privileges, and are exposed to different social norms, which all influence participation in the labor market. As Collins (2015) underscores, the analysis of labor markets is a central arena to investigate intersectionality, i.e., the ways in which multiple systems of inequality interact to produce compounded experiences of disadvantage or privilege. Disparities by gender and race are a well-known feature of the US labor market and have been investigated for several decades, but the use of population descriptors such as race and ethnicity in particular continues to pose many theoretical and empirical challenges (Browne and Misra 2003; Daly, Hobijn, and Pedtke 2020; Paul, Zaw, and Darity 2022; Mauro et al. 2022).

The distinctions between race and ethnicity are imprecise, and are neither biologically based nor static categories but "reflect the sociohistorical constructs of race and ethnicity as they currently exist in US society" (Hummer 2023: 639). Much of the categorization of race and ethnicity currently used in the United States is the result of data collection efforts by the Office of Management and Budget and the US Census Bureau, efforts that have a long and somewhat contentious history (Mays et al. 2003; Ross et al. 2020). Although we acknowledge the limitations of the concepts of race and ethnicity, and the heterogeneity within each of these categories as to origin, length of residence, language use, etc., we use the categories specified by the CPS in their data.

The importance of including race and ethnicity in the analyses of labor markets is underscored by the existence of large and persistent health differentials between population groups (Walker, Williams, and Egede 2016; Zimmerman and Anderson 2019). Hummer (2023) highlights several ethno-racial disparities in US population health and summarizes recent literature. For example, Black Americans have higher mortality rates than White Americans at most ages; American Indians or Alaska Natives (AIAN) have a lower estimated life expectancy at birth than any other ethno-racial group; and Asian Americans have lower average age-specific mortality rates, substantially higher life expectancy, and more positive health profiles compared to all other ethno-racial groups. Other ethno-racial disparities exist, stressing the need to account for these differences in studies such as ours. Health indicators vary mainly by race/ethnicity, but also by gender. With respect to life expectancy, the most recent United States Life Tables (Arias et al. 2022) show that in 2020 the life expectancy at birth of Hispanic women (81.3 years) was longer than that of non-Hispanic White women, whereas Hispanic men had a slightly shorter life expectancy (74.6 years) than non-Hispanic White men (74.8). Non-Hispanic Black women's life expectancy at birth (75.4 years) was five years shorter than that of non-Hispanic White women, while men's life expectancy (67.8 years) was seven years shorter than that of non-Hispanic White men.

Studies on intersectionality emphasize that gender and race should not be analyzed as separate population characteristics; instead, greater analytical precision can be achieved by examining how these dimensions of stratification interact in shaping labor market dynamics (Moen, Flood, and Wang 2022; Paul, Zaw, and Darity 2022). Combinations of race and gender shape social and economic identities and these combinations create distinctive obstacles and opportunities for all groups (Browne and Misra 2003). Several studies provide evidence on intersectional differences in wages and incomes, particularly of Black and White women and men. Daly, Hobijn, and Pedtke (2020), for instance, show that Black men earn less than White men and Black women less than White women, but the differential for women is only around half that for males. Paul, Zaw, and Darity (2022) and George, Milli, and Tripp (2022) highlight that Black women face an unexplained wage gap (relative to White men) that goes beyond the simple addition of the separate penalties for gender and race. On the other hand, evidence on disparities of labor force participation at the intersection of gender and race/ethnicity is scarce. McManus and Johnson (2020) show that immigration during the last two decades contributed slightly to a decline in female labor force participation as especially first-generation women are less likely to be employed. However, they also find substantial convergence in the labor force participation of native-born and foreign-born women.

Figure A-3 and Figure A-4 in the Appendix, using ASEC data from the CPS for 2017, show heterogeneous patterns in labor force participation rates by gender and race/ethnicity. For example, Hispanic men have LFPRs that are greater than those of most other minority groups and close to those of the majority non-Hispanic White population in most age groups. Hispanic women, however, have comparatively higher LFPRs only at early ages and lower rates than most other groups above the age of 25. Among the Black and African American population, by contrast, women have comparatively high participation rates, while men have low participation rates. Although these data are not adjusted for labor supply determinants such as education and fertility, they provide a first indication of the relevance of differences by gender and race/ethnicity when assessing the development of labor force participation.

The empirical findings on differences in labor market outcomes raise numerous questions about the underlying causes of the observed patterns and the extent to which these patterns vary or are persistent over time.[7] For our projections, we take an agnostic stance with respect to the mechanisms underlying the observed inequalities and assume that these inequalities will persist over time unless addressed by appropriate policies.

[7] For an overview of different approaches to studying these questions, see Browne and Misra (2003).

3. Method

3.1 Modeling approach

This study builds on previous work using the dynamic microsimulation model microWELT-US (Böheim et al. 2023), extending it to explicitly model differences in labor force participation in the United States by race and ethnicity. microWELT-US is part of the broader microWELT modeling platform, documented in Spielauer, Horvath, and Fink (2020) and Spielauer et al. (2020), which was designed as a flexible and extensible tool for comparative analyses of welfare systems.

Microsimulation models a population using a representative sample of individuals and accounts for population heterogeneity by incorporating individual- and family-level characteristics. Dynamic microsimulation extends this approach by modeling the evolution of the population over time, in contrast to static microsimulations, which are typically used for tax-benefit calculations. Our objective is to explore possible future developments in labor force participation under alternative assumptions. For this reason, we combine microsimulations with scenario analyses. While the scenarios are necessarily speculative, they are anchored in official demographic projections. Microsimulations allow us to represent heterogeneity in individual characteristics, account for potential interactions between determinants (e.g., health and education), and generate projections under counterfactual assumptions. This approach offers a different yet complementary perspective to studies such as Contreras, DeMello, and Puentes (2011) and Riekhoff and Kuitto (2024), which use decomposition techniques based on historical data to quantify the contribution of different determinants to observed changes in aggregate LFP.

At its core, microWELT-US combines demographic models for fertility, mortality, partnership dynamics, and migration, as well as socioeconomic processes such as education, employment, and health. These components are interlinked to capture the dynamic relationships between individual characteristics and labor force participation. A distinctive feature of microWELT-US is its ability to simulate individuals within their family contexts, enabling the modeling of intergenerational processes such as the influence of parental education on children's educational attainment. This approach ensures that both direct and indirect effects of socioeconomic factors on labor force participation are reflected in the simulation outcomes. microWELT-US is a highly stylized model, limited to core characteristics affecting labor force participation. Our focus is on cross-sectional consistency – for example, a person's labor force status is assigned each simulation month, based on evolving individual characteristics, without considering the status in the previous month. While these limitations prevent the use of the full potential of micro-simulation for longitudinal analysis from a life course perspective, they do not affect the type of analysis presented in this study, which focuses on the evolution of cross-sectional outcomes. The model is calibrated to align with official population projections provided by the US Bureau of the Census (2017). The alignment matches age-specific fertility rates, mortality by age and sex, and net migration patterns, ensuring that the simulated population is consistent with official demographic forecasts.

Our only additional demographic assumptions concern educational differences in fertility and mortality patterns. We make the simplifying assumption that these differences between educational levels will remain constant over our projection horizon. The empirical evidence consistently shows that fertility and mortality vary by education, but it is inconclusive on whether and how these gradients have changed over time (e.g., Meara, Richards, and Cutler 2008; Montez et al. 2019). In light of this uncertainty, we anchor the model in recent, well-documented differentials to avoid speculative parameterization and to provide a transparent baseline consistent with observed demographic patterns. From a modeling perspective, holding these gradients constant also improves interpretability and comparability across scenarios. Allowing them to evolve endogenously would add substantial complexity and make it more difficult to attribute changes in aggregate outcomes to the mechanisms under study.

Incorporating these educational differences in demographic processes at the micro level does not impact the aggregate fertility and mortality outcomes; for example, we do not alter the number of children born to women of a given age, but simulate which women of this age, considering previous births and education, will give birth. The starting population is constructed using data from the 2017 ASEC of the CPS, which provides detailed information on age, gender, race/ethnicity, education, and family composition. This dataset also serves as the basis for estimating behavioral parameters, such as labor force participation and partnership formation.

We model labor force participation using logistic regressions. The regressions incorporate individual characteristics such as age, gender, education, and health status, along with family-related factors for women such as the presence and age of dependent children, estimated separately for men and women and across major population groups defined by race and ethnicity. This approach ensures that differences in labor force participation across demographic subgroups are accurately represented in the model.

In the CPS, the race and ethnic origins of individuals are identified by two questions that ask respondents to self-identify their race and ethnicity by selecting them from 'flashcards' listing racial groups and ethnic origins.[8] People of Hispanic origin are those who indicate that their origin is Mexican, Puerto Rican, Cuban, Central or South American, or some other Hispanic origin. It should be noted that people of Hispanic

[8] The description of the CPS approach to identify race and ethnicity is taken from the survey website (https://www.census.gov/programs-surveys/cps/technical-documentation/subject-definitions.html); for further details see also the technical paper on CPS design and methodology (US Bureau of the Census 2019).

origin may be of any race. Respondents who select their race as White and indicate that their origin is not one of the Hispanic origin subgroups are called non-Hispanic White origin. We estimate the regressions separately by sex and the following population groups: (1) non-Hispanic White, (2) non-Hispanic Black and African American, (3) non-Hispanic American Indian or Alaska Native, (4) non-Hispanic Asian or Pacific Islander, (5) other non-Hispanics, and (6) Hispanics. The definition of population groups corresponds with that used in the population projection from the Census Bureau.[9]

Educational attainment is categorized into four levels: below high school, high school graduation, some college, and university degree. The model simulates three educational processes: school enrolment, educational attainment, and intergenerational transmission of education. For the latter, data from the OECD's Programme for the International Assessment of Adult Competencies (PIAAC) survey (OECD 2025) is used to quantify the impact of parental education on children's outcomes. Health is modeled as a binary variable, distinguishing individuals with work-limiting health issues from those without. We estimate the likelihood of having health limitations based on interactions between age, education level, and population group using logistic regression models. Health status is updated dynamically throughout the simulation as individuals age, providing a realistic representation of health-related changes.

The simulation is based on a continuous-time interacting population approach. This approach allows events to occur at any point of simulated time rather than only at pre-defined intervals, while it does not prohibit periodic updates. In practice, our simulation combines continuous-time processes, such as demographic events based on published rates, and monthly updates of most other characteristics, such as labor-force participation. The interacting population approach further supports social interactions, such as partnership formation and family dynamics.[10] Technically, this requires simulating all individuals simultaneously, with time evolving for all individuals according to the next event. This so-called time-based approach is also essential for modeling aggregate feedback mechanisms. For example, aggregate labor force trends can influence model parameters, allowing for dynamic adjustments during the simulation. In our context, this is used for aligning demographic processes to given population projections. However, the time-based modeling approach imposes greater computational demands as it prevents parallelization. By contrast, a case-based approach simulates each unit (person or family) individually, with interactions restricted to the members of each case.

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[9] Details can be found at https://www.census.gov/programs-surveys/popproj.html.

[10] Family status is updated monthly based on age, age of the youngest child, and education. Each month, the necessary status changes are made to meet the aggregate targets within each group, while most women will typically keep their status. Although his pragmatic approach has limited longitudinal consistency for partnership durations, this is not relevant for our type of analysis, as our objective is to be consistent with population projections in a cross-sectional perspective. Health status is updated monthly based on age, gender, education, and race/ethnicity.

Labor force status is updated in each simulated month based on the probabilities derived from the logistic regression estimates. Changes in individual characteristics, such as aging, health status, and education level, are reflected in these updates. For older workers, changes in retirement age legislation are modeled explicitly. When the retirement age increases, the likelihood of labor force participation for individuals nearing retirement is adjusted using coefficients for younger age groups, thereby accounting for the dampening effects of health limitations on extended work life. In our simulations we take the retirement age as specified in current laws and assume the full retirement age will incrementally increase to 67 for those born in 1960 or later. While early retirement benefits will still be offered from age 62, the amounts will gradually decrease over time.

Our modeling approach has various limitations. First, it is highly stylized and omits factors such as changing cultural norms and technological change. As the study's goal is not to capture all possible influences on labor force participation but to isolate and compare the relative contribution of specific disparities (gender, race/ethnicity, education, health) we do not think this is critical. Second, behavioral responses are modeled in a simplified way: labor force participation is based on statistical associations rather than causal mechanisms, and behavior remains stable over time unless modified by scenarios. Although this limits the model's ability to capture novel behaviors that might arise in response to economic shocks, policy reforms, or social change, it improves the transparency of the 'what-if' scenarios that are the focus of our analysis. Third, the modeled states are simplified. For example, health is represented in binary form (healthy vs. work-limiting conditions), ignoring gradations and comorbidities; education is simulated with stylized transitions that overlook lifelong learning and skills mismatch. While added detail might be desirable, it would not alter the qualitative conclusions of our study. Fourth, like in all projections, the results depend on the quality of the underlying data and assumptions, both of which are subject to uncertainty. By anchoring the model's projections to US Census Bureau projections, the demographic backbone of the model reflects the most widely used and authoritative source. Fifth, our scenario design is highly stylized. Scenarios (e.g., equalizing participation rates) are mechanical and do not simulate how policies achieve them. The aim is to illustrate the magnitude of potential gains if disparities were reduced, not to forecast the exact policy pathways. This stylization makes the results more transparent and easier to interpret as benchmarks for ambitious policy goals. Sixth, the study only concerns the supply side of the labor market, not accounting for how labor supply interacts with demand or productivity. We believe that ignoring this interaction does not undermine the central message that greater inclusion could substantially expand the potential labor force and mitigate population aging pressures.

For a more detailed description and documentation of the model and the underlying modeling platform, see Böheim et al. (2023), Spielauer, Horvath, and Fink (2020), and Spielauer et al. (2020).

3.2 Outcomes of interest

We are interested in the future development of the labor force and how changes in labor force participation can cushion the economic impact of demographic aging. For this reason, in addition to labor force participation rates and absolute changes in the size of the labor force, we also project the development of various economic dependency indicators.

Changes in purely demographic ratios, such as the old-age dependency ratios, can be a poor approximation of changes in the relationship between the number of persons who are economically active and those who are not (Sanderson and Scherbov 2015; European Commission 2021). In contrast to demographic dependency ratios, economic dependency ratios consider, to an extent, age-specific economic characteristics of the population, such as length of schooling, retirement age, and participation behavior (Loichinger et al. 2017).

We use two economic indicators that can be contrasted with demographic indicators computed solely as ratios of different age groups. Following a common approach, we express economic dependency as the ratio of the number of economically inactive persons (aged 15+) to the labor force (aged 15+), i.e., the number of economically active persons (Dep_{pop}). This indicator is sensitive to changes in education, changes in retirement age, as well as changes in health and, more generally, in participation behavior. In addition, we compute the ratio between inactive and active persons aged 50+ (Dep_{50+}). While these two economic dependency indicators are similar, they place a different emphasis on the impact of aging and provide complementary information for assessing changes over time. An increase in fertility leading to a larger young cohort, for instance, or an educational expansion keeping youngsters from entering the labor market at an early age, will lead to a deterioration of Dep_{pop} but not of Dep_{50+}. On the other hand, an increase in life expectancy will affect both indicators negatively but have a stronger effect on Dep_{50+} than on Dep_{pop}.

4. Results

4.1 Baseline

The baseline scenario shows how the future size and composition of the US labor force will evolve over time under the demographic assumptions defined in the Census Bureau's population projections, holding the impact of all influencing factors on labor force participation and health status (Tables A-1 and A-2 in the Appendix) constant throughout the simulation period (2022 to 2060). According to official demographic projections, the total population in the United States is set to grow from 336.4 million to 404.6 million between 2022 and 2060, corresponding to an increase of 20.3%. However, the number of people aged 65 and over will increase by 65.3% (from 57.2 to 94.5 million), while those aged between 20 and 64 will increase by only 12.7% (from 195.9 to 220.9 million). Against this backdrop, we project that the labor force will expand by 16.1% in our baseline scenario over this period (from 169.3 to 196.5 million people). With an average yearly growth rate of 0.5%, our projections are greater than the current Congressional Budget Office's projections (CBO 2025).[11]

Labor force participation rates will increase only marginally, from 77.5% to 78.6% for the age group 20 to 64 and from 67.4% to 68.2% in the total population. The change in participation rates is mainly driven by changes in education, with higher education leading to higher participation, particularly at older ages, but also to a lock-in effect and lower participation at younger ages. The LFPRs of men are projected to remain fairly stable in almost all age groups, with larger increases in age groups over 60 and small reductions in the youngest age groups (Table A-3). The overall expansion of participation rates results almost entirely from women's increased labor supply, especially in the age groups over 40.

Table A-4 in the Appendix provides a disaggregated overview of changes in labor force participation by gender and race/ethnicity, showing that 87% of the total (net) increase (23.7 out of 27 million) is attributable to Hispanic men and women. By contrast, the number of non-Hispanic White men and women in the labor force is projected to fall by 14.8 million people.

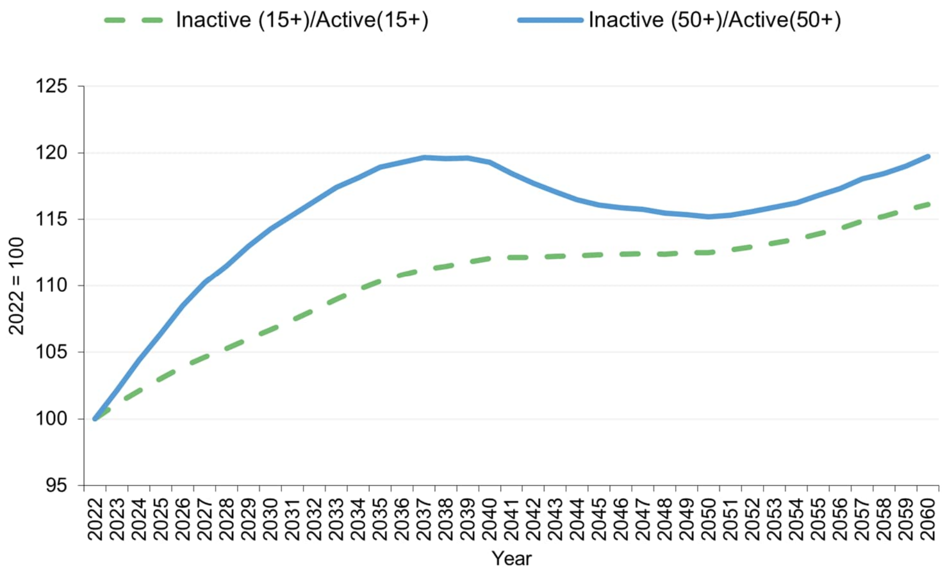
In the baseline scenario, the United States will experience a significant deterioration of demographic dependency indicators: the share of 15- to 69-year-olds to the total

[11] The CBO's projections imply an increase of 0.35% over the time period 2023 to 2053, an increase in the number of people in the labor force of approximately 18.33 million persons. Our projections imply a greater increase, of about 23 million people, over the same time period. This difference must be interpreted in light of the different modeling approaches. The CBO uses a cohort model that estimates labor force participation rates by age–sex–education and race/ethnicity subgroups. The model treats age groups within each sex–education–race subgroup as a separate system of equations and estimates cohort effects that are constrained across the age-group equations within each system (Montes 2018).

population will decrease from 71% to 66%, and the ratio of those aged 65 and older to those aged 15 to 64 years will increase from about 28 to 40 older people for every 100 people of working age. As we see in Figure 1 (and additionally in Figure A-6 in the Appendix), the economic dependency indicator (Dep_{pop}), measured as the ratio of the economically inactive to the active population, is projected to increase from 62 to 72 inactive per 100 active persons. In other words, between 2022 and 2060, for every 10 active persons, the number of inactive people will increase by one. The decrease in the labor force relative to the economically dependent population is thus weaker than implied by demographic indicators alone. This more favorable development is a result of the increasing labor force participation of certain population groups, particularly women, in the course of educational expansion. Most of the deterioration can be expected to take place in the next decade, with an approximately constant development between 2040 and the early 2050s, and a further, smaller increase at the end of our projection period. This is the result of the baby boomer cohorts reaching old age. This development affects the second economic dependency indicator – the relationship between inactive and active people among those aged over 50 – even more strongly. Dep_{50+} will deteriorate sharply in the next decade, increasing from 122 inactive to 145 active persons between 2022 and 2035. In the following decades it will improve slightly then increase again to reach the same level as in the mid-2030s.

Figure 1: Ratio between inactive and active persons according to the baseline scenario, 2022–2060

All persons aged 15 years or older and persons aged 50 years and older



Note: Simulations performed with the microWELT model based on ASEC data (US Bureau of the Census and US Bureau of Labor Statistics 2017) and population projections by the US Bureau of the Census (2017). Ratios shown here are indexed to the base year 2022.

4.2 Scenarios

To evaluate the potential impact of policy changes designed to reduce labor force participation disparities across gender and racial or ethnic groups in the coming decades, we explore a range of scenarios. These scenarios are intended to measure the effects of removing disparities between different demographic subgroups defined by gender and race/ethnicity. We first examine the implications of reducing labor force participation gaps by gender and by race/ethnicity (Scenarios 1/1b and 2). Scenario 3 models the effects of removing educational and health disparities without directly changing labor force participation rates for given characteristics. Scenario 4 combines Scenario 2 and Scenario 3. The estimated scenarios are summarized in Table 1.

With respect to closing gender gaps in labor force participation, an increase in female labor force participation will likely require a redistribution of care responsibilities between partners/spouses in families with young children. A full convergence of LFPRs without changes in men's participation behavior may thus be unrealistic, which is why we assume that increases in the labor force activity of mothers with young children are partly matched by reductions in the labor force activity of their spouses. With respect to differences between race/ethnicity, we use convergence towards the majority population as the reference point; i.e., we assume a convergence of minority population groups towards non-Hispanic Whites. This approach provides benchmarks for ambitious policy changes, while refraining from using best-performing but possibly highly selected population subgroups, such as Asian minorities, as the reference point.

Table 1: Scenario specification

	Applying parameters for…	
	…labor force participation…	…education and health status…
	…from…	
Baseline scenario	own	own
Convergence Scenarios		
S1 / S1b: Convergence in participation propensities between women and men within each group by race/ethnicity	own group men	own
S2: Convergence in participation propensities of women and men in minority groups towards women and men in majority population	non-Hispanic White	own
S3: Convergence of education and health status of women and men in minority groups towards women and men in the majority population	own	non-Hispanic White
S4: S2 + S3	non-Hispanic White	non-Hispanic White

Note: 'Own' denotes that the scenario used the baseline scenario parameters from the logistic regression models for each population and gender group when (1) the labor force status or (2) education and health status, or both, are determined by the simulation. 'non-Hispanic White' denotes that instead of own group parameters, those from the reference group (non-Hispanic Whites) are used when labor force or education and health status are determined. 'Own group men' denotes the use of the parameters of men from a population group for all women of the same population group.

4.2.1 Scenario description

Scenarios S1 and S1b: Convergence by gender within race/ethnicity subgroups, for given personal characteristics

Here, we assume that the labor force participation rates of women converge to the labor force participation rates of men in their own population group (by race/ethnicity), holding personal characteristics constant. While we do not model any changes in the education or health status of women compared to the baseline scenario, the effects of the set of characteristics controlled for in the labor force participation model (Tables A-1 and A-2) change gradually over time, so that in the year 2060 men and women with identical characteristics have the same probability of being in the labor force. Technically, this is achieved by substituting the parameters that determine women's labor force participation with the parameters of men for an increasing share of women from the same population group. Thus, over the period of 38 years, the share of women for whom the parameters of men are used increases linearly by about 2.6 percentage points each year until, in 2060, the parameters estimated for men are used for all women.

The presence of children in the household is a major explanatory factor for differences in participation rates between genders. This is shown not least by the fact that during the pandemic it was mainly women who left the labor market because there were fewer childcare and schooling options (Albanesi and Kim 2021). The availability of childcare facilities and other 'family-friendly' policies can make an important contribution to reducing gender gaps in labor market activity (Blau and Kahn 2013). However, assuming that women with (small) children increase their labor force participation while men in the same households maintain their present level of labor force participation might understate the extent to which parents form their participation decisions collectively and substitute or share caring activities within the household.[12]

For this reason, when modeling the closure of gender participation gaps, we differentiate between households with and without children and assume that in the former, the increase in mothers' labor force participation is partially offset by a reduction in fathers' participation. This reflects the reality that childcare responsibilities do not disappear simply because mothers work more. This is, however, a conservative assumption, as it does not consider that the intra-household adjustment in labor force participation might occur at the intensive rather than at the extensive margin, i.e., with fathers reducing the number of hours worked rather than exiting the labor force.

We assume a gradual convergence of caregiving activities between parents. The negative impact of young children on labor market participation fades gradually over

[12] For a theoretical model of household labor supply that accounts for parents' preferences regarding children's welfare and parental time invested in children, see, for example, Cherchye, Rock, and Vermeulen (2012).

time for mothers while we introduce exogenously a corresponding negative effect for fathers. Concerning the parameters associated with childcare (the age of the youngest child), the negative impact for women is reduced gradually over time, while for men the negative impact increases such that the increasing labor force participation of mothers is accompanied by a corresponding decrease of fathers' labor force participation. As a result, the labor force participation rates of mothers and fathers converge over the course of the simulation, leading to higher participation rates for women compared to the baseline scenario but lower ones for men (Figure A-5). In scenario S1, we simulate this convergence for all households with children under the age of 15, and in scenario S1b we restrict the convergence between spouses to households with children under the age of 5. While these age limits are ad hoc, the ages of 5 and 15 are often used as cut-offs in studies that investigate demographic or labor market outcomes (for example, Fogli and Veldkamp 2011; Smock and Schwartz 2020).

Scenario S2: Convergence by race/ethnicity, for given personal characteristics

Similar to S1 and S1b, we assume that for given personal characteristics the gap in labor force participation between population subgroups by race/ethnicity closes over the period 2022 to 2060. While in S1 and S1b, women's rates converge to men's over time, here we assume that women and men in different race/ethnicity subgroups converge to the labor force participation rates of women and men in the reference population group (non-Hispanic Whites), without closing gender gaps. Note that population groups with higher LFPRs than non-Hispanic Whites, such as Asian men and Asian women, maintain their own, higher LFPRs and do not converge to lower LFPRs.

Scenario S3: Convergence of education and health status

In scenario S3, we analyze the effect of reducing population-group-specific differences in education and health status on labor force participation. Here, the health–age profile of each population group converges over time to the reference group's profile (non-Hispanic Whites). Educational disparities are removed by assuming that educational attainment is identical to the reference group's education for all birth cohorts after 2008. In other words, this scenario assumes that men and women in minority population subgroups attain the same educational level and health status as their counterparts in the majority population, while subgroups with more favorable characteristics than non-Hispanic White women and men maintain their own characteristics. The propensities to participate in the labor market, conditional on personal characteristics, are held constant for all population subgroups.

To enhance transparency and to disentangle the relative contributions of education and health, we additionally decompose scenario S3 into two separate counterfactual scenarios. In S3_Edu, only educational attainment is adjusted to the reference population for cohorts born in 2008 or later, while health profiles remain unchanged. In S3_Health, only health status converges to the reference group's health–age profile, while educational distributions are kept at their baseline levels. Results for these two scenarios are reported in the Appendix, with their main implications discussed in the next section.

Scenario S4: combining S2 and S3

In this scenario, we combine elements of S2 and S3 to simulate the potential for closing gaps between race/ethnicity subgroups with respect to the majority population, in terms of education and health status and the labor force participation propensities associated with these characteristics. Note that here there is no convergence between genders, but only convergence between the groups towards the reference group within genders. Women from all minority populations reach the LFPRs of non-Hispanic White women (or maintain their higher LFPRs) and men from all minority populations reach the LFPRs of non-Hispanic White men (or maintain their higher LFPRs).

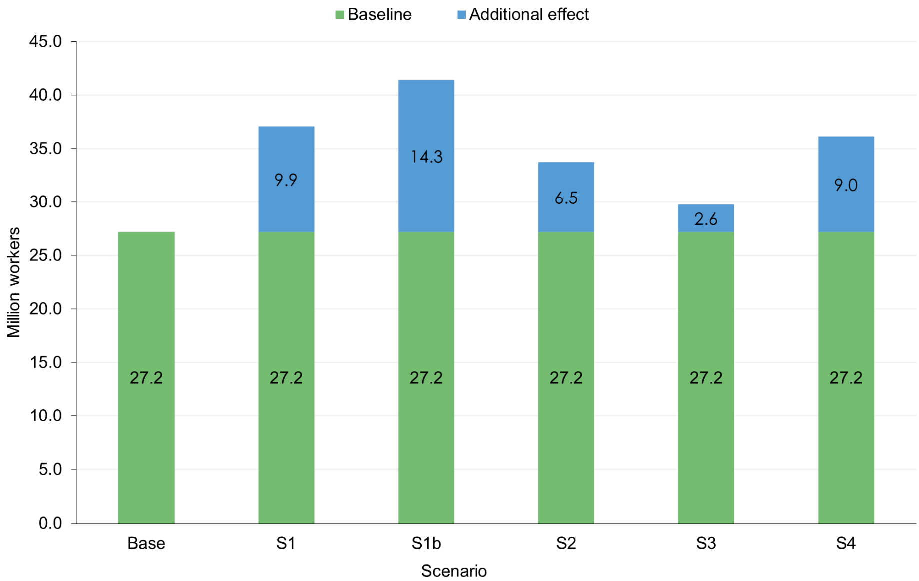
4.2.2 Scenario results

Figure 2 shows how the total number of people in the labor force changes between 2022 and 2060. While in the base scenario the labor force will increase by 27.2 million, the increase is greater in all alternative scenarios. Closing gender gaps would add an additional 9.9 million people to the US labor force according to scenario S1 and 14.3 million people according to scenario S1b. This highlights the large potential that greater activation of women has for the expansion of the labor force. Reducing disparities by race/ethnicity in terms of labor force participation rates, while holding gender gaps within population subgroups constant, can add about 6.5 million people to the labor force. Changes in education and health, by contrast, are projected to have a much smaller impact and add only about 2.6 million workers (under the assumption that participation propensities are held constant, conditional on personal characteristics). A decomposition of scenario S3 (Figure A-9 in the Appendix) indicates that this effect reflects distinct contributions of education and health. Adjusting educational attainment alone (S3_Edu) increases the labor force by about 1.4 million persons by 2060, while adjusting health status alone (S3_Health) adds about 0.9 million persons in employment. The remaining difference (around 0.3 million) reflects an interaction effect between education and health. Scenario S4, which combines S2 and S3, increases the labor force by 9 million workers compared to the baseline projection. In relative terms, the scenarios add between 1.2% (S3) and 7.2% (S1b) to the total labor force in the United States in 2060.[13]

Table A-3 in the Appendix shows how the projected labor force changes are distributed between population subgroups. When compared to the baseline, scenarios S1 and S1b lead to large numbers of additional White and Hispanic women in the labor force. In relative terms, however, the effects relative to the baseline are strongest for Asian women (+1.7/+2.1 million, respectively, compared to the baseline of +3.4 million). The additional non-Hispanic White women (+5.3/+5.8 million) would mitigate, but not fully offset, the projected decline in the labor force of our baseline (–7.2 million). Closing the gaps by race/ethnicity (S2) has the largest impact on Asian and Hispanic women's LFPR, as well as that of Black and African American men. The latter also show the strongest reaction in labor force participation under the assumption of improvements in educational attainment and health status (S3).

[13] Our simulations are based on population projections by the US Bureau of the Census (2017). The US Bureau of the Census (2017) does not publish bandwidths of these projections; in so far as the population predictions are subject to uncertainty, our simulated results might be considered less or more substantial, depending on the range of those projections. The projections might vary: for example, the median UN probabilistic population projection (United Nations 2024) for the total population in the US on January 1st, 2060 is 388.51 million, ranging between 348.87 million (low variant) and 429.75 million.(high variant). The US Bureau of the Census (2017) projects the US total population on July 1st, 2060, as 404.5 million.

Figure 2: Change in the labor force between 2022 and 2060, baseline and scenarios

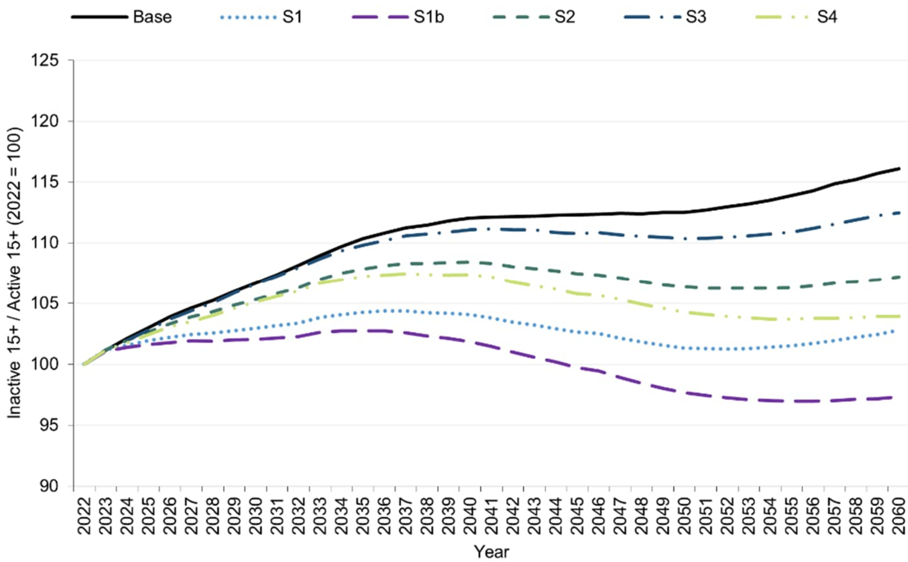


Note: The baseline scenario projects a labor force increase of 27.2 million persons by 2060. Scenarios assume convergence between women and men in each population group (S1, S1b), between women and men in minority groups towards women and men in the majority population (S2), and of education and health status of women and men in minority groups towards women and men in the majority population (S3). Scenario S4 combines scenarios S2 and S3.
Source: Own calculations, simulated values based on microWELT.

Figure 3 illustrates how the ratio of economically inactive people aged 15 and older to the total labor force (Dep_{pop}) changes over time. Removing disparities across the gender or the race/ethnicity dimension could mitigate population aging: According to scenario S1, the ratio increases much more moderately than in the baseline, reaching fewer than 64 inactive persons – compared to 72 in the baseline – per 100 active persons at the end of the projection period. According to scenario S1b, where adaptations in the participation rates of fathers are restricted to a smaller subset of households, this ratio declines to 60 inactive per 100 active persons. Scenario S2, in which race/ethnicity disparities are removed over time, is less favorable, but more than half of the negative impact of aging on the dependency ratio is offset, reaching 66 inactive for every 100 active persons in 2060. Removing health- and education-specific differences between population groups (S3) yields only a small improvement in the dependency ratio compared to the baseline. In the combined scenario S4, the ratio increases initially and declines over time to slightly over 64 inactive persons per 100 active persons.

Figure 3: Ratio between inactive and active persons aged 15+ (Dep_{pop}), 2022 to 2060

Baseline scenario and alternative scenarios

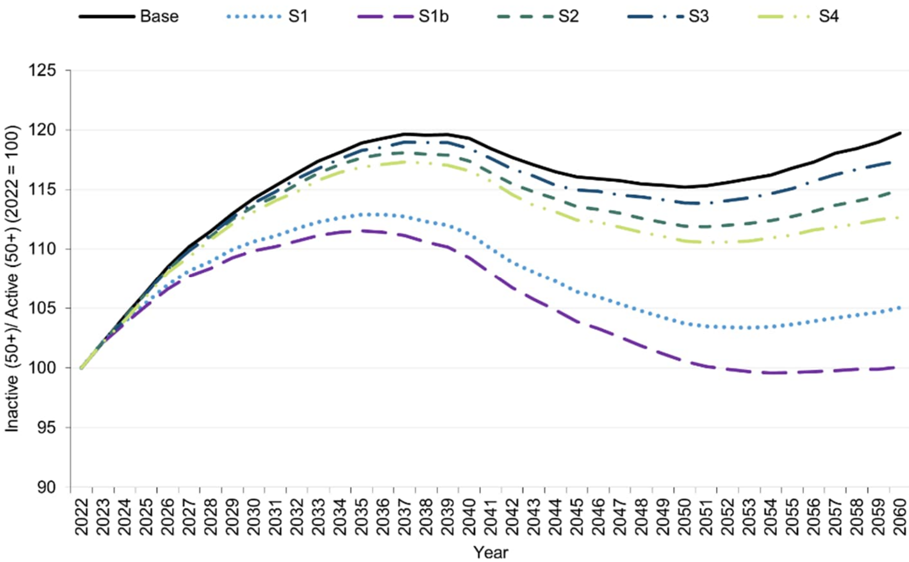


Note: Ratios shown here are indexed to the base year 2022. The baseline scenario projects a labor force increase of 27.2 million persons by 2060. Scenarios assume convergence between women and men in each population group (S1, S1b), between women and men in minority groups towards women and men in the majority population (S2), and of education and health status of women and men in minority groups towards women and men in the majority population (S3). Scenario S4 combines scenarios S2 and S3.
Source: Own calculations, simulated values based on microWELT.

Figure 4 shows how the second economic dependency indicator (Dep_{50+}) is projected to evolve over time in the different scenarios. Scenarios S2, S3, and S4 achieve only relatively small deviations from the baseline, whereas scenarios S1 and S1b appear to compensate for the projected demographic change. This highlights the potential that closing gender gaps in LFPR can have for raising the share of economically active older adults. As Figures A-3 and A-4 show, gender gaps in participation rates increase considerably with age, but there is also large variation across ethno-racial groups and gender gaps are much larger in the Hispanic and the Asian population than in the non-Hispanic White population.

Figure 4: Ratio between inactive and active persons aged 50+ (Dep50+), 2022 to 2060

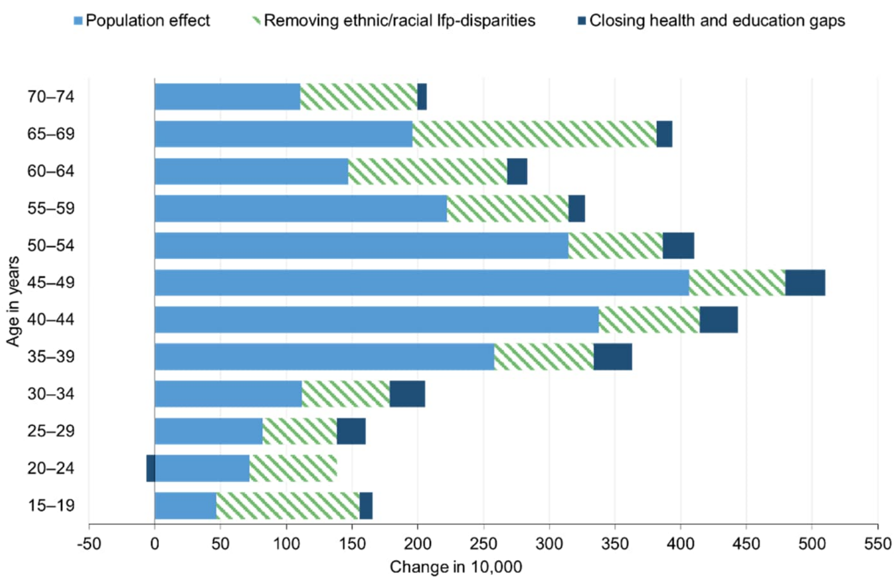
Baseline scenario and alternative scenarios



Note: Ratios shown here are indexed to the base year 2022. The baseline scenario projects a labor force increase of 13.8 million persons aged 50+ by 2060. Scenarios assume convergence between women and men in each population group (S1, S1b), between women and men in minority groups towards women and men in the majority population (S2), and of education and health status of women and men in minority groups towards women and men in the majority population (S3). Scenario S4 combines scenarios S2 and S3.
Source: Own calculations, simulated values based on microWELT.

Figure 5 decomposes the total change in the labor force of scenario 4, which combines scenarios 2 and 3 and lends itself to a decomposition into the change from differences in composition of the population (which are already included in the baseline), the change stemming from removing ethnic/racial disparities in labor force participation (scenario 2), and the change arising from removing disparities in education and health statuses (scenario 3). Population growth is the dominant effect for the majority of age groups, with the largest impacts expected for prime working-age groups. However, closing gaps in participation rates between ethno-racial groups for persons with similar characteristics would have large effects for the LFPR of younger and older persons. In the age group 65 to 69, for instance, reducing disparities would add about 1.85 million people to the labor force, thus almost doubling the effect resulting from population growth. Closing gaps in educational attainment and health status would make a smaller, evenly distributed contribution to increasing the labor force across almost all age groups. Since more education leads to a lock-in effect, improvements in health and educational attainment can have opposing effects on labor force participation at younger ages. This explains the small negative effect in the age group 20 to 24, while the positive effects resulting from improved health are slightly larger than the educational lock-in effects for the age group 15 to 19.

Figure 5: Decomposition of the total change in the number of labor force participants (scenario S4)



Note: Scenario 4 projects a labor force increase of 36.2 million persons by 2060, i.e., 9 million more than the baseline projection. Scenario 4 assumes convergence between women and men in minority groups towards women and men in the majority population, and of education and health status of women and men in minority groups towards women and men in the majority population. The simulated increase in the number of persons in the labor force for each age group is attributed to demographic aging, closing of ethnic/racial disparities, and the closing of health and educational gaps.
Source: Own calculations, simulated values based on microWELT.

5. Summary and discussion

In comparison to other advanced economies, the United States has distinctive characteristics in terms of population aging and labor force participation. Three key aspects stand out: first, the age distribution of the US population is and remains more favorable, as indicated by a lower demographic dependency ratio, than in most other OECD countries. Second, labor force participation in the United States is relatively low and lacks the pronounced upward trajectory seen in most other OECD countries. The third distinctive feature is the significant disparity in labor force participation rates between gender and racial/ethnic groups.

These disparities arise in part from substantial variations in education and health outcomes, translating into notable and enduring disparities in employment and earnings across different racial/ethnic groups and genders (Daly, Hobijn, and Pedtke 2020; Chetty et al. 2020; Moen, Flood, and Wang 2022). However, disparities in labor force participation extend beyond education and health backgrounds, as individuals with identical age, gender, familial obligations, education, and health, but belonging to different racial/ethnic groups, may differ in their participation in the labor force. Other disparities pertain to gender-based variations in labor force participation, exhibiting significant variation across different racial/ethnic groups.

The relevance of these disparities for labor force trends is highlighted by forecasts that suggest substantial shifts in the size of various population groups over the coming decades (Johnson 2020). We use a dynamic microsimulation model, microWELT-US, to assess potential changes in the labor force arising from the elimination of various gaps in labor force participation of various population groups. Incorporating education, health, partnership status, and the presence and age of dependent children in families as determinants of labor force participation, our model accurately reproduces the overall demographic shifts of official population projections based on age, gender, and race/ethnicity. The microsimulation analysis focuses on the comparison of several ‘what if’ scenarios.

In our baseline scenario, we project the future labor force from individual-level data, where labor force changes arise solely from simulated changes in population size and composition, accommodating changes in retirement age and educational attainment. Under these assumptions the labor force is expected to grow by 27.2 million, while the number of economically inactive persons will increase from 62 to 72 for every 100 economically active persons. Our scenarios indicate that around one-fourth of this change could be offset by resolving educational and health disparities between population groups, leading to the addition of 2.6 million persons to the labor force. By contrast, the complete elimination of disparities in labor force participation between racial/ethnic groups with otherwise identical characteristics would increase the labor force by about 6.5 million persons. The impact of closing the gender gap in labor force participation has an even larger impact, contingent on assumptions about how increased women’s labor force participation affects men’s participation in the presence of young children in families. These findings suggest that promoting convergence between men’s and women's labor market behaviors emerges as a notably promising strategy for enhancing labor force participation rates. The more ambitious scenario even outweighs the effect of population aging on economic dependency ratios.

While the scenarios underscore the potential consequences of addressing disparities between population groups, it is essential to acknowledge that some disparities may be more amenable to policy interventions than others, and their effects might vary in terms of timelines. For instance, improvements in education take decades to manifest in increased labor force participation, while changes in retirement age yield immediate effects. To maintain realism in our scenarios we do not adopt an idealized approach, aiming to converge labor force participation (or education) with the best-performing racial/ethnic group. Instead, we converge towards the non-Hispanic White population, while maintaining the levels of better-performing groups. In the same way, when addressing gender gaps we make assumptions about how the presence of young children influences men's labor force participation, considering that caregiving responsibilities will be more equitably shared as maternal labor force participation increases. Empirical evidence suggests that increases in maternal labor force participation affect men's labor force attachment only slightly (Patnaik 2019). Additionally, Farré and González (2019) demonstrate that the introduction of two weeks of paternity leave in Spain boosted maternal employment rates without significantly altering fathers' labor market engagement.

It is important to acknowledge that any such changes may take considerable time to materialize, as they depend on broader societal, cultural, and policy shifts. However, the recent shifts in labor force participation patterns observed in Europe, which are absent in the United States, indicate the potential responsiveness of labor force participation to policy interventions. Additionally, our simulations are based on current population projections and, while they are grounded in the best available data, they are inherently subject to uncertainty. Economic and demographic conditions can evolve in unpredictable ways, and some of the simplifying assumptions made in the model may not hold true in the future. These limitations should be kept in mind when interpreting the results, as they highlight the need for caution in drawing definitive conclusions from long-term projections.

International experiences also underscore the importance of a carefully designed policy mix rather than reliance on single measures, such as raising the retirement age, as proposed by some scholars to address the consequences of demographic aging (Goh et al. 2023; Vogel, Ludwig, and Börsch-Supan 2017). In this context, Berkman and Truesdale (2023) argue that further raising the retirement age is unlikely to counteract the impacts of demographic aging, given the challenges posed by precarious working conditions, familial caregiving obligations, health issues, and age-based discrimination, which hinder the ability of many individuals to work into their late 60s and beyond. They advocate for a comprehensive range of policies aimed at enhancing the working conditions for older workers and bolstering the financial stability of those outside the labor force. Their focus on improving job quality, particularly through prioritizing the well-being of older workers, offers a pathway to improving their employment prospects. Research by Ameriks et al. (2020) reveals that increased job flexibility would lead many older Americans to extend their working lives. Our findings align with this perspective, highlighting that a concentration on worker health coupled with a reduction in ethno-racial participation gaps can elicit behavioral changes that remove the necessity for elevating the statutory retirement age. Moreover, fostering the overall health of the US population is anticipated to yield dividends beyond the labor market, translating into investments in both physical and human capital.

Achieving convergence between groups and subsequently enhancing participation rates for minority group members necessitates addressing not just labor supply factors but also the labor demand aspects that impact labor market outcomes, particularly for younger and older workers. Consequently, policies must be formulated to account for both sides of the labor market. Successful policy frameworks mandate constant monitoring and adjustments. Certain policies may generate unintended consequences; for instance, over the past decade the creation of jobs conducive to older workers' needs has surged, yet these positions have predominantly been occupied by younger individuals, particularly well-educated women (Acemoglu, Mühlbach, and Scott 2022).

Growing recognition of the longitudinal nature of employment trajectories over the life course underscores the importance of considering long-term perspectives. Weisshaar and Cabello-Hutt (2020) demonstrate that relatively advantaged groups enjoy greater access to stable high-employment trajectories, emphasizing the potential benefits of reshaping cultural gender expectations that limit employment opportunities across the lifespan. Analogous to educational interventions that aim to level the playing field between social groups, such policies do not yield immediate changes in labor force participation but are indispensable for eradicating persistent disparities in employment patterns among racial/ethnic groups and genders. From a modeling standpoint, the long timelines of policy effects require the use of simulation tools capable of producing long-term projections to inform policy debate, promoting such a long-term perspective required for successful policy design.

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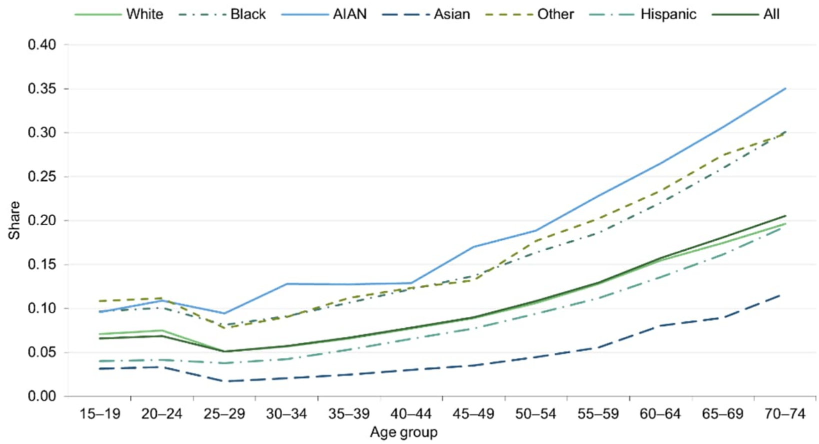
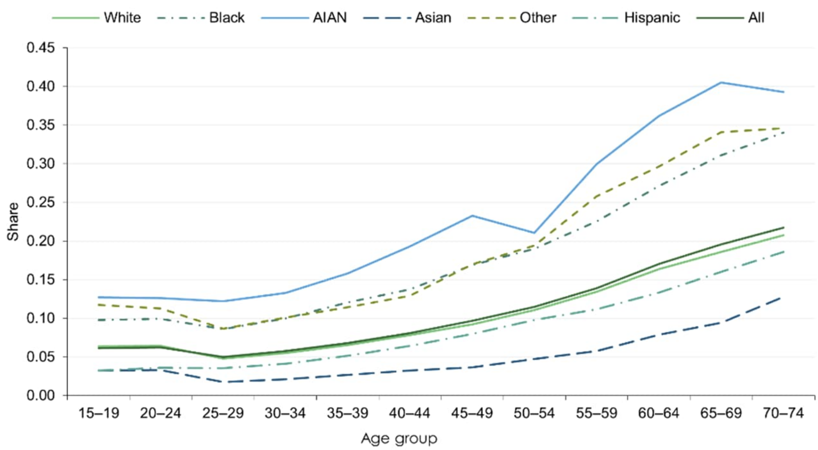
Appendix

Figure A-1: Share of women with health limitations



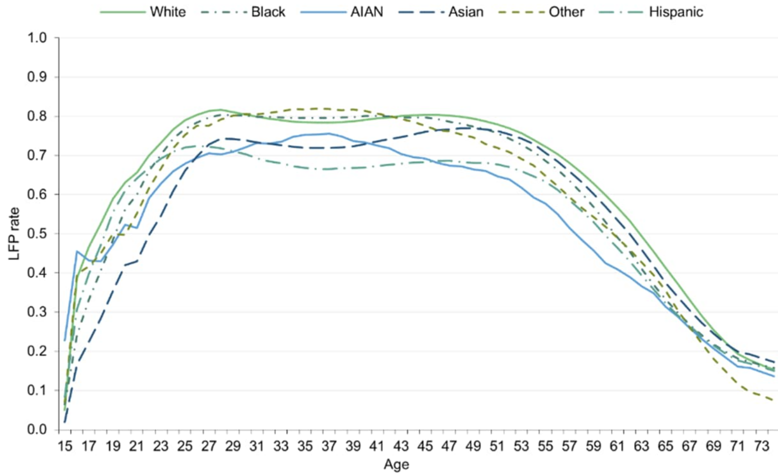
Note: Health limitation is defined as binary indicator taking the value 1 if respondents report health limitations implying work limitations, and zero otherwise.
Source: Own calculations based on ASEC-CPS data for 2017.

Figure A-2: Share of men with health limitations



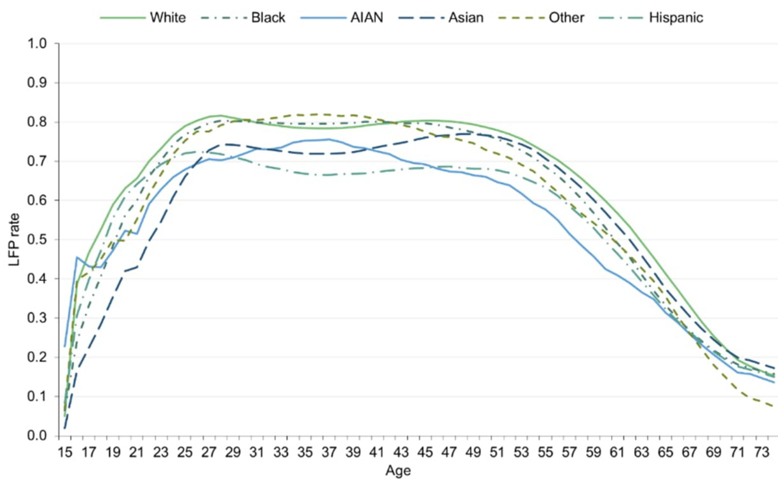
Note: Health limitation is defined as binary indicator taking the value 1 if respondents report health limitations implying work limitations, and zero otherwise.
Source: Own calculations based on ASEC-CPS data for 2017.

Figure A-3: LFP rates of women, by population group



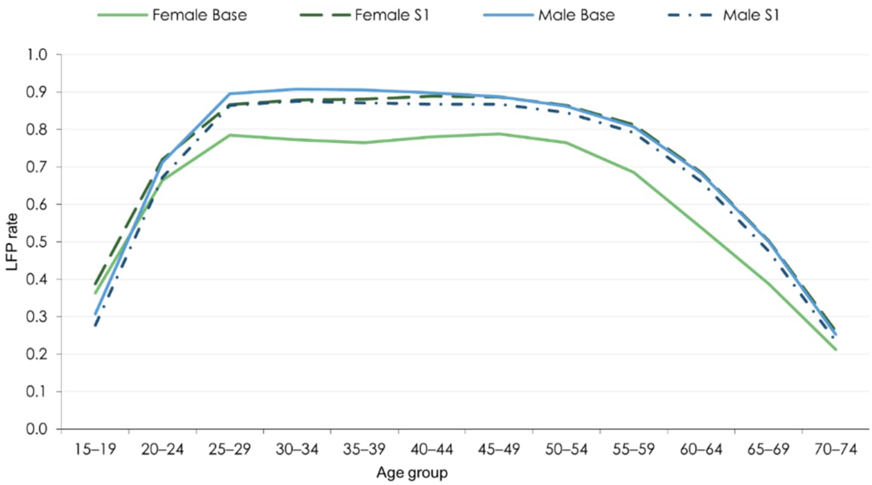
Note: For each population group, we plot the ratio of the number of women in the labor force over the total number of women in this age and population group.
Source: Own calculations based on ASEC-CPS data for 2017.

Figure A-4: LFP rates of men, by population group



Note: For each population group, we plot the ratio of the number of men in the labor force over the total number of men in this age and population group.
Source: Own calculations based on ASEC-CPS data for 2017.

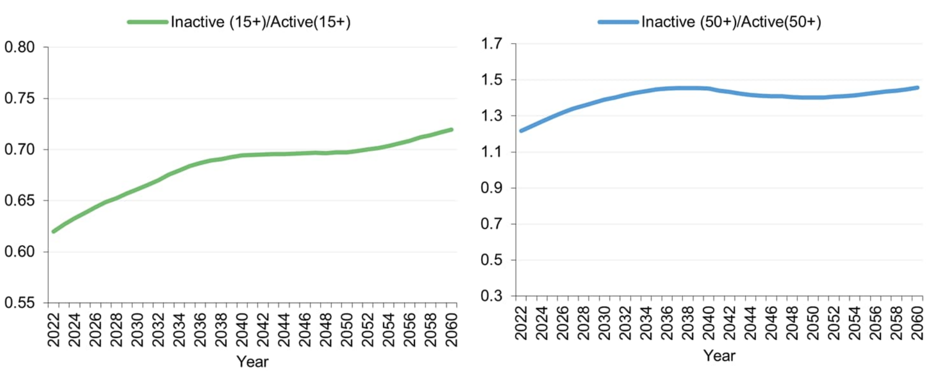
Figure A-5: Labor force participation rates of men and women, baseline and S1



Note: For each gender, we plot the ratio of the number of persons in the labor force over the total number of persons in this age and gender group.
Source: Own calculations based on ASEC-CPS data for 2017.

Figure A-6: Ratio between inactive and active persons according to the baseline scenario, 2022–2060

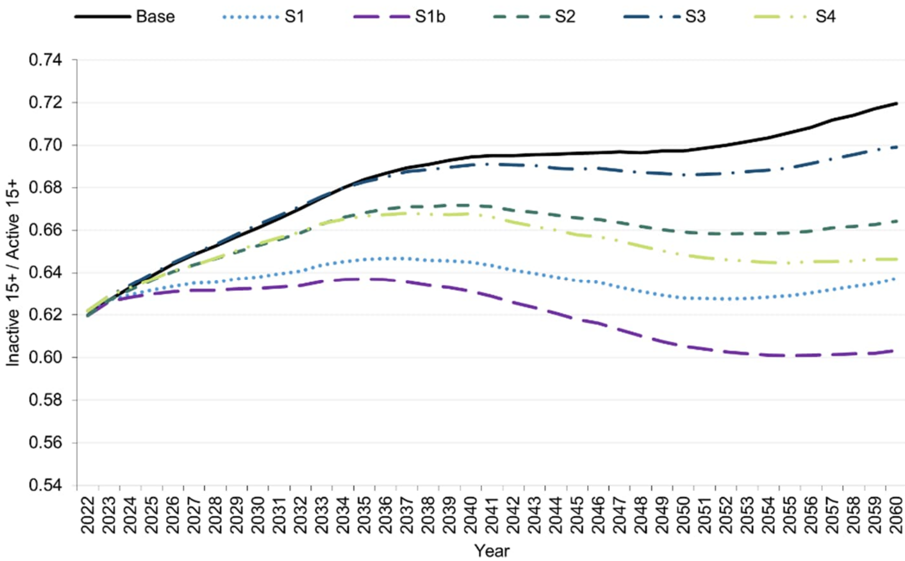
All persons aged 15 years or older and persons aged 50 years and older



Note: The baseline scenario shows how the future size and composition of the US labor force will evolve over time under the demographic assumptions defined in the Census Bureau's population projections, holding the impact of all influencing factors on labor force participation and health status constant throughout the simulation period.
Source: Simulations performed with the microWELT model based on ASEC data and population projections by the US Bureau of the Census (2017).

Figure A-7: Ratio between inactive and active persons aged 15+ (Dep_{pop}), 2022 – 2060

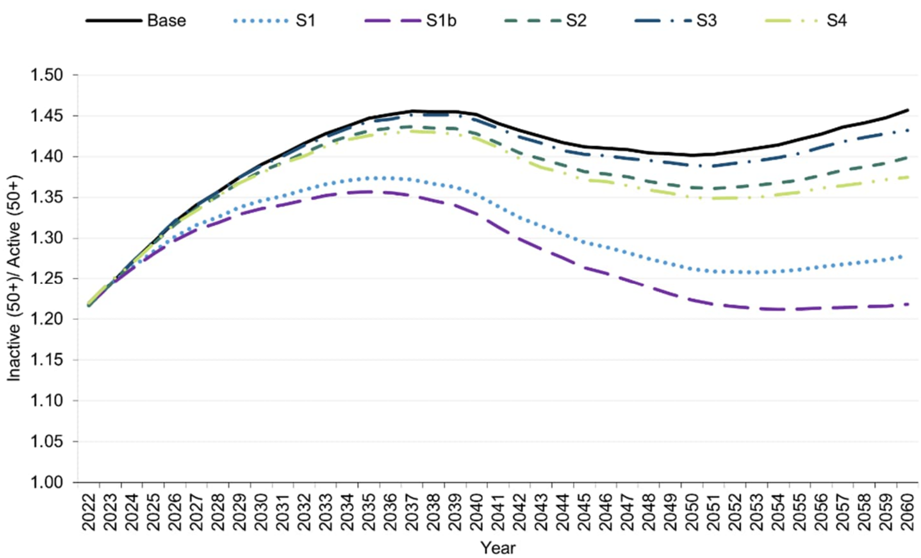
Baseline scenario and alternative scenarios



Note: The baseline scenario shows how the future size and composition of the US labor force will evolve over time under the demographic assumptions defined in the Census Bureau's population projections, holding the impact of all influencing factors on labor force participation and health status constant. Scenarios assume convergence between women and men in each population group (S1, S1b), between women and men in minority groups towards women and men in the majority population (S2), and of education and health status of women and men in minority groups towards women and men in the majority population (S3). Scenario S4 combines scenarios S2 and S3.
Source: Own calculations, simulated values based on microWELT.

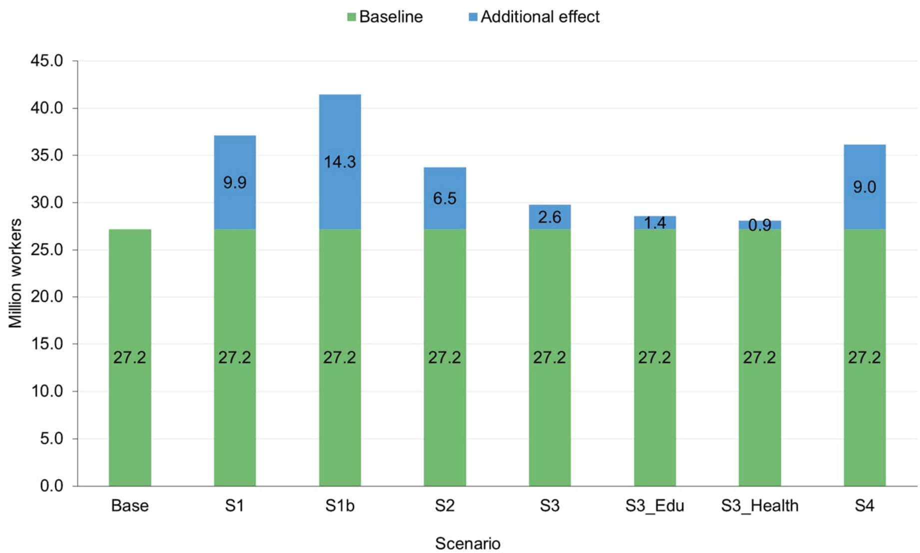
Figure A-8: Ratio between inactive and active persons aged 50+ (Dep_{50+}), 2022 – 2060

Baseline scenario and alternative scenarios



Note: The baseline scenario shows how the future size and composition of the US labor force will evolve over time under the demographic assumptions defined in the Census Bureau's population projections, holding the impact of all influencing factors on labor force participation and health status constant. Scenarios assume convergence between women and men in each population group (S1, S1b), between women and men in minority groups towards women and men in the majority population (S2), and of education and health status of women and men in minority groups towards women and men in the majority population (S3). Scenario S4 combines scenarios S2 and S3.
Source: Own calculations, simulated values based on microWELT.

Figure A-9: Change in the labor force between 2022 and 2060, including decomposition of scenario S3



Note: The baseline scenario projects an increase of the labor force of 27.2 million persons by 2060. Scenarios assume convergence between women and men in each population group (S1, S1b), between women and men in minority groups towards women and men in the majority population (S2), and of education and health status of women and men in minority groups towards women and men in the majority population (S3). Scenario S4 combines scenarios S2 and S3. Scenario S3_Edu is identical to scenario S3 but limits the convergence between groups to education. Scenario S3_Health is identical to scenario S3 but limits the convergence between groups to health.
Source: Own calculations, simulated values based on microWELT.

Table A-1: Estimated coefficients from logistic regression for LFP, men

	White	Black	AIAN	Asian	Other	Hispanic
Currently in education (Base category: no)						
Yes	–2.069	–1.836	–1.443	–2.417	–2.192	–2.310
	(–2.194 | –1.944)	(–2.086 | –1.587)	(–2.375 | –0.510)	(–2.727 | –2.107)	(–2.931 | –1.452)	(–2.501 | –2.120)
Highest level of education (Base category: below high school)						
High school	0.555	0.787	0.358	0.783	0.377	0.067
	(0.431 | 0.679)	(0.572 | 1.001)	(–0.277 | 0.994)	(0.439 | 1.126)	(–0.374 | 1.127)	(–0.086 | 0.220)
College	0.675	1.211	0.231	1.032	1.127	0.467
	(0.549 | 0.8)	(0.984 | 1.438)	(–0.454 | 0.915)	(0.682 | 1.381)	(0.375 | 1.878)	(0.298 | 0.636)
University	1.114	1.519	1.815	1.427	2.240	0.467
	(0.984 | 1.244)	(1.26 | 1.778)	(0.918 | 2.713)	(1.092 | 1.761)	(1.328 | 3.152)	(0.256 | 0.678)
Health status (Base category: good)						
Bad	–3.080	–3.526	–4.302	–2.591	–2.637	–3.367
	(–3.178 | –2.981)	(–3.739 | –3.313)	(–5.032 | –3.572)	(–2.982 | –2.200)	(–3.223 | –2.051)	(–3.562 | –3.171)
Constant	–2.074	–2.030	–1.571	–2.217	–1.872	–1.897
	(–2.353 | –1.794)	(–2.699 | –1.362)	(–3.274 | 0.133)	(–3.109 | –1.325)	(–4.187 | 0.443)	(–2.795 | –1.000)

Note: Logistic regressions also include single-year age indicators (not displayed). 95% confidence intervals are in parentheses.

Table A-2: Estimated coefficients from logistic regression for LFP, women

	White	Black	AIAN	Asian	Other	Hispanic
Currently in education (Base category: no)						
Yes	–1.165	–1.055	–1.737	–1.470	–1.322	–0.872
	(–1.269 | –1.062)	(–1.253 | –0.856)	(–2.439 | –1.036)	(–1.738 | –1.201)	(–1.856 | –0.787)	(–1.027 | –0.717)
Highest level of education (Base category: below high school)						
High school	0.643	0.389	1.064	0.512	0.298	0.568
	(0.528 | 0.757)	(0.197 | 0.581)	(0.479 | 1.649)	(0.254 | 0.77)	(–0.341 | 0.938)	(0.462 | 0.674)
College	0.940	0.837	1.701	0.893	0.619	1.084
	(0.827 | 1.054)	(0.642 | 1.032)	(1.115 | 2.286)	(0.628 | 1.158)	(–0.005 | 1.244)	(0.968 | 1.2)
University	1.296	1.085	2.476	0.803	1.070	1.342
	(1.182 | 1.411)	(0.872 | 1.298)	(1.771 | 3.182)	(0.562 | 1.044)	(0.394 | 1.746)	(1.206 | 1.478)
Health status (Base category: good)						
Bad	–2.143	–2.735	–2.500	–1.923	–2.469	–1.786
	(–2.23 | –2.056)	(–2.915 | –2.554)	(–3.074 | –1.925)	(–2.27 | –1.575)	(–2.964 | –1.975)	(–1.957 | –1.615)
Age of youngest child in family (Base category: none or at least 18 years of age)						
0–2	–1.045	–0.486	–0.533	–0.936	–1.600	–1.072
	(–1.149 | –0.941)	(–0.735 | –0.236)	(–1.185 | 0.120)	(–1.223 | –0.649)	(–2.216 | –0.984)	(–1.230 | –0.914)
3–5	–0.852	–0.310	–0.425	–1.055	–1.150	–0.789
	(–0.956 | –0.748)	(–0.559 | –0.061)	(–1.132 | 0.282)	(–1.318 | –0.791)	(–1.896 | –0.405)	(–0.94 | –0.638)
6–9	–0.398	0.226	0.757	–0.640	–0.570	–0.460
	(–0.505 | –0.291)	(–0.023 | 0.474)	(0.001 | 1.514)	(–0.909 | –0.37)	(–1.374 | 0.234)	(–0.612 | –0.309)
10+	–0.052	–0.059	–0.161	–0.206	–0.897	–0.111
	(–0.131 | 0.028)	(–0.238 | 0.119)	(–0.701 | 0.379)	(–0.428 | 0.016)	(–1.454 | –0.340)	(–0.235 | 0.014)
Constant	–2.702	–2.230	–0.929	–2.826	–1.019	–2.286
	(–2.993 | –2.411)	(–2.927 | –1.532)	(–3.116 | 1.259)	(–3.787 | –1.865)	(–3.337 | 1.299)	(–2.924 | –1.649)

Note: Logistic regressions also include single-year age indicators (not displayed). 95% confidence intervals are in parentheses.

Table A-3: Changes in the labor force, by scenario and population group, 2022 – 2060

	Baseline	S1	S1b	S2	S3	S4
	In millions	In millions, on top of baseline				
			Women			
White	–7.2	5.3	5.8	0.0	0.0	0.0
Black	2.0	0.8	0.9	0.4	0.5	0.9
American	0.0	0.1	0.1	0.1	0.0	0.1
Asian	3.4	1.7	2.1	1.4	–0.1	1.6
Other	2.8	0.4	0.8	0.1	0.1	0.3
Hispanic	10.7	5.3	5.8	1.7	0.8	2.3
			Men			
White	–7.6	–1.0	–0.5	0.0	0.0	0.0
Black	2.8	–0.2	0.0	1.3	0.8	1.9
American	0.1	0.0	0.0	0.1	0.1	0.2
Asian	3.9	–0.5	–0.1	0.4	0.0	0.4
Other	3.4	–1.0	–0.2	0.2	0.2	0.3
Hispanic	13.0	–1.0	–0.4	0.9	–0.1	0.9
Total	27.2	9.9	14.3	6.5	2.6	9.0

Note: The baseline scenario shows how the future size and composition of the US labor force will evolve over time under the demographic assumptions defined in the Census Bureau's population projections, holding the impact of all influencing factors on labor force participation and health status constant. Scenarios assume convergence between women and men in each population group (S1, S1b), between women and men in minority groups towards women and men in the majority population (S2), and of education and health status of women and men in minority groups towards women and men in the majority population (S3). Scenario S4 combines scenarios S2 and S3.
Source: Own calculations.

Table A-4: Labor force participation rates by age and gender over the projection horizon (baseline)

	2022	2030	2040	2050	2060
			Women		
15–19	0.369	0.368	0.366	0.366	0.363
20–24	0.671	0.671	0.667	0.667	0.664
25–29	0.784	0.784	0.787	0.786	0.784
30–34	0.769	0.768	0.771	0.773	0.773
35–39	0.757	0.760	0.760	0.765	0.765
40–44	0.768	0.775	0.775	0.776	0.780
45–49	0.777	0.782	0.783	0.784	0.788
50–54	0.751	0.756	0.759	0.761	0.765
55–59	0.664	0.673	0.683	0.684	0.686
60–64	0.509	0.525	0.532	0.538	0.538
65–69	0.328	0.365	0.378	0.389	0.387
70–74	0.168	0.181	0.199	0.209	0.211
All	0.622	0.626	0.636	0.638	0.633
			Men		
15–19	0.316	0.315	0.312	0.313	0.307
20–24	0.719	0.716	0.714	0.714	0.712
25–29	0.893	0.894	0.895	0.894	0.895
30–34	0.907	0.908	0.909	0.908	0.908
35–39	0.905	0.904	0.905	0.907	0.905
40–44	0.897	0.897	0.897	0.898	0.898
45–49	0.883	0.884	0.883	0.885	0.888
50–54	0.853	0.856	0.858	0.860	0.861
55–59	0.787	0.800	0.804	0.804	0.807
60–64	0.653	0.666	0.678	0.680	0.682
65–69	0.437	0.479	0.493	0.500	0.501
70–74	0.226	0.229	0.244	0.251	0.253
All	0.728	0.730	0.737	0.737	0.730

Note: The baseline scenario shows how the future size and composition of the US labor force will evolve over time under the demographic assumptions defined in the Census Bureau's population projections, holding the impact of all influencing factors on labor force participation and health status constant.
Source: Own calculations, simulated values based on microWELT.