Was It Demography All Along?
Population Dynamics and Economic Inequality

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Abstract

Broad movements in American earnings inequality since the mid-20th century show a correlation with the working-age share of the population, evoking concerns dating to the 18th century that as more individuals in a population seek work the returns to labor diminish. The possibility that demographic trends, including the baby boom and post-1965 immigration, contributed to the rise in inequality was referenced in literature before the early 1990s but largely discarded thereafter. This paper reconsiders the impact of supply-side dynamics on inequality, in the context of a literature that has favored demand-side explanations for at least 30 years, and a recent movement toward equality that coincides with the retirement of the baby boom generation, reduced immigration, and a long trend toward reduced fertility. Evidence suggests an important role for the population age distribution in economic inequality, and coupled with demographic projections of an aging population and continued low fertility portends a broad trend toward greater equality over at least the next two decades.

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1. Introduction

In the United States, the past century has been marked by three dominant trends in income inequality, with evidence suggesting the recent emergence of a fourth. The period between the late 1920s and the early 1950s, the "Great Compression," witnessed a notable decline in inequality. This era gave way to a period when inequality remained relatively stable and low; depending on how inequality is measured a transition to a multi-decade trend toward greater inequality occurred sometime between the mid-1960s and the late 1970s. The most recent data can be read as indicating either a period of stability or declining inequality. Figure 1, drawing on Current Population Survey data spanning nearly sixty years, documents the inflection point in the time series of male worker earnings, a reversal dubbed the "unexpected compression" by Autor, Dube, and McGrew (2023).

A significant and well-cited literature has proposed and investigated a series of explanations for the rise in inequality. The last half-century has been marked by increased international trade, particularly with what had been lower-income countries. Cross-sectional evidence across US local labor markets shows significant reduction in labor force participation and wages when industries are more exposed to import shocks (Autor, Dorn, and Hanson 2013). Declining unionization has been linked to rising inequality (Freeman, 1993; DiNardo, Fortin, and Lemieux 1996; Card 2001), as have declines in the real value of the minimum wage, albeit more tenuously (DiNardo Fortin, and Lemieux, 1996; Lee 1999; Autor, Manning, and Smith 2016). Skill-biased technological change, a process whereby innovation creates substitutes for traditionally low-paid and often routine tasks, is perhaps the most frequently cited explanation for rising inequality (Bound and Johnson 1992; Berman, Bound and Machin 1998; Card and DiNardo 2002). These studies have prompted calls to address inequality by strengthening labor

market regulations and institutions on the one hand, or encouraging higher education and skill investment on the other.

In contrast with these fundamentally demand-based explanations for trends in inequality, this paper investigates the supply-side hypothesis: that the rise in inequality coincides with a historic rise in the proportion of the population available to work. Figure 3 shows the long-run trends in this metric, beginning with the 1850 Census and concluding with the American Community Survey of 2020. The proportion of the population between the ages of 18 and 65 rose consistently from a local minimum in the 1960s to a global maximum of 63.7% in 2007 and 2008 and has since declined – in a period where measured inequality has also declined.

The hypothesis that society might run short of productive forms of work as the proportion of people seeking it rises has deep historical roots (Smith, 1776; Malthus, 1798; Ricardo, 1817). The possibility that the postwar rise in income inequality might be driven by a postwar demographic trend – the baby boom – figured in early literature between the late 1960s and the early 1990s but grew to be overshadowed by the demand-based explanations listed above. The fortunes of least-educated and least-experienced workers seemed to take a turn for the worse at a time when their supply was actually dwindling (Katz and Murphy, 1992). And "natural experiment" cross-sectional evidence suggested that expansions in the labor force did not cause reductions in wages (Card, 1990). To the extent supply factors into more recent studies of inequality, it is in the form of an argument that the supply of college-educated workers is not growing rapidly enough to meet rising demand.

This paper begins by documenting basic trends in the relative size of the potential workforce in the United States, drawing on data from the Census, the American Community Survey, and the Current Population Survey. It then considers the historiography of rising inequality over the past half-century – the history of how economists have offered explanations

for trends evident in workforce data from the mid-1960s onward. It reconsiders two key pieces of evidence that helped undermine the case for supply-side explanations in the early 1990s: the impact of the Mariel boatlift on the labor market in the Miami area in the early 1980s (Card, 1990), and the declining fortunes of young, less-educated workers even as they became a smaller share of the workforce in the 1980s (Murphy and Katz, 1992).

The Mariel Boatlift clearly raised the population of the Miami metropolitan area, and the working-age share of the population increased by 2 percentage points between March 1980 and March 1981. But the number of individuals in and out of the labor force grew in equal proportion, raising questions about the generalizability of the case for the hypothesis under consideration. As regards the fortunes of the least-educated and least-experienced, evidence problematizes the basic measure of potential labor market experience used in the literature, as a significant number of workers in the baby boom cohort entered the workforce years after this measure would have timed the event. Case study evidence presented later in the paper shows that the number of college-educated workers over 40 expanded by over 50 million between 1968 and 2022, while employment in the 10 occupations most likely to employ such workers in 1968, collectively accounting for nearly 60% of that segment of the workforce, expanded by under 14 million. At the same time, the share of college-educated workers in traditionally less-educated, less-experienced occupations such as farm laborer, child care worker, and waiter/waitress expanded significantly. The evidence clearly points to a surplus, rather than a shortage, of college-educated workers.

This study also presents simple regression evidence documenting an association between the working-age share of the population and the labor market outcomes of workers. The effects of a rising working-age share are more negative for less-educated workers and a simple calculation suggests that this factor could explain 28% of the rising college wage premium

between 1968 and 2022. These differential effects apply to both real weekly wages and measures of labor force attachment, and appear in models with no time controls, linear time trends, quadratic time trends, and year fixed effects, as well as models identifying off state-by-year variation in working-age share.

While there is no pure "natural experiment" that can isolate the causal impact of population demographics on inequality econometrically, the preponderance of evidence is consistent with a basic model where the level of labor demand in an economy is tied to its population, and the returns to labor diminish as a greater proportion of that population seeks work. Owing to a fundamental asymmetry in labor substitution – highly trained workers can take jobs requiring little training, but not the reverse – surplus labor tends to accumulate at the low end of the skill distribution, exacerbating inequality. Evidence suggests that this pattern is maintained by labor market institutions that impose barriers to entry in professions dominated by highly educated workers. The top three occupations for college-educated workers over 40 – schoolteachers, managers and administrators, and physicians in that order – are commonly unionized in one case, subject to quantity regulation via the rationing of training opportunities in a second, and are responsible for their own hiring in the third.

Importantly, shifting demographics can help explain the recent stabilization or decline in inequality in a way that demand-side explanations cannot. Inequality is lower than it was a decade ago, as is the share of the population of working age thanks to the retirement of the baby boom generation. It is difficult to argue that skill-biased technological change has reversed, or that international trade has diminished. As noted, the supply-side hypothesis dovetails with labor market institution arguments in potentially unexpected ways, and other factors such as recent state and local increases in the minimum wage may play a role as well.

2. Stylized facts

2.1 Broad trends in inequality

Previous historical analyses have documented broad trends in American inequality. The period between the Civil War and the Great Depression was marked by stable, high inequality with a brief interruption during World War I (Williamson and Lindert 1980; Levy and Murnane 1992). This era gave way to the "Great Compression" spanning the depression years, World War II, and the early postwar era, a time of rapidly declining earnings inequality and falling shares of income accruing to households at the top of the distribution (Goldin and Margo 1992; Piketty and Saez 2003). The immediate postwar era gave way to a three-decade-period when inequality remained relatively stable and low, although the exact extent of the stability varies by metric. By one measure, inequality rose somewhat in the 1950s and 1960s before falling in the 1970s (Goldin and Margo 1992; Karoly 1992).[1] Moving into the 1980s, there is a less ambiguous trend toward greater inequality that continues, with modest interruptions, for about three decades. And as noted above data for the past ten years suggests stability or a modest decline in inequality.

Figure 1 tracks two simple measures of inequality, the ratio of the 90th to 10th percentile of annual earnings and weekly wages among male workers meeting the selection criteria laid out in Juhn, Murphy, and Pierce (1993).[2] After showing an anomalous high reading in 1962, this measure shows a pattern of steady increases between the mid-to-late-1960s and late 1980s.[3] As

[1] Specifically, the measure showing a decline is the variance of the natural log of annual earnings, applied to white men who worked at least 35 hours a week; with adjustments for variation in weeks worked either by converting earnings to a weekly measure (Goldin and Margo 1992) or restricting analysis to those working at least 50 weeks (Karoly 1992). The pattern of rising and then falling inequality between the mid-1960s and late-1970s also appears in more comprehensive samples of workers (Blackburn & Bloom 1987; Karoly 1992; Bluestone 1990).
[2] Juhn, Murphy and Pierce focus on males age 18-65 who worked full time for at least 14 weeks in the prior year, excluding individuals who reported being retired or enrolled in school, and excluding those who report being self-employed.
[3] There are potential data quality concerns with the CPS samples before 1968, which were never released as public use files, lack complete documentation, and exhibit anomalies in weighting (Flood et al., 2022).

we will learn below, this roughly corresponds to the period of time when the baby boom cohort, born between 1946 and 1965, would have been expected to enter the workforce. Inequality in annual earnings rose more rapidly than in weekly wages, indicating that this period of rising inequality was marked by weaker labor force attachment among low-earning males.

By either measure, earnings inequality peaked in the mid-2010s. The rise in inequality after the mid-1980s was not continuous. Both annual and weekly wage measures show movements towards equality around 1990 that are then reversed. There is little net change in inequality between 1994 and the turn of the millennium, followed by increases thereafter. Annual earnings inequality has shown little fluctuation since 2005; inequality in weekly wages fell during the Great Recession, rose during the early portion of the subsequent recovery, and has since fallen again to a level just below the 2005 value.

There is some question as to what is the "right" method of measuring inequality, or the "right" sample.[4] Most studies have restricted analysis to individuals with at least some labor market income. Among these, some further restrict analysis on the basis of labor force attachment, excluding part-time workers or limiting to those who worked most of the year. These are reasonable decisions if the goal is to understand the evolution of inequality of compensation per unit of time, a basic measure of the marginal product of labor if markets are competitive. But particularly given the prevalence of involuntary unemployment and underemployment, there is also a case to be made for studying inequality in earnings regardless of effort, if the driver of effort exerted is the availability of work opportunity.

[4] In the CPS data from 1968-2022, the 90/10 ratio in household income shows a markedly different pattern. After reaching a local minimum around 1976, household income inequality has risen almost continuously for nearly fifty years, reaching its maximum value in 2022. Household income measures incorporate the value of investment and retirement income, as well as transfer payments.

Figure 2 offers perspective on this matter by plotting the proportion of the male population, age 18-65, that satisfy the selection criteria of Juhn, Murphy and Pierce (1993).[5] This statistic held steady at above 70% through the mid-1970s, then declined through the mid-1980s. An era of rising earnings inequality was thus also an era where a shrinking proportion of men even qualified to be included in the analysis. Figure 1 thus likely understates the true widening in labor market disparities during this time period.

This measure of labor force attachment shows improvement to 1990, a setback coinciding with the recession of the early 1990s. Again, this pattern suggests that basic data on earnings inequality understate the amplitude of shifts in the economic fortunes of lower-earning workers; the late-1980s decline in 90/10 ratios occurred in a period of improved labor force attachment while the early 1990s resurgence of earnings inequality was accompanied by a reversal in the attachment trend.

The stability of earnings inequality through the later 1990s was accompanied by improvements in labor force attachment; the increases seen after 2000 coincide with worsening attachment. The stable annual earnings inequality evident in data between 2005 and 2011 should be understood as occurring during a period where a declining share of men qualify to be included in the analysis. The labor force attachment trend reverses after 2011, however. The evident pandemic-interrupted decline in earnings inequality if anything understates the relative improvement in labor market prospects for lower earners.

2.2 Broad trends in basic demographics

[5] Figure 2 excludes data from the years before 1968, which show considerably lower rates of satisfying the JMP criteria, ranging from 36% to 63%.

Figure 3 presents simple data on the age distribution of the population, as revealed in the decennial Census and Current Population Survey, between 1850 and 2022. In the 19th century, the population skewed much younger than in more recent decades. Nearly half the population had yet to reach its 18th birthday, and roughly 2% of the population was over 65. From 1860 to 1940, the proportion of children in the population steadily declined, from nearly 5 in 10 to just over 3 in 10. Correspondingly, the proportion of the population of working age, broadly construed, expanded to reach a local maximum of 63.5% in 1940.

The impact of the baby boom is clearly visible in the years immediately after 1940. The proportion of the population of working age reverted to levels last witnessed in the latter 19th century, reaching a local minimum in the 1960s. By the mid-1980s, a significant proportion of the baby boom generation had reached the age of majority, and their numbers were supplemented by immigration, which had been heavily restricted between 1920 and 1965.[6] The percent of the population of working age has exhibited three inflection points since the mid-1980s, falling through the mid-1990s, rising from then through roughly 2010, and declining since. In 2022, the working-age share dropped to 61.8%, the lowest level recorded in the March CPS since 1980.

These trends occurred in the context of steady declines in the proportion under 18 and a steady rise in the elderly population. By 2020, children accounted for 22% of the population, less than half the proportion seen in the late 19th century. The proportion of the population over 65, by contrast, has reached 16%. Whereas the mid-century decline seen in Figure 2 was driven by

[6] The foreign-born population of the United States reached a local minimum in 1970. Between 1970 and 1990, the foreign-born population rose by 10 million; between 1990 and 2010 it rose 20 million more.

births, the decline since 2010 has been driven by aging, coupled with low birth rates and a reduced flow of immigrants.[7]

Figure 4 presents more fine-grained detail on recent demographic trends. Abstracting from immigration and prime-age mortality, the fifty-year trend evident in Figure 3 reflects a consistent excess of young people entering prime age over older people exiting. Figure 4, based on Current Population Survey data, shows the number of 18 and 65-year-olds in the United States each March since 1968. Acknowledging that the data from 1962 to 1967 are potentially unreliable, the graph nonetheless shows the baby boom attaining the age of majority between the mid-1960s and the early 1980s. Between 1966 and 1983, the number of 18-year-olds exceeded the number of 65-year-olds by more than 2 million every year, with a peak differential occurring in 1977.

The cohort size differential narrows as we move forward in time, reaching a local minimum in the early 1990s. From 1992 to 2000, however, the size of the 18-year-old cohort rebounds, and the surplus of 18-year-olds over 65-year-olds reaches the 2 million threshold once again in 1999. For the past two decades, there has been little trend in 18-year-old cohort size, and a significant upward trend reflecting the baby boom generation reaching retirement age. While the most recent data continue to show a surplus of 18-year-olds over 65-year-olds, if current trends continue there will soon be a historic reversal, with the number of persons aging out of the labor force exceeding the number aging in for the first time in recorded history.

If we were to craft a basic prediction on the basis of demographic data, we might expect the long period between the Civil War and 1940 to be marked by rising inequality, as the workforce grows in relation to the population. This trend would have reversed at midcentury,

[7] Estimates indicate that the foreign-born population of the United States rose by about 5 million in the 2010s, roughly halving the arrival rate of the previous two decades.

with the baby boom and immigration restrictions increasing the size of the population in relation to the workforce, then resumed as the baby boom entered the workforce and immigration restrictions relaxed. The exact prediction between the mid-1980s and roughly 2010 is complicated; based on birth rates alone we might expect a lull in rising inequality through the first part of this period, but immigration rates were quite high in the 1990s. The prediction is somewhat easier coming out of the 1990s, with the baby boom continuing to be of working age, immigration continuing at a high rate, and 18-year-old cohort sizes returning to the peaks of the baby boom era. After 2010, as immigration slows and the baby boom cohorts begin to retire, we see the working-age share of the population decline, suggesting a reversal in inequality.

Reality bears some resemblance to this predicted pattern. The timing is not always perfect. The "Great Compression" occurred before the baby boom, not as a consequence of it. But the pattern of rising inequality between the mid-1960s and late-1980s, intermittent increases in the following two decades, and evidence of downward trends in more recent data suggest that supply-side explanations merit further investigation.

2.3 From age distribution to labor supply

While the shifting age distribution of the population suggests a rising proportion of individuals seeking work over the latter half of the 20th century, individual participation decisions could theoretically offset or augment the trend. Figure 5 uses March CPS data to plot the working-age population (age 18-65) and the count of individuals in the labor force, on a logarithmic scale. Any fluctuations in the propensity to enter the workforce are barely perceptible on this plot, with even the pandemic creating only a very small blip. The size of the working age population and the size of the labor force are very strongly correlated in time-series data (r=0.996).

This chart does mask a shift in labor force participation over time. The ratio of the labor force to the working-age population rose from 72% in 1968 to 80% by the late 1980s, and has fluctuated in an extremely narrow range ever since. In the 36 years between 1987 and 2022, the ratio has remained between 79 and 81 percent with the exception of a period between 1996 and 2002 when it briefly exceeded 82 percent, and five years after the Great Recession when the ratio fell as low as 78.5%.

Revisiting earlier evidence, the period between 1968 and 1987 is marked by both a significant expansion in the share of the population of working age, and a rising share of that population choosing to seek work. After 1987, both time series fluctuate in relatively narrow bands, and somewhat inversely to each other. The period of peak labor force participation begins as the working-age share reaches a trough; the period of low participation occurs shortly after the other time series reaches its all-time peak.

2.4 Other trends of potential relevance to inequality

In recent decades, narratives seeking to explain broad changes in inequality have focused on labor market institutions, such as unionization and the minimum wage, skill-biased technological change, and international trade.

For much of the period under study, the unionization rate declined monotonically (Farber and Krueger 1992; Slaughter 2007). Figure 6 shows union representation rates derived from the Current Population Survey between 1983 and 2022. Aside from small blips associated with recessions around 2008 and 2020, the time series shows a steady drop from 23 percent to a minimum of 11.3 percent in the most recent data. Notably, unionization continues to decline through periods marked by steady or declining earnings inequality around 1990, in the late 1990s, and in recent years.

The Federal minimum wage reached an inflation-adjusted peak around 1968. Since then, steadily declining inflation-adjusted values have been punctuated by discrete increases at specific points in time. The value of the minimum wage jumped significantly in 1974, between 1990 and 1991, between 1996 and 1997, and between 2007 and 2009. There is perhaps some evidence linking these increases to declining inequality, particularly the drop witnessed in weekly earnings inequality between 2007 and 2009 in Figure 1. While the inequality declines of more recent years occurred with a fixed nominal Federal minimum, a growing number of states and localities have adopted significantly higher minimum wages.

There are few direct measures of skill-biased technological change; its presence has often been inferred on the basis of indirect observation. Figure 7 shows a basic time series measure of technological innovation, the number of patents assigned to Santa Clara County, California, home to Stanford, Palo Alto, and most of "Silicon Valley." Patent activity ramps up considerably in the 1990s, continuing an upward trend to a peak of over 1,711 patents issued in 2015. Since that time, patenting activity has declined, quite prominently in the period since the COVID pandemic. Even so, the number of patents assigned to Silicon Valley in 2022 exceeded that in all years prior to 2002. By this measure, the period of steady to declining inequality over the past decade or more coincides with a period of unprecedented technological innovation, which brought widespread handheld computing devices and applications with great potential for labor market disruption. While it is conceivable that the technological change of the iPhone era has been less skill-biased than before, it is hard to argue that technological stasis has caused the recent decline in inequality.

Finally, Figure 8 shows that the rise in inequality paralleled a rise in international trade. Imports amounted to roughly 4% of GDP from 1950 through 1965, then began a steady climb, reaching a peak of 18% of GDP in the early stages of the Great Recession. As of 2022, imports

had declined somewhat in relation to GDP, but the 15% ratio evident that year was higher than that observed in any year prior to 2004. The downward trend in trade since the Great Recession is broadly consistent, however, with patterns of inequality showing a decline over the same time period.

Disentangling the effects of these various factors is ultimately too heroic a task for this exercise. But as the next section will illustrate, factors such as technology, trade, and labor market institutions including unions and the minimum wage have figured prominently in inequality discourse over the past 30 years. Broad movements in labor supply have not. This paper seeks to assess whether labor supply has been dismissed too hastily from the conversation.

3. Theory and historiography

Concerns that a quality of life necessarily declines as the population expands trace back centuries. In *The Wealth of Nations*, Adam Smith (1776) observed a link between population growth and reduced living standards in England: "A greater number of people are thus crowded into a narrow compass, and the necessaries of life are more scantily distributed to each individual. This necessarily diminishes, more or less, the enjoyments of all those who have not acquired fortune sufficient to supply them with the superfluities of life." Malthus (1798) imagined a simple model of population increasing geometrically while food supplies rose linearly. Ricardo (1817) argued that population increases in excess of capital growth would necessarily reduce laborers' quality of life.

Each of these arguments hinges on the presumption that population expansion would stretch some finite resource to its limit. Technological advances, particularly in agriculture, have rendered Malthusian predictions of mass starvation antiquated if not offensive in hindsight. But a variation on this general theme, most closely articulated by Ricardo, holds that the amount of

work to be done in an economy is largely a function of the population, and as a growing share of that population seeks to do the work a shortage of employment opportunity may emerge. Roughly a quarter of the workforce in the March 2022 CPS, for example, reported an industry related to health care, residential care, child care, or education. As the share of young or old members of society increases, demand in these industries rises.

Predictions of reduced opportunity or wages as the workforce grows in proportion to the population also derive from more contemporary mathematical models. In a simple aggregate production function where output in any time period is a function of undifferentiated labor and some fixed factor such as land, an increase in the availability of labor predicts a decline in wage income relative to land rents under reasonable assumptions (Lam, 1997).[8] Similar results hold in models with endogenous capital accumulation.

Arguments that an abundance of labor would create scarcity of work opportunity persisted well beyond the late 18th century. Lindert (1978) maintained that "no other potential influence on the distribution of income fits the long-run movements in inequality as well as the behavior of the labor supply." (as quoted in Lam, 1997). Yet even the earliest attempts to understand the rising inequality that took root in the latter half of the 20th century discount the potential importance of labor supply movements (Henle, 1972; Dooley and Gottschalk 1982), on the basis of arguments that the timing of the baby boom's entry into the workforce didn't quite match up with the timing of the rise in inequality, or that inequality rose within cohorts and not only between them.

These rhetorical arguments, based on empiricism much more casual than economists would come to expect after the "credibility revolution," spawn ready counterarguments. Henle

[8] Specifically, the elasticity of substitution between labor and the fixed factor must be less than one, consistent with available evidence (Morawetz, 1976).

(1972) notes "The youngsters representing the postwar 'baby boom' did not start to enter the work force in large numbers until the last half of the 1960's, yet the trend toward inequality is just as strong for the period before 1965. Thus, at a minimum other causal factors were also at work." Yet Henle's own data show that the Gini coefficient for wage and salary income of male workers rose from 0.338 in 1960 to 0.341 in 1965, and then from 0.341 to 0.356 between 1965 and 1970. Selecting different time series or different starting and ending points can significantly alter conclusions.

The Dooley and Gottschalk (1982) focus on between- versus within-cohort inequality echoes other literature of the time suggesting that the size of the baby boom cohort might be bad for that cohort, but would not have more pervasive effects (Easterlin 1978; Welch 1979). The effect of the baby boom on inequality, to the extent it existed, was forecast to be a temporary phenomenon, linked to the then-young age of the cohort and the well-established age-earnings profile. Embedded in this literature, and later studies to come, would be the notion that workers of a given age or experience level are more substitutable for one another than workers of different ages.

An alternative view of the labor market might be termed one of *asymmetric substitutability*. The logic is simple; highly trained and experienced workers can, in a pinch, always perform tasks that require less training and experience. Physicians can, with a modest amount of training, drive taxis; attorneys can wait tables; philosophers can sell vacuum cleaners door-to-door. But the reverse is generally not true. In the presence of a surfeit of highly trained and experienced workers, members of the group that cannot find work join a *cascading surplus*, widening the ranks of the labor force available to perform less highly specialized tasks. Predictions that middle-aged baby boomers would not negatively impact the prospects of newer, smaller cohorts rest on the

presumption that middle-aged workers unable to find work suitable to their experience level would not turn to jobs requiring less experience.

As additional labor market data arrived through the 1980s, a spate of researchers documented the continued rise in inequality and considered explanations therefor. While several studies attributed the declining college wage premium of the 1970s to a glut of baby boom graduates, demand-side explanations received much more attention than the supply-side in general. Bound and Johnson (1992) note some support for supply-side explanations in their analysis, but focus much more attention on skill-biased technological change – only the latter explanation appears in the article's abstract.

Katz and Murphy (1992) examine income inequality spanning three time periods: 1963-71, 1971-79, and 1979-87. Members of the baby boom opting to join the workforce rather than pursue higher education began to be a factor in the first time period; college-educated workers would have entered the labor market in larger numbers during the second. The relative movements in experience and education premia suggest that the first wave of baby boomers were substitutes for more-experienced but less-educated workers, who saw setbacks in their earnings. The college premium declined in the second.

In the third time period, Katz and Murphy note that less-educated, inexperienced workers declined as a share of the workforce yet saw their relative earnings decline. In their analysis, this pattern is a significant strike against supply-side explanations for rising inequality. Juhn, Murphy and Pierce (1993) for their part cite Katz and Murphy's evidence as limiting the potential role of the baby boom.

Strikingly absent from many of these early-1990s analyses is any mention of the role of immigration. In part, this can be attributed to data limitations. The Current Population Survey, which played a leading role in study of the labor market in this era, did not collect information

on respondent birthplace until 1994. Authors of the early 1990s correctly noted that much of the baby boom generation had entered the workforce by the late 1970s, thirty years after the boom began. But thanks in large part to accelerating immigration, the growth of the labor force between 1979 and 1987 reflected only a minor slowing relative to the rate between 1971 and 1979 (13.5% in the latter period against 15.4% in the former).[9]

Around the same time these studies of rising inequality were published, the question of the impact of immigration on the labor market rose in prominence. Card's (1990) examination of the impact of the Mariel boatlift on the Miami labor market heavily influenced this literature, adopting a "natural experiment" approach presaging the "credibility revolution" that would transpire over the subsequent decade. The notion that an influx of immigrants to a local labor market might not have a negative impact on incumbents in that same labor market undoubtedly amplified skepticism regarding the role of labor supply shifts in rising inequality.

From the early 1990s forward, the possibility that trends in inequality might be attributed at least in part to supply-side trends receded further from view. DiNardo, Fortin, and Lemieux (1996), in an analysis primarily focused on the relative importance of labor market institutions such as unionization and the minimum wage, note that "supply and demand" factors also matter, but in introducing the analysis the set of such factors enumerated are drawn almost exclusively from the demand side – trade, skill-biased technological change. The one supply-side factor noted is not the ratio of working-age persons to population, but "the slowdown in the rate of growth in the supply of skilled workers."

Card and DiNardo (2001), casting doubt on skill-biased technological change as the "unicausal" factor driving trends in income inequality, and referencing Lee (1999), point to the

[9] Freeman and Katz (1994) mention immigration, particularly low-skilled immigration, as a factor in American inequality during the 1980s.

declining real value of the minimum wage as the alternate culprit; there is no reference to the "baby boom" or even immigration in their study. Autor, Katz, and Kearney (2008) in turn cast doubt on Card and DiNardo's conclusions, citing what would become a consensus that that the slowing growth of college-educated workers contributed to rising inequality, but did not consider broader supply factors. This consensus underlies Goldin and Katz's (2008) framing of labor market dynamics as a race between education and technology. Even Peter Lindert, who asserted the predominance of labor supply in driving shifts in the income distribution in 1978, struck a more conciliatory tone revisiting the issue in 2016, conceding that "labor supply growth cannot sweep competing explanations from the field" (Lindert and Wiliamson, 2016).

Bringing the literature to the present day, Autor, Dube, and McGrew (2023) begin their analysis examining some of the same trends in inequality presented in section 3 above by stating "a vast economic and sociological literature studies the contributions of technology, trade, and institutions to four decades of rising inequality in the United States." Technology and trade, once again, being the demand-side factors identified over the past thirty years. And while Autor, Dube, and McGrew state a goal of exploring a lacuna in this prior literature, it is not the role of supply-side factors, but rather the role of the competitive structure of the labor market.

4. Reconsidering key pieces of evidence

4.1 What kind of shock was the Mariel Boatlift?

David Card's 1980 conclusion that the Mariel Boatlift, which brought over 100,000 Cuban immigrants to South Florida in the span of several months in 1980, had "virtually no effect on the wages or unemployment rates of less-skilled workers" ignited a spirited debate. Different voices in this debate have relied on different methods of assessing the impact of immigration. Studies analogous to Card's fundamentally cross-sectional approach has been used

to establish comparable findings (Card 2001; Friedberg 2001). Analyses that focus more squarely on time-series patterns, of the sort presented in Section 2 above, have reached differing conclusions (Borjas, Freeman, and Katz 1997; Borjas 2003; Borjas and Katz 2007).

The Mariel Boatlift looms large enough in the study of immigration that reconsiderations of the evidence were published nearly three decades after Card's work (Borjas, 2017; Peri and Yasenov 2019). But the event was not necessarily a pure shock to labor supply; raising the population could raise labor demand significantly depending on the demographic composition of the influx. Bodvarsson, Van den Berg, and Lewer (2008) provide evidence that the Mariel Boatlift contributed significantly to labor demand in the Miami area. As such, the evidence is not necessarily germane to the question of what happens when, holding population fixed, a larger share of that population seeks work.

Table 1 presents evidence from the Current Population Survey on how the Mariel Boatlift altered not just the population of the Miami area, but the composition of the population. The boatlift began after March 1980 and was complete by the fall of that year, implying that the difference in population counts between 1980 and 1981 capture the relatively short-term impact of the event.

The working-age population of the Miami metropolitan area increased by roughly 105,000 between 1980 and 1981. While this is consistent with the documented size of the boatlift, it should be noted that this time period followed two years of robust, if more modest, growth that brought 123,000 more working-age adults to the region between 1978 and 1980. Miami's non-working age population expanded as well, but by just under 12,000. The Mariel intervention thus appears to have raised the working-age share of the population from 61.9% to 63.8%. This 1.9 percentage point increase compares to an 0.3 percentage point increase nationwide. The

magnitude of the Mariel intervention equates to roughly one-fourth the trough-to-peak change in working-age share documented in Section 2 above.

While the boatlift does appear to have represented a shock to the age distribution of the population, it had surprisingly little effect on the share of the population participating in the labor force. Between 1980 and 1981, the share of Miami-area residents in the labor force actually shrank slightly, from 49.8% of the population to 49.6%. Of the net 116,000 person increase in the Miami-area population between March 1980 and March 1981, approximately 54,000 represented labor force participants. The growth in adult non-participants, approximately 38,000 was distributed broadly by age and concentrated at high education levels – the number of Miami-area adult labor force non-participants with 4 or more years of college rose by an estimated 22,000 between 1980 and 1981.

Overall, then, while it appears reasonable to consider the Mariel Boatlift a shock to the working-age share of the population, circumstances suggest that it does not necessarily reveal what happens when a growing share of the population exogenously *seeks work*.

4.2 Did the availability of low-skilled labor decline in the 1980s?

Katz and Murphy (1992) evaluate the role of labor supply shifts in explaining relative wage changes by dividing adults into 64 demographic categories defined by sex, education, and potential labor market experience and asking, effectively, whether groups that grew as a share of the overall workforce tended to witness rising or declining wages. They find that particularly in the 1980s growing groups tended to have higher wage growth, not lower, a pattern they interpret as pointing to the importance of demand factors over supply.

While intuitive, this approach rests on assumptions regarding the substitutability of workers in varying sex/education/experience cells. It is akin to examining the effect of rainfall on

flooding by dividing hilly terrain into small quadrants and observing that the hilltop quadrants received more rain yet exhibited less flooding, and thereby concluding that rainfall does not cause flooding. The concern, in less metaphorical terms, is that a set of workers in a sex/education/experience cell may suffer declining wages not because their own group is growing rapidly, but because rapid growth in a superior education or experience cell has led to excess supply of workers in that cell, causing a "cascading surplus" that leads those workers to be direct competitors.

Katz and Murphy's evidence raises concerns that exactly this phenomenon may have occurred. It is the least educated and least experienced groups of workers that exhibits the greatest relative decline in supply between 1979 and 1987 (Table II), the period when the wages for these groups declined the most (Table I). These are the metaphorical observations that saw little rain but significant flooding.

Section 6 below will document evidence of rainwater flowing downhill. Over time, the shares of older and more educated workers in occupations traditionally the domain of the least educated, least experienced workers – child care workers, waiters and waitresses – have expanded. This observation is at odds with the general consensus described above, that labor market data point to a failure to produce educated workers in sufficient quantity as a driving force in economic inequality. If employers seeking educated workers were having such trouble finding them, why would we observe educated workers becoming an increasing share of what has traditionally been the low-skilled labor force?

Table 2 illustrates another challenge in applying fine divisions to the workforce on the basis of potential experience. It tracks a single birth cohort – those born between March 1947 and March 1948, in the early part of the baby boom – through the CPS over more than half a century. As of 1968, when the cohort was 21 years old, they numbered just over 3 million and

the majority had already entered the labor force. By 1976, at the age of 29, the cohort's labor force participation rate reached 75%. As only a small share of the cohort could expect to continue their education past this age, contemporary observers might have considered this "peak" labor force participation.

Those contemporary observers would have been wrong. Peak labor force participation for this birth cohort is not observed until 1992, at the age of 45. Moreover, the size of the birth cohort is some 20% larger than it was when first observed in 1968, consistent with rising rates of immigration after restrictions were relaxed in 1965. Altogether, there are more than half a million members of this birth cohort in the labor force as of 1992 who were *not* in the labor force in 1976.

Absent a complete earnings history, it is impossible to accurately code labor market experience for these new entrants. Moreover, with a growing proportion of the cohort born abroad, a precise categorization would need to reckon with the discounting of foreign education and experience that immigrants experience (Friedberg, 2000).

For Katz and Murphy's analysis, members of this birth cohort would have been coded as having more than 20 years of potential labor market experience if they were high school graduates, and more than 15 if they possessed a 4-year college degree. However, because a significant proportion of them entered the workforce later than the 1966-1970 window implied by the Katz and Murphy calculation – nearly 30%, based on the evidence in Table 2 -- it's not clear that these workers should be considered distinctly more experienced, and hence not substitutable with, younger workers.

5. Regression evidence from the CPS

Identifying the labor market impacts of increasing the working-age share of the population to the standards of modern empirical economics is fundamentally impossible. Econometric methods are most reliable when studying the impacts of interventions that begin at a clear moment in time and have instantaneous, constant treatment effects. The difficulty of approaching this standard in the current context is exemplified by the simple question of how to operationalize the construct of "working age." In this study, the ages of 18 to 65 are considered to be "working age." But clearly some individuals begin work before the age of 18; evidence in section 6 below will establish that half of all child care workers enumerated in the 1968 Current Population Survey were no more than 16 years old. Some individuals above the age of 18 do not work; in prior studies computations of "potential experience" embed the assumption that no one gains relevant work experience before they complete their formal education, which is patently false. At the other age of the spectrum, not all workers separate from the labor market at age 65, some retire earlier and others continue working for decades beyond. "Working age population" here is meant to capture the sense of "that segment of the population who might be reasonably presumed to seek work of some sort." The simple operationalization by age does not perfectly reflect that construct. Were the measurement error to be classical, the consequence would be attenuation bias, an understating of the impact. But measurement error may not be classical in this case.

The effects of a hypothetical one-time shock to the proportion of the population seeking work may be neither instantaneous nor constant. A cohort of college graduates seeking work may first seek jobs utilizing their full skill set, spending a considerable amount of time in search before settling for other types of work. In the intermediate run, employers may adjust production technologies in response to a persistent shock to the amount of available labor. And the effects of exogenously pushing a greater share of the population into the workforce almost certainly

depends critically on where those workers are located, what they have been trained to do, and transitory factors such as the business cycle.

In light of these complications, presenting regression evidence on the relationship between the working-age share and labor market outcomes would seem a quixotic exercise. Nevertheless, this section reports on models that utilize repeated cross-sectional data from the March Supplements to the Current Population Survey between 1968 and 2022. Specifications examine two outcomes. Using a sample selected using the same criteria as Juhn, Murphy and Pierce (1993), evidence examines the impact of working-age share on the natural logarithm of (inflation-adjusted) weekly wages. A second set of specifications examines the probability that a prime-age (25-54) male meets the Juhn, Murphy, and Pierce criteria, which include being a full-time worker employed a sufficient number of weeks per year.

Table 3 presents summary statistics for the variables used in the analysis, omitting categorical race and educational attainment variables. The table reports unweighted sample sizes, though individual-level characteristics employ CPS ASEC person weights. Age is restricted from 18 to 65, and the sample mean is 39.5. Real log weekly wages average 5.9 with a standard deviation of 0.6.[10] Working-age share of the population ranges from 55.4% to 63.7% in this sample, with a mean of 61.7%. Some specifications use state-level variation in working-age share; there is more variability in this measure with a range from 51.7% to 73.2%.

Table 4 examines the relationship between working age-share and the logarithm of real weekly wages, for male workers meeting the Juhn-Murphy-Pierce sample selection criteria between 1968 and 2022. All specifications include categorical controls for race and educational

[10] Additional specifications not reported here substitute the logarithm of real annual wage and salary income for the weekly measure. Results are substantively similar. Real annual wage and salary income averages 9.8 with a standard deviation of 0.69. The greater dispersion of annual wage and salary indicates that weekly wages correlate positively with weeks worked.

attainment, as well as a quartic in age, and cluster standard errors at the year level. Panel A focuses on the main effect of working-age share in models without year fixed effects. The first model shows a coefficient on percent working age of -2.5 ($p<0.001$), which suggests that the rise in working-age share from 55.4% to 63.7% between 1968 and the local peak around 2007-2008 reduced weekly wages by roughly 20%. This coefficient is reduced in magnitude by roughly one quarter in a model with a linear time trend, and flips to positive and significant ($p=0.003$) with a quadratic time trend. The evidence suggests broad alignment in long-term trends, but not in the shorter-term fluctuations rendered more important by the quadratic time trend.

Panel B of Table 4 shifts attention to effect heterogeneity in specifications that, among other things, admit the use of year fixed effects. In a model with no time controls, working age share continues to be a predictor of lower wages for all workers, but more acutely for the least-educated. There is no evidence of effect heterogeneity by worker age. This basic pattern is little altered by inclusion of a linear time trend. With a quadratic time trend, the main effect of working age share continues to be positive, but the model continues to estimate a significant differential effect disadvantaging less-educated workers ($p=0.001$). Adding year fixed effects to the model eliminates the control for percent working age, but results continue to show a significant differential effect on less-educated workers, with a magnitude somewhere between the models with linear and quadratic time controls ($p<0.001$).

The raw differential log real weekly wage gap between college and high school educated workers expanded from 0.47 to 0.73 between 1968 and 2022. The year-fixed-effect specification yields a coefficient of -1.12, and the working age share increased by 6.4 percentage points between these years. This result thus suggests that 28% of the widening wage gap between education categories can be explained by the differential impact of an increasing working age share in the population. This simple calculation should be taken with a significant caveat: the

working age share variable measures an underlying construct with error and thus this coefficient may exhibit bias. And of course, the fundamental source of identification here is time series and there are many contemporaneous trends that might confound the working age share variable.

Table 5 presents the results of linear probability models focusing on labor force attachment, operationalized as the probability that a male, age 25-54, meets the Juhn, Murphy, and Pierce (1993) criteria for inclusion in an analysis of wages. The main requirements are to have worked full-time in the prior year for a minimum of 14 weeks. Table 3 shows that across all years of the sample, about three-quarters of men of prime working age satisfy the criteria. Panel A focuses on the main effect of working age share, again presenting specifications with no time controls, linear, and quadratic trends. Here, the introduction of a linear time trend once again reduces the magnitude of the coefficient, but moving to a quadratic leaves a statistically significant ($p<0.001$) negative effect estimate. The 6.4 percentage point net increase in working age share from 1968 to 2022 thus predicts a 5.2 percentage point reduction in the probability that a prime-age male meets labor force attachment criteria.

Panel B shows that this negative effect is disproportionately large for less-educated workers. All workers become less likely to satisfy labor force attachment criteria as the working age share increases, but estimates indicate that the effect is between two and three times the magnitude for workers with no more than a high school education relative to those with at least some college. In these specifications, a statistically significant pattern emerges whereby the effect of working age share is statistically significantly, if only slightly, smaller for workers under the age of 30.

Table 6 presents a final set of regression results, these moving the measurement of working-age share from the national to the state level in models that incorporate both year and

state fixed effects.[11] The use of state-level variation introduces additional concerns regarding the possibility of endogenous migration. The working-age share within one state might rise in response to a localized economic boom, such as the recent shale oil "fracking" boom in North Dakota. For this reason, it is reasonable to expect estimates of the relationship between working-age share and labor market outcomes to exhibit a positive bias. And the basic results for both the log of real weekly earnings and labor force attachment do show positive coefficients. Examining effect heterogeneity by worker education level, however, establishes the same pattern observed in Tables 4 and 5 above, that an increase in working-age-share predicts more negative outcomes for less-educated workers.

Given the obvious flaws in measurement and potential for bias when using state-level variation, this exercise is intended to be illustrative rather than conclusive. The working-age share evolves slowly over time, and with the exception of rare events such as the Mariel Boatlift – which as noted above did not actually induce a shock to actual labor force participation rates in the Miami region – is not amenable to analysis by natural experiment. Given these caveats, however, the evidence in this section consistently points to the conclusion that a rising working age share associates with deteriorating labor market outcomes for less-educated workers, and thus can potentially help explain broad patterns in economic inequality.

6. Occupation case studies

Table 7 lists the ten most common occupations among individuals with no more than a high school education under the age of 25, as of 1968. These account for just over half (51.4%) of young, less-educated adults reporting an occupation in the preceding year. Categories of basic

[11] Sample sizes are slightly reduced in this table because not all states are uniquely identified in the CPS in all years. Observations not uniquely identified in a state are excluded from the analysis.

physical labor top the list, but it also includes sales, office-based, and service occupations. Table 7 also verifies that these occupations were overwhelmingly held by less-educated workers in 1968. Overall, 85% of individuals employed in these occupations had no more than a high school degree, with a range from 71% among secretaries to 97% among door-to-door salespersons. Granted, roughly 77% of the 1968 workforce had no more than a high school degree, but nonetheless these occupations accounted for a disproportionate share of the less-educated, less-experienced workforce.

Table 8 tracks the number and characteristics of individuals in these occupations at four evenly-spaced points in time: 1968, 1986, 2004, and 2022. All but one of these occupations shrank over time, and in many cases the erosion neatly corroborates either the narrative of skill-biased technological change or the impact of international trade. The mechanization of agriculture, a process that long predates 1968, reduced the need for farm labor. Industrial occupations including common laborers and machine operators dropped dramatically between 1968 and 1986, though both show some rebound in later years. The number of jobs in sales shows some increase between 1968 and 2004, but disruptions in the form of less-labor-intensive "big box" retail and internet commerce have clearly taken their toll by 2022. While some of these occupations, such as secretaries, child care workers, and restaurant waitstaff, hold reasonably steady, they should be understood in the context of a workforce that nearly doubled in size between 1968 and 1986. Clearly, the jobs that young, less-educated workers were most likely to hold in 1968 did not fare well over the next five decades. The ten occupations represented in Table 6 saw an aggregate decrease of some 15 million jobs over this time period.

The number of workers with no more than a high school diploma also declined between 1968 and 2022, by roughly 13 million. The number of workers under age 25 declined by about 700,000. Clearly, the decline in demand for younger and less-educated workers outpaced the

decline in supply. Given that phenomenon, and under the consensus presumption that there has been excess demand for college-educated workers in the decades since 1968, we might expect these occupations to continue to be predominantly young and less-educated.

In fact, Table 8 shows a profound shift in most, but not all cases. In eight of ten occupations the median age of workers increased, in some cases dramatically. The median farm worker was 24 years old in 1968, and 41 in 2022. The median secretary was 31 in 1968, and 47 in 2022. In all 10 occupations, the percent of workers with a 4-year college degree increased. In the workforce as a whole, college-educated workers rose from 11% of the workforce to nearly 40%, so from one perspective this is not entirely surprising. But in all ten cases, the share college-educated increases by more than a factor of 4. It is difficult to reconcile this pattern with the argument that inequality rose because of excess labor demand in occupations demanding a college education – were that the case, why would we see such an increase in the percentage of farm workers, restaurant waitstaff, and salespersons with a college degree?

An alternate explanation for the phenomenon in Table 8 is the cascading surplus hypothesis. Older and college-educated workers are filtering into these occupations because there is insufficient demand for their labor in occupations that might have been better suited to their education and experience levels in an era of more scarce labor.

Table 9 examines the other end of the 1968 labor market, listing the top ten occupations held by college-educated workers ages 40 and up. Nearly one in five older college graduates worked as a K-12 teacher, and another one in five worked in a managerial or administrative role.[12] Altogether, these ten occupations account for 58.3% of older college graduates in 1968. Two – salesperson and general office clerk – also appear in Table X, but this list includes more

[12] Table 9 aggregates both teaching and managerial and administrative occupations to address changes in occupational coding over time.

specialized roles including physicians, lawyers, accountants, clergy, electrical engineers, and musicians.

Whereas the number of young workers and workers with no more than a high school education declined in raw numbers between 1968 and 2022, the number of older college graduates exploded, from about 6.2 million to over 57 million, vastly outpacing the rate of growth in the population or workforce overall. Before considering the evidence, it is instructive to contemplate how the occupations listed in Table 9 ought to expand with population size. The number of teachers, physicians, and clergy required to serve a given population should scale roughly linearly. The number of managers and administrators could exhibit economies of scale, as managing an organization of twice the size could require less than twice the number of managers. But population growth could lead to more organizations rather than larger ones. In labor markets with the potential for "superstar" effects, employment might bear little relation at all to population growth. It is also noteworthy that several of these occupations – teachers, physicians, accountants, lawyers, and even musicians – are marked by labor market features such as licensing requirements, limitations on graduate training, or unionization that might serve to restrict growth and impose wage premia.

With these preliminary thoughts in mind, Table 10 shows the evolution of employment counts in these occupations, using the same time points as Table 8 above. Seven of these ten occupations saw a net expansion in employment between 1968 and 2022. Of the three that did not, two are the occupations also appearing on the list of most common jobs for less-educated young workers. The third is musicians and composers.

None of the expanding occupation categories comes anywhere close to matching the general growth rate of experienced college-educated workers. The closest is lawyers, whose ranks expanded by a factor of 5 over this 54-year period. The remainder generally fall somewhere

between doubling and tripling in raw number, with physicians slightly exceeding that mark and electrical engineers falling somewhat below. On net, these ten occupations accounting for the majority of the educated, experienced workforce in 1968 added fewer than 14 million jobs total in an era where the number of educated, experienced workers expanded by over 50 million.

It is true that some of these jobs would be surpassed by occupations that essentially did not exist in 1968, particularly related to computers. Computer-related occupations, including software developer, programmer, computer systems analyst, computer scientist, and operations and systems researchers and analysts, numbered roughly 6 million in 2022. There would appear to be a significant surplus of college-educated workers remaining after accounting for these new positions, which may help explain why a growing number are found working as waitstaff, in child care, or as farm labor in 2022.

7. Implications, projections, and conclusions

The working-age share of the population is a forecastable number, and projections for the United States point to a future that does not resemble the recent past. As noted above, the working-age share of the population reached historic highs near 64% at the cusp of the Great Recession, representing an eight-percentage-point rise from the levels witnessed in the midst of the baby boom at mid-century. Thanks to the retirement of the same baby boom generation, a slowdown in immigration, and declining birth rates this metric has fallen over the past 15 years, to levels last seen in 1980.

U.S. Census Bureau projections released in 2018 and updated in 2020 point toward multiple decades of continued decline (Vespa, Medina, and Armstrong 2018). The proportion of the population age 65 or older, roughly 17% in the 2020 Census, is projected to reach 21% by 2030 and continue rising at a somewhat slower pace through at least 2060. The aging of the

population is projected to be accompanied by continued declines in fertility, meaning that the working-age share will not necessarily decrease monotonically. With current projections, the Census forecasts that the working-age share will decline another 6 percentage points between 2020 and 2050 before stabilizing or reversing.

If this projection proves correct, the working-age share will have reverted to the levels of the 1960s – the four-decade increase from 1968 to 2008 would be offset by a four-decade decrease. If this projection errs on the conservative side, either because of improved longevity among the aged or an increase in the fertility rate sometime after 2030, the working-age share could fall to levels not seen since the late 19th century – when the population was disproportionately young, not aged.

If demography is truly destiny, the "unexpected compression" of the past few years may be the start of a longer-run trend, a forty-year reduction in income inequality. The large number of potential workers in relation to the population of the past forty years has effectively produced a "buyer's market" for labor. Some occupations, particularly those employing the most educated, most experienced workers, appear to have staved off the effects of deleterious competition by imposing barriers to worker entry, or creating market power through unionization. Surplus labor has accumulated in occupations with lower entry barriers, to the disadvantage of the least educated and experienced workers. Recent data point to the emergence of a "seller's market" for labor, which may in fact prove to be the "new normal" in the United States.

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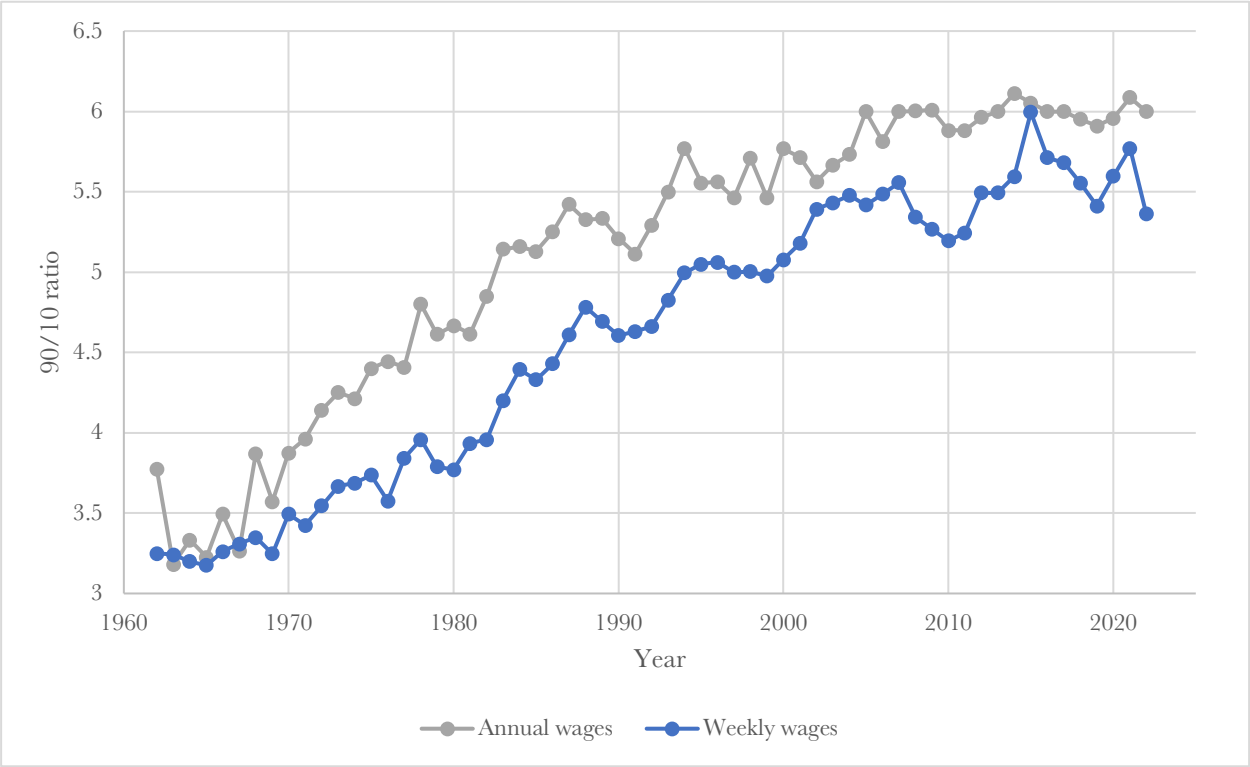

Figure 1: 90/10 ratios in annual and weekly wages, male workers meeting the Juhn, Murphy, and Pierce (1993) selection criteria, March CPS 1962-2022.

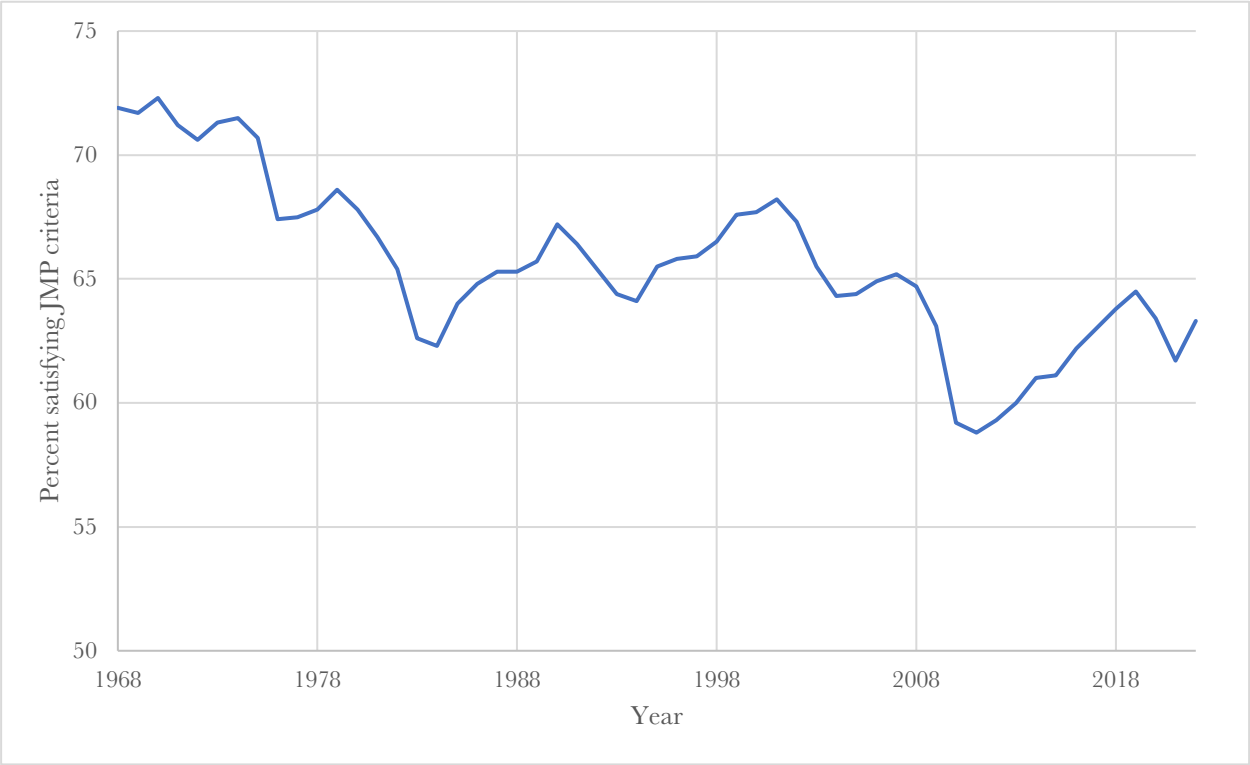

Figure 2: Proportion of male workers age 18-65 satisfying Juhn, Murphy, and Pierce (1993) selection criteria, March CPS 1968-2022.

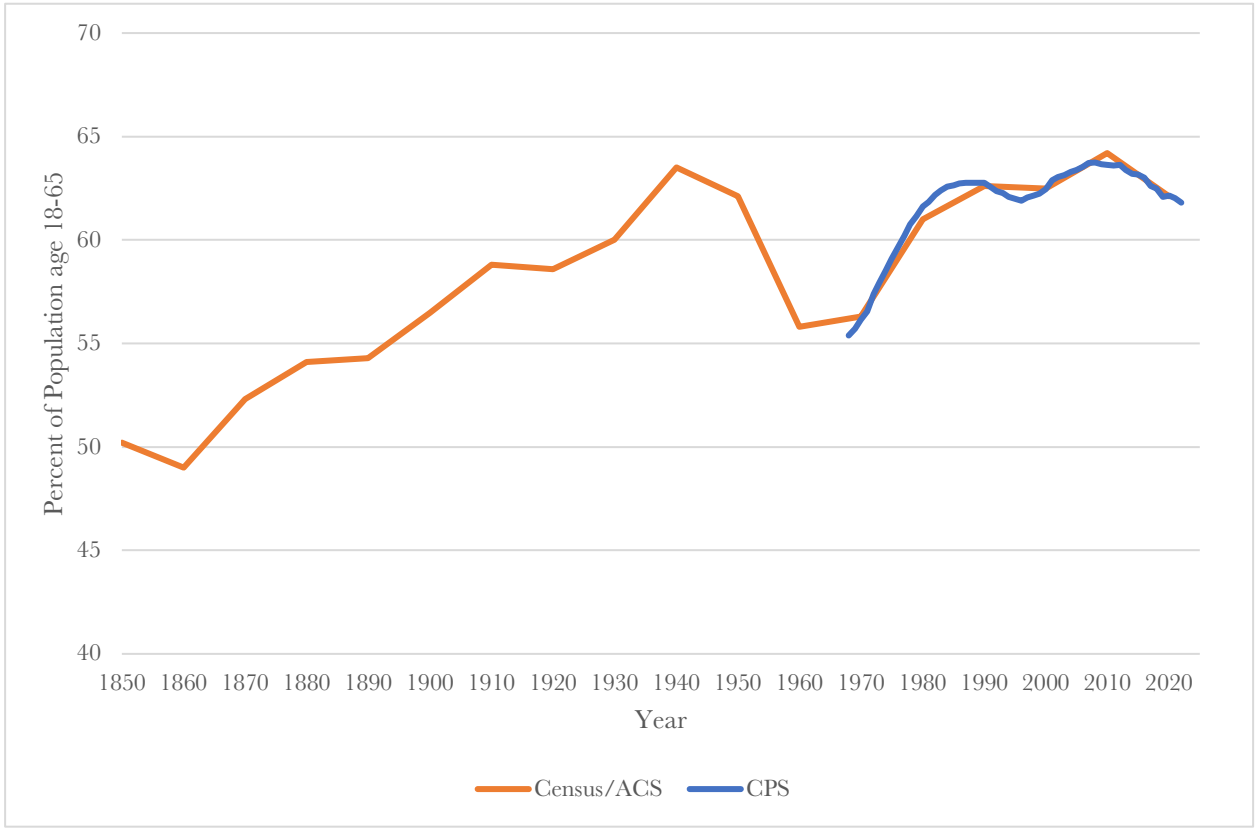

Figure 3: Share of the population between 18 and 65 years old, 1850-2022.

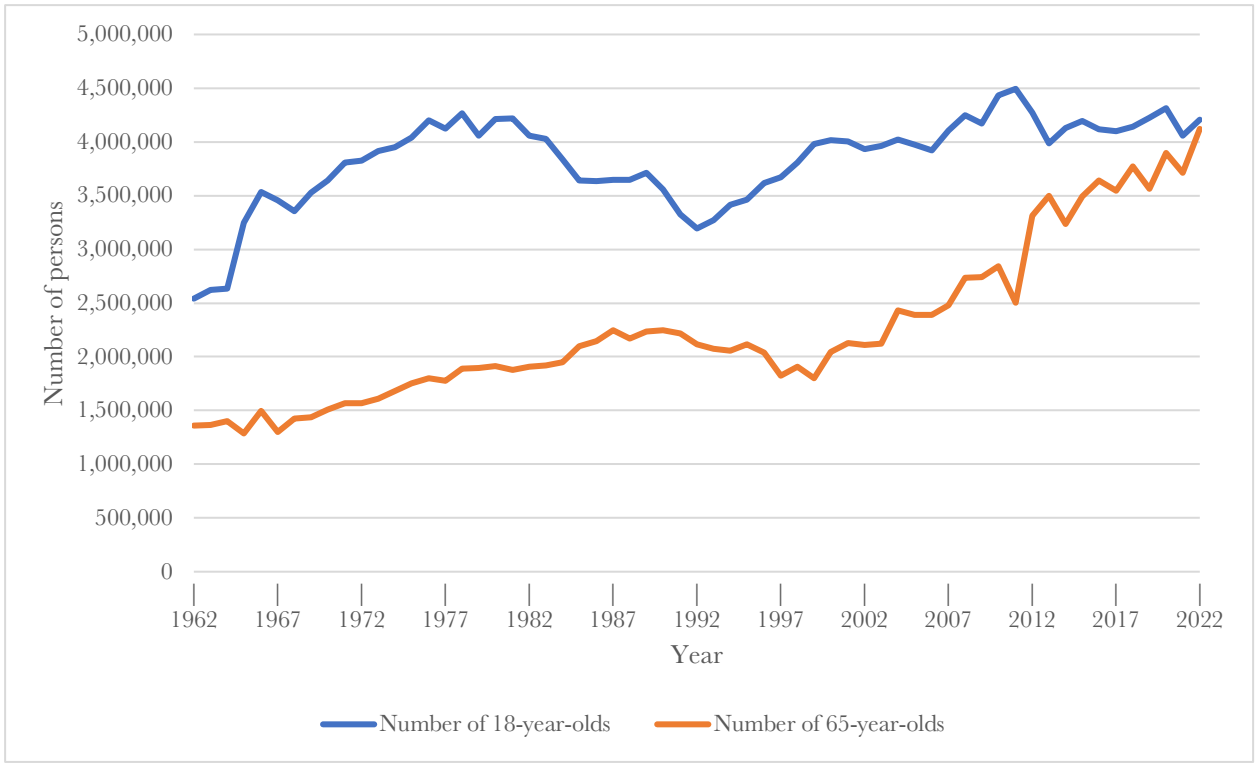

Figure 4: Population of 18- and 65-year olds, United States, March CPS, 1962-2022.

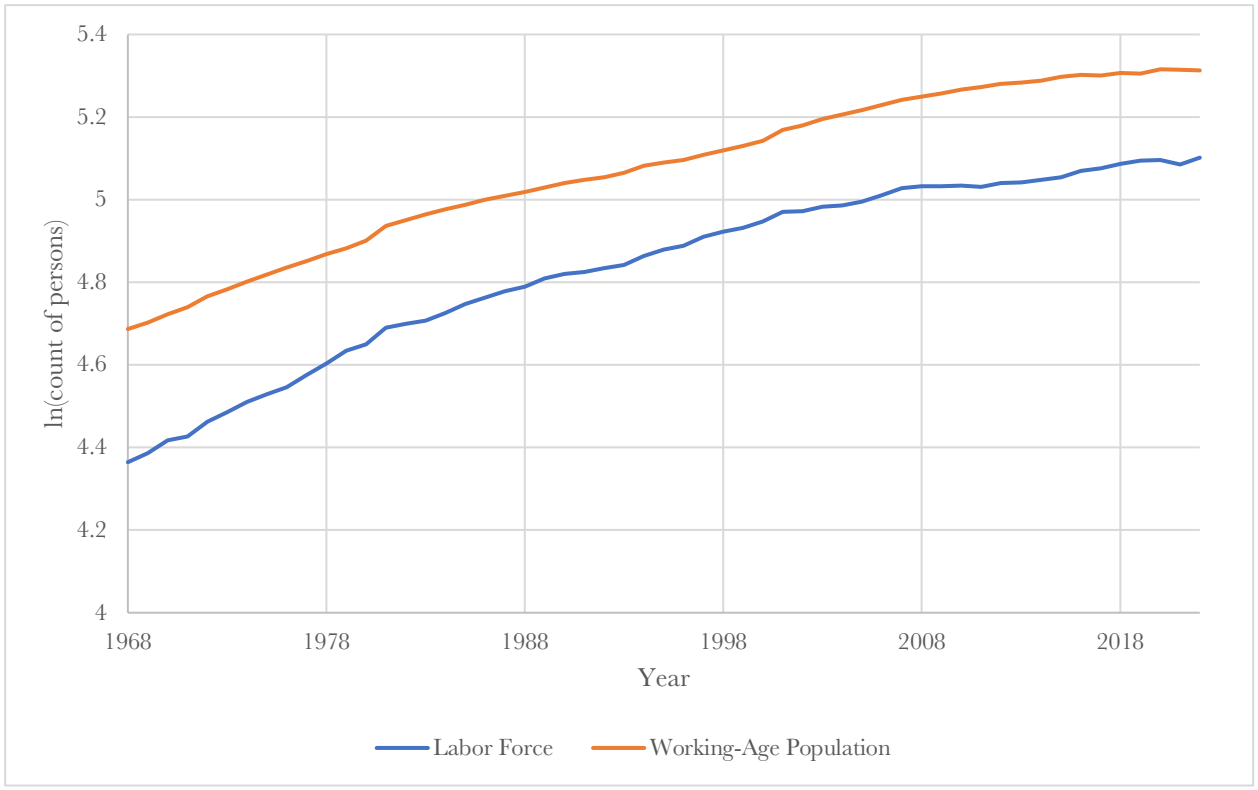

Figure 5: Natural logarithm of working-age population and labor force, March CPS 1968-2022

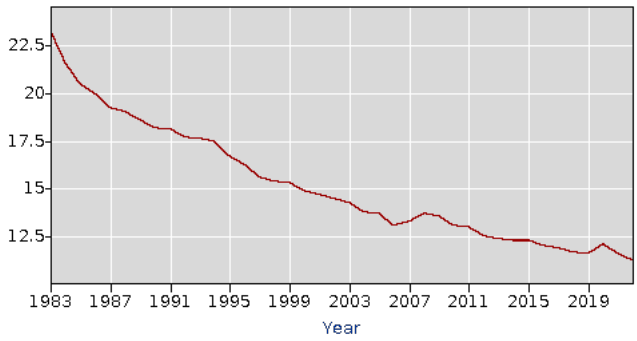

Figure 6: Unionization rate, 1983-2022 (Source: Bureau of Labor Statistics/CPS)

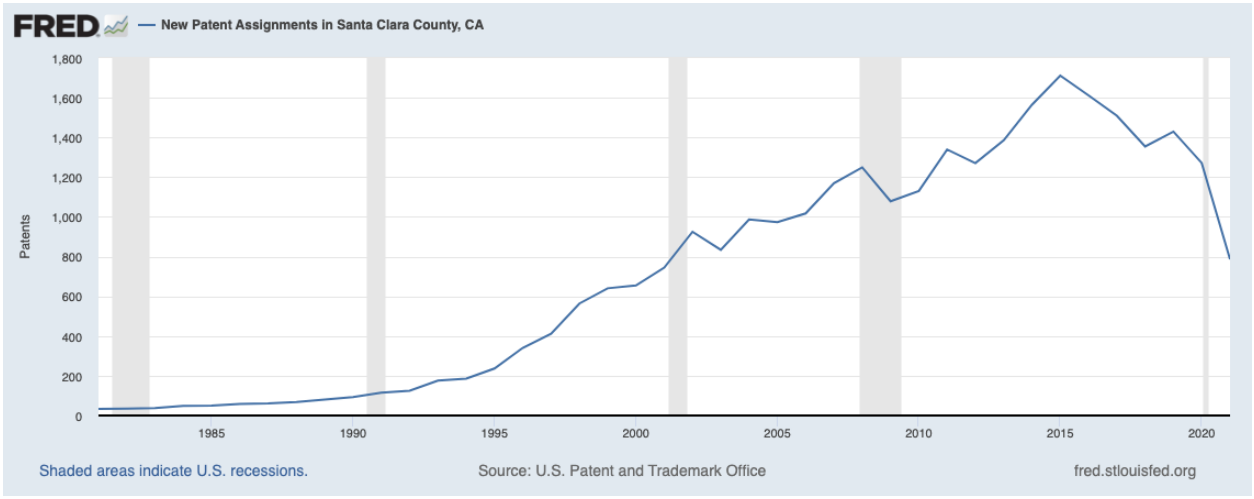

Figure 7: A proxy for technological innovation, 1980-2022 (Source: U.S. Patent and Trademark Office)

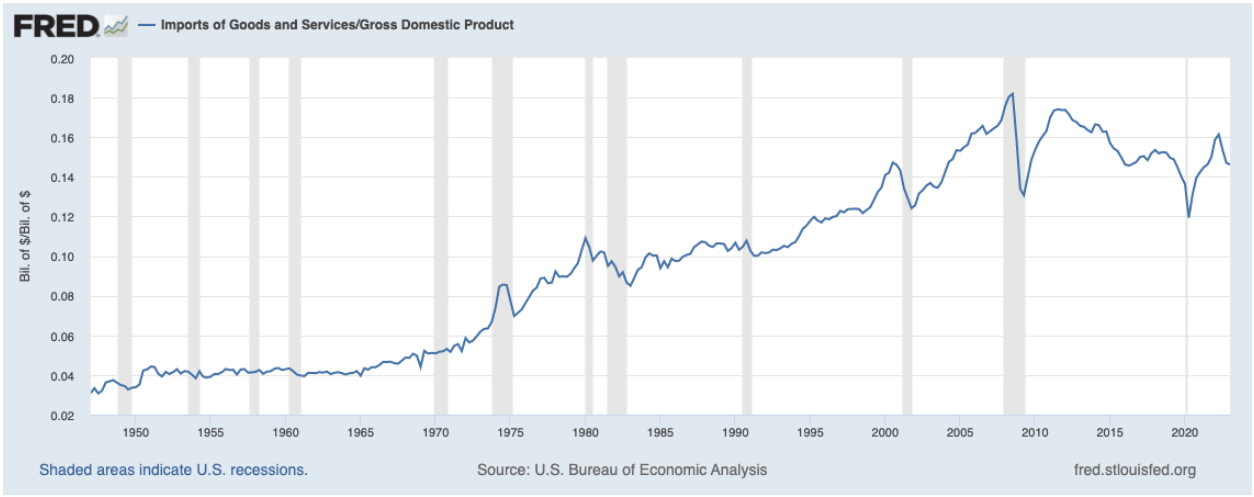

Figure 8: Imports as a share of GDP, 1947-2023 (Source: U.S. Bureau of Economic Analysis)

Table 1: The Mariel Boatlift Intervention

Year	Miami Metropolitan Area			United States	
	Population	% Working Age	% of pop in LF	% Working Age	% of pop in LF
1973	1,371,947	60.2	46.3	58.0	43.0
1974	1,456,259	61.1	47.7	58.5	43.8
1975	1,527,970	60.7	48.7	59.1	44.2
1976	1,560,480	61.7	47.8	59.6	44.7
1977	1,495,028	59.7	46.3	60.2	45.7
1978	1,496,919	56.9	44.6	60.8	46.6
1979	1,564,806	58.3	47.4	61.2	47.7
1980 (pre)	1,576,896	61.9	49.8	61.6	48.0
1981 (post)	1,693,027	63.8	49.6	61.9	48.3
1982	1,832,715	63.5	48.5	62.2	48.3
1983	1,757,721	63.7	46.9	62.4	48.3
1984	1,903,835	62.4	47.5	62.6	48.7
1985	1,913,572	60.4	45.3	62.7	49.2
1986	1,885,467	61.3	48.0	62.7	49.5
1987	1,840,971	65.5	51.5	62.8	49.9
1988	2,099,774	60.8	49.5	62.8	49.9
1989	2,150,029	60.1	47.7	62.8	50.3
1990	2,066,647	61.5	46.9	62.8	50.4

Note: All statistics weighted by CPS ASEC person weights. The Miami metropolitan area is first identified in CPS data in 1973.

Table 2: Labor Force Particpation in the Birth Cohort of March 1947-March 1948

Year	Weighted CPS Count	Labor Force Participation Rate
1968 (age 21)	3,112,521	57.4%
1969	3,079,964	63.0
1970	3,357,029	68.5
1971	3,470,466	71.0
1972	3,558,767	68.4
1973	3,459,074	72.2
1974	3,375,417	73.5
1975	3,494,854	73.2
1976	3,542,607	75.0
1977 (age 30)	3,431,760	75.3
1978	3,599,084	76.7
1979	3,499,387	76.3
1980	3,451,777	79.3
1981	3,638,992	80.4
1982	3,776,780	81.0
1983	3,799,165	79.7
1984	3,743,044	80.8
1985	3,635,099	81.6
1986	3,669,886	82.7
1987 (age 40)	3,773,866	85.2
1988	3,853,814	85.1
1989	3,584,567	84.2
1990	3,697,279	83.2
1991	3,655,418	84.3
1992	3,684,208	87.0
1993	3,733,641	85.2
1994	3,734,676	83.9
1995	3,766,256	85.0
1996	3,688,404	82.9
1997 (age 50)	3,658,659	81.5
1998	3,698,009	81.9
1999	3,796,331	81.2
2000	3,578,250	79.7
2001	3,585,944	78.4
2002	3,648,515	77.7
2003	3,633,256	76.8
2004	3,487,644	73.9
2005	3,565,569	73.1
2006	3,614,043	70.1
2007 (age 60)	3,470,797	65.7

Note: All statistics use CPS ASEC person weights.

Table 3: Summary statistics for CPS analysis

	Mean	Std. Dev.	Minimum	Maximum
Age	39.5	12.0	18	65
Ln(real weekly wage)	5.92	0.63	4.20	9.99
Ln(real annual wage/salary income)	9.80	0.69	7.20	13.49
Working age share of nat'l population (n=55)	0.617	0.021	0.554	0.637
Working age share of state population (n=2,493)	0.621	0.026	0.517	0.732
Satisfy Juhn, Murphy, Pierce criterion (unweighted n=1,791,759)	0.741	--	--	--

Note: Unweighted sample size is 1,771,047 except as noted. Sample consists of male respondents to the Current Population Survey who satisfy criteria as established in Juhn, Murphy and Pierce (1993). Individual-level characteristics are weighted using CPS ASEC person weights. National and state-level characteristics are unweighted. The sample for analysis of satisfying the Juhn, Murphy, and Pierce criterion consists of males between the ages of 25 and 54.

Table 4: Working-Age Share and Real Weekly Wages

Panel A: Main Effects			
Working-Age Share	-2.54***	-1.85***	2.79***
	(0.303)	(0.358)	(0.904)
Time controls	None	Linear	Quadratic
N (unweighted)	1,771,047	1,771,047	1,771,047
R^2	0.322	0.323	0.325

Panel B: Effect Heterogeneity				
Working-Age Share	-1.28***	-0.797**	3.36***	---
	(0.264)	(0.323)	(0.863)	
Working-Age Share x	-1.88***	-1.67***	-1.21***	-1.12***
Education HS or less	(0.355)	(0.379)	(0.340)	(0.299)
Working-Age Share x	0.001	0.002	0.003	0.003
Age 30 or less	(0.006)	(0.006)	(0.006)	(0.006)
Time controls	None	Linear	Quadratic	Fixed Effects
N (unweighted)	1,771,047	1,771,047	1,771,047	1,771,047
R^2	0.322	0.323	0.325	0.328

Note: Standard errors, clustered by year, in parentheses. Dependent variable is the natural logarithm of wage and salary income last year divided by weeks worked last year. Sample is drawn from March CPS ASEC supplements 1968-2022. All models control for a quartic in age and categorical controls for educational attainment and race. Sample is restricted to males age 18-65 who meet the Juhn, Murphy, and Pierce (1993) criteria for labor force attachment. All models use CPS ASEC person weights.
*** denotes a coefficient significant at the 1% level, ** the 5% level, * the 10% level.

Table 5: Working-Age Share and Labor Force Attachment

Panel A: Main Effects				
Working-Age Share	-1.63***	-1.03***	-0.809***	
	(0.111)	(0.120)	(0.368)	
Time controls	None	Linear	Quadratic	
N (unweighted)	1,791,759	1,791,759	1,791,759	
R^2	0.024	0.026	0.026	
Panel B: Effect Heterogeneity				
Working-Age Share	-0.947***	-0.499***	-0.420	---
	(0.109)	(0.133)	(0.337)	
Working-Age Share x Education HS or less	-1.06***	-0.864***	-0.855***	-0.669***
	(0.098)	(0.131)	(0.136)	(0.121)
Working-Age Share x Age 30 or less	0.014***	0.015***	0.015***	0.014***
	(0.004)	(0.004)	(0.004)	(0.004)
Time controls	None	Linear	Quadratic	Fixed Effects
N (unweighted)	1,791,759	1,791,759	1,791,759	1,791,759
R^2	0.025	0.026	0.026	0.028

Note: Standard errors, clustered by year, in parentheses. All models are OLS linear probability models and control for a quartic in age and categorical controls for educational attainment and race. Sample is drawn from March CPS ASEC Supplements 1968-2022. Dependent variable is a binary indicator for whether the respondent meets the labor force attachment criteria of Juhn, Murphy, and Pierce (1993). Sample consists of males between the ages of 25 and 54. All models use CPS ASEC person weights.
*** denotes a coefficient significant at the 1% level, ** the 5% level, * the 10% level.

Table 6: Using cross-sectional variation across states

	Ln(real weekly wage)		Labor force attachment	
Working-Age Share	0.243***	0.736***	0.159***	0.322***
	(0.068)	(0.078)	(0.049)	(0.054)
Working-Age Share x	---	-0.979***	---	-0.338***
Education HS or Less		(0.086)		(0.052)
Working-Age Share x	---	0.003	---	0.013***
Age 30 or less		(0.004)		(0.004)
N (unweighted)	1,681,184	1,681,184	1,709,944	1,709,944
R2	0.337	0.337	0.031	0.031

Note: Standard errors, clustered by state/year cell, in parentheses. All models are estimated by OLS and control for state and year fixed effects, a quartic in age and categorical controls for educational attainment and race. Sample is drawn from March CPS ASEC Supplements 1968-2022. Labor force attachment measure is a binary indicator for whether the respondent meets the labor force attachment criteria of Juhn, Murphy, and Pierce (1993). Sample consists of workers who meet the Juhn, Murphy, and Pierce (1993) criteria in the first two columns, and males between the ages of 25 and 54. All models use CPS ASEC person weights.
*** denotes a coefficient significant at the 1% level, ** the 5% level, * the 10% level.

Table 7: Most common occupations for young, less-educated workers in 1968

Occupation	Percent of workers under 25 with no more than HS education reporting this occupation, 1968	Percent of workers in this occupation with no more than HS education, 1968
Farm laborer	8.9%	93.9%
Laborers outside construction	7.8	90.0
Machine operators n.e.c.	6.4	93.0
Child care workers	6.1	96.3
Salespersons n.e.c.	5.6	73.5
General office clerks	4.8	76.4
Secretaries	3.8	71.4
Waiter/waitress	3.3	88.4
Personal service occupations n.e.c.	2.6	91.8
Door-to-door sales, street sales, and news vendors	2.2	97.3

Note: All statistics weighted by CPS ASEC person weights.

Table 8 characteristics of workers in selected occupations, 1968-2022

	1968	1986	2004	2022
Farm Laborers				
Number	3.2M	1.5M	1.0M	1.0M
Median age	24	27	34	41
Percent college grad	0.9%	2.4%	5.7%	10.4%
Laborer ex. Constr.				
Number	3.6M	1.4M	2.2M	2.3M
Median age	27	30	32	35
Percent college grad	1.4%	2.4%	4.5%	8.9%
Machine ops. NEC				
Number	6.0M	1.6M	1.1M	1.4M
Median age	37	36	40	41
Percent college grad	1.4%	3.1%	6.1%	9.2%
Child Care Workers				
Number	1.4M	1.7M	1.6M	1.1M
Median age	16	27	35	34
Percent college grad	0.8%	4.1%	9.0%	16.9%
Salespersons NEC				
Number	4.9M	5.7M	6.4M	2.5M
Median age	39	33	36	42
Percent college grad	8.7%	21%	27.5%	46.2%
Gen. ofc. Clerks				
Number	4.0M	0.9M	1.1M	1.3M
Median age	36	32	40	43
Percent college grad	5.1%	12.1%	18.8%	28.7%
Secretaries				
Number	2.9M	4.3M	3.8M	2.6M
Median age	31	36	44	47
Percent college grad	6.3%	8.7%	15.5%	31.3%
Waiter/waitress				
Number	1.5M	1.9M	2.2M	1.9M
Median age	27	24	23	24
Percent college grad	1.6%	6.3%	9.3%	10.1%
Personal svc. NEC				
Number	2.1M	0.2M	0.4M	0.7M
Median age	42	30	23	30
Percent college grad	1.8%	10.9%	13.3%	17.9%
Door-to-door sales				
Number	0.4M	0.6M	0.3M	0.1M
Median age	15	30	38	51
Percent college grad	0.7%	13.3%	16.8%	27.8%

Note: All statistics weighted using CPS ASEC person weights.

College educated over 40, 1968

Table 9: Most common occupations for college-educated workers over 40, 1968

Occupation	Percent of workers over 40 with a 4-year college degree reporting this occupation, 1968	Percent of workers in this occupation with a 4-year college degree, 1968
Primary/secondary school teacher	19.8%	78.2%
Managers and administrators	19.3	20.2
Physicians	3.6	92.9
Salespersons, n.e.c.	3.5	8.7
Lawyers	2.9	87.7
General office clerks	2.2	5.1
Accountants and auditors	2.0	36.8
Clergy and religious workers	2.0	56.3
Electrical engineers	1.6	57.9
Musicians and composers	1.4	37.7

Note: All statistics weighted by CPS ASEC person weights.

Table 10: Supply of experienced, educated workers and related occupational trends

	1968	1986	2004	2022
Number of college-educated workers over 40	6,200	13,500	33,500	57,400
School teachers	2,755	4,191	7,117	8,377
Manager/administrators	7,456	9,682	13,991	20,001
Physicians	295	480	743	1,011
Salespersons n.e.c.	4,928	5,741	6,361	2,541
Lawyers	260	622	978	1,255
General office clerks	4,043	927	1,114	1,332
Accountants and auditors	628	1,304	1,872	1,781
Clergy and religious workers	282	397	607	547
Electrical engineers	352	520	408	495
Musicians and composers	381	167	197	228

Note: All statistics weighted by CPS ASEC person weights. All numbers in thousands.