

## Economic Brief

October 2021, No. 21-35

# What Can Firm-Level Data Show about Immigration's Impact on Labor Markets?

Article by: [Nicolas Morales](#) and [Agostina Brinatti](#)

We examine how immigration affects native workers by focusing on firms, as they play a crucial role in immigration and are massively heterogeneous even within sectors. We use a comprehensive establishment-level dataset from Germany to document a new dimension of firm heterogeneity: Large firms spend higher shares of their payroll on immigrants than small firms. Such differences help with understanding the impact of immigration on native workers' wages. When immigration increases, natives and immigrants specialize further in working for different firms, which reduces their direct competition in the labor market. Our economic model predicts that immigration has a positive impact on native workers through both lower consumption prices and higher wages for native workers.

---

Some firms tend to employ more immigrant workers than others. In the U.S., for example, large tech companies like Microsoft, Apple, Amazon and Google tend to be among the main employers of immigrant college graduates. In Germany, large firms in tradable sectors — such as manufacturing and IT — also use immigrants more intensively than smaller firms.

Understanding how firms respond to immigration is crucial for understanding the economic impact of immigrants on labor markets, as firms are responsible for making hiring and production decisions. At the same time, in many countries, employers are responsible for screening and sponsoring immigrants for visas, effectively deciding which immigrants get into the country.

The literature on the economics of immigration has focused on understanding the impact of immigrants on native workers' labor market outcomes, such as their wages. While employers can play a key role in these dynamics, there are few datasets that include firm-level information on the employment of immigrants and natives, which makes measuring firm-level responses to immigration more difficult.

In our working paper "[Firm Heterogeneity and the Impact of Immigration: Evidence from German Establishments \(PDF\)](#)," we open the black box on the employment composition of firms by using a comprehensive dataset from Germany that contains establishment-level information on the employment and wages of native and immigrant workers.

We document that large establishments employ greater shares of immigrants than small establishments, as they spend larger shares of their payrolls on immigrant labor. We then use an economic model to understand how an economy adjusts after an influx of immigrants.

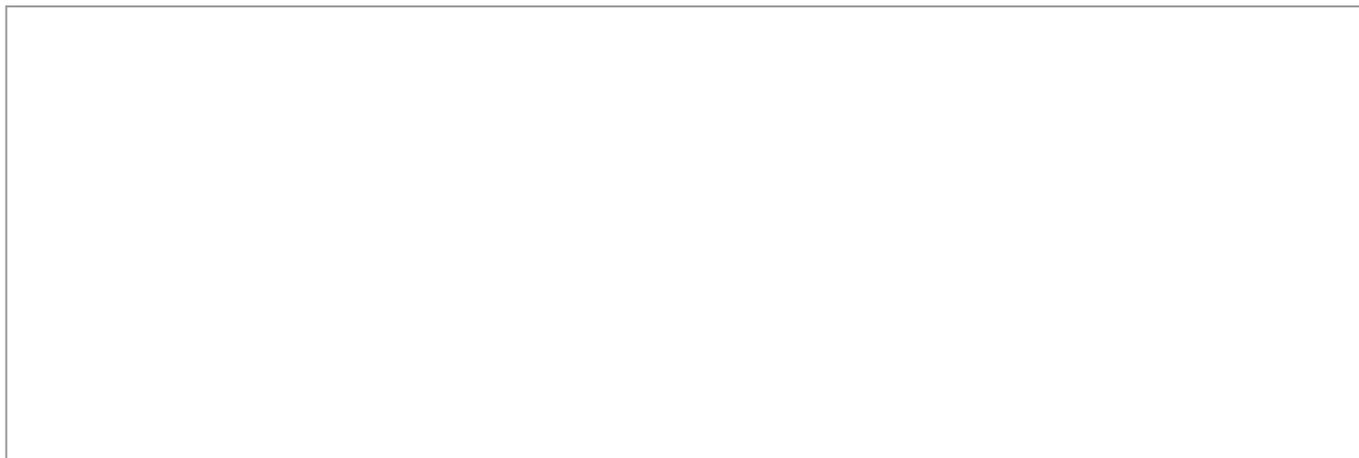
Overall, native workers gain from immigration through both lower prices and higher wages. As there are large differences across firms in their immigrant employment, some firms will specialize in hiring more native workers and others in hiring more immigrants. Such specialization reduces the downward pressure on wages that would typically result from labor market competition and predicts higher gains from immigration for native workers than what the literature has previously estimated.

For our analysis, we use administrative, employer-employee matched data from Germany.<sup>1</sup> Our data include a sample of establishments for the period 2003 to 2011, where we observe citizenship status, wages and other individual characteristics for these firms' entire workforces. We also observe establishment-level financials such as revenues and exports.<sup>2</sup>

While our results focus on Germany, our setup can be used to understand how workers and employers respond to immigration in other countries where firms have a deciding role on who comes into the country.<sup>3</sup>

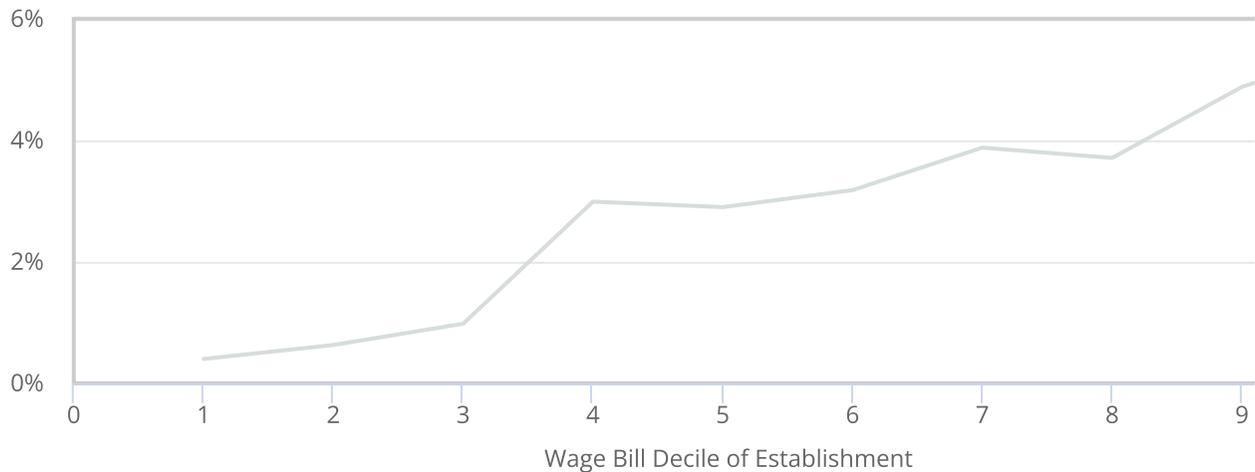
## **Employer Size and Immigrant Employment Share**

As a first step, we calculate immigrant intensities — that is, the share of payroll spent on immigrants — for each establishment in our sample. In Figure 1a, we divide our establishments into size deciles, with decile 1 including the smallest establishments and decile 10 the largest ones. For each decile, we plot the immigrant intensity of the median firm.



**Figure 1a: Immigrant Share in Wage Bill Across Establishments**

Total



**Sources:** Authors' calculations based on data from the Research Data Centre of the German Federal Employment the Institute for Employment Research.

**Notes:** All establishments with more than 10 employees are divided into total wage bill deciles. Wage bill decile 1 is smallest, and 10 is the largest. For each decile, the median immigrant share of the total wage bill spent in each ed group is plotted.

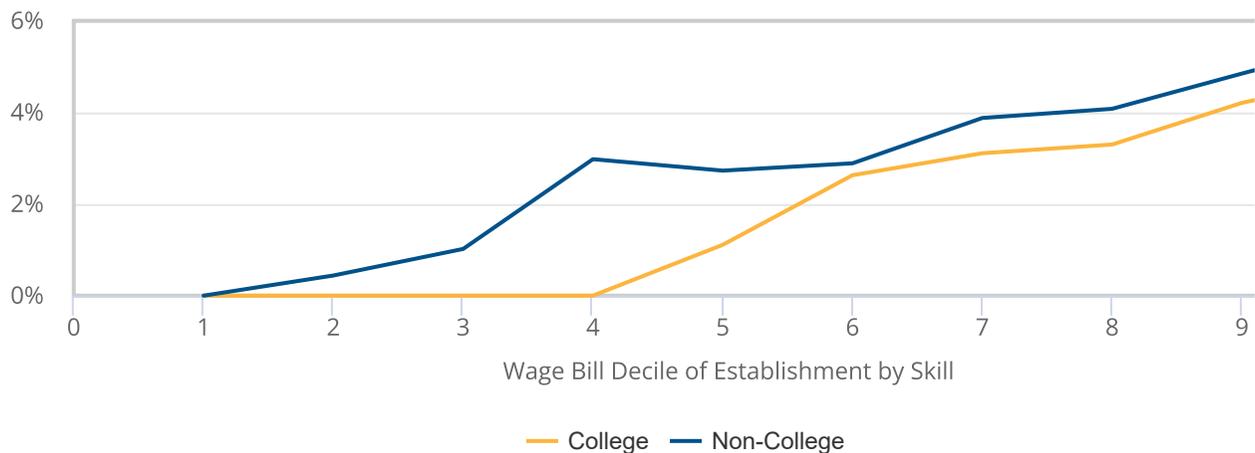
The observed pattern is quite striking: While the median firm in decile 10 spends about 5.6 percent of its payroll on immigrants, the median firm in the fifth decile spends almost half of that (2.9 percent), and the median firm in the bottom decile spends even less (0.4 percent).

The heterogeneity across firms is pervasive, even within narrow geographic areas and industry groups. This indicates that the relationship of firm size and immigrant share is not driven by immigrants and large firms concentrating in specific industries or labor markets.

Nor is the relationship driven by differences in the education level of immigrants and natives, as shown in Figure 1b, since the positive relationship is observed for college graduates and non-college graduates alike.

**Figure 1b: Immigrant Share in Wage Bill Across Establishments**

*College Vs. Non-College*



**Sources:** Authors' calculations based on data from the Research Data Centre of the German Federal Employment the Institute for Employment Research.

**Notes:** All establishments with more than 10 college and non-college employees are divided into total wage bill decile 1 is the smallest, and 10 is the largest. For firms in each decile, the median immigrant share of the total spent in each education group is plotted.

We argue that firms starting to recruit immigrant workers need to make some initial investments, such as establishing an HR or legal team to process and apply for visas. Firms also need to invest in evaluating foreign credentials and recruiting candidates from abroad when they want to hire workers from a new country. Large firms — which tend to be more productive and earn higher profits — are able to pay more of these costs and become more immigrant intensive than small firms.

## How Do Economies Adjust to Immigration Increases?

To evaluate how economies adjust to immigration increases, we modeled firm decisions' on how many immigrants to hire. Large firms have higher profits and can afford to invest more in recruiting immigrants, hence becoming more immigrant intensive than small firms.

At the same time, immigrants and natives compete for jobs but specialize in different tasks and firms, which mitigates the competition effect in the labor market. Within the firm, studies have shown that natives and immigrants tend to specialize in different tasks. For example, natives tend to focus more on communication-intensive tasks, while immigrants specialize in more manual or analytical tasks. This channel allows for a positive impact of immigration on wages: More immigrants help expand production, and firms increase their employment of both immigrants and natives who work in complementary activities.

We go one step beyond and allow for the possibility that natives and immigrants specialize in producing different products or varieties, as they tend to work for different firms, which further mitigates the competition effect between natives and immigrants.

# Impact of an Increase in Immigration

First, to ensure our model accurately represents the real dynamics between immigration and production, we test whether the predictions of our model are backed by the data. A key prediction is that large firms — which are more immigrant intensive — will expand their market share by more than small firms when the number of immigrants in the labor market increases.

Our results show that if the number of immigrants in the labor market increases by 1 percent, the revenues of firms in the highest size decile would increase by 1.15 percent more than revenues of firms in the fifth decile. Such empirical findings corroborate what the model predicts: Large firms are not only more intensive on immigrants than small firms but also benefit more than small firms in response to immigration.

We also use the model to understand how the economy would adjust after a 20 percent increase in immigrants. A key advantage of this approach is that we can measure how wages, prices and employment across firms and sectors would change whenever the number of immigrants in the economy changes.

We find that immigrants improve the outcomes of native workers through two main channels: prices and wages. On one hand, when more immigrants enter the country, they help produce more efficiently and drive local prices down. On the other hand, as immigrants and natives tend to perform complementary activities in production, an increase of immigrants also pushes up demand for native workers, increasing their wage. Such benefits are muted by an increase in labor market competition, which drives wages down.

As shown in Table 1, wages of native workers increase by 0.07 percent, and the local price index decreases by 0.17 percent in response to a 20 percent increase immigration. Putting those numbers together implies that real wages (the wage deflated by the local price index) increase by 0.24 percent.

Firm owners benefit the most from immigration, since their profits increase and local prices decrease for consumption, but they don't compete with immigrant workers for jobs. Overall, the model predicts their real income to increase by 1.22 percent. To put these numbers into context, each new immigrant generates a gain of \$1,940 for native workers every year, and a gain of \$7,157 for firm owners.

**Table 1: Effect of Immigration on Wages and Prices**

	Real Income	Local Price Level	Wages/Profits	Monetary Gains (Per Immigrant)
Native Workers	0.24%	-0.170%	0.07%	\$1,940
Firm Owners	1.22%	-0.170%	1.04%	\$7,157

Source: Authors' calculations.

Note: We compute the changes on wages, prices and profits from the number of total immigrants rising 20 percent. Monetary gains are computed using average wages PPP adjusted at 2019 dollars and total workforce numbers from the OECD, then divided by the number of new immigrant workers.

[Enlarge](#)

A key novelty in our model is that we allow firms to have different immigrant intensities, a feature found in the data and shown in Figure 1a and 1b. Incorporating such a feature matters for our calculation of the impact of immigration on real wages. The real wage gains predicted by our model are 11 percent larger than in a model where all firms are equally intensive on immigrants.

The intuition of this result is as follows: When immigrants come into the country, they are more likely to work at firms that are immigrant intensive. Native workers, as a response, switch jobs to firms that are less immigrant intensive. As natives and immigrants specialize further into different firms, they compete less for the same type of jobs, mitigating any negative effect on wages driven by competition with immigrants.

---

Nicolas Morales is an economist in the Research Department at the Federal Reserve Bank of Richmond. Agostina Brinatti is a Ph.D. candidate in economics at the University of Michigan.

---

<sup>1</sup> *The data basis of this paper is the Longitudinal Model (version 1993 – 2014) of the Linked Employer-Employee Data from the IAB. The data were accessed on-site at the Research Data Centre of the Federal Employment Agency at the Institute for Employment Research (FDZ) and/or via remote data access at the FDZ. Data documentation: Heining, Jörg; Klosterhuber, Wolfram; Lehnert, Patrick; Seth, Stefan (2016): Linked Employer-Employee Data from the IAB: LIAB Cross-sectional model 2 1993 – 2014 (LIAB QM2 9314). FDZ-Datenreport, 10/2016 (en), Nuremberg.*

<sup>2</sup> *We use the terms establishment and firm interchangeably, but our data is on physical establishments.*

<sup>3</sup> *In the U.S., for example, most immigrant college graduates come to the country through employer-sponsored visas such as the H-1B visa program.*

---

This article may be photocopied or reprinted in its entirety. Please credit the authors, source, and the Federal Reserve Bank of Richmond and include the italicized statement below.

*Views expressed in this article are those of the authors and not necessarily those of the Federal Reserve Bank of Richmond or the Federal Reserve System.*



---

## Subscribe to Economic Brief

Receive an email notification when Economic Brief is posted online:

### Contact Us

---

**RC Balaban**

(804) 697-8144