

Changes in the Educational, Racial and Ethnic Composition of U.S. Employment, January 2008 to August 2018, and the Debate over Diversity in the U.S. Economy

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I. Introduction¹

For a considerable period, Americans have debated the costs and benefits of various forms of diversity in the U.S. economy. Much of the recent public discussion of these issues has proceeded through the national debate over immigration. Based on that debate and numerous surveys, many Americans, especially Caucasians without college degrees, believe they are economically disadvantaged by the growing numbers of working-age immigrants from Latin America and Asia.² Moreover, Donald Trump has demonstrated the broad appeal of attacking immigrants in both the 2016 and 2018 elections.

Yet, numerous studies have found little evidence that immigration has adversely affected the wages of native-born Americans.³ There has been less attention to a related aspect of this issue, namely changes in the racial, ethnic and educational composition of U.S. employment. This study examines those issues over the current business cycle. It finds that from January 2008 to August 2018, the composition of employment changed markedly with respect to education and, at each level of education, with respect to race and ethnicity. These findings provide a new economic context for the current political potency of anti-immigration populism.

The study finds that from January 2008 to August 2018, the numbers of employed people without a high school diploma dropped sharply, the number of employed people with high school degrees dropped substantially, the number of employed people with college training short of a bachelor's degree rose modestly, and the number of employed college graduates rose so sharply that it far exceeded the total increase in jobs.

The study further finds that at every educational level, the racial and ethnic composition of the workforce changed significantly. Hispanic employment increased sharply among three of four educational groups: college graduates, those with college training short of a bachelor's degree,

¹ I gratefully acknowledge the research assistance of Siddhartha Aneja and the insightful comments of John Mayo of Georgetown University.

² Gimple, James (2017). "Immigration Policy Opinion and the 2016 Presidential Vote." Center for Immigration Studies. December 4, 2017. <https://cis.org/Report/Immigration-Policy-Opinion-and-2016-Presidential-Vote>. Also, Salvanta, Anthony, De Pinto, Jennifer, Khanna, Kabir and Backus, Fred (2018). "CBS News Battleground Tracker: Sharp divides over immigration, separations." June 24, 2018. <https://www.cbsnews.com/amp/news/cbs-news-battleground-tracker-sharp-divides-over-immigration-separation/>

³ For example, Hanson, Gordon and Scheve, Kenneth and Slaughter, Matthew and Spilimbergo, Antonio, "Immigration and the U.S. Economy: Labor-Market Impacts, Illegal Entry, and Policy Choices" (May 2001), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=296108; Basso, Gaetano and Peri, Giovanni, "The Association between Immigration and Labor Market Outcomes in the United States." IZA Discussion Paper No 9436. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2684246; Toussaint-Comeau, Maude (20007). "The Impact of Mexican Immigrants on U.S. Wage Structure." Federal Reserve Bank of Chicago Working Paper No. 2007-24. <http://dx.doi.org/10.2139/ssrn.1087329>; Card, David, Immigration and Inequality (2009). NBER Working Paper No. w14683. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1335708.

groups. Among employed people without high school diplomas, whites earned less than Asians or Hispanics, and blacks earned the least of the four groups.

The data used in this analysis come from the Census Bureau Current Population Surveys – the household survey for the Bureau of Labor Statistics (BLS) -- and cover civilian workers ages 16 and over working full-time or part-time.⁴ They also allow analyses by the race and ethnicity, including people in the three main racial groups of whites, blacks and Asians, and the main ethnic group of Hispanics.⁵ In addition, some data have been adjusted to ensure accuracy. The Census Bureau classifies whites, blacks and Asian as races and Hispanic as an ethnicity, which is correct technically. As a result, some of the jobs data issued by BLS classify as whites both non-Hispanics and Hispanics who identify as white, and similarly for blacks and Asians. An accurate picture of who is employed emerges only when those data are resorted into the four categories of non-Hispanic whites, non-Hispanic blacks, non-Hispanic Asians, and Hispanics.

Following this introduction, Section II will examine the gains and losses in employment by educational level. Section III will examine the gains and losses in employment at each educational level by race and ethnicity. Section IV will examine factors that can help explain those gains and losses in employment by race and ethnicity at different educational levels. Section V will review and summarize the findings of this study.

II. The Growing Dominance of College Educated Workers

First, I tracked changes in employment by education and found that both the advantage of a college degree and the disadvantage of never having attended college clearly intensified sharply. While this general finding is widely known, the extent of the attendant effects is less well appreciated. In August 2018, more than 10 years after the last recession began in January 2008 and nine years into the subsequent recovery and expansion, total employment across the four educational groups had risen by 8,828,323.⁶ However, the number of employed college graduates increased 12,360,732. From January 2008 to August 2018, the increase in the number of employed college graduates was equivalent to 140.0 percent of the total increase in employment, increasing their share of all employed people from 31.9 percent to 38.2 percent. (Table 1, below)

⁴ Bureau of Labor Statistics (2018). "Labor Force Statistics from the Current Population Survey." <https://www.bls.gov/cps/>

⁵ Our data set does not cover Alaskan Natives, American Indians, and people who self-identify as multiracial or who do not identify with any race. Those groups are small, although they did expand from 3.5 percent of employment in January 2008 to 5.0 percent in December 2017. Nevertheless, I do not include these small race-related groups, because the samples of each disaggregated by educational level do not support statistically-reliable results. As a result, the race and ethnicity categories for this study cover non-Hispanic whites, non-Hispanic blacks, non-Hispanic Asians, and Hispanics.

⁶ As noted, these data come from the Current Population Survey (CPS) -- household survey at the BLS -- because the CPS data are disaggregated by both education and by race and ethnicity. The corresponding aggregate data from the Current Employment Statistics (CES) based on the establishment survey reports are higher, but the general patterns are the same.

By contrast, employment gains by people with college training short of a bachelor's degree lagged their share of total employment at the beginning of this period. The number of employed people who had attended college and did not receive a bachelor's degree increased over this period by 749,147. Therefore, their gains accounted for 8.5 percent of the total increase in employment from January 2008 to August 2018, while the group had accounted for 28.6 percent of all employment at the beginning of this period.

The employment gains at those two educational levels were offset significantly by large declines in employment by those who did not attend college. From January 2008 to August 2018, the number of employed people without high school diplomas fell 2,770,203, and the number of high school graduates with jobs declined by 1,511,353 over the same decade, including nine years of steady economic growth. Considered together, these two educational groups accounted for 55,890,413 jobs in January 2008 or 40.0 percent of all employment; and by August 2018, they accounted for 51,608,857 jobs or 34.4 percent of total employment. All of these results are presented in Table 1, below.

Table 1. Changes in Employment by Educational Level, January 2008 to August 2018

Education	January 2008		August 2018		Change	
	Number	Share of Jobs	Number	Share of Jobs	Number	Percent
No HS Diploma	14,876,054	10.5%	12,105,851	8.1%	-2,770,203	-18.6%
HS Graduate	41,014,359	29.0%	39,503,006	26.3%	-1,511,353	-3.7%
Some College	40,365,097	28.6%	41,114,244	27.4%	749,147	1.9%
B.A. or More	45,041,297	31.9%	57,402,029	38.2%	12,360,732	27.4%
Total	141,296,807	100.0%	150,125,130	100.0%	8,828,323	6.2%

III. Racial and Ethnic Changes in the Workforce by Educational Level

Next, I tracked changes in employment by each of the racial and ethnic groups at each educational level. The data do not show large gains by the two groups with the largest shares of college graduates, whites and Asians, but rather large changes in the racial and ethnic makeup of U.S. employment at each educational level. Overall, white employment declined at most educational levels, and black, Hispanic and Asian employment increased at most or all levels.

Table 2: Changes in Employment by Race and Ethnicity and by Education, January 2008 to August 2018

<i>Employed Non-Hispanic Whites</i>						
Education	January 2008		August 2018		Change	
	Number	Share of Jobs	Number	Share of Jobs	Number	Percent
No HS Diploma	6,279,099	42.2%	4,548,228	37.6%	-1,730,871	-27.6%
HS Graduate	28,730,506	70.0%	23,875,812	60.4%	- 4,854,694	-16.9%
Some College	29,845,066	73.9%	27,274,552	66.3%	- 2,570,514	- 8.6%
B.A. or More	35,080,000	77.9%	41,531,288	72.4%	6,451,288	18.4%
Total	99,934,671	70.7%	97,229,880	64.8%	-2,704,791	-2.7%
<i>Employed Non-Hispanic Blacks</i>						
No HS Diploma	1,682,986	11.3%	1,118,852	9.2%	-564,134	-33.5%
HS Graduate	5,274,760	12.9%	5,605,641	14.2%	330,881	6.3%
Some College	4,904,044	12.1%	5,884,635	14.3%	980,591	20.0%
B.A. or More	3,427,843	7.6%	5,247,340	9.1%	1,819,497	53.1%
Total	15,289,633	10.8%	17,856,468	11.9%	2,566,835	16.8%
<i>Employed Non-Hispanic Asians</i>						
No HS Diploma	556,205	3.7%	585,969	4.8%	29,764	5.4%
HS Graduate	1,225,782	3.0%	1,699,916	4.3%	474,134	38.7%
Some College	1,244,819	3.1%	1,523,587	3.7%	278,768	22.4%
B.A. or More	3,779,158	8.4%	5,903,739	10.3%	2,124,581	56.2%
Total	6,805,964	4.8%	9,713,211	6.5%	2,907,247	42.7%
<i>Employed Hispanics</i>						
No HS Diploma	6,357,764	42.7%	5,852,802	48.3%	-504,962	-7.9%
HS Graduate	5,783,311	14.1%	8,321,637	21.1%	2,538,326	43.9%
Some College	4,371,168	10.8%	6,431,470	15.6%	2,060,302	47.1%
B.A. or More	2,754,256	6.1%	4,719,662	8.2%	1,965,406	71.4%
Total	19,266,499	13.6%	25,325,571	16.9%	6,059,072	31.4%

A summary of these findings:

- The number of employed whites fell sharply among workers without high school degrees, high school graduates, and those with college training short of a bachelor's degree; and while the number of employed white college graduates rose substantially, whites' share of that employment declined.
- The number of employed blacks increased at every educational level except among people without high school degrees; and black workers' share of total employment increased at every educational level except, again, those without high school degrees. Black worker's share of employment increased very sharply among college graduates.

- The number of employed Asians increased substantially at all educational levels except among people without high school degrees, where their numbers rose modestly. Asians' share of employment increased substantially among all educational groups.
- The number of employed Hispanics increased sharply at every educational level except those without high school degrees; and as with Asians, Hispanics share of employment increased substantially among all educational groups.

The American workforce clearly has become much more racially and ethnically diverse as the share of white workers has contracted and the shares of Hispanic, Asian and black workers have expanded. Across all educational levels, total employment increased 8,828,323 or 6.2 percent from January 2008 to August 2018. Across those educational groups, total white employment declined 2,704,791 or 2.7 percent, while black employment increased 2,566,836 or 16.8 percent, Asian employment grew 2,907,247 or 42.7 percent, and Hispanic employment increased 6,059,072 or 31.4 percent.

The diminishing dominance of white workers overall and at all educational levels

Over this period, employment among whites, especially those without college degrees, contracted in a singular way, providing a basis for a sense of economic injury among many in this group. The decline in the numbers of employed whites was disproportionately large among people without high school degrees and singularly negative among high school graduates and people with some college training. In addition, their increase among college graduates was disproportionately small.

Among college graduates, the number of employed whites increased 18.2 percent. compared to the 27.4 percent increase in total employment of college graduates. Whites accounted for 77.9 percent of employed college graduates in January 2008, but their increase in this group accounted for only 52.2 percent of the total. As a result, the white share of this part of the workforce fell 5.5 percentage points or by 7.1 percent.

Among high school graduates, the number of employed whites declined by 4,854,694 or 16.9 percent, while the total number of employed high school graduates fell by just 1,511,353 or 3.7 percent. Whites were the only group with declining employment among high school graduates, and their share of this part of the workforce fell 9.6 percentage-points or 13.6 percent.

Among people without high school degrees, employed whites declined by 1,730,871 or 27.6 percent, compared to an 18.6 percent overall decline in jobs held by people in this educational group. As a result, the white share of group fell 4.6 percentage points or 10.9 percent.

Among people with college training short of a bachelor's degree, the number of employed whites declined by 2,570,514 even as total employment by this educational group increased

749,147. As a result, the white share of this part of the workforce declined 7.6 percentage points or 10.3 percent.

The rapid growth of Hispanic and Asian employment at all or most educational levels

In sharp contrast, over the same period, the numbers of employed Hispanic and Asian workers increased at significantly higher rates than overall employment at every educational level. The outsized job gains by Hispanics and Asians paralleled the outsized contractions in employment by whites in most educational groups, providing a new narrative for anti-immigrant populism. From January 2008 to August 2018, the combined employment gains by Hispanics and Asians totaled 8,966,319, compared to 8,828,323 for all groups and a contraction in total employment among whites of 2,704,791.

Among people without high school diplomas, the numbers of employed Hispanics declined 504,962 or 7.9 percent, compared to an 18.6 percent decline overall and a 27.6 percent contraction in employed whites at this educational level. As a result, the Hispanic share increased 5.6 percentage-points or 13.1 percent, while the white share contracted 10.9 percent. The number of employed Asians without high school diplomas rose 29,764 or 5.4 percent, increasing their share of this part of the workforce by 1.1 percentage points or 29.7 percent.

Among high school graduates, the numbers of employed Hispanic increased 2,538,326 or 43.9 percent, even as the total number of employed high school graduates fell 3.7 percent and the numbers of white high school graduates with jobs contracted 16.9 percent. As a result, the Hispanic share of this part of the workforce increased 7.0 percentage points or 29.6 percent, while the white share fell 13.7 percent. Similarly, the number of employed Asian high school graduates increased 474,134 or 38.7 percent over this period, raising their share of this part of the workforce by 1.3 percentage points or 43.3 percent.

Among people with college training short of a bachelor's degree, the number of employed Hispanics increased 2,060,302 or 47.1 percent, compared to overall gains across all four racial and ethnic groups of 1.9 percent, as well as employment losses of 8.6 percent by among whites in this group. As a result, the Hispanic share of this part of 4.8 percentage points or 44.4 percent, while the white share contracted 10.3 percent. Similarly, the number of employed Asians in this educational group increased 278,768 or 22.4 percent over this period, expanding their share of this part of the workforce by 0.6 percentage points or 19.4 percent.

Finally, among college graduates, the number of employed Hispanics increased 1,965,406 or 71.4 percent, compared to gains at this educational level of 27.4 percent across all groups and 18.4 percent by whites in this group. As a result, the Hispanic share of employment by college graduates increased 2.1 percentage point or 34.4 percent, while the white share fell 7.1 percent. Similarly, the number of employed Asian college graduates increased by 2,124,581 or

56.2 percent, expanding their share of this part of the workforce by 1.9 percentage points or 22.6 percent.

The fast-expanding role of more educated black workers

Finally, employment gains by blacks with college degrees or college training short of a bachelor's degree were comparable to the gains by Asians in those educational groups. Job gains by black high school graduates were more modest, and the number of employed blacks without high school diplomas fell very sharply. All told, from January 2008 to August 2018, black employment increased by 2,566,835 or 16.8 percent, as compared to employment gains of 6.2 percent across all four groups and a 2.7 percent contraction in employment by whites.

Among college graduates, black employment increased by 1,819,497 or 53.1 percent, compared to the 27.4 percent increase in all employed college graduates and the 18.2 percent increase in white college graduates with jobs. As a result, the black share of all employed college graduates increased 1.5 percentage points or 19.7 percent, while the white share contracted 7.1 percent.

Among people with college training short of a bachelor's degree, black employment increased 980,591 or 20.0 percent, compared to gains across the four racial and ethnic groups of 1.9 percent in this educational group and a 8.6 percent decline among employed whites in this group. As a result, the black share of employed people with college training short of a bachelor's degree increased 2.2 percentage-points or 17.9 percent, while the white share of this group contracted 10.6 percent.

Among high school graduates, black employment increased 330,881 or 6.3 percent, even as the numbers of employed high school graduates fell 3.7 percent over and 16.9 percent among whites. As a result, the black share of employed high school graduates increased 1.3 percentage-points or 10.9 percent, while the white share fell 13.7 percent.

Finally, among employed people without high school diplomas, the number blacks declined to a greater degree than any other group. Employed blacks without high school diplomas fell 564,134 or 33.5 percent, compared to declines of 3.7 percent across all working people without high school degrees and 27.6 percent among whites in this group. As a result, the black share of this part of the workforce fell 2.1 percentage points or 18.6 percent.

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These workforce changes have three prominent features: Employment of whites contracted or slowed at every educational level; employment of Hispanics and Asians increased sharply at most educational levels; and employment of blacks increased sharply in the two higher educational groups. The employment declines among whites created economic hardships and grievances, and the contrasting employment gains among Hispanics and Asians, and blacks to a

lesser degree, may well have amplified the appeal of Donald Trump's attacks on immigrants and minorities, especially for non-college educated whites.

IV. Major Factors Driving these Workforce Changes

Jobs markets shift around a great deal over the course of most business cycles. In the first two years of the current one, the financial system cracked open, a mild downturn became a steep recession, and a net 7,677,140 Americans lost their jobs. In due course – given massive government stimulus, virtually zero interest rates, and generally resilient markets -- the economy stabilized, and employers started hiring again. By January 2014, total employment was nearly back to January 2008 levels. Four years and eight months later, in August 2018, 8,828,323 more people were employed than when the cycle began in January 2008.

From one cycle to the next, however, the employment markets usually change very gradually. Yet, this time, the educational, racial and ethnic composition of the U.S. workforce changed dramatically. What can explain this striking, rapid reshuffling of the jobs market?

We can set aside two factors cited by some commentators. First, some of those commentators point to differences in disability rates for each group, especially regarding opioids and between whites and Hispanics without college degrees. However, these differences do not explain the workforce changes, because the numbers of whites and Hispanics who did not work for disability reasons over this period, as well as the numbers of Asians and blacks, all declined at every educational level over that period.

Other commentators cite geography as a factor in these workforce developments, positing that the decline in the employment of whites without college degrees occurred disproportionately in rural places, while the large employment gains by other groups occurred in more prosperous non-rural areas. To test this proposition, I looked for disproportionate declines in employment by whites without college degrees in rural states, using the Census Bureau demographic topography of rural versus urban states. The Bureau designates 10 states as very rural based on more than 40 percent of their populations living in communities of 50,000 people or less and designates another 17 states as somewhat rural based on 25 percent to 40 percent of their populations living in such communities. Similarly, nine states and the District of Columbia are considered very urban, because less than 10 percent of their populations live in communities of 50,000 people or less, and the remaining 14 states are designated as somewhat urban with 10 percent to 25 percent of their populations living in such smaller communities.

Our analysis did not find evidence that compared to more urban states, rural states saw disproportionate declines in employed whites without college degrees or disproportionate increases in employed Hispanics, blacks and Asians without college degrees. Rather, those contractions in white employment occurred everywhere. Similarly, substantial gains in

Hispanic, black and Asian employment occurred across in almost all states with substantial populations of working-age Hispanics, blacks or Asians. The question of whether county-level data might show a geographic impact on these workforce changes cannot be answered at this time, because county-level data disaggregated by race, ethnicity and education are not available.

The main factor is the labor market: labor force changes and pay requirements

The major force at work here is the labor market itself, starting with changes in the racial and ethnic composition of the labor force, or labor supply. When employment dropped sharply in the Great Recession, most of the 7,677,100 people in our four groups who lost their jobs in 2008-2009 were ready to return to work when employers started hiring again. Yet, over the following eight years and eight months, from January 2010 to August 2018, the numbers of people looking for jobs, especially new entrants, increased substantially among Hispanics and Asians, followed by blacks, and contracted among whites.

Demography plays a role in this shifting composition of the labor supply as well as the workforce. As groups, whites are older than blacks, Asians and Hispanics: Over this period, the [average median age of whites was 43.6 years, compared to 40.7 years for Asians, 39.3 years for blacks, and 36.5 years for Hispanics](#). As a result, some of the decline in the number of whites with jobs or seeking work reflects a larger share reaching retirement age and a smaller share entering the workforce. Similarly, some of the increase in the numbers of Hispanics working or looking for work reflects a larger share growing old enough to enter the workforce and a smaller share retiring.

These differences in median age also reflect differences in birthrates and immigration rates. Higher birthrates two to three decades earlier pushed up labor force growth for immigrant and minority groups over the years 2010 to 2017. Data from the [Centers for Disease Control \(CDC\)](#) show that birth rates from 1980 to 1989 averaged 15.1 per-thousand for whites, 19.15 for Asians, and 21.0 for blacks. CDC issued birth rates for Hispanics on a once-per-decade basis until 1989, when it shifted to annual data. Those data show that from 1989 to 1999, [the Hispanic birthrate](#) averaged 24.7 per-thousand, compared to averages of 14.5 per-thousand for whites, 17.3 per-thousand for Asians, and 19.4 per-thousand for blacks. By 2008, babies born in 1990 had attained working-age status at 18 years old, and the varying birthrates by race and ethnicity in the 1980s and 1990s clearly affected the composition of the labor supply available for employment over this business cycle.

The composition of the [pool of new immigrants](#) from 2000 to 2014 also aligns generally with the disproportionate labor force growth by Hispanics and Asians, compared to whites and blacks. Over those 14 years, an estimated 8,580,000 immigrants arrived from Latin America and 5,007,000 arrived from Asia, compared to 2,384,000 arriving from Europe, the Mideast and Canada, and 974,000 arriving from Africa. In this recent period in which 16,945,000 immigrants

entered the United States, Hispanics accounted for 50.6 percent of them, Asians for 29.5 percent, whites for 14.1 percent, and blacks for 5.7 percent. Further, [68 percent](#) of those immigrants were prime working age when they arrived (ages 20 to 49 years old). These immigration rates also clearly affected the labor force available for employment in this business cycle.⁷

All told, based on the differences in the four groups' age distributions, birthrates and immigration rates, as well as factors such as incarceration and institutionalization rates, the U.S. [prime working-age population, ages 20 to 49, changed at different rates based on race and ethnicity](#). From January 2010 to August 2018, the prime working-age population of whites contracted by 6,357,056 or 8.2 percent. By contrast, this prime working-age cohort of blacks increased 856,021 or 5.2 percent. The comparable cohort expanded among Asians by 2,588,279 or 40.1 percent, and among Hispanics increased 18.7 percent or 3,916,241. All told, the supply of prime working-age Hispanics, Asians and blacks increased 7,360,541 over the extended period of job creation from January 2010 to August 2018, while the supply of prime working-age whites contracted 6,357,056.

The four groups also have [significantly different labor participation rates](#), the percentage of each group's working-age population employed or looking for work. Over this period, the was highest over this period for Hispanics and lowest among blacks, bracketing both Asians and whites followed by whites. From January 2010 to August 2018, the average labor participation rate was 66.2 percent among Hispanics, followed by 63.7 percent among Asians and 63.0 percent among whites, and finally 61.7 percent among blacks. These labor participation rates reinforced the impact of the large gains in the Hispanic prime working-age population and the Asian working-age population – as well as the more modest gains among blacks and the substantial decline in the white prime working-age population.

From 2010 to 2018, therefore, the supply of prime working age people actively in the labor force contracted 5,125,072 among whites and expanded by 791,428 among blacks, by 2,015,115 among Asians, and by 2,602,962 among Hispanics. For all of these reasons, when employers created new jobs over this business cycle, the supply of available Hispanic and Asian workers had expanded substantially, the supply of black workers on the job market had expanded more modestly, and the supply of available white workers had contracted significantly.

The other critical labor market factor here is wages, which affect employers' demand for workers. The data show that employers looking to hire workers not only had an expanded pool of Hispanics and Asians to choose from, and to a lesser degree more blacks. [At each](#)

⁷ The overall net migration rate into the U.S. fell steadily from 2000 to 2015, from 6.3 per-1,000 in 2000 to 3.6 in 2005, 3.3 in 2010, and 2.9 in 2015. "United States of America – Net migration rate." World Data Atlas. Knoema. 2018. <https://knoema.com/atlas/United-States-of-America/topics/Demographics/Population/Net-migration-rate>.

[educational level, employers also pay Hispanics, Asians and blacks less, on average, than they pay whites.](#) There is a long history of immigrants and minorities working for less than others with the same education, sometimes willingly and more often unwillingly. Italians, Poles, Eastern Europeans and Irish, as well as blacks, did so a century ago; and according to the Census Bureau's Current Population Survey, many Hispanics, Asians and blacks have done so through this business cycle.

The largest pay differences are evident among high school graduates. From 2008 to 2017, the average annual earnings of white high school graduates, at \$37,734 (2017 \$), were 35.5 percent higher than the average for their black counterparts of \$27,848, 25.3 percent more than the average for Hispanic high school graduates at \$30,114), and 20.7 percent more than the average for Asians with that education, or \$31,270. The pay differences are substantial but smaller among workers with college training short of a bachelor's degree. Across this group, whites took home on average \$42,112 per-year over this period, or 26.9 percent more than blacks with the same education at \$33,198, 23.4 percent more than Hispanics at \$34,130, and 14.4 percent more than Asians at \$36,819.

Pay disparities associated with race and ethnicity also are significant among college-educated employees. Across college graduates in the four groups, whites took home on average \$78,916 per-year over this period, or 27.6 percent more than their Hispanic counterparts at \$61,794 and 29.6 percent more than black college graduates at \$60,903. However, the earnings gap between Asian and white college graduates changes direction – whites in this educational group earned on average 1.7 percent less per year at \$78,916 than Asians in this group at \$80,290.

The exception to this pattern involves people without high school diplomas, which also is the only educational group with contracting employment over this period in three of the racial and ethnic groups. Among employed people without high school diplomas, Hispanics earned an average of \$22,745 per-year over this period and Asians earned on average \$22,111 per-year, which respectively 12.2 percent more and 9.1 percent more than whites at \$20,270. Employed blacks without high school diplomas earned by far the least of the four groups, at an average of \$16,390 per-year over this period or 27.9 percent less than their Hispanic counterparts, 25.9 percent less than their Asian counterparts, and 19.1 percent less than whites employed whites in this educational group.

Extensive research has found that discrimination in a variety of forms is a crucial force behind earnings differences among people of different races and ethnicities but comparable education.⁸ The ambitions of new immigrants and minorities also play a role, as does the

⁸ For example, Cotton, Jeremiah (1988). "On the Decomposition of Wage Differentials." *The Review of Economics and Statistics*. Vol 70, No.2 (May 1988). Pp. 236-43. Blinder, Alan (1973). "Wage Discrimination: Reduced Form and Structural Estimates." *The Journal of Human Resources*. Vol. 8, No. 4 (Autumn 1973). Pp. 436-455. Flanagan, Robert J (1973). "Racial

greater prevalence of part-time work among Hispanics, Asians and blacks than among whites. Whatever the precise mix of these and other factors, the economic result is that people who will work for less are more likely to be hired.

V. Summary of Findings

This study establishes that over the course thus far of the current business cycle, from January 2008 to August 2018, changing conditions in U.S. labor markets produced a reshuffling of overall employment that substantially affected its educational, racial and ethnic composition. As to education, the numbers of employed people without college training dropped sharply, the number of employed people with college training short of a bachelor's degree increased at a modest rate, and the number of employed people with a college degree or more increased so sharply that those gains greatly exceeded the total increase in jobs.

Concerning to the racial and ethnic composition of U.S. employment at each educational level, we find that the numbers of employed Hispanic and Asian high school graduates increased sharply even as employment of all high school graduates fell sharply. The numbers of employed Hispanic and Asian college graduates and the numbers of employed Hispanics and Asians with college training short of a bachelor's degree all increased at rates substantially higher than the overall employment gains for those educational groups and substantially greater than their shares of the workforce at those educational levels in January 2008. The numbers of employed blacks with college degrees or college training short of a bachelor's degree also increased at rates significantly higher than the overall employment gains for those educational groups and significantly greater than black workers' share of the workforce at those educational levels in January 2008. Finally and in sharp contrast, the numbers of employed whites fell sharply at every educational level except people with college degrees, and the number of employed white college graduates increased at a rate substantially less than the total increase in employed college graduates or white workers' share of this part of the workforce in January 2008.

Major factors affecting these shifts include demographics and the normal operations of labor markets. From 2010 to 2018, the labor supply of prime working-age people (ages 20 to 49) increased by 3,916,241 among Hispanics, by 2,588,279 among Asians, and by 856,021 among blacks. By contrast, the number of prime working age whites declined by 6,357,056 over the same period. In addition, the average annual labor participation rates of Hispanics and Asians were substantially higher than the rates for whites and blacks. Finally, in every educational

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group except people without high school diplomas, the cost of employing Hispanics, Asians and blacks was substantially less than the cost of employing whites with the same education.