Race and Declining Labor Force Participation

Nathan Lazarus

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Abstract

I investigate the causes of declining labor force participation in the U.S. I find that the changing age structure of the population fully explains the decline in white labor force participation. African-Americans, who were more likely to participate in the labor force in 1970, have grown less likely, even when controlling for age. Using a logistic regression with reasonable controls, I find that African-Americans now have a 5 percentage point lower labor force participation rate than whites. I propose various explanations for this, including health, immigration, labor demand and discrimination, but I find incarceration to be the most compelling.

1. Introduction

Labor forces grew worldwide for the entire 20th century, providing a major source of input-driven growth (Juhn & Potter, 2006; Kosai et al., 1998). Economists know that input-driven growth is unsustainable (Krugman, 1994), and the fact that the labor force cannot again increase by 50% (as a share of the population) offers a check on future growth prospects. Nevertheless, there is no apparent reason for a reversal of growth in the labor force. Conventionally, low labor force participation a century ago is explained as a consequence of a great deal of non-market labor, and there has not been a return to non-market household tasks and barter exchange that would explain the decline. Yet the U.S. labor force participation rate is declining, and has done so for the entire 21st century (Fujita et al., 2014), which calls for an explanation.

Labor force participation has been particularly salient in recent years, as the Great Recession brought the prime-age (25-54 year-old) participation rate down from 80% to 75%. Shifts out of the labor force were almost as large a contribution to the declining employment to population ratio as the rising unemployment rate (Farber, 2010). Whether this was largely a cyclical trend or a cyclical component spotlighting an existing trend became a topic of urgent research (Erceg & Levin 2014; Fujita et al. 2014; Krueger 2017). The consensus is that there is a large structural component that the recent shift exposed (CEA, 2016; Eppsteiner et al., 2017; Krueger, 2017), which I also find. I specifically find that structural component has two parts, aging and the racial divergence in labor force participation. Race neutral explanations like Krueger (2017), which argues that health drove declining labor force participation, are therefore deficient.

The phenomenon of declining labor force participation is uniquely American. Figure 1 shows that most countries are seeing their labor forces grow, which is largely attributable to women continuing to enter the workforce (Black et al., 2017). Women entering the

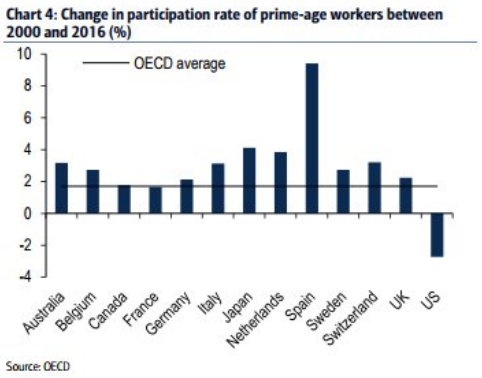

Figure 1: Cross National Comparison

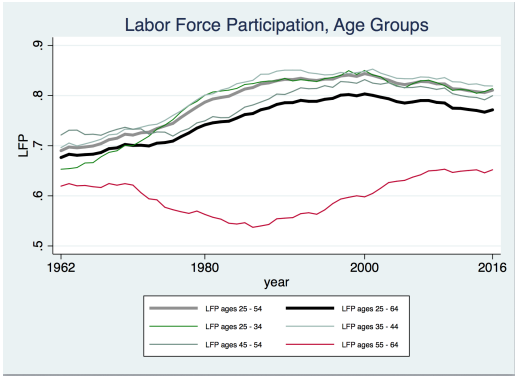

Figure 2: Age Breakdown

labor force has been the driving factor behind its secular upward trend in the past century, so it is natural to look to those trends to explain the decline. Black et al. (2017) find a decline in women's labor force participation in the U.S., which contrasts with the rises in other developed countries. Japan has seen a massive rise in women's labor force participation as Shinzo Abe's "Womenomics" has emphasized structural and cultural ways to encourage women to participate in the labor force, and there are certainly barriers of both types that could be addressed in the U.S (Mandel & Semyonov 2006; Bowen & Finegan 2015).

The decline is not localized among women, however; male labor force participation is declining as well (Krueger 2017; Krause & Sawhill 2017). It is declining faster in the U.S. than any OECD country except Italy (CEA, 2016). While it is possible that this could still be a consequence of gender dynamics, with men and women exiting the labor force for "home production," that does not match up with survey data about labor force non-participants (Aaronson et al., 2014). (It also would require very different marriage dynamics than the current ones that select for high education and income (Gould & Paserman 2003; Kearney & Wilson 2016).)

If the decline in labor force participation is not entirely about gender, another explanation could be aging dynamics. Labor force participation is generally measured as a proportion of the working age (25-64 year-old) population, but people between the ages of 55 and 64 work markedly less, as Figure 2 shows. If the share of the population in that age range grows, labor force participation will appear to fall even though no changes occur within cohorts. This effect is very large in the Japanese data, where prime age labor force participation has risen by 4 percentage points (Figure 1), but working age labor force participation has fallen from 62% to 60% due to a massive increase in the 55-64 year-old population (OECD, 2017). Eppsteiner et al. (2017) find that, while the signs point the same direction in the U.S. (both measures are falling), an aging population explains 79% of the decline in labor force participation since 2007. The changing population age structure is an important explanation; I find that it explains all of the decline in white labor force participation in the last 50 years.

There has been a secular downward trend in prime-age male labor force participation for 50 years, which puzzles economists (Moffit, 2012). Prime-age men, a population

of interest due to some insulation from gender and aging dynamics, are expected to participate in the labor force at very high rates. From World War II until the mid-1960s, 97 to 98% of prime-age men sought employment. That number today has fallen to 88%. I find that shifts in the age structure of the prime-age population (among whites) and African-Americans exiting the labor force are the leading causes of this decline.

2. Data and Methods

2.1. Methods

I look at labor force participation among groups to identify groups that have become less likely to participate in the labor force. I then run probit regressions to find individual level predictors of participation (Table 1). An interaction term between race and year allows me to identify the marginal effect of race on labor force participation over time. I used a logistic regression instead of the more common probit because the underlying data-generating process (the labor supply decision) should be genuinely Bernoulli (though see Section 4.1 for issues with that assumption), as opposed to the common situation in econometrics where a dichotomous variable is a censored continuous variable as a probit assumes (Albert & Chib, 1993).

I also examine labor force participation while holding constant the population age structure (Figure 5). To do this, I follow Eppsteiner et al. (2017), Krueger (2017), and many others in normalizing the sizes of the age cohorts, but while they fix the age structure to the first year in their sample, I use the average age structure across years in my sample. This is, of course, isomorphic to the index problem, to which Frisch (1930) proved there is no ideal solution. However, using the mean quantities can reduce the bias relative to picking one reference point (Edgeworth, 1925).

To illustrate the benefit of such a method, imagine a population divided between old and young. In period 1 there are 8 young and 2 old members, while in period 2 there are 2 young and 8 old. The mean of the dependent variable falls from 0.75 to 0.5 for the young, while it rises from 0.5 to 0.75 for the old. Using the population structure for period 1 (Paasche-style) implies that the overall mean fell from 0.7 to 0.55, and using the structure for period 2 (Laspeyres-style) implies that the mean rose from 0.55 to 0.7, while an average suggests that the mean was unchanged at 0.625. The intuitive answer is that the mean was unchanged at 0.7, and the average method is the only one to show the mean unchanged. The bias in the change in means with two groups using the age structure from period t, where i and j denote groups of size K and L will be

$$\frac{K_t}{K_t+L_t}(\bar{i}_{t+1}-\bar{i}_t)+\frac{L_t}{K_t+L_t}(\bar{j}_{t+1}-\bar{j}_t)-(\frac{\sum_t^{t+1}K_t}{\sum_t^{t+1}K_t+\sum_t^{t+1}L_t}(\bar{i}_{t+1}-\bar{i}_t) + \frac{\sum_t^{t+1}L_t}{\sum_t^{t+1}K_t+\sum_t^{t+1}L_t}(\bar{j}_{t+1}-\bar{j}_t)), \text{ or}$$

$$(\bar{i}_{t+1}-\bar{i}_t)(\frac{K_t}{K_t+L_t}-\frac{\sum_t^{t+1}K_t}{\sum_t^{t+1}K_t+\sum_t^{t+1}L_t})+(\bar{j}_{t+1}-\bar{j}_t)(\frac{L_t}{K_t+L_t}-\frac{\sum_t^{t+1}L_t}{\sum_t^{t+1}K_t+\sum_t^{t+1}L_t})$$

That is rather intuitive: the change in mean multiplied by the deviation from the mean population share. In fact, this generalizes to N variables and M periods,

$$\sum_{n=1}^{N}(\frac{(\sum_{t=1}^{M}\bar{i}_{n_t})-(M+1)\bar{i}_{n_t}}{M})(\frac{K_{i_{n_t}}}{\sum_{n=1}^{N}K_{i_{n_t}}}-\frac{\sum_{t=1}^{M}K_{i_{n_t}}}{\sum_{n=1}^{N}\sum_{t=1}^{M}K_{i_{n_t}}})$$

2.2. Data

The Bureau of Labor Statistics has asked respondents to the Annual Social and Economic Supplement (ASEC) of the Current Population Survey (CPS) if they are participants in the labor force since its inception in 1962. CPS data has a colossal sample size (8.7 million over the 53 years in my sample), very careful demographic weighting, a wide array of independent variables, and largely consistent question wording. Demographic factors like education, marital status and children are often cited as predictors of labor force participation (Psacharopoulos & Tzannatos 1989; Connelly 1992; Compton & Pollak 2014; Cajner et al. 2017), and I am able to control for them when examining the individual level propensity to participate in the labor force (Table 1). With less data available, I would examine trends and coefficients for significance and offer confidence intervals. Given the size of the CPS data, however, there is little question as to whether, for example, the slight decline in white labor force participation when holding the age structure constant is significantly different from zero. The questions here are of practical, not statistical significance.

I used single imputation with chained equations to interpolate missing values, which were a small portion of the data and completely absent from the race and labor force participation variables. Single imputation is inferior to multiple imputation because it uses the matches sample variance with the imputed data (Rubin 1996, 2004). With sample sizes this large, however, there are no standard errors in the regression to worry about artificially deflating. The one variable I did not try to impute was Hispanic origin, which was not available before 1971 and asked to only a subsample of the population from 1971-1974. For more on the data coding, see Appendix A.

The labor force is traditionally reported as the civilian non-institutional labor force, so members of the military are excluded (as well as prisoners, see Section 4.5). This poses an issue I have not seen discussed in the literature, namely that people can select into the armed forces. Perhaps young people who did not expect to be employable used to join the military, but now, due to changing attitudes or changing recruitment, they are less likely to. This would downwardly bias the labor force participation rate. The best theoretical approach to dealing with this would be a Heckman Correction (Heckman, 1976). I did not do this, but future researchers should consider that possible selection bias.

3. Results

First, I decompose labor force participation by race. The important finding here is that minorities are substantially less likely to participate in the labor force than whites. This gap has grown steadily over the entire sample. In the 1960's, African Americans were more likely to participate in the labor force; participation rates are now 5 percentage

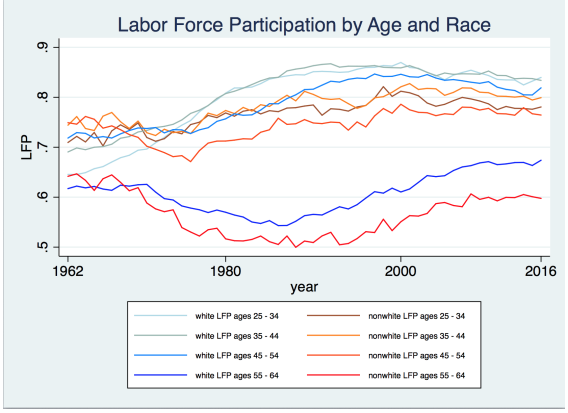

Figure 3

points lower. Figure 3 shows that this gap between races is similar in size and growth rate across age groups, so the age-race interaction is not important.

However, there is an important compositional issue with age and race. White Americans, despite recent rises in mortality (Case & Deaton, 2015), have a larger population between the ages of 45 and 64 due to birth rate and mortality differences (Colby et al., 2015). As Figure 1 shows, workers between the ages of 45 and 54 are the least likely to participate among prime age workers, and those 55 to 64 are particularly likely to exit the labor force.

The discussion of declining labor force participation in the literature suffers because researchers look at the data found in Figure 4. Toossi (2013), Aaronson et al. (2014), CEA (2016), and Krause & Sawhill (2017) all explicitly note that the decline in participation rates is strongest among African-Americans, but present for all age groups. They cite CPS data for either the prime or working age participation rates, as in Figure 4, without adjusting for age. Keeping the age structure constant, using the method described in Section 2.1, produces Figure 5. Figure 5 shows an imperceptible decline in white and Hispanic labor force participation, while the decline in African-American labor force participation is equally prevalent in Figures 4 and 5. Aging is not one competing explanation for a widespread decline in labor force participation. It is a compositional issue, and researchers should carefully age adjust their data.

In Table 1, I report the results of a regression of various individual-level characteristics on labor force participation. These results seek only to describe the current characteristics of the labor force. I did not find natural experiments, instruments, or anything else that could be used to isolate causality. These estimate local average treatment effects, not average treatment effects, and include age and year fixed effects (as well as race-year interactions to account for the declining African-American labor force participation), taking the estimates further from the average treatment effects, but insulating them from bias due to the changing composition of the labor force. The regressions all include education, which is known to be very important for labor force participation (Brundage, 2017; Cajner et al., 2017). Then, Model 2 adds gender and family structure variables. As Bowen & Finegan (2015) show, women and those with young children are much less

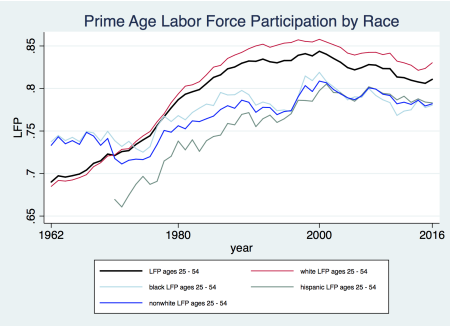

Figure 4

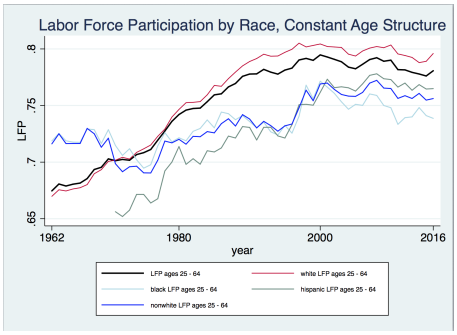

Figure 5

likely to participate in the labor force.

Model 3 shows the economic variables that could influence labor supply. Long-term wages may not impact labor supply due to the countervailing income and substitution effects (Kimball & Shapiro, 2008), and short-term wages, as are present in the CPS, will of course be endogenous to the labor supply decision. Juhn (1992) also finds that the decline in African-American labor force participation is not attributable to wage differentials. I therefore looked at income earned by non-wage means or by other family members, which don't present the substitution effect, so they should lead to declines in labor supply (LaLumia, 2008). Those sampled with higher non-labor income do participate in the labor force less. An increase from $10,000 to $200,000 in non-wage or family member income reduces the log odds of labor force participation by -0.4, or a similar effect to adding a child under 5 to the household. Model 4 combines the family and economic variables. The coefficients are relatively unchanged, suggesting that the estimates from Models 2 and 3 were not greatly biased by the omission of the other set of factors.

The logistic regression (specifically Model 4, as it included the entire vector of controls) allows me to estimate the marginal effect of race on employment over time. I examine the marginal effect of race and the race-year interaction at the overall means for the data. This is shown in Figure 6, where the marginal effect of the African-American indicator variable on labor force participation falls from 7 percentage points to -5 over the course of the sample. This is slightly larger, but similar in size to the divergence in Figure 5, so control variables seem to have little impact on the observed effects.

4. Explanations

4.1. Overview

I consider the following as possible explanations for African-Americans' declining labor force participation rate: more elastic labor supply, health, immigration, labor demand, discrimination, and human capital (formed by education or incarceration). With the exception of labor supply elasticity and health, those are demand side factors that would not affect a theoretical labor supply curve. Were there a perfect measure of labor supply, it would not respond to those demand side factors, but the labor force participation rate is imperfect. In dynamic equilibrium, workers make their labor supply decision based on prevailing wage rates and expected future wage rates, and we can

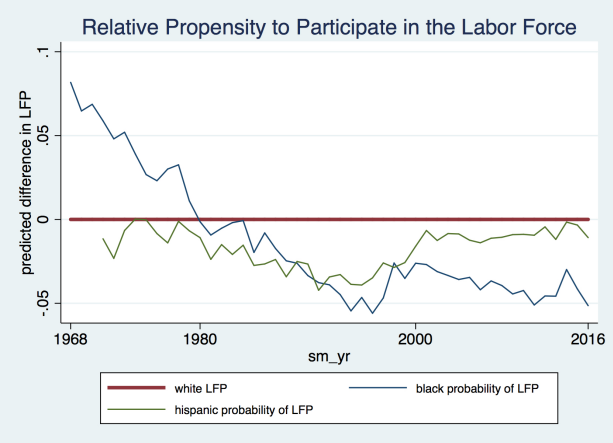

Figure 6

only observe that decision. Additionally, some workers who do seek work will not report actively seeking work in the past four weeks, so some (presumably demand side) reasons for unemployment will be categorized as labor force exits. This is why I discuss labor force participation as opposed to labor supply.

If African-Americans had a greater elasticity of labor supply, we would expect that to be reflected in prices. Instead, with controls, we see lower wages (Card & Lemieux, 1996; Neal, 2004). Empirical estimates of labor supply elasticity, though limited, also do not find a difference across race (Card, 1991).

4.2. Health

Krueger (2017) finds that about half of labor force non-participants have a health condition that prevents them from working. Currie & Madrian (1999) similarly finds that poor health outcomes cause labor force non-participation. Braveman et al. (2010) and Hamilton (2017) show that within every income and educational cohort, African-Americans have consistently worse health outcomes. The challenge is in explaining the increasing divergence, while the racial health gap has shrunk across most dimensions (National Center for Health Statistics, 2007). The gap also shrank in the early 1990's (Harper et al., 2007), while Figure 6 shows the gap in participation was growing.

I see two channels through which levels of instead of changes in health inequality could affect labor force participation: greater awareness or treatment for disability or welfare states increasing the incentive to report disability. Bound et al. (1996) finds African-Americans are more likely to say they are impaired by a disability, but no more likely to say that they are unable to work due to a disability. This opens the potential for sorting to remove those differences, which would cause a relative decline in the African-American labor force participation rate. Kreider (1999), by contradiction, finds that African-Americans who are out of the labor force report disabilities relative their employed peers at a higher rate than white labor force to their employed peers, suggesting they are actually better sorted. Krueger (2017) finds a general increase in the treatment of pain and disability, but actually finds that it is greater in magnitude among whites.

Individual Level Predictors of LFP (with Age and Year Fixed Effects)

	base	family	economic	combined
black	**-0.1030**	**-0.0684**	**-0.2481**	**-0.1451**
hispanic	**-0.0295**	**0.0155**	**-0.1266**	**-0.0960**
HS (relative to <HS)	**0.4335**	**0.5976**	**0.5255**	**0.6550**
some college	**0.7196**	**0.8965**	**0.8527**	**1.0154**
college	**1.0354**	**1.2082**	**1.2326**	**1.3914**
grad/professional	**1.4755**	**1.5957**	**1.7099**	**1.8335**
Female		**-1.3759**		**-1.4068**
married		**0.2210**		**0.4894**
spouse absent		**0.2500**		**0.2021**
separated		**0.2358**		**0.2366**
divorced		**0.4939**		**0.4544**
widowed		**0.3057**		**0.4209**
children		**-0.0337**		**-0.0108**
children under 5		**-0.3965**		**-0.4579**
weeks unemployed past year			**-0.0036**	**-0.0047**
nonwage income (log)			**-0.1321**	**-0.1849**
family members inc. (log)			**-0.1343**	**-0.1075**

Table 1

Gruber (2000) finds that labor supply is substantially elastic to the generosity of disability benefits, but disability benefits have only become slightly more generous over the period of the divergence (Von Wachter et al., 2011). Von Wachter et al. (2011) find somewhat of an increase in labor force exits due to disability insurance among the applicants ages 30-44, but none among applicants ages 45-64. Mueller et al. (2016) find that applicants are not using disability insurance as protection from labor market outcomes, as most applicants were not in the labor force. Krueger (2017) greatly undermines the health hypothesis; he finds that 32% of African-American labor force non-participants report a work-impairing disability in the CPS, while 36% of white respondents do. While African-American labor force non-participants are a relatively larger population, African-Americans with health issues are also a relatively larger population. This survey data casts doubt on the hypothesis that health inequality is driving differentials in labor force participation.

4.3. Immigration

Borjas et al. (2010) argues that immigration brought competitors to African-American workers, causing their wages to decline and them to exit the labor force. Borjas (2015), using a natural experiment, undermines that finding. There, he finds natives with less than a high school education saw their wages fall after an influx of immigrants, but there were strong complementaries with high-school educated workers. This is then a poor explanation for the African-American labor force decline, as African-Americans would experience both effects. Card (1990), Duncan & Trejo (2011), Card (2012), Peri & Yasenov (2015), and Clemens & Hunt (2017) find smaller overall effects of immigration,

both in complementarities and substitutions. Additionally, an issue with immigration as an explanation for the racial divergence in labor force participation is that white and black Americans have a similar elasticity of labor supply with respect to immigrants (Gang & Rivera-Batiz, 1994).

4.4. Labor Demand and Discrimination

The next two explanations, labor demand and discrimination, have to operate in conjunction with one another. There is no theoretical mechanism by which weak labor demand would be concentrated among one demographic of workers that is spread across many sectors. For discrimination to be the sole driver of outcomes, shifts in the racial employment gap would have to reflect changing attitudes about race (Becker, 2010). Instead, I propose that discriminatory tastes lead employers to prefer not hiring African-Americans, but they are more able to act on this preference when labor demand is weak. I find mixed evidence in favor of this mechanism. While theoretically strong, empirically it does not fit the data as well as incarceration.

It is established that African-Americans are more responsive to changes in labor markets than whites. A 1 percentage point increase in the white unemployment rate leads to a 1.7 percentage point increase in African-American unemployment (Wilson, 2015). Even when controlling for demographic characteristics, African-American employment is lower and more volatile (Bucknor & Baker, 2017). Bound & Holzer (2000) finds that this dynamic occurs on a regional level as well—areas with weakening labor demand show lower employment for African-Americans than those with strong labor demand. Cajner et al. (2017) cannot find an explanation for this procyclical employment pattern, but rule out demographic factors, leaving employer preferences as a likely explanation. Cajner et al. (2017) find that the racial labor force participation gap is less cyclical, but are also unable to explain it. Biddle & Hamermesh (2013) contradict this, finding that wage discrimination is unchanged over the business cycle, while relative wages fall in recessions, presumably due to the exit to unemployment or non-participation of African-Americans. The magnified effects of business cycles on of African-American unemployment is a regularity across the literature.

It is unclear if cyclical factors can explain what appears to be a structural decline. Coglianese (2016) and Erceg & Levin (2014) argue that a large component of recent labor force declines are cyclical in nature. As I addressed, residual cyclicality in labor force participation rates is an unfortunate but necessary issue, and Erceg & Levin (2014) is persuasive in showing that the measurement issue exists. Nonetheless, I identify a much more important structural trend, one that Aaronson et al. (2014), CEA (2016), and Krueger (2017) also isolate. While business cycle persistence literature (Fatas, 2000; Summers, 2014) is persuasive, cyclical factors cannot explain the pre-recession trend in Figure 6. Autor et al. (2013) and Acemoglu et al. (2016) argue that Chinese import competition caused both labor force non-participation and recent business cycles, but that does not match up with the dates or racial composition in Figure 6. I think they are observing endogeneity in the pre-2000 tariff rates and the vulnerability of industries.

However, Acemoglu et al. (2016) notes that labor markets have been persistently weak. Bunker (2017) and Cajner et al. (2017) also find this, which squares with the persistently low inflation in the 21st century (Blanchflower & Levin, 2015). Weaker labor markets would pass through to worse outcomes for African-Americans through the mysterious effect discussed above (likely discrimination). The issues with this explanation

are that all estimates agree that the labor market had little slack in the 1990's, where African-American labor force participation fell (Figure 6). Another issue is that cyclical shocks in 2000 and 2008 had little effect of the racial gap in labor force participation, instead causing a broad decline. It is unemployment, not labor force participation, that displays that cyclical behavior (Cajner et al., 2017).

4.5. Human Capital

The human capital explanations are education characteristics and incarceration. Education could operate through the skill-biased technical change channel (Bound & Johnson 1989; Katz & Murphy 1992), and this explanation has been proposed in the literature (O'Neill 1990; Couch & Daly 2002). African-Americans have lower levels of educational attainment, and if labor market outcomes improved for the highly educated, that could have caused a relative decline in African-American labor force participation. Brundage (2017) shows that labor force non-participants have lower levels of education, and I find large increases in the likelihood of labor force participation after achieving both high school and college degrees (Table 1). Card & DiNardo (2002) examines this hypothesis and finds that it woefully insufficient for the racial divergence in wages, and I think their analysis extends to labor force participation. Card and Dinardo note that the general trend for African-Americans and whites should be similar, as the differences in educational composition are not large enough to bring about opposite trends. They also note that within educational cohorts, the patterns of racial wage disparities are similar. My outputs in Table 1 and Figure 6 control for educational attainment, and they show that the effects of race on labor force participation remain.

I was not able to control for criminal records, and it is a compelling explanation for the divergence. Prisoners are not part of the civilian non-institutional population surveyed, and when they are included in the pool of potential labor force entrants, the racial participation gap grows substantially (Western & Pettit, 2000). The effects of incarceration on labor supply, however, last after a prisoner is released. Pager (2003) conducted an audit study, with testers posing as formerly incarcerated individuals and applying for identical jobs. Pager found that a criminal record reduced the odds of receiving a callback by 50% for a white applicant, and 70% for a black applicant. Lyons & Pettit (2011) use administrative data and find declines in wages and labor force attachment for all former prisoners, as well as for African-American former prisoners relative to their white counterparts. Pager & Western (2009) found the same bias against African-Americans with a criminal record.

When unable to gain information about an applicants criminal record, employers appear to resort to statistical discrimination, and African-American and Hispanic men see declines in employment (Doleac & Hansen, 2016). Agan & Starr (2016) replicate this finding in a field experiment, finding massive increases in racial discrimination after employers were prohibited from asking about incarceration history. Holzer (2007) suggests that employers engage in similar statistical discrimination even without such restrictions, especially in industries with less formal application processes. In theory, incarceration operates as a reverse Spence (1973) signal, where avoidance is costly.

The rise in African-American incarceration took place from 1970-1990 (Pettit & Western, 2004), which matches up well with the growth and plateau pattern in Figure 6. With somewhat of a lag, as the offenders and information would need time to disseminate, and ignoring the early data due to quality issues, this explanation seems to match the

data quite well. The magnitude of the effect is large and concentrated among African-Americans: (Pettit & Western, 2004) find that 20% of African-American men and only 3% of white men will have served time in prison by their prime earning years (30-44). Raphael (2014) estimates the figures as 16% and 2.6%; regardless of their exact magnitude, it can account for a significant portion of the divergence in Figure 6. It is also concentrated among those with a low education, who we know make up a large portion of labor force dropouts (Krueger, 2017). Unlike other explanations about education and labor markets (Couch & Daly, 2002; Autor et al., 2013), however, it neither operates equally between African-Americans and whites nor occurs too recently to explain the secular decline.

In fact, Visher et al. (2008) find that employment rates fell from 68% to 45% after imprisonment, and Holzer et al. (2005) estimate that incarceration reduced overall labor force participation among black men 16-24 and 25-34 by 3 to 5 percentage points. Western (2002) and Raphael (2007) find similar effect sizes, and Raphael (2007) finds that the effect grows over time, parallel to the growth of the incarcerated population. Incarceration fits better as explanation for the divergence than the others considered; it occurred close to the start of the changing dynamics of labor force participation and it affected the low-educated African-American population that has exited the labor force. Additionally, in contrast to the other proposed explanations, the effect from incarceration clearly points in the direction of an increasing racial gap in labor force participation. (Holzer (2007) considers that incarceration might increase labor market attachment through education and crime deterrence, but it has no empirical support). Some prisoners certainly exit the labor force due to low employment demand for their services, but the magnitude of the effect is unclear. Estimates from the literature place it in a range that would contribute a large part of the observed divergence in racial labor force participation.

5. Conclusion

The decline in the labor force participation rate is a strange phenomenon, cutting the share of the population employed in production, contrary to broad trends in labor markets. Aging in the white population and incarceration in the black population explain a great deal of the 50-year secular downward trend in male participation discussed by CEA (2016). The literature currently overstates some of the population characteristics of labor force non-participants, and suffers because it does not decompose the participation rate into age-race cohorts. The declines are concentrated among African-Americans of all ages, and any explanation needs to account for that. I show that many popular explanations fail to do that, and explanations of the decline based off of characteristics like the low education levels or poor health of those outside the labor force are therefore unpersuasive.

There is little effort to do causal estimation of any of these explanations. If future researchers find a randomly selected group that was sent to a treatment program instead of prison, a discontinuity in a health metric that gave access to disability insurance, or another similar identification mechanism, they will be able to better estimate the relative contributions of these explanations. If an explanation that operates on both white and African-American labor force participation is found to be significant, researchers ought to look for a countervailing effect that keeps age-adjusted white labor force participation stable.

Appendix A.

I used the percentages of respondents who reported 26-39 and 40 or greater weeks of unemployment to impute the values of unemployment duration for respondents between 1962 and 1967 who reported unemployment for 26 weeks or longer, which is technically linear imputation. That allowed me to use the information contained in that response. Educational attainment was not surveyed in 1963, so that year's data was excluded from the regression.

I adjusted the income data with the CPI deflator. Income would presumably operate multiplicatively as individuals make the labor leisure trade off, so I used the natural log of income. Those with less than $250 in income were presumed to be living at subsistence level, 250 dollars in 2014. Non-wage income is given by wage income subtracted from total income, and family income is given by reported total income subtracted from family income. The CPS warns that there can be consistency issues when doing that.

Individuals who reported some black ancestry were coded as black, those who did not, but reported some Hispanic ancestry were coded as Hispanic, and both categories, as well as those of part Asian or American Indian descent were coded as non-white. Some college includes those with an associate's degree, and less than high school includes those with 12 years of high school but no diploma.

I also ran an ordered logistic regression using a qualitative measure of the reservation wage, ranking respondents employed, unemployed, not in the labor force but able to work, and not in the labor force and unable to work. The outputs were not very different and it required some very strong assumptions, but using data on why people are not in the labor force could be useful in future research.

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