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Article

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Do immigrant workers depress the wages of native workers?

Short-term wage effects of immigrants are close to zero—and in the long term immigrants can boost productivity and wages

Keywords: immigration, wages, productivity, complementarity, skills, wage distribution, dynamic adjustments

ELEVATOR PITCH

Politicians, the media, and the public express concern that immigrants depress wages by competing with native workers, but 30 years of empirical research provide little supporting evidence to this claim. Most studies for industrialized countries have found no effect on wages, on average, and only modest effects on wage differentials between more and less educated immigrant and native workers. Native workers' wages have been insulated by differences in skills, adjustments in local demand and technology, production expansion, and specialization of native workers as immigration rises.

KEY FINDINGS

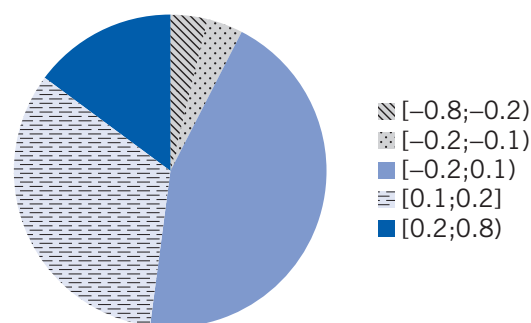
Pros

- ⊕ Immigration has a very small effect on the average wages of native workers.
- ⊕ There is little evidence of immigration lowering wages of less educated native workers.
- ⊕ In the long term, immigration, especially of high-skilled workers, increases innovation and the skill mix, with potentially positive productivity effects.
- ⊕ In many countries, the share of graduate workers is higher for immigrants than for native workers.
- ⊕ Firms have absorbed immigrants by adopting appropriate technologies, expanding production, and moving native workers into more communication-intensive jobs.

Cons

- ⊖ There is some evidence of a negative effect of newly settled immigrants on the wages of earlier immigrants.
- ⊖ The positive wage effects of immigration are weaker in countries with rigid labor markets, which may even experience some negative employment effects.
- ⊖ In some southern European countries, immigrants have been more concentrated among less educated workers.

Share of empirical evidence showing negative and positive effects of immigrant share on native wages



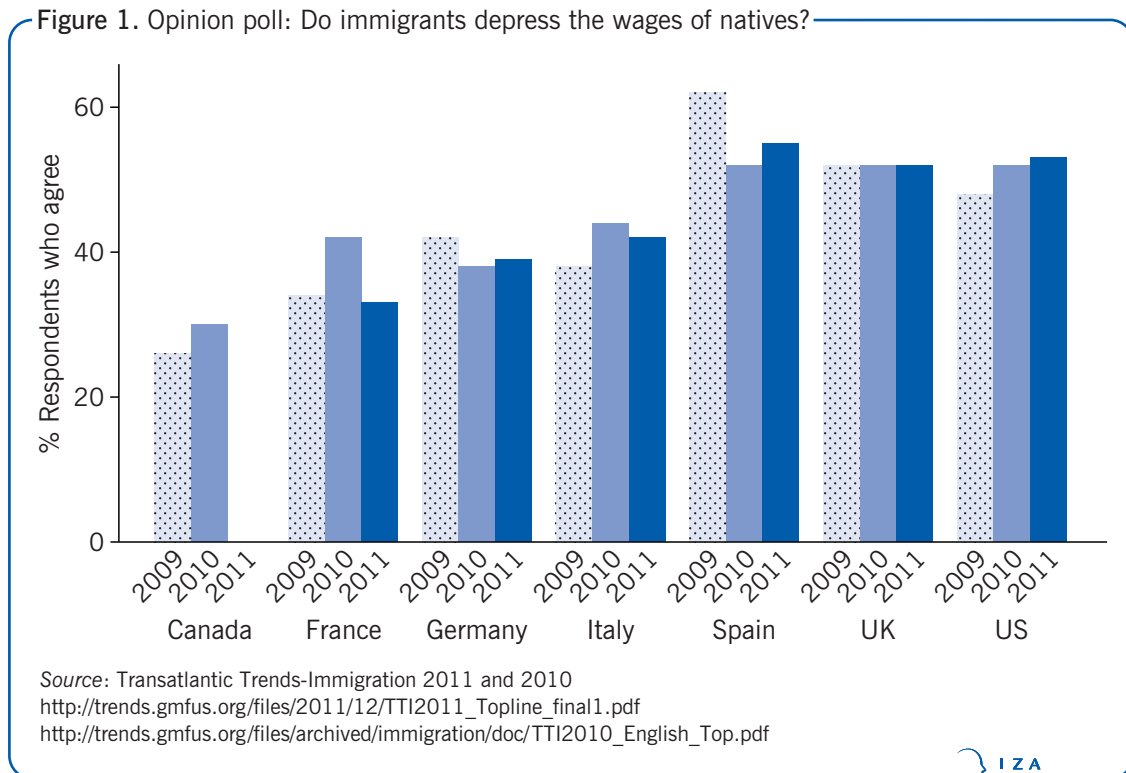
Source: Based on averages of 270 baseline estimates from 27 empirical studies listed in the Additional references.

AUTHOR'S MAIN MESSAGE

While the literature reports a range of wage effects of immigration, most estimates are small and, on average, essentially zero. Recent evidence shows that immigration is likely to boost firm productivity and the wages of native workers in the long run by stimulating firm growth and contributing a range of skills and ideas. More open immigration policies, which allow for balanced entry of immigrants of different education and skill levels, are likely to have no adverse effects on native workers' wages and may pave the way for productivity growth.

MOTIVATION

Many people hold the belief that immigrants “take jobs” from the native labor force in industrial countries; that they crowd out job opportunities; and that they depress wages (see Figure 1). This fear is often manifested in stringent immigration restrictions, especially on immigrants with little education. Such measures are defended as necessary to protect native workers. But this view is rooted in a simplified, static model of labor demand and supply in which immigration increases the supply of some workers while everything else in the economy remains fixed.



The recent empirical literature emphasizes that to understand the impact of immigrant workers on wages, immigration and the response of firms and workers must be analyzed together. This literature focuses on how firms and local economies respond to immigrant inflows by expanding, investing, adjusting product specialization, adopting efficient technologies, and creating new businesses. A review of the literature finds little evidence of a wage-depressing effect of immigration because immigrants are absorbed into the receiving economy through a series of adjustments by firms and other workers. Once these adjustments are accounted for, the wages of native workers, even workers with skills similar to those of immigrants, do not change much in response to immigration.

DISCUSSION OF PROS AND CONS

An overview of the estimated wage impact of immigrants

Many studies in recent decades have analyzed the effect of immigration on the wages of native workers, assessing the magnitude and direction of the impact. These studies have used both

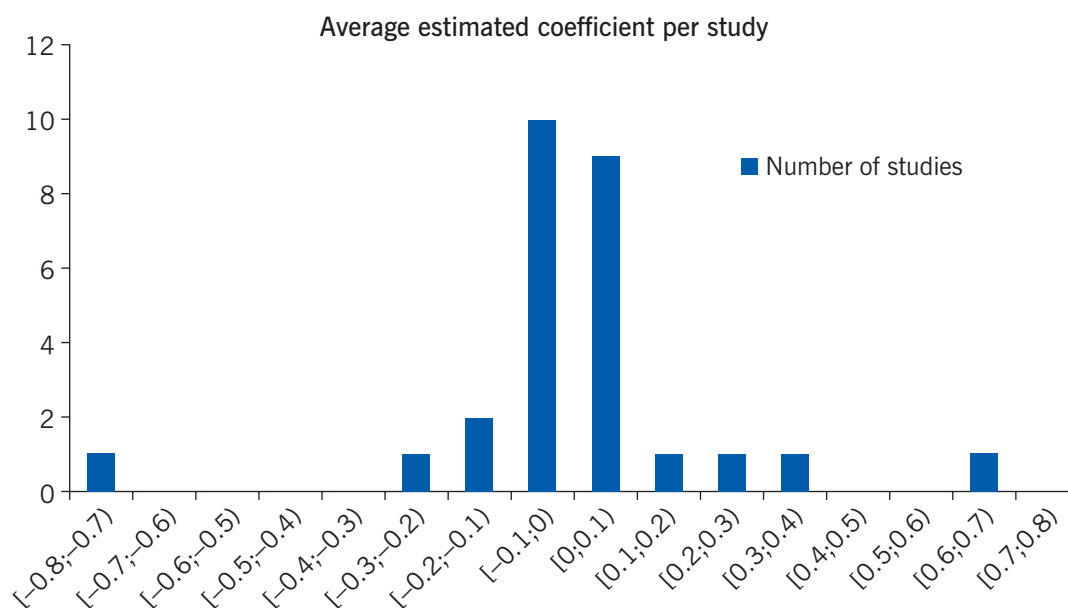
cross-sectional data and panel (cross-sectional plus longitudinal) evidence of immigration flows into regions, countries, occupation groups, and skill groups in countries that have received large inflows of immigrants, such as Canada, Germany, Spain, the UK, and the US. About a third of these studies used US data. The others used data mainly for Austria, Germany, Israel, and the UK, whilst a few used data for other European countries. Most of the studies used labor market statistics as a control. The more recent studies, which used mainly panel data analysis, included labor market and year fixed effects. Several studies, especially those based on regional variation, used econometric “instrumental variables” to separate the exogenous, supply-driven variation in immigrants from variations correlated with demand shocks, to identify the causal effect of a supply-driven change in immigrants on native wages.

Econometric instrumental variables

The instrumental variable technique isolates the part of immigration driven by supply choices of migrants and tracks its effect on wages. As migrants prefer locating near other migrants of the same nationality the presence of older communities is used to predict immigrant supply changes. By using this technique the response of wages can be tracked, for given labor demand, when only supply shifts.

This paper summarizes that abundant literature, based on a review of 27 original studies published between 1982 and 2013. Most of the reviewed studies were published, and some have been quite influential. Together, the 27 studies produced more than 270 baseline estimates of the effects of an increase in the share of immigrants on the wages of natives in the same labor market. The message that emerges from these studies is illustrated in Figure 2,

Figure 2. Number of studies with estimated wage effects within each 0.1 bin, from -0.8 to +0.8: The largest concentration of estimated effects is very close to zero



Note: The histogram shows how many of the 27 articles analyzed fell within each 0.1 bin for its average estimate of the effect on native wages of a 1 percentage point increase in the share of immigrant workers.

Source: Author's calculations based on data from 27 analyzed articles.

which shows the distribution of the average estimated wage effect for each of the 27 studies, ranging from -0.8 to $+0.8$, in bins of length equal to 0.1 . The histogram would look very similar if it showed all the estimates from the 27 studies rather than an average for each study. Additionally, a meta-analysis of 18 studies conducted between 1982 and 2003 showed a very similar histogram, centered on 0 and populated mostly with very small estimates between -0.1 and $+0.1$ [1].

The values report the effects of a 1 percentage point increase in the share of immigrants in a labor market (whether a city, state, country, or a skill group within one of these areas) on the average wage of native workers in the same market. For example, an estimated effect of 0.1 means that a 1 percentage point increase in immigrants in a labor market raises the average wage paid to native workers in that labor market by 0.1 percentage point. These studies used a variety of reduced-form estimation and structural estimation methods; all the estimates were converted into the elasticity described here.

While there are important qualifications to each method and a degree of imprecision in each study (some discussed below), one clear finding emerges: the largest concentration of estimated effects is clustered around zero. Furthermore, the effects are often economically very small and at least half are not statistically significant. While the full range of estimates is between -0.7 and $+0.7$, two-thirds of them (19 out of 27) are between -0.1 and 0.1 , equally distributed over positive and negative values. The average estimated coefficient is 0.008 . Applying the average value of the estimates to total immigration in the US between 1990 and 2010, a time when the share of foreign-born workers rose from 9% to 16% , would imply an impact of immigrants on the average wage of native workers of 0.056 of a percentage point (7% times 0.008), or an increase of roughly one-twentieth of a percentage point. These are extremely small changes, especially over a 20-year period, and do not support the notion that immigrants lower the wages of native workers.

Two other general findings emerge from the literature.

- First, while some of the surveyed studies find a more significant negative effect on the wages of less educated native workers than native workers overall, most do not. The meta-analysis study does not identify any significant difference in estimated wage effects between less educated native workers and all native workers [1]. This is understandable. In many countries, immigrants are concentrated in the highly educated group or evenly distributed across skill groups, so there is no reason to believe that they will hurt the wages of less educated workers more than others. In several large immigrant-receiving economies (such as Canada, Sweden, and the UK), the college-educated group makes up the largest concentration of immigrants relative to native workers in the same group. Even in the US, where some of the estimated effects on the wages of less educated native workers are negative, this holds true only for the 1990s, a particularly low-skill-intensive time; during the period 2000–2010, net immigration was high-skill-intensive.
- Second, the wage effects of recent immigrants are usually negative and slightly larger for earlier immigrants than for native workers. New immigrants may be stronger labor market competitors of earlier immigrants than of native workers.

Do native workers attenuate the wage effects of immigrant labor by moving?

Researchers have sought to identify the mechanisms that allow immigrant-receiving economies to absorb immigrants without lowering the wages of their native workers. Since many studies

have analyzed local labor markets (cities, regions, states), one proposed mechanism was the “skating-rink” model: as immigrants moved into a local economy, native workers with similar skills moved out, leaving total employment and the skill composition unchanged. In the canonical labor supply and demand model, this adjustment mechanism would weaken any detectable effect on native wages. Immigrants might still displace native workers by pushing them out of the market, but the wage effect would not be detectable in the local economy.

Most studies find no empirical evidence that native workers move out in response to immigration [2]. With the exception of particularly rigid labor markets (discussed below), local economies, firms, and native workers do respond to immigration and eliminate potential adverse wage impacts, but not by moving out of the region or by becoming unemployed.

Examining the effects of immigrants on wages in national labor markets and by skill

Due to the fact that analyses of local labor markets might miss wage effects that diffuse beyond the local market, several recent studies have analyzed the effects over time of immigrants in national labor markets segmented by skill (usually education-age groups). Changes in the supply of one skill in a national labor market, such as an inflow of college-educated immigrants, are assumed to affect the wages of workers in that skill group. Using data for the US over the period 1960–2000, one study estimated a negative effect of -0.76 of an increased share of immigrants in one skill group on the wages of native workers in the same skill group [3]. This is the largest negative estimated effect of immigrants on native wages in any of the reviewed studies (it is the negative outlier at the left edge of the histogram in Figure 1, with a value of -0.76).

What explains such a large, negative estimate, and how can it be reconciled with the much smaller and sometimes positive effects found in most of the literature?

Partial versus total effects: Skill complementarities and firm investments

The more recent literature using national data by skill group has emphasized the importance of three mechanisms for correctly estimating the effects of immigration on wages. Specifically these are:

- immigration has cross-skill effects (complementarity) that must be considered;
- firms respond to the increased supply of immigrant workers by adjusting capital; and
- immigration has potentially important overall productivity effects. Taking these adjustment mechanisms into account would therefore attenuate the negative effects estimated in the US study [3].

The first effect can be explained by the fact that different jobs are connected within a firm’s production process. Having more immigrants in one skill group (for example, engineers) allows firms to expand job opportunities (complementarities) for workers in other skill groups (for example, sales representatives and janitors). Accounting for these cross-skill effects substantially reduces the negative wage impact of immigrants, while failing to account for them isolates a partial effect of immigration without considering the total effect.

The second effect is related to the first. An increase in available workers means that existing firms can grow, investing in new plant and equipment, and that new firms may start up. Unless the immigrant influx is sudden and unexpected, this mechanism operates continuously and allows the local economy to expand and absorb additional immigrant labor without lowering wages.

Incorporating these two effects into the analysis requires some assumptions to be made about the extent of cross-skill complementarity and about how fast firms adjust investment. Recent studies that apply this model to the US and the UK, using a reasonable set of assumptions, find very small effects on the wages of native workers, including the less educated ones [4]. The estimates concerning the increase in US immigrants between 1990 and 2006 imply a negative effect of less than 1 percentage point for the wages of native workers with no diploma in response to a small positive effect for native workers with a high school education, and ultimately a zero effect for native workers with a college education.

Productivity effects

A third effect overlooked in the earlier analyses of national labor markets by skill group is the effect of immigration on productivity. In the long run, immigrants can increase the overall efficiency of the economy by bringing new skills, stimulating efficient specialization, and encouraging firm creation. In the long run this can have an important effect on wages, because productivity drives all wage growth. There is evidence of this positive effect in recent analyses at the city [4], [5], state [6], region [7], [8], and national levels.

This effect has, however, been hard to identify and is often neglected. In particular, studies based on the canonical model of the labor market and the national skill-group approach ignore the possibility of an overall productivity effect and focus only on the narrow competition or complementarity effects within and between skill groups. Some studies do not explicitly consider this potential effect but simply absorb it into a fixed term [3], [9].

Moving beyond the canonical model of the labor market: Alternative mechanisms offsetting wage effects

Understanding how immigrants create positive productivity effects requires moving beyond the canonical model of labor supply and demand. That model assumes that immigration is simply a shift of the labor supply for a given labor demand and given labor supply of native workers. It also assumes that native and immigrant workers of similar skills perform identical tasks, that firms *do not* respond to immigration (at least in the short term), and that native workers *do not* change occupations or specializations.

More likely, as evidenced by several recent studies, immigrants bring different skills and perform different tasks than native workers [2], [4], [6]. Native workers also respond to immigration by specializing in more communication and cognitive-intensive production tasks, which complement the tasks performed by immigrants. This is important because skill diversity among workers facing a wide array of differentiated tasks increases specialization and efficiency. Skill diversity may also spur innovation and productivity growth. Firms may also expand in response to an increase in immigrant workers and create new complementary jobs filled largely by native workers. If any of these mechanisms lead to an increase in overall productivity, a canonical model applied at the national level would be unlikely to capture these effects of immigration [3], [9].

Most studies that explicitly consider these possibilities find positive, sometimes large, productivity effects of increased numbers of immigrant workers. When the impact of these mechanisms on wages is also accounted for, it seems clear that these mechanisms could offset competition effects, producing the overall nil or positive effects observed in the 27 broad studies of immigration and native wages.

Recently, scholars have explored other adjustment mechanisms not included in the canonical model that might offset the negative competition effects of an increase in immigrant workers. One is the choice of appropriate firm technology. When the supply of certain skills rises in the local labor market, firms tend to choose technologies that use those skills efficiently. For example, an immigration-induced increase in the supply of less educated manual workers in some US cities has pushed firms to adopt more manual-intensive technologies in place of more mechanized technologies. This has resulted in keeping the productivity and wages of that skill group relatively high. Similarly, the larger number of foreign scientists and engineers in some US cities encouraged firms to adopt technologies that increased the productivity of native workers with these specialties.

Another mechanism protecting wages and boosting the productivity of native workers is the occupational upgrading that occurs when the share of immigrant workers rises. When immigrants fill lower-skill, manual-intensive positions, native workers move into more complex, cognitive- and communication-intensive jobs [2], [10]. Similarly, when highly educated immigrants enter the labor market and take analytically intensive positions in science and technology, highly educated native workers move into managerial occupations. Finally, a large share of immigrants with specific skills are absorbed by new firms that spring up to take advantage of the availability and skills of new immigrants (for a more comprehensive overview see **Why immigrants may not depress natives' wages**).

More rigid labor markets lower the productivity gains from immigration

While immigration was found to have small, non-significant wage effects in most of the countries analyzed, there were some systematic differences.

- First, countries with greater wage rigidity and protective institutions, such as some of the southern European economies, seem to respond with less flexibility to immigration, with weaker technology and investment effects and less occupational upgrading of native workers. This may result in smaller productivity gains. And while labor market rigidity might also result in only small wage effects for native workers, some studies have found negative employment effects for native workers and higher unemployment rates for earlier immigrants.
- Second, in southern European countries, immigrants were more concentrated at the low-skill level. This might have reduced the complementarity and positive productivity effects associated with highly educated and more diverse immigrant groups.

It should be emphasized that attracting college-educated professionals is an explicit priority in the immigration policies of some countries. Acting on the notion that college-educated professionals, scientists, and engineers are good for productivity and job creation and can raise the wages of native workers, the immigration point systems in Australia and Canada give high priority to high-skilled immigrants. More generally, however, because people with a college education are more mobile than other workers, countries that do not specifically

select skilled immigrants (such Switzerland, the UK, and the US) still receive large inflows of high-skilled immigrants—to the point that the share of immigrants with a college education is higher than the share for native workers.

Why immigrants may NOT depress natives' wages

While the simplest labor–demand labor–supply model predicts that more immigrants in the labor market depress wages of national workers, several refinements of that model imply no effect or positive effect. Empirical studies typically fail to find significant effects of immigration on the wages of native-born workers.

Here are important reasons why the simple theory may not capture empirically important factors that explain the lack of an effect:

- Despite natives' perceptions that immigrants are too many, immigration flows may be too small to make an impact on the host economy.
- Immigrant and native workers have different skills and characteristics, and immigrants may take jobs natives do not want. Hence they do not compete for the same type of jobs.
- Immigrants bring new skills in the host economy that may spur innovation, ultimately increasing productivity (and hence wages) of native-born workers.
- As immigrants may perform manual jobs at low cost, native-born workers respond by specializing in communication-intensive jobs in which they have a comparative advantage. Specialization helps natives to upgrade their jobs and protect their wages from immigrant competition.
- Firms can reduce labor costs by hiring immigrant workers at a lower wage with respect to natives. Firms then take advantage of this cost cut by creating complementarity/support jobs largely filled by native-born workers, who will not experience job losses or wage cuts.
- As new immigrants arrive into a local labor market, natives move out. Because of this crowding-out effect, characteristics of the labor market, such as wages and employment rate, are unaffected.
- Immigrants are not simply workers but consumers. They increase the host country's demand for goods and services. In the long run, immigration can lead to more investment, resulting in greater demand for labor and thus increased wages and employment in the economy.
- The inflow of less-educated immigrants increases the labor supply of highly educated natives with family responsibility. High-skilled female workers may now buy household services at a lower cost and then participate in the labor market with potential positive effects on the whole economy and natives' wages.
- When more workers are available, entrepreneurs respond by expanding their capacity or starting new firms up. The creation of new jobs will then raise wages for both native and migrant workers.

LIMITATIONS AND GAPS

Until recently, the research on immigration and wages has been dominated by analyses based on the canonical model of labor supply and demand. While such studies are a useful first step,

much more can be learned by looking at alternative mechanisms for wage adjustment. More recent studies, with access to firm-level data and longer longitudinal data series, applying new techniques in micro and dynamic analysis, have begun to focus on the many adjustment channels and responses to immigration. These studies have uncovered important effects that explain why the competition effect of immigration has not resulted in lower wages.

This new research suggests that it is appropriate to talk about the “gains from immigration” in terms of firm productivity and specialization. The wage effects of immigration are a result of the interaction of the competition effects (more intense for some groups) and the productivity effects. For some groups of native workers (usually the less educated), these two forces may offset each other. For earlier immigrants, the overall effect may even be negative. However, for more educated workers and for the average native worker, the net effect may be positive, especially in the long run. These analyses are still preliminary, however, and more research is needed on the productivity effects of immigrants.

SUMMARY AND POLICY ADVICE

Decades of research have provided little support for the claim that immigrants depress wages by competing with native workers. Most studies for industrialized countries have found, on average, no effect on the wages of native workers. To understand the impact of immigrant workers on wages, immigration and the response of firms and workers must be analyzed together. Such studies show that native workers’ wages have been insulated by differences in skills between native and immigrant workers, adjustments in local demand and technology, expansion of production, and specialization of native workers in response to rising immigration.

Two policy lessons emerge from these findings.

- First, considering the very small evidence of absolute and relative wage effects of immigration and the evidence that market mechanisms work to absorb immigrants, there is no clear basis for government intervention to reduce losses for native workers or to tax firms that hire immigrants.
- Second, while the wage effects are small, the productivity, complementarity, and dynamic-response effects may have positive impacts in the long term. This implies that more open immigration policies, focused on attracting immigrants with a balanced skill mix or slightly favoring the college educated, would probably not change wages in the short term, but would likely boost productivity (and wages) in the long term.

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Competing interests

The IZA World of Labor project is committed to the *IZA Guiding Principles of Research Integrity*. The author declares to have observed these principles.

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