

THE IMPACT OF IMMIGRATION ON WAGES OF UNSKILLED WORKERS

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Immigrants did not contribute to the national decline in wages at the national level for native-born workers without a college education. This article reviews how the timing of their immigration and skill sets of immigrants between 1970 and 2014 could not have been responsible for wage declines. This article then reviews other evidence at the local level that implies immigration is not associated with wage declines for noncollege workers, even if they are high school dropouts. Higher immigration is associated with higher average wages. Causality is difficult to tease out but numerous factors could explain the positive association between the quantity of immigrants and native wages.

Wage Stagnation in the American Workforce

Wages for noncollege graduates, which this article refers to as “unskilled,” have been stagnant since 1980 (Autor, Katz, and Kearney 2008). The Census data confirm that the average national real weekly wage of college-educated workers who are natives, employed for at least one week of the previous year, and aged between 18 and 65 grew by about 20 percent from 1980 to 2014. In contrast, the average real weekly wage of noncollege graduates decreased by 8 percent

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during the same period, while dropouts lost about 18 percent of their real weekly wages. Trends in wage inequality between college and noncollege workers highlight this trend but with significant variation over the period. For instance, the 1990s were the only decade in which college and noncollege workers both saw positive wage gains of 10 and 14 percent, respectively.

Immigration's Contribution to Wage Stagnation on the National Level

Immigration could affect wages by changing the relative supply of different types of workers. For instance, if immigration increased the supply of noncollege graduates substantially relative to workers in other education levels then it could contribute to a pure "relative supply" explanation whereby an increase in one type of worker reduces their wages relative to other types of workers. This section uses the estimates of the elasticity of complementarity between college and noncollege workers and between high school graduates and dropouts to see how relative changes in the quantity of immigrants by education affects wages.

Wage Gap for College and Noncollege Workers

This article calculates the effect of the relative worker-supply shift produced by immigrants with a constant elasticity of substitution (CES) in a production function (Katz and Murphy 1992). The size of this effect depends inversely on the elasticity of relative wages to relative supply. Table 1 uses the elasticity of 1.75, the proper elasticity according to the current state of the peer-reviewed literature, to show that immigration cannot account for the observed increase in wage inequality in the considered period by decade; thus it cannot account for relative wage stagnation. The relative supply effect of immigration actually attenuates wage inequality in the periods of largest increase in the gap between college and noncollege workers from 1980 to 1990 and 2000 to 2010. Immigrants were disproportionately college educated in those two decades, but these periods also experienced the largest increase in the college and noncollege wage differentials. Immigration can explain 14 percent of the increase in the wage gap in the 1990s. Too many immigrants are college educated to explain any of the relative wage decline of noncollege graduates especially in the decades when this relative wage

TABLE 1
COLLEGE-NONCOLLEGE RELATIVE WAGES AND EFFECTS OF IMMIGRANTS

	1	2	3	4	5	6	7	8
	Change of Immigrants as % of High School or Less	Change of Immigrants as % of Some College and More	Relative % Change	Potential % Effect on Wage of Noncollege Relative to College (elasticity 1.75)	Actual National Change in Wage of Noncollege Relative to College	What Share of Noncollege Underperformance Can Be Due to Immigrants?	Increase in Share of College Educated Due to Immigrants	Potential Externality Range on Average Wages
1970-80	4.6	8.7	4.2	+2.4	2.6	91% (reducing inequality)	+1.1	+0.3/1.1
1980-90	3.3	5.2	1.8	+1.0	-13.7	wrong sign	+1	+0.3/1
1990-00	6.7	5.8	-0.9	-0.5	-3.7	14%	+1.7	+0.4/1.7
2000-10	3.9	4.8	0.9	+0.5	-6.6	wrong sign	+1.6	+0.4/1.6
2010-14	0.1	1.3	1.2	+0.7	0.8	91% (reducing inequality)	+0.6	+0.1/0.6

SOURCES: U.S. Census, American Community Survey, and author's calculations.

decline was the greatest. Only in the 1990s was immigration moderately noncollege intensive. The 1980 to 2010 relative supply change due to immigrants could account only for 0.1 percent of the *increase* in wage inequality when there was a 24 percent *decrease* in the relative college to noncollege wage ratio.

The Wage Gap for High School Dropouts and High School Graduates

There is some disagreement among economists, but there is substantial evidence that workers who are high school dropouts and those with only a high school degree are substitutable, which means that changes in their relative supplies do not significantly affect their relative wages (Goldin and Katz 2008, Ottaviano and Peri 2012, Card 2009). If that characteristic holds for the period that this article examines then it would negate a significant argument for how immigration affects the relative and absolute wage declines of dropouts.

Nevertheless, using a nested-CES approach, we consider noncollege workers as a combination of imperfectly substitutable dropouts and high school only graduates. The elasticity of substitution between dropouts and high school graduates is set to be equal to 1.75, the same elasticity as used above to describe the elasticity of relative wages to relative supply of college educated (Borjas 2003; Borjas, Grogger, and Hanson 2012). Even in this case, the theory that an increase in relative immigrant supply decreases wages and boosts inequality does not hold up (Table 2). Immigration can explain 75 percent of the increased inequality in the 1990 to 2000 period but actually attenuates or has no significant effect on inequality in any other period. Immigration can only account for approximately one-fifth, or 3.9 percentage points of the 18.2 percent, of the relative wage decline of dropouts to high school graduates from 1980 to 2010.

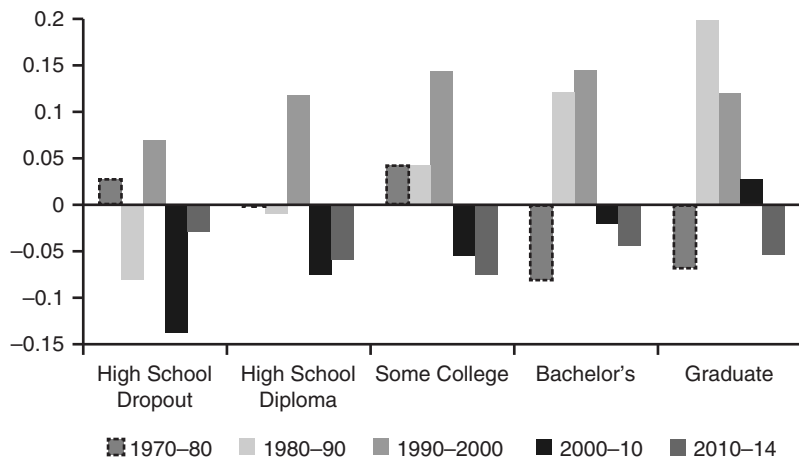
Similar analysis for more detailed education groups confirms that immigration cannot explain changes in the wage gap. Immigration increased the supply of highly educated workers more than that of less educated ones in most decades except for the 1990s when the supply of high school dropouts increased at an unusually high rate. Figure 1 shows the observed percentage growth in weekly wages for the five education groups of natives by period. If increased immigration were associated with a lower relative growth of real wages across groups, the distribution of wage changes should be inversely related to the change in immigrants. This happens only in the 1990 to

TABLE 2
HIGH SCHOOL GRADUATES-DROPOUTS RELATIVE WAGES AND EFFECTS OF IMMIGRANTS

	Change of Immigrants as % of Dropouts Employed	Change of Immigrants as % of High School Graduates	Relative Change	Potential Effect on Wage of Dropouts Relative to Diploma (elasticity 1.75)	Actual National Change in Relative Wages	What Share of Dropouts' Underperformance Can Be Due to Immigrants?
1970-80	4.9	4.2	-0.7	-0.4	2.9	wrong sign
1980-90	3.2	3.4	0.2	0.1	-7.2	wrong sign
1990-00	10.9	4.7	-6.2	-3.5	-4.7	75%
2000-10	4.4	3.6	-0.8	-0.5	-6.3	7%, very small impact
2010-14	-1.4	0.7	0.2	0.12	3.1	39% reducing inequality

SOURCES: U.S. Census, American Community Survey, and author's calculations.

FIGURE 1
 REAL WAGE CHANGE FOR NATIVES BY EDUCATION,
 1970–2014



SOURCES: U.S. Census, American Community Survey, and author's calculations.

2000 period. During all other decades, the immigrant supply and native wage growth are *positively* associated. Immigration's effect on the relative supply of differently educated workers is either irrelevant to explaining wage inequality or actually attenuated it.

The flow of immigrants by decade had a greater relative impact on the supply of college-educated workers than noncollege-educated workers, especially in the 1980–90 and 2000–10 decades when inequality rose and wage stagnation for noncollege and dropouts increased. Immigration was only dropout intensive, relative to the native education distribution, during the 1990–2000 decade. However, this was a period when inequality did not grow much and the real wage of noncollege workers increased more than in any other period. The aggregate numbers simply make it impossible for the relative supply of immigrants to explain any significant change in inequality or wage loss for unskilled workers.

Immigration and Wage Decline on the Local Level

The inflow of immigrants across the decades rules out any significant effect on noncollege wage losses on the national level.

However, concentrated and highly localized immigration might be able to affect wage gaps, especially for noncollege or dropout workers at the local level.

Current research already shows very little local wage effects. Card (2001, 2009) found that immigration may change the relative supply of dropouts to high school graduates across metro areas but that such a shift does not seem to have a significant effect on their relative wages. Lewis (2011) explains the lack of a relative wage effects at the local level by showing that immigration may increase the intensity of dropout workers and thus induce the choice of dropout-efficient production techniques that demand more dropout workers that then offsets the increased supply of such workers. Peri (2012) further shows that firms in states with many immigrants choose techniques more efficient in the use of noncollege workers that offsets the anticipated negative wage impacts with productivity gains. In other words, firms change their production techniques to take account of immigrant labor that can then attenuate immigration's potential negative impact on wages.

Rather than firms changing in response to immigrants, native workers could also change their behavior by specializing in other specific tasks that are different than those undertaken by immigrants. Recent research looks at the skills distribution of workers across productive tasks rather than by education group (Autor 2015). Peri and Sparber (2009) show that immigrants increased the relative supply of manual tasks in some U.S. states among noncollege-educated workers but that native decisions to shift to nonmanual tasks over time attenuated the potentially negative wage effects. This may also explain the imperfect substitution between immigrants and natives who are both noncollege workers (Ottaviano and Peri 2012).

Immigrants do not cause much of a local negative wage effect. Empirical studies do not find that local immigrant inflows depress wages of noncollege- or college-educated workers by location. Basso and Peri (2016) look at all 722 continental U.S. commuting zones that are local labor markets. They show a correlation between changes in immigrants as a share of the workforce and the percentage change of wages for noncollege- and college-educated workers for the 1970 to 2010 period. The correlation is positive and significant in both cases, which demonstrates that larger inflows of immigrants are somewhat associated with higher wages. The positive association is stronger for college-educated workers and is small, but positive, for noncollege

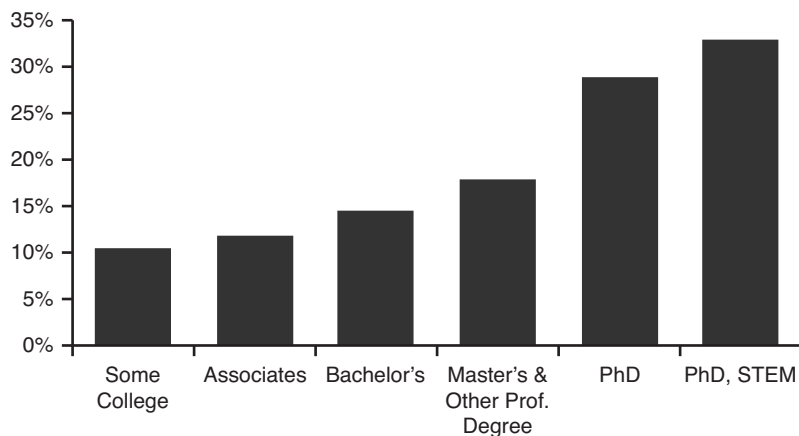
workers. Further statistical analysis reveals an insignificant correlation of immigration and native noncollege wages and a positive correlation with average wages.

The fact that commuting zones with large immigration rates are not associated with lower wages of noncollege workers rules out the possibility that immigration can explain geographic wage differentials for noncollege-educated workers. The positive association of immigrants with changes in college-educated worker wages at the local level may be due to omitted productivity shocks on college wages which also attract immigrants or to other positive economic spillovers.

Why Immigrants Have Not Lowered Native Wages

One reason why local wages did not decline due to immigration is an increase in local productivity generated by immigrants (Peri, Shih, and Sparber 2015). Foreign-born workers are concentrated among very highly educated workers in science, technology, engineering, and mathematics (STEM) occupations. Figure 2 illustrates the presence of foreign-born among workers with some tertiary education in 2014. STEM immigrant workers enhance local firms' productivity

FIGURE 2
PERCENTAGE OF IMMIGRANTS IN EACH
EDUCATIONAL GROUP, 2014

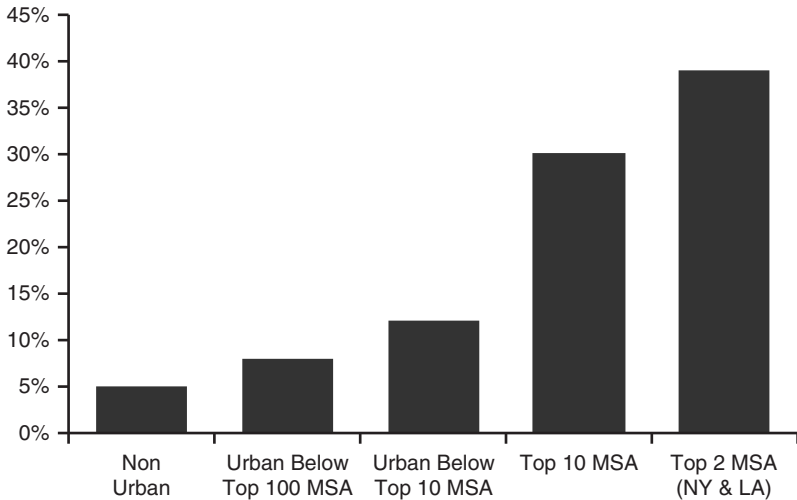


SOURCES: U.S. Census, American Community Survey, and author's calculations.

and may generate positive local effects on growth and wages. On the national level, foreign college-educated STEM workers may have produced a 2 percent increase in noncollege wages and a 5 percent increase in college wages through local technological growth and adoption from 1990 to 2010 (Peri, Shih, and Sparber 2015). Those findings are supported by evidence that immigrant workers are also more likely to patent and, thus, innovate than natives in ways that could produce positive productivity spillovers (Iranzo and Peri 2009, Hunt and Gauthier-Loiselle 2010, Kerr and Lincoln 2010).

Three other potential channels are worth mentioning, and they suggest that immigrants may actually have had a role in stimulating average local wage growth. First, immigrants are highly concentrated in denser metropolitan areas (Figure 3). Density reduces transportation costs, increases labor market interactions and efficiency, increases knowledge spillovers, reduces information asymmetries, and has positive effects on productivity known as “agglomeration economies” (Ciccone and Hall 1996, Greenstone, Hornbeck, and Moretti 2010). Without immigrants, several of the largest U.S. metropolitan areas would be from 10 to 30 percent

FIGURE 3
PERCENTAGE OF IMMIGRANTS BY URBAN AREA, 2014



SOURCES: U.S. Census, American Community Survey, and author’s calculations.

smaller, and hence would benefit to a lesser extent from these local effects of density. Thus, immigrant inflows contributed positively to all of these effects by increasing the density of productive workers in American cities.

The second positive channel is through entrepreneurs at small firms and startups. Immigrants have a higher self-employment rate than natives and they have started several high-tech companies (Fairlie 2013). Their inflow therefore implies a larger share of entrepreneurs in the labor force. In this role, immigrants may generate local employment opportunities for natives, further increasing demand for native workers that would offset any increase in labor supply. More academic research is necessary to explore how immigrant entrepreneurs increase labor demand.

The third potential explanation is that immigrants are actually competing with the new immigrants rather than with natives. Immigrants comprised almost 40 percent of dropouts in 2014, up from less than 20 percent in 1970, and their wages overall are somewhat lower than those of corresponding natives by 4 to 10 percent after controlling for demographics. However, there is not much evidence that the relative wage disadvantage of this group has worsened in the last 14 years. One interesting difference in labor market outcomes is that, while having relatively low wages, immigrant dropouts have a much higher employment rate than natives. Hence, including all high school dropouts in working age, immigrants have higher average earnings than natives due to their higher probability of working. A significant share of this group (about 80 percent) are Hispanic, and many of them are undocumented. Policies that allow regularization and full access of these workers to the labor market may raise their wages and narrow the pay gap.

Conclusion

Simple modeling and regression analysis applied to the last four decades of U.S. labor market history show that immigrants are not responsible for the stagnating or declining wages of noncollege workers, either nationally or in regions with high immigration. In fact, immigrants may be responsible for preventing an even further relative decline in wages by education group. While we need more evidence that these factors have helped the wages of noncollege workers, there is no evidence that immigrants have lowered their wages. A policy of

larger and more education-balanced immigration inflows combined with a legalization of many existing unskilled immigrant workers could boost U.S. productivity and wages. Immigration did not contribute to wage stagnation, growing wage-inequality, or absolute declines. More appropriate immigration policies, however, may help boost wages and jobs at the local level.

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