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Safety at Work and Immigration

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Safety at Work and Immigration*

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Abstract

This paper examines the effect of immigration on workplace safety, a new and previously unexplored outcome in the literature. We use a novel administrative dataset of the universe of workplace accidents reported in Spain from 2003 to 2015 and follow an IV strategy based on the distribution of early migrants settlements across provinces. Our results show that the massive inflow of immigrants between 2003 and 2009 reduced the number of workplace accidents by 10,980 for native workers (7% of the overall reduction during that period). This is driven by Spanish-born workers shifting away from manual occupations to those involving more interpersonal interactions. Immigrant flows during the economic crisis (2010-2015) had no impact on natives' workplace safety. The scarcity of jobs during that period could have prevented shifts between occupations. Finally, we find no effects of immigration on the workplace safety of immigrants. These results add a previously unexplored dimension to the immigration debate that should be taken into account when evaluating the costs and benefits of migration flows.

JEL Codes: J61, J28, I1

Keywords: Immigration, Workplace Accidents, Safety at Work.

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1 Introduction

Immigration and its potential consequences continue to be a major concern in many developed countries. The current refugee crisis in the European Union, Brexit, and Donald Trump's determination to construct a wall on the Mexico-US border are just examples that immigration is at the forefront of political debates in developed countries. But what is the source of the immense preoccupation over immigration? There is an unsubstantiated fear that immigration has detrimental effects on many socioeconomic variables, such as criminality, health, or labor outcomes. Previous literature has already analyzed the effects of immigration on the most diverse outcomes. This paper contributes to this existing literature by examining the effect of immigration inflows and outflows on a new and previously neglected outcome: workplace safety.

Workplace accidents entail massive economic and social costs. They affect not only individuals involved in the accidents, but the society as a whole. According to Takala et al. (2014) in 2012, 2.3 million individuals died worldwide due to workplace related accidents. For the different countries, this implied an average economic cost between 1.8% and 6% of their GDP. The cost of workplace accidents includes, not only medical costs and insurance premiums, but also costs related to early retirement, loss of skilled staff or absenteeism.

In this paper we focus on Spain, a country that stands at a relatively bad position with respect to its European neighbors regarding workplace safety. Aibar (2006) examines differences in workplace accidents among EU-15 countries for the years 1996 and 2003 and concludes that, in almost all outcomes, Spain was at the back tail of workplace safety standards. Between 1996 and 2003, Spain was the country with the largest number of workplace accidents that required three or more days of sick leave in order to recover. Moreover, Spain has almost three times the number of workplace accidents in which at least one person dies compared to countries such as Sweden or UK. Therefore, the large personal and economic costs caused by working accidents justify the focus on this outcome in a country like Spain.

Most of the literature examining the effects of immigration on labor outcomes has focused on wages and employment of the native population.[1] There is no strong evidence that immigration has a negative labor market effect on the native population. For instance, Altonji and Card (1991), Borjas (1995) or Friedberg and Hunt (1995) do not find a robust significant effect of immigration

[1] Theoretically, the direction of this relationship is not clear. On one hand, an inflow of immigrants increases the supply of labor, which could lead to lower wages and higher unemployment rates for the native population. On the other hand, an increase in labor supply could make the economy more competitive, which could be beneficial for the native population in the long-run.

on natives' wages or employment.[2] For Spain,[3] Amuedo-Dorantes and De la Rica (2008) show that immigration affects the occupational distribution of natives, shifting from occupations with more manual tasks to those with more interactive tasks. Blanes et al. (2011) and Gonzalez and Ortega (2011) examine the effects of immigration on wages and unemployment over the period of 1995 to 2002 and 2001 to 2006, respectively. They report that both wages and unemployment of the native population are not distorted by the inflow of immigration during that period of time.[4]

Examining the effect of immigration on workplace safety fills some gaps in the existing literature. Workplace safety could be distorted by changes in the labor supply generated by immigration inflows and outflows. Firstly, inflows of immigrants could add pressure to the labor supply inducing Spanish-born workers to accept more precarious working conditions in order to keep their jobs. This could lead to an overall decrease in workplace safety, which could result in an increase of the number of workplace accidents. Secondly, the additional pressure from immigrants on the labor supply could force Spanish-born workers to underreport small workplace accidents due to fear of losing their jobs. This would imply a decrease in the number of reported workplace accidents by Spanish-born workers.

Immigrants tend to be different from the average population in their respective countries of origin and from the native population, as a consequence of self-selection. A large number of authors have examined the phenomenon of self-selection among immigrants (Borjas, 1987; Antecol and Bedard, 2006; Bertoli, 2010; Moraga, 2011; Kennedy et al., 2015; Giuntella and Mazzonna, 2015; Farré, 2016; Giuntella, 2017), generally concluding that immigrants tend to be less educated, younger and healthier with respect to the average native population. These characteristics can affect workplace safety in two different ways. Firstly, immigrants tend to work in unskilled occupations. This is a consequence of having lower education levels with respect to the average native population, as well as, suffering from other labor disadvantages.[5] Given their physical demands, unskilled occupations could have a higher injury risk with respect to higher skilled occupations. Thus, an inflow of im-

[2] On the other hand, Ottaviano and Peri (2005) analyze the impact of immigration on income and find that immigration has a positive effect on natives' income. This relationship may be explained by immigrants not perfectly substituting natives at their workplaces and by immigrants having lower house ownership rates than the natives. Immigration generally leads to an increase in housing prices, which then generates an income transfer from immigrants (lower ownership rates) to natives (higher ownership rates).

[3] Amuedo-Dorantes and De la Rica (2007) were the first to analyze employment and occupational assimilation of recent immigrant waves to the Spanish labor market.

[4] Carrasco et al. (2008), on the other hand, found that the growth in the share of immigrants during the period 1991 to 2001 was negatively correlated with the growth in employment rates and wages. However, their results are small and not robust to different samples and models.

[5] Immigrants have to adapt to the language and social behavior of the host country. Moreover, in many cases, they do not have a strong labor and social network in the host country.

migrants that takes over (from native workers) jobs that have a higher injury risk, may improve the workplace safety numbers of the native population. Secondly, it seems reasonable to assume that younger and healthier workers will engage in safer attitudes at their workplace compared with older and unhealthier workers. Given this, an inflow of younger and healthier immigrants (with respect to the native population) could improve workplace safety for natives without increasing the number of workplace accidents of immigrants.

Very few studies have explored the effect of immigration on workplace safety. Bauer et al. (1998) examine the interdependence between native and foreign workers in relation to workplace accidents for blue collar occupations in Germany in 1975. They find that 1 percent increase in the employment share of foreigners is associated with a 0.4 percent decrease of severe accidents of German-natives, without affecting immigrants.[6] Amuedo-Dorantes and Borra (2013) explore the differences in work injury and fatality rates between immigrants and natives during the financial crisis in Spain. They find that during the economic downturn, immigrants tended to work in riskier occupations compared with natives. This reduced workplace injury rates of the latter, but not fatality rates. In the context of Germany, Giuntella and Mazzonna (2015) find that immigration reduces the likelihood that residents will report disability. This effect seems to be particularly pronounced for blue-collar occupations and low-skilled individuals. Giuntella et al. (2019) consider the effects of immigration on the allocation of occupational physical burden and work health risk in the UK for the years 2003-2013. They find that a 10 percentage point increase in the share of immigrants in a local authority reduces the average physical burden of native males by 5% with respect to the mean. A similar approach to Giuntella et al. (2019) is used for the US in the paper by Dillender and McInerney (2020) where the authors explore the role of Mexican immigration to the United States on workplace safety for the native population. Their results show that Mexican immigration can explain 26% of the improvements in occupational risk among natives between 1980 and 2015. It also explains 17% of the reduction in worker's compensation cash benefits among non-Mexican males in the US.[7] The effect of immigration on workplace accidents has not been examined for the US or the UK.

We contribute to this scarce literature in several dimensions. Firstly, we use a novel administrative database that includes the universe of workplace accidents that were registered in Spain from

[6]Compared with the paper by Bauer et al. (1998), we find that an inflow of 1,000 immigrants decreases the proportion of workplace accidents by 9 for every 100,000 Spanish-born workers (15%), during the period 2004 to 2009. The difference in size between Bauer et al. (1998) and our paper could be driven by the time period and the sector considered.

[7]A recent working paper by Alacevich and Nicodemo (2019) uses Italian data and finds that a 10 percentage point inflow of foreign-born residents is associated with reductions in the injury rate for the native population of 8.5% of its mean.

2003 to 2015. This database allows us to analyze in detail the mechanisms behind the effect of immigration on workplace accidents, as we have information about the gender, age and nationality of the worker that suffered the accident, the occupation that he/she was performing at the time of the accident, and the level of severity of the accident. Secondly, we examine this effect for both Spanish-born and immigrant workers. Thirdly, we focus on Spain, a country that stands at a relatively bad position with respect to its European neighbors in terms of workplace safety (Aibar, 2006). In addition, Spain has been experiencing dramatic changes in immigration flows in the last years. These two facts make Spain very suitable to study our research question. Fourthly, during the period studied, Spain experienced both a massive inflow (2003-2009) and outflow (2010-2015) of immigrants, which gives us the opportunity to study the symmetry of the effects.[8] Finally, we provide causal estimates. As the actual changes of immigrant population might be endogenous, and correlated with shocks in the labor market, we follow the instrumental variable approach developed by Altonji and Card (1991), and Card (2001). Immigrants' location decisions are strongly influenced by earlier migrant settlements of individuals of the same country of origin who migrated before them. Then, we use immigrant clusters during the 1980s in Spain's provinces to distribute the current national inflow of immigrants from each country across the different provinces in Spain. This way we are able to reduce the endogeneity bias.[9]

For the entire time period, we find that an inflow of 1,000 immigrants decreases the incidence of workplace accidents by 4.2 for every 100,000 Spanish-born workers. This effect is entirely driven by the period 2004 to 2009. Our results show that an inflow of 1,000 immigrants decreased the proportion of workplace accidents by 9 for every 100,000 Spanish-born workers. Performing a simple back of the envelope calculation indicates that a drop in the number of working accidents suffered by the native population amounting to 10,890 during the period 2004 to 2009 may be attributed to the inflow of immigrants during this period in Spain. This constitutes a 7% of the overall decrease in the number of workplace accidents during that time period. This effect is larger for men than women. An inflow of 1,000 immigrants reduced the proportion of workplace accidents by 12 for

[8] Another reason why we divided the data into two periods is the economic crisis that hit Spain hardly, specially after 2009. The unemployment rate went from 10% in the first quarter of 2008 to 18% in the first quarter of 2009 and up to a peak value of 27% in the first quarter of 2013. Thus, the strong reduction in employment and labor market opportunities from the onset of the 2008 recession coupled with reductions in social assistance benefits introduced by the government to reduce the public deficit (cuts in unemployment benefits, health care, etc...) had a massive impact on immigration flows in Spain. In 2002 an inflow of 742,000 immigrants was estimated in Spain. This raised to 777,000 in 2007. After the 2008 recession this trend stopped drastically. In 2008 the inflow of immigrants in Spain was of 599,074 immigrants and in 2014 of 291,041 immigrants (Alonso et al., 2015).

[9] We also perform several robustness tests to ensure that the identification assumptions are reasonable in our setting. First, we adopt the "multiple instrumentation" procedure suggested by Jaeger et al. (2018) and find that our main results are robust to the inclusion of lagged immigrant inflows. Secondly, following Goldsmith-Pinkham et al. (2018), we calculate the Rotemberg weights and show that the high-powered and high-weighted countries are clustered very closely to the overall point estimate, indicating that misspecification is not a concern in our setting.

every 100,000 workers for men and by 5 for women. We find a reduction in both mild and severe accidents, supporting the idea that reporting biases are not an important concern, at least for nationals during this time period. Finally, the reduction of workplace accidents is stronger in the service sector, where immigrants are very represented.

Similar to previous literature, we find evidence that immigration influence the type of occupations in which natives are employed during the period 2004 to 2009. While immigrant inflows tend to reduce the employment rate of natives in occupations such as low or medium rank officers in the armed forces, workers in agricultural, farming and fishing sectors, in the extractive industry, or in domestic work, we find that immigration inflows increase employment of natives as technicians and associate professionals, managers with less than 10 employees, or project managers and team leaders. Using the O*NET classification,[10] we give suggestive evidence that native workers reallocate from jobs which entail a higher physical burden (i.e., jobs with more exposure to hazardous equipment, minor burns, cuts, bites, or that require protective or safety equipment) to jobs that require more human interactions (i.e., jobs that require public speaking, use of letters and memos, face-to-face discussions, work in groups or teams, interaction with external customers or coordination or supervision). Given this, the reduction in the number of workplace accidents that we find could be driven by the reallocation of native workers towards jobs that have probably lower injury risks. These results are consistent with those of Giuntella et al. (2019) and Dillender and McInerney (2020) for another country.

For the period 2010 to 2015, we find that immigration flows have a small positive effect on workplace accidents. However, this effect is quite sensitive to the different specifications and robustness checks. We also show that, during that time period, immigration influenced much less the type of occupations in which natives are employed. In particular, we only observe a decrease in the probability that national workers are employed as technicians and an increase in the probability being employed as a professional, operator or in the construction sector or in other elementary occupations. We believe that the economic crisis of 2008, that hit particularly hard Spain, could be behind the differences between the two time periods. In particular, the scarcity of jobs during that period, could have prevented a larger of shift between occupations.

Finally, we do not find any significant effect of immigration on workplace safety of immigrants. Previous literature has pointed out that immigrants tend to be less educated, younger and healthier

[10]The Occupational Information Network (O*NET) is developed under the sponsorship of the U.S. Department of Labor/Employment and Training Administration and contains a rich set of variables that describe work and worker characteristics, including skill requirements.

than the average population. In addition, the downward occupational mobility that immigrants experience after their arrival to Spain, makes them, in some cases, overqualified for the jobs they are performing. This null effect over immigrants, then, goes in line with younger, healthier and overqualified immigrant workers engaging in safer attitudes at the workplace compared with national workers. If this is true, we could expect the inflow of immigrants to improve workplace safety for natives without increasing the number of workplace accidents of immigrants. Yet, this explanation is speculative given that we are not able to explore this mechanism in this paper, due to data limitations.

The remainder of the paper is organized as follow. Section 2 explains the suitability of having Spain as the focus of the study. Section 3 describes the data sources and introduces the empirical strategy. Section 4 presents the results and Section 5 concludes.

2 Why Spain?

In the past years, Spain has experienced large inflows and outflows of immigrants. More precisely, the share of immigrants with respect to the total population in Spain increased from 8.07% in 2003 to 15.78% in 2010 (Spanish National Institute of Statistics). However from 2010, this increasing trend reversed and the share of immigrants fell to 13.54% in 2015. Figure 1 illustrates how these flows have fluctuated over time. The strong inflow of immigrants until 2009 can be explained by Spain's strong economic growth during that time period (partly led by a housing bubble), while the change in trend was due to the onset of the great recession of 2008. This scenario offers an ideal opportunity to study the symmetry of the effects of immigration inflows with respect to its outflows.

Immigration inflows and outflows have been quite heterogeneous across the different regions of Spain. This is probably a result of huge cultural and socioeconomic differences among the subregions of Spain. Figure 2 represents the mean annual change in the share of immigrants (aged 25-54) for the 52 Spanish provinces. The first graph considers changes from the years 2003 to 2009, while the second graph covers the years 2010 to 2015. We observe a large heterogeneity among the 52 provinces. For instance, from 2003 to 2009, the share of immigrants grew more than 1.5% every year on average in Almería, La Rioja, Tarragona and Girona. For the same time period, there were provinces that experienced an annual growth rate of at most 0.1%.[11] The period from 2009 to 2015 also saw variations across provinces with positive growth for some provinces and negative growth for others.

[11] Palencia, Jaen, Badajoz, or Melilla.

The important changes in immigration flows in the past few years and the heterogeneity of these changes across provinces make Spain an ideal scenario to examine the effects of immigration flows on workplace accidents.

3 Data and Empirical Straregy

3.1 Data Sources

For our analyses we use three different data sources: the Register of Workplace Accidents, the Spanish Labor Force Survey, and the Census of 1991.

The Register of Workplace Accidents is a newly released dataset that contains detailed information on non- fatal and fatal workplace accidents that were registered in Spain from 2003 to 2015. This database is collected by the Spanish Social Security Administration and includes personal data of the injured worker (gender, month and year of birth, nationality), information about the job that he/she was performing at the time of the accident, and the date, place, level of severity, and consequences of the accident. The data provides a total of 9,562,105 workplace accidents for the years 2003 to 2015. We restrict the analysis to the population aged 25 to 54 (7,310,660 observations) as this constitutes the bulk of the working-age population and minimizes the age composition effects.[12] The number of workplace accidents for natives and immigrants are considered separately for our study. For our main specification we collapse the individual data at the level of year, province, and gender $[WA(t)_{rg}]$.[13] This way we generate a panel data of workplace accidents in each province and gender over time. For our heterogeneity analysis we further collapse the individual data at the level of year, province, gender, and economic activity $[WA(t)_{rga}]$,[14] or level of severity $[WA(t)_{rgs}]$.[15]

Note that this database only contains reported workplace accidents. We believe that biases in reporting should be lower for fatal accidents, so examining fatal and non-fatal accident separately will be useful to asses the importance of this bias. There is some anecdotal evidence that immigrants are both less likely to report workplace accidents while, at the same time, those that do

[12] Our results are robust if we re-estimate all models for the population aged 25 to 45, and 25 to 65. Table A11, at the Appendix, shows the our main results estimated for the population aged 25 to 45, while Table A12 reports our main results for individuals aged 25 to 65.

[13] The collapsed data will have 1,352 observations (13 years*52 provinces*2 sex).

[14] The collapsed data will have 5,408 observations (13 years*52 provinces*2 sex*4 economic activities).

[15] The collapsed data will have 2,704 observations (13 years*52 provinces*2 sex*2 levels of severity).

report the accident are less likely to be granted sickness leave when compared to the native population (Instituto Sindical de Trabajo, Ambiente y Salud, 2006).[16] However, according to the report, these differences in reporting behavior between immigrants and the native population seem small and very persistent over time. Unfortunately, there is no other panel data source available that can provide a more quantitative and in depth analysis of these trends. Thus, we should keep in mind when interpreting our results that these small underreporting differences may slightly bias downwards our results, specially for the immigration group.

The Spanish Labor Force Survey (LFS) is a continuous quarterly survey with information related to the labor force status of the population living in Spain. We use this database from 2003 to 2015 (8,872,258 observations in total). Following Gonzalez and Ortega (2011), we also take this database as appropriate to capture demographics of the foreign-born and the Spanish-born populations. For one, it is a reliable, large-sample, and up-to-date database. For another, the LFS uses a sampling design based on the local population registry data. Therefore, this database is not only representative at the regional level, but also includes all individuals living in Spain, independently of their nationality and their legal status.[17] We apply weights to the sample as provided by the Spanish Institute of Statistics. Among others, the LFS contains information regarding the province of residence, educational level, age, gender, country of birth, employment status, and economic activity of those employed. We restrict the sample to individuals between 25 and 54 years of age. As in Gonzalez and Ortega (2011) we construct three educational level categories: high school dropouts,[18] high-school graduates,[19] and tertiary education graduates.[20]

We use the LFS to come up with several indicators used for the instrument and the dependent variables. First, we construct the annual inflow of migrants between the years 2003 to 2015 that we will use as part of our instrument. In order to do this, we restrict the LFS to individuals with non-Spanish nationalities and we collapse the data by year, country of origin,[21] gender, and educational level $[M(t)_{gec}]$.[22] We also use the LFS to calculate the number of Spanish and foreign-born

[16] This information is taken from a report carried out by the Spanish Ministry of Employment and Social Affairs in which several immigrants were surveyed at the individual level and this was combined with a number of focus groups.

[17] Then, this data measure inflows of immigrants, both legal or illegal.

[18] High school dropouts includes all individuals that at most completed the first stage of secondary education, or vocational studies that only required the first stage of secondary education as a prerequisite.

[19] We consider as high-school graduates those individuals that obtained a high-school degree or those with middle or advanced-level professional training.

[20] Those with a university degree or beyond.

[21] We generate 17 different countries or areas of origin: France, Italy, Portugal, UK, Germany, Other EU-12, other Europe, Morocco, other Africa, USA, Cuba, Argentina, Venezuela, Mexico or Canada, other Central America and Caribbean, other South America, and Asia and Oceania.

[22] The collapsed data will have 1,224 observations (13 years*2 sex*3 levels of education*17 countries).

individuals employed as a dependent variable. We first keep those individuals that are employed, and then collapse the data at the year, gender, province, and educational level $[E(t)_{rge}]$.[23]

The third database is the Census of 1991, which surveys a representative sample of 5% of the population that lived in Spain in 1991 and collects information on individuals characteristics, households, buildings and dwellings. The raw data contains information on 3,894,525 individuals. We first restrict our sample to all those individuals aged 25-54 (1,523,483 obs.) and foreign (22,098 obs.). We use this database to calculate our instrument, determining the distribution of immigrants across the Spanish provinces in 1991. We do this by collapsing the individual data at the country and province level $[M(1991)_{rc}]$, and then dividing it by the individual data collapsed at the country level $[M(1991)_{c}]$.[24]

3.2 Descriptive Evidence

In Figure 3 we can observe the evolution of the number of workplace accidents and the total number of individuals employed for both nationals (top graph) and immigrants (bottom graph). For Spanish-born individuals, the total number of employed individuals increased from 2003 to 2009, as we expected, due to the economic boom that Spain was experiencing during these years. At the same time, the number of workplace accidents experienced by Spanish-born workers did not increase proportionately, remaining quite flat during 2004 and 2009 at around 650,000 accidents a year. During the same period, the number of immigrants employed also increased substantially however, in contrast to the native population, the number of workplace accidents for these individuals also increased significantly. After 2009, with the onset of the recession, we observe a decrease in the number of individuals employed for both the native and immigrant populations. But the decrease in the number of workplace accidents was larger for the immigrant population than for the native one.

Table 1 reports the descriptive statistics on the percentage of workplace accidents and the total number of workers collapsed at the province, year, and gender level (economic activity or level of severity). Note that there are more or less the same percentage of workplace accidents involving immigrants as nationals. On average, before 2009 there are 4.37 workplace accidents for every 100 Spanish-born workers, and 4.69 accidents per 100 immigrant workers per year and province. After 2009, the incidence of workplace accident is lower for both nationals and immigrants (2.89 accidents per Spanish-born workers and 2.36 accidents per immigrant workers, on average). We

[23] The collapsed data will have 4,056 observations (13 years*2 sex*52 provinces*3 levels of education).
[24] The collapsed data will have 884 observations (17 countries*52 provinces).

can also observe that workplace accidents are more common for men than women, although this difference becomes smaller after 2009. As expected, before 2009 the construction sector takes a higher percentage of workplace accidents per worker (for both immigrants and nationals). After 2009, immigrants working in the agriculture sector have the higher share of workplace accidents. Finally, it is important to note that the majority of workplace accidents have been classified as mild in nature.

3.3 Empirical Strategy

In order to examine the effects of changes in immigration on workplace accidents of the native and foreign-born population, our main outcome variable will be the annual change in the number of workplace accidents per employed individual. In order to construct the dependent variable, we first divide the number of workplace accidents of Spanish-born or foreign-born individuals of gender g living in province r by the number of Spanish-born or foreign-born employed individuals of gender g living in province r each year t $[\frac{WA(t)_{rg}}{E(t)_{rg}}]$. Then, we calculate the annual change of the number of workplace accidents per worker $[\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}}]$. To facilitate the interpretation, we will multiply the dependent variable by 100,000.

On the other hand, our main regressor is the annual change in the number of the immigrant population of a certain gender g and education e in a province r. This regressor is constructed by subtracting the number of immigrants of a certain gender, and educational level living in a specific province in year t $[M(t)_{rge}]$ from the number of immigrants of a certain gender and educational level living in that same province the year before $t-1$ $[M(t-1)_{rge}]$. Thus, our regressor could be expressed in the following way: $[M(t)_{rge} - M(t-1)_{rge}]$.[25] To ease interpretation we divide this migration flow by 1,000.

We then estimate a regression of the following form:

$$(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}}) * 100,000 = \alpha + \beta\frac{(M(t)_{rge} - M(t-1)_{rge})}{1,000} + \delta_t + \alpha_r + \mu_g + \gamma_e + \epsilon_{trge} \quad (1)$$

The main coefficient of interest, β is interpreted as the effect of an inflow of 1,000 immigrant of

[25] Our results are robust in sign and significance level if we divide the migration flows and the instrument by the population in each province, gender and educational cell in the period t-1. Table 13 reports the main results using this alternative specification.

gender g and skill group e in province r on the number of workplace accidents of individuals of that gender g in the province r and year t per 100,000 workers. In addition, our specification includes year, province, gender and education fixed effects (δ_t, α_r, μ_g and γ_e, respectively). We estimate all regressions with standard errors clustered at the province level (52 provinces) and using weights.[26]

The inclusion of fixed effects addresses the issue of unobserved heterogeneity across time, provinces, gender and skill groups. However, our previous specification will still be affected by the endogeneity of immigrants' location choices. For instance, immigrant inflows will most likely occur in provinces with high economic growth, low unemployment, and/or more jobs with lower injury risk (the other way around with immigration outflows). To solve this problem we adopt an instrumental variable approach (the shift-share instrument or Bartik instrument) following Altonji and Card (1991), Card (2001) and Gonzalez and Ortega (2011).

The objective of this instrument is to disentangle the exogenous part in immigration inflows and outflows from its endogenous part. In other words, we want a variable that is correlated with the percentage change of the immigrant population, but is orthogonal to the local specific shocks and trends in the labor market conditions. This approach exploits the observation that changes in immigration are tightly linked with migrant networks. Immigrants tend to move to areas where big groups of immigrants from their same country of origin are already established. As discussed in the previous section, we use the Census (1991) to determine the cluster of immigrants of different countries across the different Spanish provinces in 1991.

Using this data, we calculate the share of all immigrants born in country c living in province r in 1991 $[\Pi_{rc}]$.[27] Next, we compute country-wide changes over time for the number of immigrants from country c, with gender g and educational level e, $[M(t)^{esp}_{gec} - M(t-1)^{esp}_{gec}]$. Then we build the imputed change of immigrants over time from country c, gender g and educational level e multiplying the country-wide changes with the share of immigrants in each province in 1991. Finally, we obtain our instrument by summing up the previous indicator over all countries:

$$Z(t)_{erg} = \sum_{c=1}^{C} Z(t)_{ergc} = \sum_{c=1}^{C} \Pi_{rc}(M(t)^{esp}_{gec} - M(t-1)^{esp}_{gec}) \tag{2}$$

This instrument should reflect the exogenous annual inflows and outflows of immigrants in Spain

[26] For our first stage and employment regressions, we use as weight the Spanish population of specific gender and educational level living in each province in t-1. For our workplace safety regressions we use as weight the Spanish/Immigrant employed population of specific gender living in each province.

[27] Our results are robust to the use of gender- and education- specific baselines shares in the instrument $[\Pi_{rcge}]$.

between 2003 and 2015.

3.4 Identification Assumptions

For our IV approach to derive causal estimates, we need two identification assumptions to hold: the exclusion restriction and instrument relevance.

3.4.1 Exclusion Restriction

The exclusion restriction requires that the motivations for most immigrants to migrate to the different Spanish provinces in the 1980s should be uncorrelated with our outcome of interest (workplace accidents) during the period 2003 to 2015. Although this statement cannot be formally proved, we provide evidence to support that this identification assumption holds.

First, we use a lag of more than 10 years between the measurement of our instrument and our outcomes of interest, which is considered sufficiently long for the assumption to hold. Secondly, we are able to present suggestive evidence that the location patterns of early immigrant groups are uncorrelated with the more recent changes in regional labor market conditions. Figure 4 shows the distribution of South American and African immigrants across the different provinces of Spain in the Census of 1991. We see that South American and African immigrants had very distinct geographic distributions in 1991. If we ignore Madrid and Barcelona, that had important immigrant clusters from all countries, African immigrants tended to have more presence in the south-eastern coast. This could be explained by the geographic proximity to their countries of origin. On the other hand, South Americans were clustered in the north-west provinces and in the Canary Islands. In the early 20th century, there was considerable emigration to South America from these regions. It is likely that part of the South American immigrant inflows into these regions during the 80s was mostly composed by descendants or relatives of these Spanish emigrants. These two distinct patterns support the exogeneity of the instrument, suggesting that non-economic reasons largely determined the location choices of early immigrant settlements within Spain.

Jaeger et al. (2018) pointed out that the exclusion restriction of the shift-share instrument will be violated in the presence of strong serial correlation of immigrant flows. However, this is a very unlikely problem in our setting. The immigration pattern in Spain has changed substantially over the years, leading to a smaller correlation in the number of immigrants by country of origin com-

pared to the US.[28] In Figure 5 we show the correlation in the share of immigrants coming from a certain country living in a particular province in Spain in 1991 with 2006 (top graph), and later with 2015 (bottom graph). We do not observe a strong correlation between these years[29] indicating that the composition of immigrants has changed over time in Spain. Moreover, Figure 6 reports the composition of immigrants in Spain by country of origin at four points in time. We see that the country of origin composition of migrants has changed substantially across time. The period from 1998 to 2003 saw an increase in the percentage of immigrants coming from South America. However, this percentage has declined since then. On the other hand, the number of immigrants with European origins has increased since 2003. Later, in Section 4.4 we show the results from adopting the "multiple instrumentation" procedure suggested by Jaeger et al. (2018) to check if our main results are robust to the inclusion of lagged immigrant inflows.

3.4.2 Instrument Relevance

To fulfill the second requirement that our instrument is relevant, that is, our instrument should be able to predict actual changes in the migration flows, we analyze whether the instrument is correlated with the actual changes in the immigrant population. This will be our first-stage regression. The dependent variable will be the change over time in the actual number of the immigrant population of a certain gender g and educational level e taking place in province r $[M(t)_{rge} - M(t-1)_{rge}]$. The instrument is the main regressor. Thus, we estimate the following regression:

$$\frac{M(t)_{rge} - M(t-1)_{rge}}{1,000} = \alpha + \beta \frac{Z(t)_{erg}}{1,000} + \delta_t + \alpha_r + \mu_g + \gamma_e + \epsilon_{trge} \tag{3}$$

Table 2 reports the OLS estimates of the first-stage regressions for the entire period, as well as, two different periods: 2004-2009 and 2010-2015. As we mentioned at the beginning of the paper, Spain experienced a massive inflow of immigrants from 2003 to 2009 due to the strong economic expansion during this period. However, this trend reversed with the onset of the recession in 2008, and Spain began to experience some outflows of immigrants (particularly pronounced in certain regions). As we expect differential effects between inflows and outflows of immigrants on workplace safety, for the rest of the paper we will analyze these two periods separately.[30]

[28] This was already pointed out by Jaeger et al. (2018): "the prospects to satisfy the exclusion restriction may be better in settings in which the first-stage link is weaker because immigrant inflows have been less stable over time, as is the case in many European countries".

[29] Under the presence of strong serial correlation we will observe all the dots over the 45 degree line.

[30] Figure A1, in the Appendix, reports the IV estimates of the effect of immigration inflows on workplace accidents for national workers considering different time periods.

Across all the samples, we observe that the coefficient of our instrument is highly significant and close to one, as expected, based on the definition of the instrument. More importantly, the F-statistics of the excluded instrument is high (greater than 10) for all the subgroups, indicating that the instrument is relevant and strong.

4 Results

4.1 Baseline Results

In this section, we examine the effects of the imputed changes in the number of the immigrant population on the proportion of workplace accidents for native and foreign-born workers. In column 1 of Table 3, we observe this relationship for the native population during the period 2004 to 2015. The OLS specification in the top panel of the table already shows a negative coefficient, though smaller than the IV estimate found at the bottom panel of the table. The OLS estimates, for nationals, are upwardly biased due to the suspected endogeneity of migrants' location choices.[31] The IV estimates indicate that, for the period 2004 to 2015, an inflow of 1,000 immigrants of a certain gender and educational level in a province decreases the number of workplace accidents by 4.25 for every 100,000 Spanish-born workers.

This negative and significant effect is entirely driven by the period 2004 to 2009. During that period, an inflow of 1,000 immigrants of a certain gender and educational level in a province decreases the number of workplace accidents by 8.86 for every 100,000 Spanish-born workers. Performing a simple back of the envelope calculation shows that working accidents were reduced by 10,890 for native workers during the period 2004 to 2009 (as there is an average of 40,209 workers of each gender and education level in each province and the mean inflow of immigrants is 1,616 for each gender and educational level in each province).[32] We also analyze the effects by gender. In column 3 and 4 of Table 3, we observe that this relationship is larger for men than for

[31] This positive bias is consistent with, for instance, immigrants migrating more to provinces where the number of job openings with low probability of injury is increasing. These provinces will experience a stronger labor supply shock, reducing the probability of nationals obtaining a job with low risk of injury. For nationals, then, the omitted variable (change in safe jobs) will be positively correlated with migration flows and workplace accidents.

[32] Our estimates show a reduction of working accidents by 0.0009 (for each 100,000 workers) when 1 immigrant enters. As there is a mean of 40,209 workers in each province (of each gender and educational level and year) each immigrant reduces accidents by 0.0036 (0.00000009*40209) for each gender, education, year and province. As, on average, there is an inflow of 1,616 immigrants (for each province, gender, education and year) accidents are reduced by 5.8 (1,616*0.0036) (for each gender, education, province and year). Finally, as there are 52 provinces, 2 genders and 6 years and 3 educational levels, accidents are reduced by 10,890 for native workers for the entire period (1,872*5.8).

women. An inflow of 1,000 immigrants in a province decreases the number of workplace accidents by 12.7 for men and 4.9 for women (for every 100,000 workers).

In columns 5, 6, and 7 of Table 3 we explore the same effects for the years 2010 to 2015. We find that immigration flows have a small positive effect on workplace accidents for nationals for that period. Yet, this small effect is very sensitive to the specification chosen. For instance, this effect is not longer significant if we consider the period 2011-2015 instead (Figure A1), we estimate this effect for the population aged 25 to 45 (Table A11), or the data is collapse by year and province or by year, province and level of severity (Table A1 and A3). We also do not find any significant effect for any of the subgroups (men or women) for this period.

Table 4, shows the effect of changes in the number of immigrants on the change in the proportion of workplace accidents for foreign-born workers.[33] This table indicates that neither inflows nor outflows of immigrants have any significant effects on their workplace safety.

Figure A1, in the Appendix, reports the IV estimates considering different time periods. We can observe that the result is stable around -9 for the periods 2004-2006, 2004-2007, 2004-2008, 2004-2009, and 2004-2010. Adding more years after 2010 to the period analyzed significantly reduces the magnitude of the effect, but the result continues to be negative and significant. If we consider only the last years available, the effect is always close to zero and not significant, except for the periods 2008-2015, 2009-2015 and 2010-2015, where the immigrant inflows increase workplace accidents for nationals. This graph indicates that the negative effect of immigration on workplace safety that we find in Table 3 for the second period is very sensitive to the time period chosen.

As we explained before, in constructing the instrument, we collapsed the data at four levels: year (t), province (r), educational level (e), and gender (g). To ensure that our results are not driven by the level of aggregation, Table A1 shows the results on the effect of immigrant inflows on the number of workplace accidents of national workers when we collapse the data only at the year and province level. An inflow of 1,000 immigrants in a province decreases the number of workplace accidents by 2.26 for every 100,000 Spanish-born workers during the period 2004-2009. However, we do not observe any impact during the period 2010 to 2015. In Table A2, when we collapse the data only at the year, province and gender level, we find the same pattern as in Table

[33]Note that, for immigrants, the OLS bias is negative. This negative bias is consistent with, for instance, foreigners migrating more to provinces where the number of job openings with low probability of injury is increasing. Then, immigrants will have a higher probability of being employed in safer jobs. For immigrants, then, the omitted variable (change in safe jobs) will be positive correlated with migration flows but negatively correlated with workplace accidents.

3. Therefore, we can conclude that our results are not driven by the level of aggregation of the data.

4.2 Heterogeneous Effects

In this section we analyze the impact of immigration on workplace accidents depending on the level of severity of the accident. The increase in competition for a job due to immigration pressures could decrease workplace absences due to mild accidents. The fear of losing one's job due to absenteeism might induce native workers not to report accidents that are not considered severe. Occurrence of severe accidents would be more difficult to hide or ignore, however, and workers are compelled to declare them. As the Register of Workplace Accidents distinguishes between mild and severe working accidents, we also perform the baseline analysis differentiating between these two types of accidents. Table 5 shows a significant effect for both mild and severe accidents for the period 2004 to 2009, though the reduction is larger for mild accidents.[34] Finding significant effects on the incidence of severe accidents suggests that reporting biases are not a very important concern, at least for nationals during this time period.[35]

Some types of jobs may involve higher accident rates than others. We expect immigrant flows to have a specific influence on workplace safety for the different economic sectors. In Table 6, we examine whether immigration flows affect workplace accidents of nationals differently by economic sector. We divide our sample into four sectors: agriculture, industry, construction, and services. The IV estimates in Table 6 indicate that changes in immigrant flows have significant effects on workplace accidents only for jobs in the services sector between 2004 and 2009. An inflow of 1,000 immigrants of a certain gender and educational level in a province decreases the number of workplace accidents by 8.3 in the service sector (for every 100,000 native workers).[36] Immigrants are overrepresented in the service sector. In particular, during 2003 to 2015, around 70% of all immigrants were employed in the service sector, and this percentage is increasing with the level of education of the immigrant.[37]

Finally, we analyze if the positive effect of immigrants on workplace safety of nationals differs by the skill level of the immigrant population. However, most immigrants working in Spain have

[34] Table A3 in the Appendix, shows that the results by the level of severity of the workplace accident are robust when we collapse the data only at the year, province, and level of severity of the accident.

[35] We also find a small positive effect of immigration flows over mild workplace accidents of nationals for the period 2010-2015. However, as we can observe in Table A3 and 12, this effect is not robust.

[36] Table A4 in the Appendix, shows that the results are robust when we collapse the data only at the year, province, and economic activity.

[37] We also find a positive effect of immigration flows over workplace accidents of nationals in the construction sector for the period 2010-2015. However, as we can observe in Table 12, this effect is not robust.

low qualified occupations, independently of their education level. Using the Spanish Labor Force Survey from 2003 to 2015, Figure A2 shows that immigrants in Spain, independently of their level of education, are overrepresented in elementary jobs, especially as domestic employees, in construction, services and in other type of elementary occupations. In addition, Stanek and Ramos (2013) use data of the Spanish National Immigrant Survey of 2007 and estimate that around 50% of immigrants have experienced downward occupational mobility after their arrival in Spain. Less the 13% of immigrants, experienced upward mobility and only around 37% found jobs adequate to their pre-migration occupational status. In Table A5, in the Appendix, we analyze the effect of changes in the number of immigrants based on the different education levels on the change in the proportion of workplace accidents for the native population. We find the largest effects for immigrants with tertiary education, which is consistent with these immigrants being more likely to experience downgrading and being overqualified for the occupations they develop in Spain.

In Tables A6, A7 and A8, in the appendix, we perform the same heterogeneity analysis for foreign-born workers. Consistent with our main results, we do not find any effect on workplace safety by severity of the accident, education level, or economic sector for immigrants.

4.3 Possible Mechanisms

Workplace accidents of natives

The change in workplace safety of native workers in the period 2004 to 2009 may have occurred through different channels. Firstly, the inflow of immigrants could add pressure to the labor supply. As a consequence, Spanish-born workers may be forced to accept more precarious working conditions in order not to lose their jobs, leading to an increase in the number of workplace accidents. Our results show the contrary. As such, we conclude that this channel is probably not relevant.

Secondly, the additional pressure from immigrants on the labor supply could force Spanish-born workers to underreport small workplace accidents if they are afraid of losing their jobs. Thus, immigrant inflows would imply a decrease in the number of reported workplace accidents by Spanish-born workers. However, Table 5 presents significant effects on the incidence of severe accidents, which are more difficult to hide or ignore. This suggests that reporting biases are not a very important concern, at least for nationals during this time period.

Thirdly, immigrant inflows could substitute Spanish-born workers in jobs that have a higher injury risk. This would result in an improvement in workplace safety of the native population. In order

to explore the plausibility of this channel, we analyze the effects of the inflow of the immigrant population on the total employment rate of both nationals, as well as on the type of job that they have. In Table 7 we observe that the inflow of immigrants did not have any effect on the total employment rate of nationals. This also holds true when we segregate the analysis by gender and by economic activity. This result is in line with previous literature (Altonji and Card, 1991; Borjas, 1995; Friedberg and Hunt, 1995; Gonzalez and Ortega, 2011). In addition, we explore whether the inflow of immigrants has an effect on the type of economic activities in which nationals are employed. In Figure 7 and Table A9, we show that, for the period 2004 to 2009, there is a decrease in the probability that Spanish-born workers are employed as domestic employees, low-medium rank officials in the armed forces, workers in the agrarian, farming and fishing sector, or in the extractive industry. At the same time, the probability of native workers being employed as managers with less than 10 employees, technicians, project managers, team leaders, or workes in the agriculture sector increases. In Figure 8, using the O*NET classification,[38] we classify the different occupations by the level of physical work conditions and the level of human interaction needed in these occupations. The classification goes from 1 to 15. Those occupation with a lower number are characterized as being more physically intense, or requiring a higher level of human interaction. With this classification, we give suggestive evidence that, in the period 2004 to 2009, native workers reallocate from jobs with heavier physical demands (jobs with more exposure to hazardous equipment, minor burns, cuts, bites, or than require protective or safety equipment) to jobs that entail more human interactions (jobs that require public speaking, use of letters and memos, face-to-face discussions, working in groups or teams, dealing with external customers, coordination, or supervision).

Therefore, we can conclude that the reduction in workplace accidents for national workers that took place from 2004 to 2009 was, at least partly, driven by the shift of Spanish-born workers from jobs with higher occupational risks to jobs with a lower risk of injury. This result is in line with the findings of Giuntella et al. (2019) for the UK and Dillender and McInerney (2020) for the US.

For the period 2010 to 2015, we do not find any robust effect on workplace safety for the native population. We believe that the null effects for this period are driven by two possible mechanisms that are very related to the economic crisis that hit Spain during the period.

Firstly, the fear of losing the job during a period when employment was scarce, could have reduced reporting of workplace accidents among national workers. However, we do not find effects on se-

[38]The Occupational Information Network (O*NET) contains a rich set of variables that describe work and worker characteristics, including skill requirements.

vere accidents during the period 2010-2015, which suggests that this mechanism could not fully explain the differences between the two periods.

Secondly, the economic crisis could have prevented any kind of shift between occupations due to the scarcity of jobs at the time. During the period 2010 to 2015 the total number of employed nationals decreased by 2 millions. Figure 7 and Table A10 show that the probability that national workers are employed as technicians slightly decreases while the probability of native workers being employed as operators, professionals or workers in construction or elementary occupations mildly increases. If anything, these changes in employment will predict an increase in workplace accidents although these shifts are probably too small to affect overall workplace safety.

Therefore, these results seem to indicate that immigration improves workplace safety of Spanish-born workers only if it leads to a reallocation of native workers from more physically intense to less manual occupations with lower injury risks.

Workplace accidents of immigrants

We do not find any effect of immigration inflows on workplace safety of immigrants. Previous literature has pointed out that immigrants tend to be less educated, younger and healthier with respect to average national individuals (Borjas, 1987; Antecol and Bedard, 2006; Bertoli, 2010; Moraga, 2011; Kennedy et al., 2015; Giuntella and Mazzonna, 2015; Farré, 2016; Giuntella, 2017). In addition, the downward occupational mobility that immigrants experience after their arrival to Spain, makes them, in some cases, overqualified for the jobs they are performing.

It seems reasonable to assume that younger, healthier and overqualified immigrant workers will engage in safer attitudes at the workplace compared with national workers. If this is true, we could expect the inflow of immigrants to improve workplace safety for natives without increasing the number of workplace accidents of immigrants. Given the limitations of our data, we are not able to fully explore this mechanism.

4.4 Robustness Check

Multiple instrumentation procedure

Jaeger et al. (2018) show that migration flows with high persistence pose a threat for the validity of the shift-share instrument. They claim that when the spatial distribution of immigrant flows is stable over time, the shift-share instrument will capture both the short and long-run responses

of the immigration shocks. Jaeger et al. (2018) propose a "multiple instrumentation" procedure, that will allow to separately estimate the short- and long-run effects of immigration shocks. This "multiple instrumentation" procedure consists in adding a lag to the model to estimate the effect of contemporaneous immigration shocks (at time t) and past immigration shocks (at time t-1).

$$(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}}) * 100,000 = \alpha + \beta_1 \frac{(M(t)_{rge} - M(t-1)_{rge})}{1,000} + \beta_2 \frac{(M(t-1)_{rge} - M(t-2)_{rge})}{1,000} + \delta_t + \alpha_r + \mu_g + \gamma_e + \epsilon_{trge} \quad (4)$$

where β_1 will still be our coefficient of interest, capturing the impact of immigration on workplace accidents in the short run, and β_2 captures the longer-term reaction to past immigration shocks.

As both contemporaneous and past immigrant inflows are endogenous, we instrument them using the shift-share instrument and the lag of the shift-share instrument.

$$Z(t)_{erg} = \sum_{c=1}^{C} \Pi_{rc}(M(t)^{esp}_{gec} - M(t-1)^{esp}_{gec}) \quad (5)$$

$$Z(t-1)_{erg} = \sum_{c=1}^{C} \Pi_{rc}(M(t-1)^{esp}_{gec} - M(t-2)^{esp}_{gec}) \quad (6)$$

We then have two first-stage equations:

$$\frac{M(t)_{rge} - M(t-1)_{rge}}{1,000} = \alpha + \beta_1 \frac{Z(t)_{erg}}{1,000} + \beta_2 \frac{Z(t-1)_{erg}}{1,000} + \delta_t + \alpha_r + \mu_g + \gamma_e + \epsilon_{trge} \quad (7)$$

$$\frac{M(t-1)_{rge} - M(t-2)_{rge}}{1,000} = \alpha + \beta_1 \frac{Z(t)_{erg}}{1,000} + \beta_2 \frac{Z(t-1)_{erg}}{1,000} + \delta_t + \alpha_r + \mu_g + \gamma_e + \epsilon_{trge} \quad (8)$$

$Z(t)_{erg}$ and $Z(t-1)_{erg}$ are both constructed using the distribution of immigrants in the Spanish provinces in 1991. Then, as suggested by Jaeger et al. (2018), the difference between the instruments will come from the variation over time in the composition of national inflows. To avoid the weak instrument problem in the two first stages, we would need the country of origin composition of migrants to change substantially across time. Recall that in Figure 6, we have shown that the composition of immigrants in Spain by country of origin has indeed changed at four points of time.

Another way of showing the change in the composition of immigrants over time is to calculate the correlation between the instruments. In Table 8, we observe that the correlation between the instrument $[Z(t)_{erg}]$ and the lag of the instrument $[Z(t-1)_{erg}]$ is 0.44, indicating that in our context serial correlation is not an important issue. This is true for the two periods under consideration as well as when we split the sample by gender and education level of the immigrants. Moreover, we also show that, as expected, the correlation of the instrument with current immigrant inflows is larger (ranging from 0.43 to 0.76) than the correlation with lagged immigrant inflows (-0.06 to 0.28). This provides further evidence that the composition of immigrants in Spain during the time considered in our analysis is changing enough.

In Tables 9 and 10, we can observe the two first stages. Table 9 shows that the coefficient of our instrument is highly significant and close to one, very similar to the estimates in the first stage regression in Table 2. On the other hand, the lagged instrument does not seem to be correlated with the contemporaneous immigration inflows. Notably, the F-statistic of the excluded instruments is also high, indicating that the instrument is strong. Similarly, Table 10 shows the first stage for the lagged immigration flows and the coefficient of the lagged instrument is significant and close to one, while the coefficient of the instrument is not significant or much smaller.

Table 11 reports the IV estimates for the main results. We find that the impact of recent immigration inflows on workplace accidents of Spanish-born workers is still negative and statistically significant for the period 2004 to 2009. In fact, the coefficients are quite similar to the estimates in our main specification in Table 3. An inflow of 1,000 immigrants of a certain gender and educational level in a province decreases the number of workplace accidents by 8.67 (11.5 for men and 3.6 for women) for every 100,000 Spanish-born workers. However, the lagged immigrant inflow has no effect on workplace accidents, suggesting no long-term effect on workplace safety. For the period 2010 to 2015, we find that the small positive effect on workplace accidents of nationals is coming from the lagged immigrant inflow, instead of the contemporaneous one. This indicates that for the period 2010 to 2015 there are no short-term effects of immigration over workplace accidents of nationals. For each regression, we report the Kleibergen-Paap rk LM statistic for underidentification,[39] which provides information on the difference in the predicted values from the two first stage regressions. For all the regressions for the period 2004-2009, we can reject the null hypothesis of underidentification.

We also look at the main heterogeneous effects (those that were significant in our main specifica-

[39]This statistic tests the null hypothesis that the rank of the matrix formed from the coefficient vectors from the first stage regressions is equal to 1 against the alternative that it is equal to 2.

tion) in Table 12. In the first three columns, we report the effect of contemporaneous and lagged immigrant inflows on workplace accidents of Spanish-born workers for the period 2004 to 2009. We find that the effects of the contemporaneous immigrant inflows for mild, severe accidents or accidents occurring in the service sector are very robust to the inclusion of the lagged immigrant inflows. In columns 4 and 5, we look at the effect of immigrant inflows on mild workplace accidents and accidents occurring in the construction sector for the period 2010 to 2015. We find that the inclusion of the lagged immigrant inflows affects a lot the effect of the contemporaneous immigrant inflows. In particular, the contemporaneous effect for mild accidents is no longer significant while the effect for construction is largely reduced.

Following these analyses, we can conclude that the shift-share instrument in our context for the period 2004 to 2009 only captures the short-run response of the immigration shocks.

Dividing migration flows and the instrument by the total population

With our identification strategy we are capturing the effect of an increase of a 1,000 immigrants of gender g and skill group e in province r on the number of workplace accidents per 100,000 workers of gender g in province r. One potential concern is that an inflow of 1,000 immigrants in a large province may not have the same effect on safety as the same immigration inflow in a less populated province. We explored this possibility by re-estimating our main results dividing the actual immigration inflows and our instrument by the total population of gender g and skill level e living in province r in the previous year $(t-1)$.

We estimate a alternative regression of the following form:

$$(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}}) * 100,000 = \alpha + \beta(\frac{M(t)_{rge} - M(t-1)_{rge}}{Pop(t-1)_{rge}}) * 100$$

$$+\delta_t + \alpha_r + \mu_g + \gamma_e + \epsilon_{trge}$$

where we instrument the endogenous inflow of immigrants to the different provinces in Spain $(\frac{M(t)_{rge} - M(t-1)_{rge}}{Pop(t-1)_{rge}})$ using

$$Z(t)_{erg} = \frac{\sum_{c=1}^{C} Z(t)_{ergc}}{Pop(t-1)_{rge}} = \frac{\sum_{c=1}^{C} \Pi_{rc}(M(t)^{esp}_{gec} - M(t-1)^{esp}_{gec})}{Pop(t-1)_{rge}}$$

With this new specification, the main coefficient of interest (β) is interpreted as the effect of an

increase of 1% in the share of immigrants of gender g and skill level e in province r over the share of workplace accidents per 100,000 workers of gender g in province r.

Table 13 presents the results for Spanish-born individuals during the period 2004-2009. We find that a 1% increase in the share of immigrants of a certain gender and educational level in a province decreases the number of workplace accidents by 30 for every 100,000 Spanish-born workers. We also observe that the effect is larger for men, mild accidents, and accidents occurring in the service sector. We can conclude that the sign and significance of our main results are maintained using this alternative specification.

Opening the black box of the Bartik estimator

Goldsmith-Pinkham et al. (2018) probe very nicely that the 2SLS estimator using the Bartik instrument (or the shift-share instrument) is numerically equivalent to a GMM estimator using the share of immigrants in 1990 in the different provinces of Spain as instruments and a weight matrix constructed from the national migration inflows. Then, our strategy is equivalent to an exposure research design, where the distribution of immigrants across the different provinces in 1990 measure the differential exogenous exposure to a common shock (migration inflows to Spain). For this exposure design to be credible, Goldsmith-Pinkham et al. (2018) suggest several tests.

We should be skeptical about the identifying assumptions if the distribution of immigrants in 1990 predict our main outcome (changes in workplace accidents) through a different channel than the one we are suggesting in our paper (Spanish-born workers shifting away from manual labor occupations). In our particular setting, we should be worried if the share of immigrants in the different provinces of Spain in 1990 are correlated with trends in the labor market characteristics of these provinces that could explain changes in the incidence of workplace accidents in 2003-2015. For instance, we can observe Table 1 that workplace accidents are more common in certain types of occupations and sectors. Moreover, the level of education might be correlated with the probability of suffering from a workplace accident. To alleviate these concerns, we use the Labor Force Survey (2004-2015) to construct a set of controls with characteristics of the labor market of each Spanish province across time. In particular, we have calculated the percentage of Spanish-born workers in the agriculture, industry, construction and services sectors, the percentage of Spanish individuals working in a high-skilled, semi-skilled white, semi-skilled blue and low-skilled occupation, and the percentage of Spanish individuals with less than a high-school degree, with a high-school degree and with college education. In Tables A13, A14 and A15 in the Appendix, we report the first stage and the main results for nationals and immigrants adding the time-varying controls. We can

observe that these controls barely affect our estimates.[40]

In addition,[41] we can explore the validity of the design exploring how the Bartik instrument is combining all instruments. We can decompose the Bartik estimator into a weighted sum of the just-identified instrumental variable estimators that use each country of origin share (π_{rc}) as a separate instrument. We do this for our sample where the data is only collapsed at the province and year level (as this is the level at which our shares vary). Goldsmith-Pinkham et al. (2018) show that $\hat{\beta}_{Bartik} = \sum_c \hat{\alpha}_c \hat{\beta}_c$ where $\hat{\alpha}_c$ are the Rotemberg weights and $\hat{\beta}_c$ is the just-identified IV estimates based on each country of origin instrument. The validity of each $\hat{\beta}_c$ depends on the exogeneity of that country's instrument (Z_{rc}). Importantly, if one instrument is misspecified, $\hat{\alpha}_c$ will tell us how much that misspecification translates into the overall bias of the Bartik instrument. Figure 9 shows graphically the heterogeneity in $\hat{\beta}_c$ and the relationship to the first stage f-statistic. Following Goldsmith-Pinkham et al. (2018) we have only included instruments with reasonable first-stage power (F-statistic>5). Also, to show how the $\hat{\beta}_c$ compare to the Bartik estimate, the figure includes a horizontal line that reflects the overall Bartik estimate. The individual points of $\hat{\beta}_c$ are weighted by the absolute size of the $\hat{\alpha}_k$ from the Bartik Rotemberg weights. Finally, we shaded the points differently depending on the sign of the Rotemberg weights. First, we can observe that the instruments with more weight correspond to South American countries, European countries outside the EU-12 and African countries. We have already pointed out in the introduction of our paper that South American and African immigrants had very distinct geographic distributions in 1991 driven by different non-economic reasons. This already suggest that the exogeneity assumption holds for the countries with more weight in our instrument. This is confirmed as the $\hat{\beta}_c$ of all these countries are quite close to the Bartik estimate.[42] Thus, as all the high-weight countries are clustered very closely to the overall point estimate, we expect the potential misspecification of the other countries to generate only a very small bias in our estimates with the Bartik instrument.

5 Conclusion

In this paper, we explore the effects of immigration on workplace accidents of native and immigrant workers in Spain for the time period 2004 to 2015. Workplace accidents are important

[40] Note that we only control for these covariates as a robustness check and not in our main analysis because these controls might be partially endogenous.

[41] Goldsmith-Pinkham et al. (2018) also recommend looking at the pre-trends. We believe that this analysis might have been already addressed, in spirit, with the "multiple instrumentation" procedure.

[42] Moreover, we can also see that we have no negative weights. Note that negative Rotemberg weights will suggest that some of the underlying effects receive negative weight so that there is unlikely to be a LATE-like interpretation of the parameter estimate.

because they entail massive economic and social costs. They affect not only individuals involved in the accidents, but the society as a whole. However, they have been relatively unexplored in the previous literature studying the effects of migration flows.

Spain constitutes a perfect scenario to study this research question because it stands at a relatively bad position with respect to its European neighbors regarding workplace safety (Aibar, 2006). In addition, Spain has been experiencing dramatic changes in immigration flows during that time period.

We follow an instrumental variable approach using immigrant clusters during the 1980s in Spain's provinces to distribute the current national inflow of immigrants from each country across the different provinces in Spain. From 2004 to 2015, we find that an inflow of 1,000 immigrants decreases the incidence of workplace accidents by 4.2 for every 100,000 Spanish-born workers. This reduction is driven entirely by the period 2004 to 2009, while migrant flows did not strongly affect workplace safety during the economic recession (2010-2015).

For the time period 2004 to 2009, our results indicate that an inflow of 1,000 immigrants decreases the proportion of workplace accidents by 9 for every 100,000 Spanish-born workers. Performing a simple back of the envelope calculation indicates that the inflow of immigrants during that time period decreased the number of working accidents suffered by the native population by 10,890 (a 7% of the overall decrease during that period). Our administrative data allows us to analyze in detail the mechanisms behind the effects, as we have information on the gender, age and nationality of the worker that suffered the accident, the job that he/she was performing at the time of the accident, and the level of severity of the accident. We find a reduction in both mild and severe accidents, supporting the idea that reporting biases are not an important concern, at least for nationals during this time period. In addition, the reduction of workplace accidents is stronger in the service sector, where immigrants are more represented.[43]

We find that the reduction in the number of workplace accidents could be driven by the reallocation of native workers towards jobs that have lower injury risks. In particular, during 2004 to 2009, immigrant inflows reduce the employment rate of natives in occupations such as low or medium rank officers in the armed forces, workers in agricultural, farming and fishing sectors, in the extractive industry, or in domestic work. These occupations, based on the O*NET classification, are char-

[43]We also find that the estimated effect is stronger when considering inflows of immigrants that have tertiary education. This could be explained by the downward occupational mobility that immigrants experience after their arrival to Spain.

acterized by entailing a high physical burden. At the same time, the immigration inflows increase employment of natives as technicians and associate professionals, managers with less than 10 employees, or project managers and team leaders. These occupations are characterized by requiring a lot of human interaction. These results are consistent with those of Giuntella et al. (2019) for the UK and Dillender and McInerney (2020) for the US.

We do not find a robust effect of migrant flows on workplace accidents of nationals for the period 2010 to 2015. We believe the economic crisis of 2008, that hit Spain particularly hard, is behind the differences between the two periods, preventing strong shifts between occupations due to the scarcity of jobs at the time.

Finally, we do not find any effect of immigration on workplace safety of immigrants. This null effect goes in line with younger, healthier and overqualified immigrant workers (due to self-selection and downward occupational mobility) engaging in safer attitudes at the workplace compared with national workers. Given the limitations of our data, we are not able to fully explore this mechanism.

The results of our study add a previously unexplored dimension to the immigration debate that should be taken into account when evaluating the costs and benefits of migration flows. In the conduct of our various analyses for this paper, we highlight the complexity of the immigration issue that has been dominating the political arena in recent years. We believe our results have relevant policy implications, in particular, for developed countries that receive large migration inflows.

Compliance with Ethical Standards

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- Conflict of interest: The authors declare that they have no conflict of interest.

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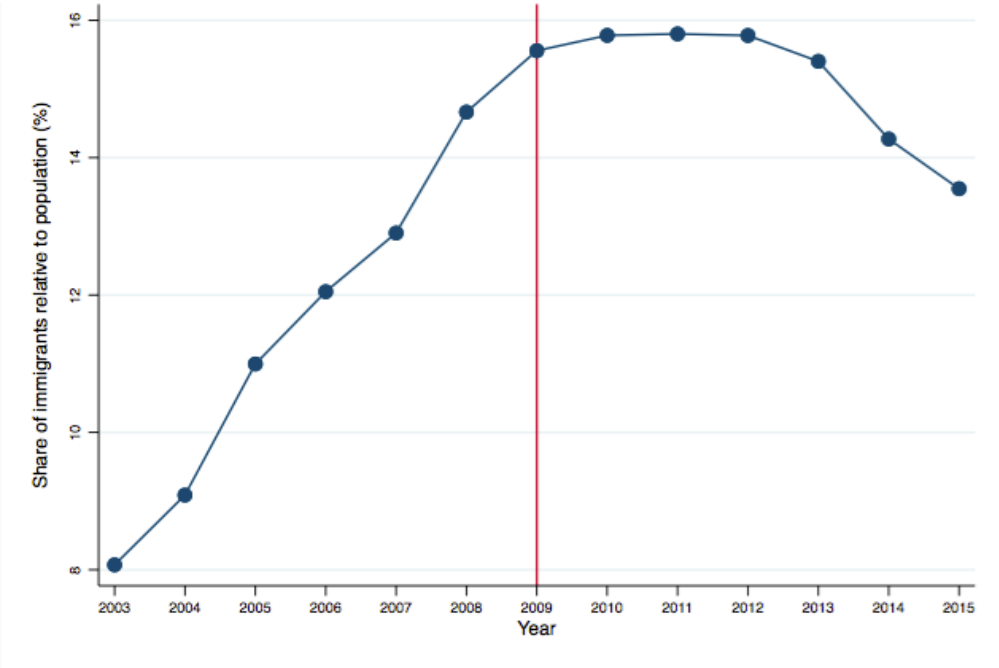
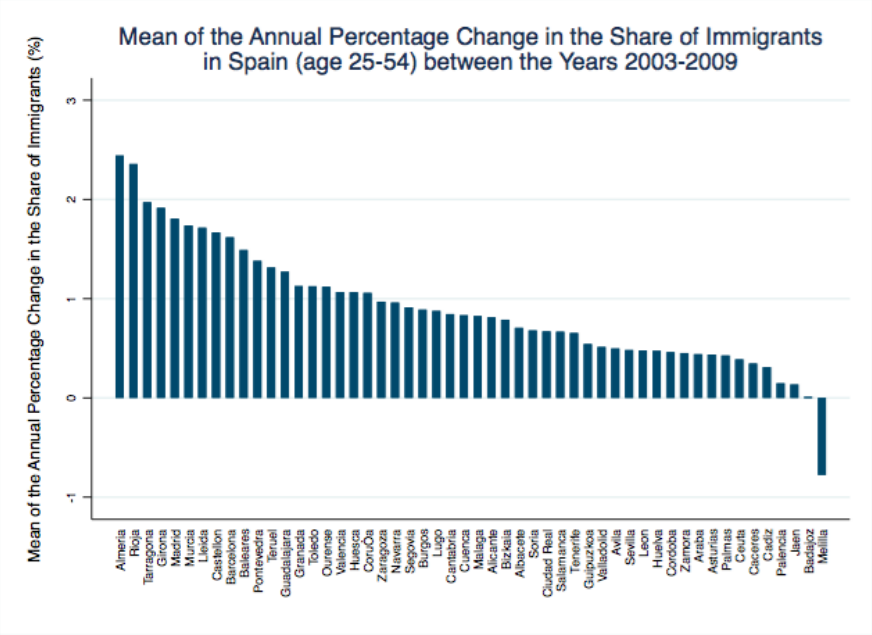
Tables and Figures

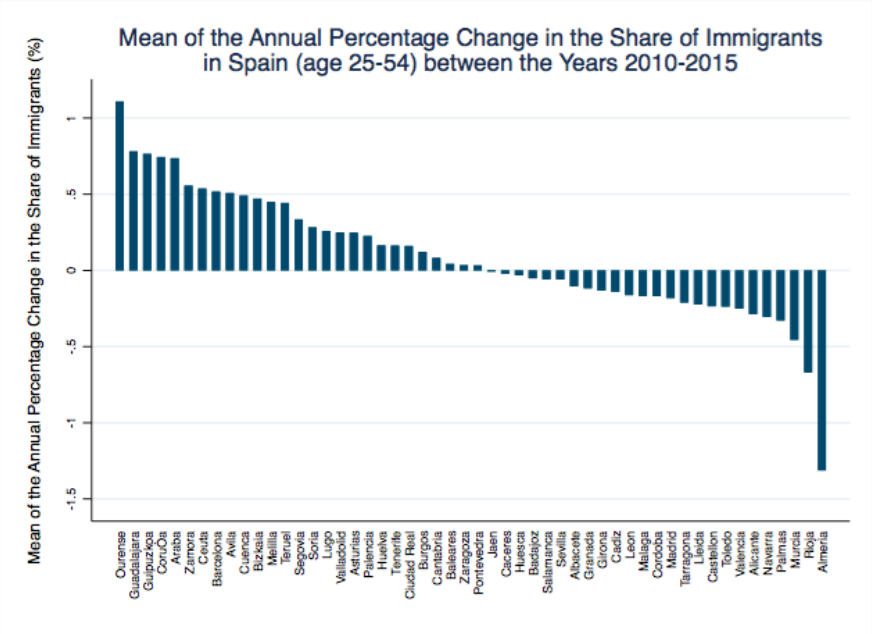
Figure 1: Share of Immigrants Relative to the Population in Spain (2003-2015)



Notes: These graphs represent the evolution of the share of immigrants relative to the population (aged 25-54) in Spain from 2003 to 2015. *Source*: Spanish Population Census (2003-2015).

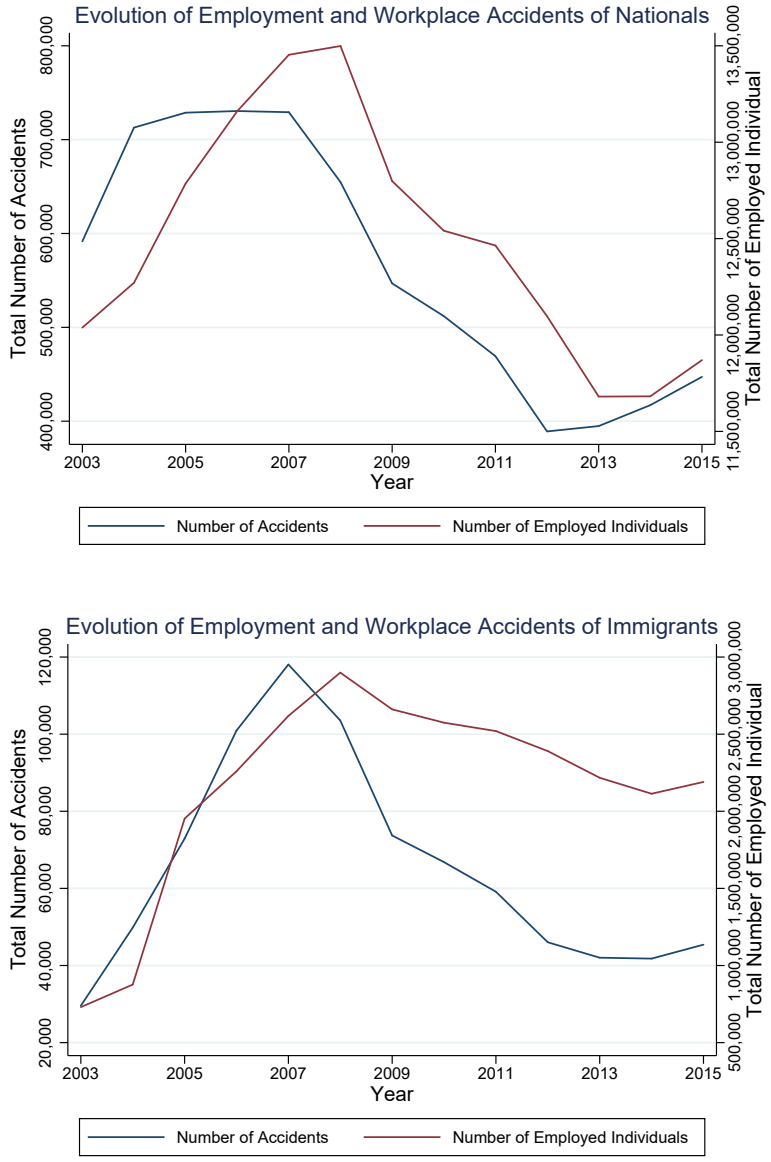
Figure 2: Percentage Change in the Share of Immigrants





Notes: These graphs represent the mean annual percentage change in the share of immigrants relative to the population (age 25-54) in the 52 provinces of Spain during two periods: 2003-2009 and 2010-2015. *Source*: Spanish Population Census (2003-2015).

Figure 3: Evolution of Employment and Workplace Accidents in Spain



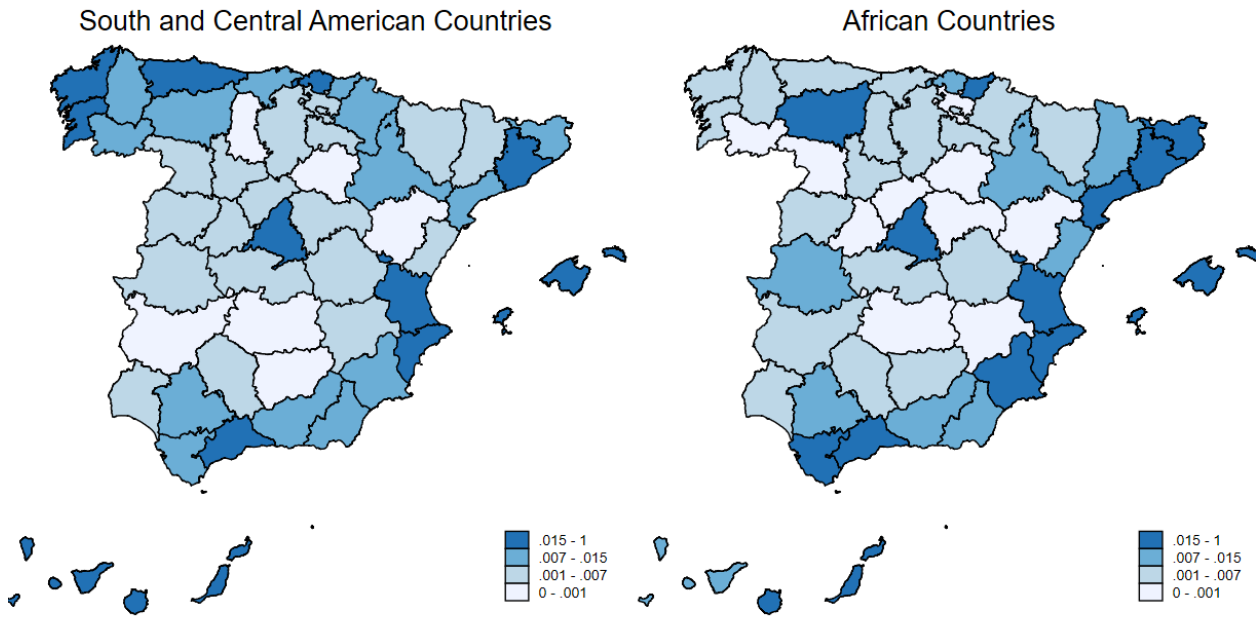
Notes: These graphs represent the evolution of the total number of employed individuals and the total number of workplace accidents of nationals (graph above) and immigrants (graph below) during the period of 2003 to 2015 in Spain. *Source*: Register of Workplace Accidents (2003-2015), and Spanish Labor Force Survey (2003-2015).

Table 1: Descriptive Statistics of Workplace Accidents per Worker

	Period 2003-2009						Period 2010-2015					
	Obs.	Mean	Std. Dev	Min.	Max.	Total	Obs.	Mean	Std. Dev	Min.	Max.	Total
Workplace Accidents per Worker (*100) for Nationals												
Total	364	4.37	1.10	1.94	10.03	1591.62	312	2.89	0.59	1.77	4.84	903.04
Men	364	5.53	1.46	2.08	11.89	2013.52	312	3.57	0.79	1.69	6.34	1114.00
Women	364	2.61	0.72	1.25	6.72	950.68	312	2.04	0.49	1.05	3.51	637.88
Agriculture	364	3.69	2.51	0.00	17.13	1344.80	312	3.86	2.66	0.00	29.30	1205.86
Industry	364	6.70	2.43	1.50	19.48	2437.25	312	4.48	1.93	0.00	21.91	1397.92
Construction	364	11.19	3.48	4.41	20.94	4072.99	312	5.49	2.18	0.00	29.59	1713.06
Servicies	364	2.73	0.76	1.28	6.69	994.89	312	2.34	0.55	1.32	4.16	730.13
Mild	364	4.31	1.09	1.88	9.91	1570.17	312	2.86	0.59	1.75	4.81	893.52
Severe	364	0.06	0.02	0.02	0.16	21.45	312	0.03	0.01	0.00	0.08	9.51
Workplace Accidents per Worker (*100) for Immigrants												
Total	364	4.69	2.83	0.56	19.04	1707.31	312	2.36	1.06	0.56	6.94	736.28
Men	364	7.00	4.69	1.05	36.52	2549.61	312	3.66	2.20	0.82	22.36	1142.94
Women	364	1.87	1.32	0.00	9.21	680.27	312	1.16	0.55	0.27	3.18	360.49
Agriculture	364	5.46	6.82	0.00	51.01	1986.00	312	6.39	7.63	0.00	65.13	1994.07
Industry	364	8.01	12.83	0.00	191.59	2915.66	312	4.19	5.09	0.00	47.07	1306.28
Construction	364	11.67	11.25	0.00	91.40	4248.91	312	5.12	4.42	0.00	24.76	1596.22
Servicies	364	2.43	1.61	0.17	11.09	883.27	312	1.60	1.10	0.43	12.16	498.86
Mild	364	4.61	2.78	0.53	19.04	1679.47	312	2.33	1.05	0.56	6.82	726.11
Severe	364	0.08	0.07	0.00	0.68	27.84	312	0.03	0.03	0.00	0.17	10.16

Notes: This table reports the number of observations, mean, standard deviation, minimum, maximum and total number of workplace accidents per worker (multiplied by 100) for nationals and immigrants collapsed at the province and year level for two time periods: from 2003 to 2009 and 2010 to 2015. *Source*: Register of Workplace Accidents (2003-2015), and Spanish Labor Force Survey (2003-2015).

Figure 4: Distribution of Immigrants in the Different Regions of Spain in 1991

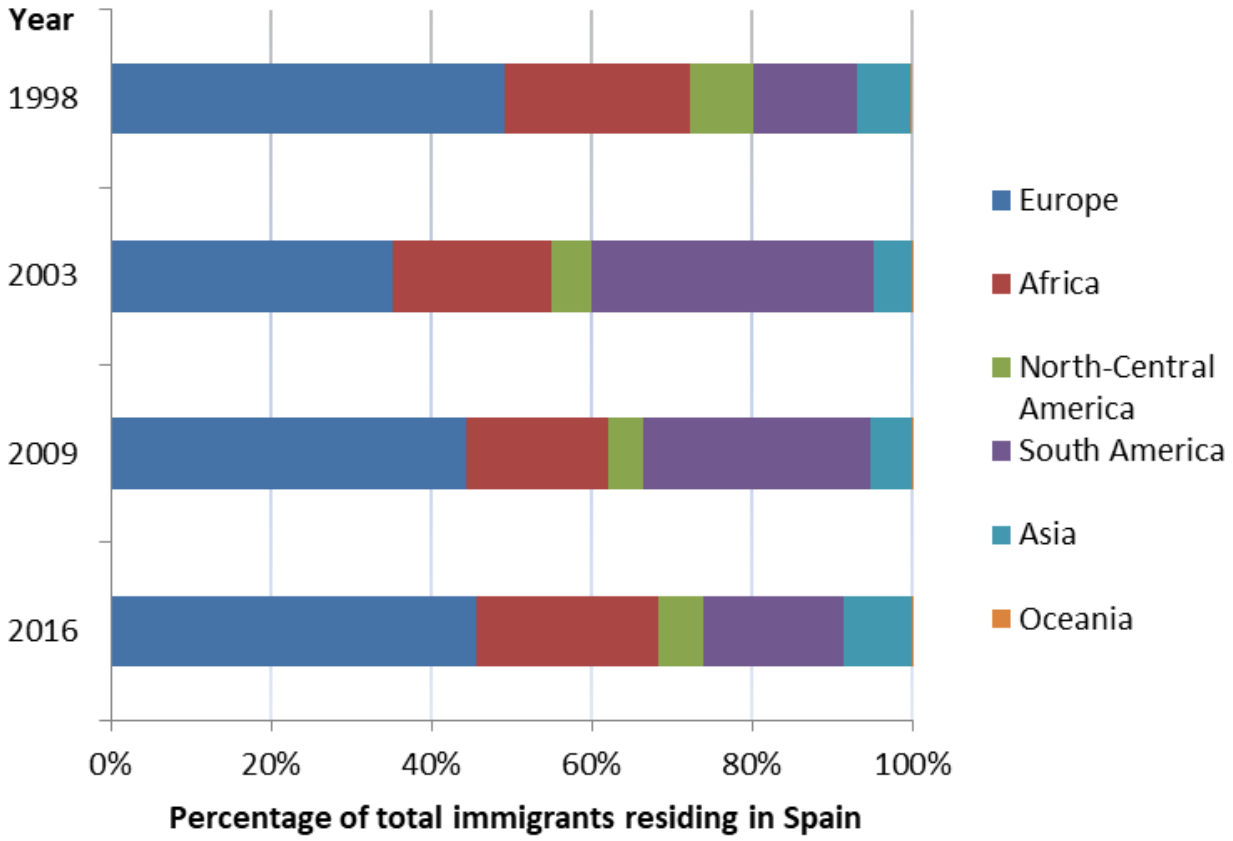


Notes: These maps show the distribution of immigrants in the different provinces of Spain by country of origin in 1991. *Source*: Census (1991).

Figure 5: Correlation between the Distribution of Immigrants among Spanish Provinces in 1991 and 2006 or 2015

Notes: These graphs represent the correlation of the share of immigrants of country c living in province r in 1991 and in 2006 (graph above) or 2015 (graph below). Spanish Labor Force Survey (2006 and 2015), and Census (1991).

Figure 6: Immigrants Residing in Spain by Country of Origin



Notes: Percentage of total immigrants residing in Spain by country of origin at four point of time: 1998, 2003, 2009 and 2016. *Source*: Spanish Population Census (1998, 2003, 2009 and 2016).

Table 2: First Stage Regressions

	Change Immigrant Population $(M(t)_{rge} - M(t-1)_{rge})$												
	2004-2015	2004-2009						2010-2015					
	All	All	Men	Women	HS Dropouts	HS Graduates	Tertiary Edu Graduates	All	Men	Women	HS Dropouts	HS Graduates	Tertiary Edu Graduates
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Instrument $(Z(t)_{erg})$	0.804***	0.778***						1.100***					
	(0.025)	(0.095)						(0.161)					
Instrument for Men $(Z(t)_{erg})$			0.833***						1.206***				
			(0.124)						(0.041)				
Instrument for Women $(Z(t)_{erg})$				0.720***						1.026***			
				(0.077)						(0.314)			
Instrument for HS Dropouts $(Z(t)_{erg})$					0.727***						1.151***		
					(0.086)						(0.074)		
Instrument for HS Graduates $(Z(t)_{erg})$						0.963***						0.770***	
						(0.091)						(0.232)	
Instrument for Tertiary Edu Graduates $(Z(t)_{erg})$							0.717***						1.212***
							(0.048)						(0.365)
Observations	3,744	1,872	936	936	624	624	624	1,872	936	936	624	624	624
R-squared	0.545	0.651	0.622	0.696	0.638	0.773	0.683	0.279	0.317	0.242	0.392	0.175	0.323
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES
Education FE	YES	YES	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	NO
F-test	1064	67.60	44.90	88.28	71.30	112	227	46.88	877	10.64	242.3	11.04	11.01
Mean dep. var.	0.698	1.617	1.622	1.612	2.118	1.993	0.739	-0.222	-0.333	-0.110	-0.394	-0.263	-0.00698
Std. dep. var.	4.920	5.459	5.647	5.268	6.289	6.145	3.319	4.115	4.295	3.925	4.764	4.298	3.098

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the actual immigration population in a (r,g,e) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include region and year fixed-effects. The weights used are the total population the year before in a (r,g,e) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Spanish Labor Force Survey (2003-2015), and Census (1991).

Table 3: Workplace Accidents of Spanish-born Workers

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$						
	2004-2015	2004-2009			2010-2015		
	All	All	Men	Women	All	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
OLS:							
Immigrant Inflows	-0.287	-2.463**			2.971**		
	(0.677)	(1.169)			(1.173)		
Immigrant Inflows of Men			-3.873**			5.050**	
			(1.571)			(2.210)	
Immigrant Inflows of Women				-1.260			0.651*
				(1.170)			(0.379)
IV:							
Immigrant Inflows	-4.258***	-8.858***			1.948***		
	(1.115)	(1.634)			(0.646)		
Immigrant Inflows of Men			-12.776***			1.821	
			(2.342)			(1.351)	
Immigrant Inflows of Women				-4.914***			-0.368
				(1.661)			(0.586)
Observations	3,744	1,872	936	936	1,872	936	936
R-squared	0.490	0.486	0.603	0.398	0.615	0.700	0.630
Provincial FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	NO	NO	YES	NO	NO
Education FE	YES	YES	YES	YES	YES	YES	YES
First-stage F	911.4	82.30	61.87	97.22	46.03	313.1	12.03
Mean dep. var.	-69.45	-57.62	-113.1	-2.130	-81.27	-127	-35.56
Std. dep. var.	560.5	704.4	873.4	473.1	363.4	445.7	247.9

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province, year, and education fixed-effects. The weights used are the number of national employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of workplace accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table 4: Workplace Accidents of Immigrant Workers

	Change Workplace Accidents per Immigrant Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$						
	2004-2015	2004-2009			2010-2015		
	All	All	Men	Women	All	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
OLS:							
Immigrant Inflows	-7.834	-15.916***			-6.196**		
	(4.708)	(5.448)			(2.955)		
Immigrant Inflows of Men			-19.364*			-9.072	
			(11.448)			(5.435)	
Immigrant Inflows of Women				-10.777***			-2.896***
				(3.605)			(0.881)
IV:							
Immigrant Inflows	4.388	-1.161			-0.761		
	(9.950)	(19.797)			(1.929)		
Immigrant Inflows of Men			-3.191			-1.131	
			(31.026)			(3.235)	
Immigrant Inflows of Women				-6.782			-1.856
				(6.917)			(1.346)
Observations	3,744	1,872	936	936	1,872	936	936
R-squared	0.294	0.346	0.408	0.497	0.136	0.177	0.222
Provincial FE	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	NO	NO	YES	NO	NO
Education FE	YES	YES	YES	YES	YES	YES	YES
First-stage F	1020	60.50	44.65	66.34	52.50	267.6	14.13
Mean dep. var.	-178.4	-190.3	-340.4	-40.18	-166.4	-268.6	-64.27
Std. dep. var.	2638	3321	4551	1143	1701	2356	467.6

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the number of workplace accidents per 100,000 foreign-born workers in a (r,g) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province, year, and education fixed-effects. The weights used are the number of immigrant employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of Workplace Accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table 5: Workplace Accidents of Spanish-born Workers by Level of Severity

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_{rgs}}{E(t)_{rg}} - \frac{WA(t-1)_{rgs}}{E(t-1)_{rg}} * 100,000)$			
	Mild		Severe	
	2004-2009	2010-2015	2004-2009	2010-2015
	(1)	(2)	(3)	(4)
OLS:				
Immigrant Inflows	-2.329**	2.922**	-0.134***	0.048
	(1.146)	(1.143)	(0.042)	(0.034)
IV:				
Immigrant Inflows	-8.579***	1.933***	-0.279***	0.015
	(1.620)	(0.632)	(0.062)	(0.027)
Observations	1,872	1,872	1,872	1,872
R-squared	0.485	0.618	0.269	0.067
Provincial FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES
Education FE	YES	YES	YES	YES
First-stage F	82.30	46.03	82.30	46.03
Mean dep. var.	-53.12	-80.01	-4.497	-1.262
Std. dep. var.	696.9	360.7	16.79	12.44

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), 12 years (subscripted t), and 2 levels of severity (subscripted s). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g,s) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province, year, gender, and education fixed-effects. The weights used are the number of national employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of Workplace Accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table 6: Workplace Accidents of Spanish-born Workers by Economic Activity

	Change Workplace Accidents per Spanish-born Worker ($\frac{WA(t)_{rga}}{E(t)_{rga}} - \frac{WA(t-1)_{rga}}{E(t-1)_{rga}} * 100,000$)							
	Agriculture		Industry		Construction		Services	
	2004-2009	2010-2015	2004-2009	2010-2015	2004-2009	2010-2015	2004-2009	2010-2015
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
OLS:								
Immigrant Inflows	-28.271*	-4.218	4.132*	4.213**	-21.645	10.968***	-2.519	2.188**
	(14.822)	(13.920)	(2.340)	(1.863)	(31.383)	(3.681)	(1.681)	(0.950)
IV:								
Immigrant Inflows	-24.313	-47.028	0.943	-2.062	-44.193	30.159***	-8.366**	0.536
	(27.515)	(41.708)	(5.436)	(2.885)	(50.099)	(9.808)	(3.561)	(0.826)
Observations	1,872	1,872	1,872	1,872	1,872	1,872	1,872	1,872
R-squared	0.134	0.096	0.298	0.314	0.205	0.189	0.331	0.502
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES	YES	YES	YES	YES
First-stage F	111.2	72.29	68.59	47.96	71.59	179.1	94.02	43.47
Mean dep. var.	65.88	-13	-126.1	-109.2	-1798	-217.8	44.87	-30.23
Std. dep. var.	3068	2535	2144	1543	18727	2714	487.3	329.8

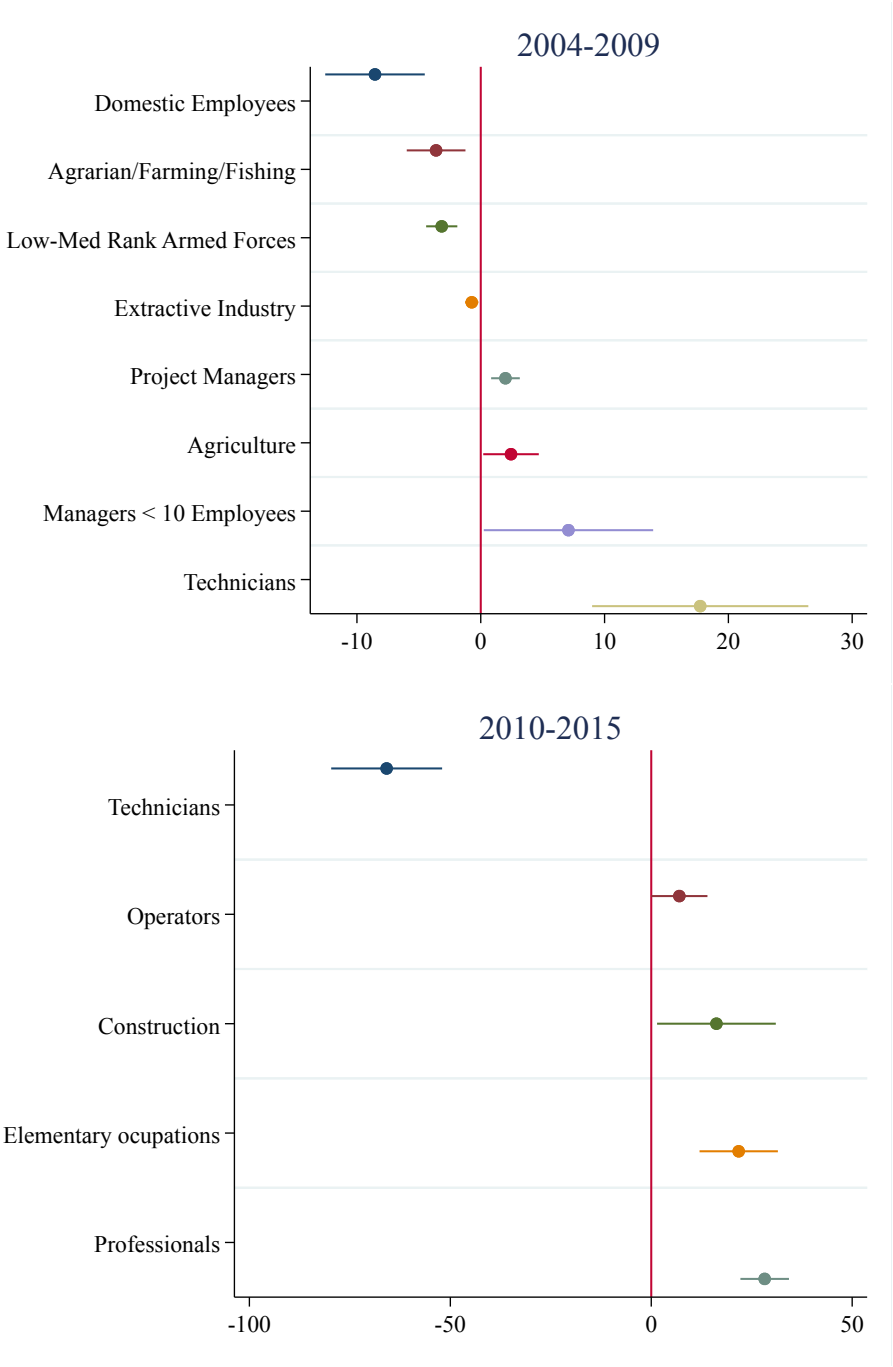
Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), 12 years (subscripted t), and 4 economic activities (subscripted a). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g,a) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province, year, gender, and education fixed-effects. The weights used are the number of national employees in a (r,g,a) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of Workplace Accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table 7: Employment of National Individuals

	Change in Total Number of Spanish-born Workers ($\frac{E(t)_{rgea}}{Pop(t)_{rge}} - \frac{E(t-1)_{rgea}}{Pop(t-1)_{rge}}$)													
	2004-2009							2010-2015						
	All (1)	Men (2)	Women (3)	Agriculture (4)	Industry (5)	Construction (6)	Servicies (7)	All (8)	Men (9)	Women (10)	Agriculture (11)	Industry (12)	Construction (13)	Servicies (14)
OLS:														
Immigrant Inflows	-1.492			-4.728	-7.974	-2.310	9.044	-5.705**			5.075	-18.553**	-3.283	-6.060
	(2.111)			(3.895)	(7.029)	(14.779)	(13.882)	(2.832)			(3.225)	(7.801)	(6.005)	(9.762)
Immigrant Inflows of Men		-2.045							-4.942					
		(2.676)							(5.036)					
Immigrant Inflows of Women			-0.781							-6.129				
			(3.769)							(4.268)				
IV:														
Immigrant Inflows	1.385			-1.841	-5.881	-5.263	18.526	-4.105			11.397	-26.704	-15.919***	14.808
	(4.177)			(6.297)	(9.689)	(15.641)	(40.594)	(7.949)			(10.159)	(23.603)	(2.874)	(18.752)
Immigrant Inflows of Men		-0.664							1.685					
		(6.552)							(10.516)					
Immigrant Inflows of Women			3.703							-12.666				
			(3.501)							(8.203)				
Observations	7,488	3,744	3,744	1,872	1,872	1,872	1,872	7,488	3,744	3,744	1,872	1,872	1,872	1,872
R-squared	0.068	0.058	0.091	0.036	0.063	0.131	0.071	0.021	0.031	0.015	0.029	0.048	0.081	0.048
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Econ. Act. FE	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
First-stage F	69.25	47.13	92.66	67.60	67.60	67.60	67.60	48.02	920.6	11.17	46.88	46.88	46.88	46.88
Mean dep. var.	118	-128.7	364.7	-98.02	-74.48	-100.2	744.8	-214.1	-258.9	-169.4	-5.444	-208.4	-308	-334.7
Std. dep. var.	3924	4294	3499	2302	3688	2977	5773	3828	4237	3370	2185	3518	2440	5956

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), 6 years (subscripted t), and 4 economic activities (subscripted a). The dependent variable is the annual change in the number of Spanish-born workers divided by the total Spanish-born population in a (r,g,e,a) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province, year, gender, and education fixed-effects. The weights used are the total population the year before in a (r,g,e) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Spanish Labor Force Survey (2003-2009), and Census (1991).

Figure 7: Employment of National Individuals by Type of Occupation



Notes: The graph plots the estimated coefficient and the 95% interval of the IV regression where the dependent variable is the annual change in the total number of Spanish-born workers divided by the number of Spanish-born population in a (r,g,o) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g) cell. All specifications include province, year, and gender fixed-effects. The weights used are the total population the year before in a (r,g) cell. Standard errors are clustered at the province level. *Source*: Spanish Labor Force Survey (2003-2009), and Census (1991).

Figure 8: Occupation Classification by Job Environment

	Public Speaking	Letters and Memos	Face-to-Face Discussions	Work With Work Group or Team	Deal With External Customers	Coordinate or Lead Others	Exposed to Hazardous Equipment	Exposed to Minor Burns, Cuts, Bites..	Wear Common Protective or Safety Equipment
Public Adm. Or Managers with > 10 workers	1	1	1	1	3	1	12	13	13
Managers < 10 workers	5	5	4	3	5	3	10	10	10
Professionals	2	2	2	4	6	2	15	15	15
Technicians	3	3	3	5	4	5	13	12	12
Administrative	7	4	6	7	1	7	14	14	14
Catering, Personal, Protection and Sellers	4	6	8	2	2	4	11	11	11
Agriculture	15	14	15	14	12	15	4	2	1
Agrarian, Farming and Fishing industry	14	13	14	15	15	14	6	4	6
Project Managers and Team Leaders	6	7	5	6	9	6	8	9	8
Construction Workers	12	9	7	12	10	9	1	3	2
Metallurgy and machine construction	13	12	10	13	14	13	2	5	4
Extractive Industry	8	10	9	11	13	10	3	6	5
Operators	9	11	11	10	11	11	5	7	7
Domestic Employees	11	15	13	8	8	8	7	1	3
Other non-qualified Workers	10	8	12	9	7	12	9	8	9

Notes: Classification of the different occupations by some of their job environment. These characteristics take into account the interactions between the worker and the physical job environment, as well as, the different human interaction processes. "Public Speaking" classifies occupation depending on how often workers have to perform public speaking during their job. "Letters and Memos" classifies occupations depending on how often the job requires written letters and memos. "Face-to-Face Discussions" classifies occupations depending on how often workers have to have face-to-face discussions with individuals or teams in their job. "Work With Work Group or Team" classifies occupations depending on how important it is to work with others in a group or team in this job. "Deal With External Customers" classifies occupations depending on how important it is to work with external customers or the public in this job. "Coordinate or Lead Others" classifies occupations depending on how important it is to coordinate or lead others in accomplishing work activities in this job. "Exposed to Hazardous Equipment " classifies occupations depending on how often this job requires exposure to hazardous equipment. "Exposed to Minor Burns, Cuts, Bites..." classifies occupations depending on how often this job requires exposure to minor burns, cuts, bites, or stings. "Wear Common Protective or Safety Equipment" classifies occupations depending on how much this job requires wearing common protective or safety equipment such as safety shoes, glasses, gloves, hard hats or life jackets. The classification goes from 1 to 15, where occupations get a lower punctuation if these characteristics and requirements are more important for the occupation. *Source*: "Work Context" O*NET OnLine, National Center for O*NET Development www.onetonline.org, and Spanish Labor Force Survey (2003-2009).

Table 8: Correlations in Local Immigrant Inflows

	Correlation between the Instruments							
	All sample	2004-2009	2010-2015	Men	Women	HS Dropouts	HS Graduates	Tertiary Graduates
Serial Correlation								
Instrument	0.4345	0.4380	0.0744	0.4702	0.3977	0.4379	0.4652	0.2409
Cross-Sectional Correlation of Immigrant Inflows and Instruments								
Correlation of Immigrant Inflows with								
Instrument	0.6661	0.7586	0.4111	0.6787	0.6557	0.6710	0.6858	0.5873
Lagged Instrument	0.3178	0.3178	-0.0208	0.2942	0.2455	0.2709	0.2921	0.1760
Correlation of Lagged Immigrant Inflows with								
Instrument	0.2677	0.2860	0.1105	0.2460	0.2876	0.2732	0.2800	0.1867
Lag Instrument	0.6763	0.7826	0.4193	0.6925	0.6623	0.6767	0.6985	0.6030

Notes: Each entry is a pairwise correlation. *Source*: Spanish Labor Force Survey (2003-2015), and Census (1991).

Table 9: Robustness Check: First Stage Regressions for Contemporaneous Immigration Flows

	Change Immigrant Population $(M(t)_{rge} - M(t-1)_{rge})$											
	2004-2009						2010-2015					
	All	Men	Women	HS Dropouts	HS Graduates	Tertiary Edu Graduates	All	Men	Women	HS Dropouts	HS Graduates	Tertiary Edu Graduates
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Instrument $(Z(t)_{erg})$	0.774***						1.007***					
	(0.120)						(0.140)					
Lagged Instrument $(Z(t)_{erg})$	0.019						-0.350					
	(0.044)						(0.345)					
Instrument for Men $(Z(t)_{erg})$		0.827***						1.053***				
		(0.150)						(0.019)				
Lagged Instrument for Men $(Z(t)_{erg})$		-0.119						-0.455				
		(0.152)						(0.553)				
Instrument for Women $(Z(t)_{erg})$			0.729***						0.974***			
			(0.095)						(0.291)			
Lagged Instrument for Women $(Z(t)_{erg})$			0.142***						-0.262			
			(0.047)						(0.194)			
Instrument for HS Dropouts $(Z(t)_{erg})$				0.820***						1.041***		
				(0.177)						(0.261)		
Lagged Instrument for HS Dropouts $(Z(t)_{erg})$				0.109						-0.242		
				(0.144)						(0.809)		
Instrument for HS Graduates $(Z(t)_{erg})$					0.974***						0.776***	
					(0.116)						(0.287)	
Lagged Instrument for HS Graduates $(Z(t)_{erg})$					0.089						-0.495	
					(0.059)						(0.329)	
Instrument for Tertiary Edu Graduates $(Z(t)_{erg})$						0.739***						1.045**
						(0.057)						(0.423)
Lagged Instrument for Tertiary Edu Graduates $(Z(t)_{erg})$						0.137						-0.250
						(0.139)						(0.353)
Observations	1,560	780	780	520	520	520	1,560	780	780	520	520	520
R-squared	0.652	0.627	0.707	0.635	0.778	0.694	0.319	0.368	0.278	0.450	0.221	0.322
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES
Education FE	YES	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	NO
F-test	351.6	720.5	763.8	282.4	605	147.5	993.5	1865	146.2	440.4	14.01	38.27
Mean dep. var.	1.617	1.622	1.612	2.118	1.993	0.739	-0.277	-0.410	-0.144	-0.489	-0.297	-0.0456
Std. dep. var.	5.459	5.647	5.268	6.289	6.145	3.319	4.182	4.249	4.112	4.762	4.424	3.192

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the actual immigration population in a (r,g,e) cell.The main explanatory variables are the annual change in the "imputed" immigration population in a (r,g,e) cell, and the lagged value of the same variable. All specifications include province and year fixed-effects. The weights used are the total population the year before in a (r,g,e) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Spanish Labor Force Survey (2003-2015), and Census (1991).

Table 10: Robustness Check: First Stage Regressions for Lagged Immigration Flows

	Lagged Change Immigrant Population $(M(t-1)_{rge} - M(t-2)_{rge})$											
	2004-2009						2010-2015					
	All	Men	Women	HS Dropouts	HS Graduates	Tertiary Edu Graduates	All	Men	Women	HS Dropouts	HS Graduates	Tertiary Edu Graduates
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Instrument $(Z(t)_{erg})$	-0.079*						0.196					
	(0.041)						(0.254)					
Lagged Instrument $(Z(t)_{erg})$	0.799***						1.168***					
	(0.117)						(0.151)					
Instrument for Men $(Z(t)_{erg})$		-0.076***						0.379				
		(0.020)						(0.376)				
Lagged Instrument for Men $(Z(t)_{erg})$		0.843***						1.320***				
		(0.142)						(0.112)				
Instrument for Women $(Z(t)_{erg})$			-0.086						0.124			
			(0.053)						(0.148)			
Lagged Instrument for Women $(Z(t)_{erg})$			0.753***						1.106***			
			(0.106)						(0.232)			
Instrument for HS Dropouts $(Z(t)_{erg})$				0.268**						0.199		
				(0.112)						(0.813)		
Lagged Instrument for HS Dropouts $(Z(t)_{erg})$				1.050***						1.235***		
				(0.073)						(0.460)		
Instrument for HS Graduates $(Z(t)_{erg})$					-0.137						0.476***	
					(0.181)						(0.066)	
Lagged Instrument for HS Graduates $(Z(t)_{erg})$					0.888***						0.758***	
					(0.121)						(0.101)	
Instrument for Tertiary Edu Graduates $(Z(t)_{erg})$						-0.023						0.209**
						(0.055)						(0.102)
Lagged Instrument for Tertiary Edu Graduates $(Z(t)_{erg})$						0.640***						1.271***
						(0.105)						(0.297)
Observations	1,560	780	780	520	520	520	1,560	780	780	520	520	520
R-squared	0.714	0.669	0.775	0.706	0.820	0.734	0.300	0.343	0.272	0.382	0.212	0.405
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES
Education FE	YES	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	NO
F-test	341.8	98.70	1280	267.6	430.4	119.2	1214	849	232.2	390.2	32.34	13.96
Mean dep. var.	1.799	1.842	1.756	2.360	2.218	0.819	-0.251	-0.364	-0.137	-0.472	-0.267	-0.0132
Std. dep. var.	5.735	5.965	5.499	6.517	6.528	3.499	4.271	4.500	4.029	4.988	4.429	3.194

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the lagged annual change in the actual immigration population in a (r,g,e) cell. The main explanatory variables are the annual change in the "imputed" immigration population in a (r,g,e) cell, and the lagged value of the same variable. All specifications include province and year fixed-effects. The weights used are the total population the year before in a (r,g,e) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Spanish Labor Force Survey (2003-2015), and Census (1991).

Table 11: Robustness Check: Workplace Accidents of Spanish-born Workers

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$					
	2004-2009			2010-2015		
	All	Men	Women	All	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
IV:						
Immigrant Inflows	-8.675***			0.156		
	(1.621)			(0.562)		
Lagged Immigrant Inflows	-0.123			3.370***		
	(1.381)			(0.874)		
Immigrant Inflows of Men		-11.506***			-1.042	
		(2.271)			(2.122)	
Lagged Immigrant Inflows of Men		0.216			0.601	
		(2.489)			(1.027)	
Immigrant Inflows of Women			-3.604**			-1.356
			(1.624)			(0.865)
Lagged Immigrant Inflows of Women			0.126			-0.533
			(3.644)			(0.780)
Observations	1,560	780	780	1,560	780	780
R-squared	0.400	0.492	0.278	0.653	0.746	0.686
Provincial FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Gender FE	YES	NO	NO	YES	NO	NO
Education FE	YES	YES	YES	YES	YES	YES
First-stage F	14.52	7.386	33.47	14.71	7.265	10.97
Kleibergen-Paap LM statistic	3.561	3.420	3.718	1.590	1.396	1.639
Mean dep. var.	-57.62	-113.1	-2.130	-59.37	-101.7	-17
Std. dep. var.	704.4	873.4	473.1	371.7	456	254.8

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g) cell. The main explanatory variables are the annual change in the "imputed" immigration population in a (r,g,e) cell, and the lagged value of the same variable. All specifications include province, year, and education fixed-effects. The weights used are the number of national employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Spanish Labor Force Survey (2003-2015), and Census (1991).

Table 12: Robustness Check: Heterogeneity in the Effects on the Workplace Accidents of Spanish-born Workers

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$				
	2004-2009			2010-2015	
	Mild	Severe	Services	Mild	Construction
	(1)	(2)	(3)	(4)	(5)
IV:					
Immigrant Inflows	-8.391***	-0.284***	-7.096**	1.084	25.652***
	(1.663)	(0.082)	(3.604)	(0.799)	(7.453)
Lagged Immigrant Inflows	-0.123	-0.000	1.090	5.347***	23.577***
	(1.332)	(0.078)	(0.903)	(1.060)	(4.913)
Observations	1,560	1,560	1,560	1,872	1,872
R-squared	0.402	0.186	0.222	0.604	0.193
Provincial FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES	YES
Education FE	YES	YES	YES	YES	YES
First-stage F	14.52	14.52	16.88	11.81	10.27
Kleibergen-Paap LM statistic	3.561	3.561	3.667	1.503	1.558
Mean dep. var.	-53.12	-4.497	44.87	-80.01	-217.8
Std. dep. var.	696.9	16.79	487.3	360.7	2714

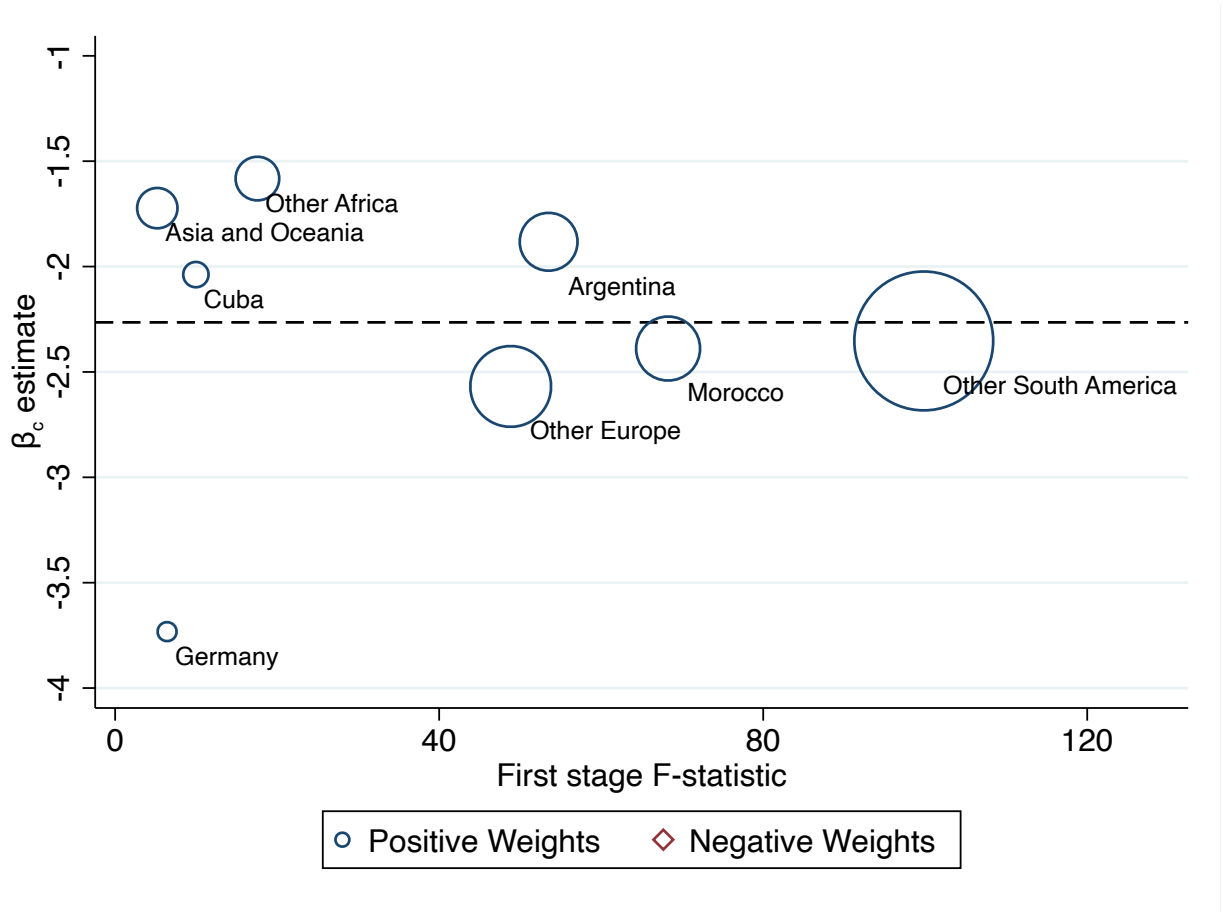
Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), 12 years (subscripted t), 4 economic activities (subscripted a), and 2 levels of severity (subscripted s). The dependent variables are: (1-2, 4) the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g,s) cell, or (3, 5) the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g,a) cell. The main explanatory variables are the annual change in the "imputed" immigration population in a (r,g,e) cell, and the lagged value of the same variable. All specifications include province, year, gender, and education fixed-effects. The weights used are the number of national employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Spanish Labor Force Survey (2003-2015), and Census (1991).

Table 13: Robustness Check: Migration Inflows divided by Total Population

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$								
	All	Men	Women	Mild	Severe	Agriculture	Industry	Construction	Services
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
OLS:									
Immigrant Inflows	4.106			4.078	0.028	0.078	-0.656	-13.866	4.553**
	(2.770)			(2.722)	(0.081)	(12.178)	(7.927)	(30.990)	(2.176)
Immigrant Inflows of Men		4.661							
		(3.907)							
Immigrant Inflows of Women			2.478						
			(2.103)						
IV:									
Immigrant Inflows	-30.022**			-29.058**	-0.964**	50.435	-25.630	-105.467	-26.499**
	(12.374)			(12.032)	(0.469)	(85.680)	(29.762)	(157.864)	(12.523)
Immigrant Inflows of Men		-50.548**							
		(20.018)							
Immigrant Inflows of Women			-13.374						
			(8.940)						
Observations	1,872	936	936	1,872	1,872	1,872	1,872	1,872	1,872
R-squared	0.441	0.518	0.371	0.442	0.171	0.114	0.292	0.198	0.231
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	NO	NO	YES	YES	YES	YES	YES	YES
Education FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
First-stage F	34.12	15.54	95.32	34.12	34.12	14.71	45.49	14.62	36.31
Mean dep. var.	-57.62	-113.1	-2.130	-53.12	-4.497	65.88	-126.1	-1798	44.87
Std. dep. var.	704.4	873.4	473.1	696.9	16.79	3068	2144	18727	487.3

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), 6 years (subscripted t), 4 economic activities (subscripted a), and 2 levels of severity (subscripted s). The dependent variables are: (1-3) the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g) cell, (4-5) the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g,s) cell, or (6-9) the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g,a) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell divided by the total population in the year before in a (r,g,e) cell . All specifications include province, year, and education fixed-effects. The weights used are the number of national employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Spanish Labor Force Survey (2003-2009), and Census (1991).

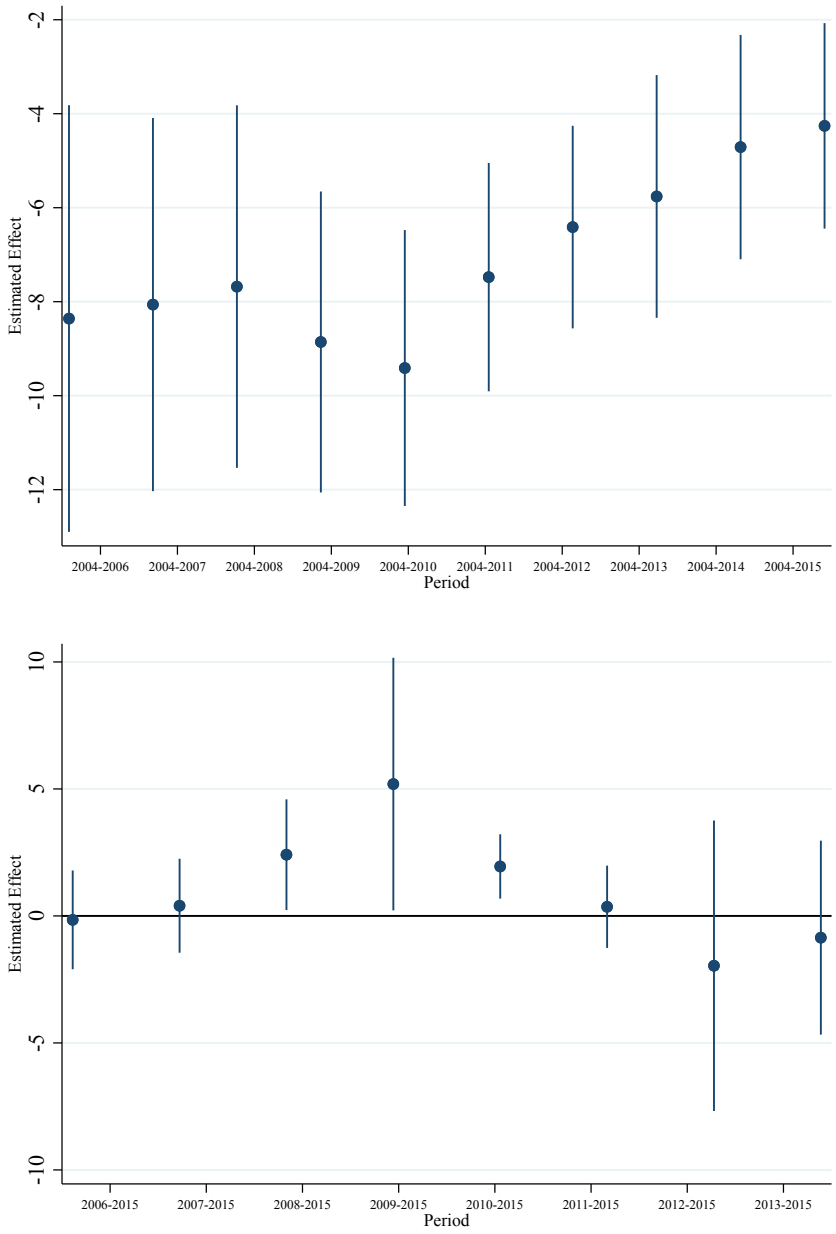
Figure 9: Heterogeneity of β_k for the Period 2004-2009



Notes: This figure plots the estimated $\hat{\beta}_c$ for each instrument on the y-axis and the estimated first-stage F-statistic on the x-axis. The size of the points are scales by the magnitude of the Rotemberg weights. The circles denote positive Rotemberg weights while the diamonds indicate negative weights. The horizontal dashed line indicates the the estimated $\hat{\beta}$ using the Bartik instrument. This figure only includes instruments with a first-stage F-statistics above 5. *Source*: Spanish Labor Force Survey (2003-2009), and Census (1991).

6 Appendix Tables

Figure A1: Effect on Workplace Accidents of Spanish-born Workers Considering Different Periods



Notes: These graphs represent the estimated coefficient and the 95% interval of different IV regressions considering different time periods. For all regressions, the dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. And the regressions include province, year, gender, and education fixed-effects. The weights used are the number of national employees in a (r,g) cell. Standard errors are clustered at the province level. *Source*: Register of Workplace Accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table A1: Workplace Accidents of Spanish-born Workers (data collapsed by year, and province level)

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_r}{E(t)_r} - \frac{WA(t-1)_r}{E(t-1)_r} * 100,000)$	
	2004-2009	2010-2015
	(1)	(2)
OLS:		
Immigrant Inflows	-1.518***	2.764***
	(0.566)	(0.770)
IV:		
Immigrant Inflows	-2.265***	0.754
	(0.400)	(0.935)
Observations	312	312
R-squared	0.592	0.772
Provincial FE	YES	YES
Year FE	YES	YES
First-stage F	235.1	18.10
Mean dep. var.	-91.41	-92.36
Std. dep. var.	678.2	325.2

Notes: There are 52 provinces (subscripted r), and 6 years (subscripted t). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r) cell. All specifications include province, and year fixed-effects. The weights used are the number of national employees in a (r) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Spanish Labor Force Survey (2003-2009), and Census (1991).

Table A2: Workplace Accidents of Spanish-born Workers (data collapsed by year, province, and gender level)

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$					
	2004-2009			2010-2015		
	All	Men	Women	All	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
OLS:						
Immigrant Inflows	-1.754**			5.631***		
	(0.864)			(1.552)		
Immigrant Inflows of Men		-3.414**			9.302***	
		(1.568)			(1.718)	
Immigrant Inflows of Women			-0.693			1.400*
			(0.681)			(0.758)
IV:						
Immigrant Inflows	-4.255***			2.444***		
	(0.846)			(0.752)		
Immigrant Inflows of Men		-6.906***			3.066	
		(1.471)			(2.153)	
Immigrant Inflows of Women			-2.047***			-0.424
			(0.680)			(0.655)
Observations	1,872	936	936	1,872	936	936
R-squared	0.490	0.611	0.400	0.632	0.726	0.628
Provincial FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Gender FE	YES	NO	NO	YES	NO	NO
Education FE	YES	YES	YES	YES	YES	YES
First-stage F	373.5	425.7	199.6	55.84	30.37	29.11
Mean dep. var.	-57.62	-113.1	-2.130	-81.27	-127	-35.56
Std. dep. var.	704.8	874.4	473.6	363.6	446.2	248.1

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), and 12 years (subscripted t). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r, g) cell. All specifications include province, and year fixed-effects. The weights used are the number of national employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of workplace accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table A3: Workplace Accidents of Spanish-born Workers (data collapsed by year, province and level of severity)

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_{rs}}{E(t)_r} - \frac{WA(t-1)_{rs}}{E(t-1)_r} * 100,000)$					
	2004-2009			2010-2015		
	All	Mild	Severe	All	Mild	Severe
	(1)	(2)	(3)	(4)	(5)	(6)
OLS:						
Immigrant Inflows	-0.759***	-1.463**	-0.055***	1.382***	2.729***	0.036
	(0.268)	(0.556)	(0.015)	(0.365)	(0.742)	(0.035)
IV:						
Immigrant Inflows	-1.132***	-2.194***	-0.071***	0.377	0.748	0.006
	(0.200)	(0.397)	(0.012)	(0.468)	(0.941)	(0.018)
Observations	624	312	312	624	312	312
R-squared	0.317	0.591	0.372	0.426	0.773	0.095
Provincial FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
First-stage F	261	235.1	235.1	20.10	18.10	18.10
Mean dep. var.	-45.70	-85.85	-5.559	-46.18	-90.85	-1.503
Std. dep. var.	476	671.1	14.27	232.7	323.1	9.675

Notes: There are 52 provinces (subscripted r), 12 years (subscripted t), and 2 levels of severity (subscripted s). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,s) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r) cell. All specifications include province, and year fixed-effects. The weights used are the number of national employees in a (r) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of Workplace Accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table A4: Workplace Accidents of Spanish-born Workers (data collapsed by year, province and economic activity)

	Change Workplace Accidents per Spanish-born Worker ($\frac{WA(t)_{ra}}{E(t)_{ra}} - \frac{WA(t-1)_{ra}}{E(t-1)_{ra}} * 100,000$)									
	2004-2009					2010-2015				
	All	Agriculture	Industry	Construction	Servicies	All	Agriculture	Industry	Construction	Servicies
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
OLS:										
Immigrant Inflows	-1.594*	-3.476	0.612	-5.441	-1.633*	2.981***	19.321	3.774*	14.022***	1.793***
	(0.847)	(3.696)	(2.394)	(10.275)	(0.822)	(0.703)	(16.662)	(2.175)	(2.243)	(0.619)
IV:										
Immigrant Inflows	-2.319***	-0.805	0.156	-8.808	-2.158**	0.683	9.961	-5.637*	13.389***	0.651
	(0.719)	(2.305)	(2.297)	(10.383)	(0.947)	(1.034)	(59.701)	(3.012)	(4.327)	(0.522)
Observations	1,248	312	312	312	312	1,248	312	312	312	312
R-squared	0.226	0.200	0.389	0.481	0.440	0.221	0.169	0.365	0.265	0.682
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
First-stage F	273.9	213.4	194.6	275.4	255.2	21.05	18.55	12.29	21.70	19.83
Mean dep. var.	-128.8	95.54	-146.1	-504	39.44	-115.3	66.67	-120.3	-375.1	-32.58
Std. dep. var.	2043	2515	1753	2632	428.1	2084	2633	1951	2549	263.4

Notes: There are 52 provinces (subscripted r), 12 years (subscripted t), and 4 economic activities (subscripted a). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,a) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r) cell. All specifications include province, and year fixed-effects. The weights used are the number of national employees in a (r,a) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of Workplace Accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table A5: Workplace Accidents of Spanish-born Workers by the Level of Education of the Immigrants

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$					
	2004-2009			2010-2015		
	(1)	(2)	(3)	(4)	(5)	(6)
OLS:						
Immigrant Inflows with Less HS Edu	-2.600**			2.310		
	(1.275)			(2.224)		
Immigrant Inflows with HS Edu		-4.382**			2.608	
		(1.760)			(2.670)	
Immigrant Inflows with Tertiary Edu			2.384			5.913***
			(6.250)			(1.976)
IV:						
Immigrant Inflows with Less HS Edu	-10.549***			0.466		
	(1.975)			(2.056)		
Immigrant Inflows with HS Edu		-9.195***			11.683***	
		(1.828)			(2.716)	
Immigrant Inflows with Tertiary Edu			-19.273***			-0.430
			(4.396)			(1.502)
Observations	624	624	624	624	624	624
R-squared	0.480	0.491	0.467	0.612	0.564	0.608
Provincial FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES	YES	YES
First-stage F	70.04	125.1	275.2	234.2	10.39	6.052
Mean dep. var.	-57.62	-57.62	-57.62	-81.27	-81.27	-81.27
Std. dep. var.	704.8	704.8	704.8	363.6	363.6	363.6

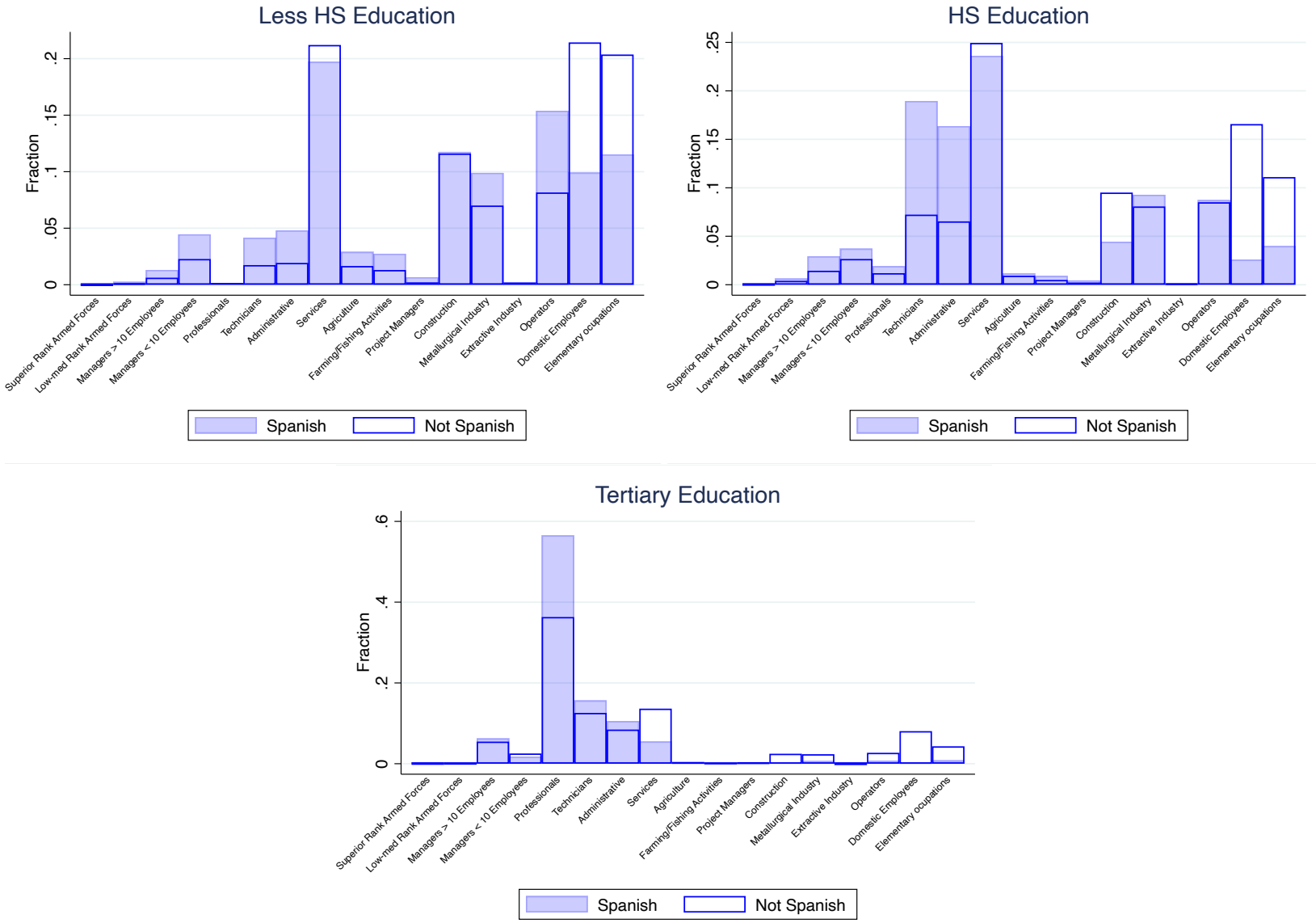
Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g,e) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province, year, and gender fixed-effects. The weights used are the number of national employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of Workplace Accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table A6: Workplace Accidents of Immigrant Workers by the Level of Education of the Immigrants

	Change Workplace Accidents Per Immigrant Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$					
	2004-2009			2010-2015		
	(1)	(2)	(3)	(4)	(5)	(6)
OLS:						
Immigrant Inflows with Less HS Edu	-25.880**			-5.592*		
	(10.777)			(2.961)		
Immigrant Inflows with HS Edu		-10.131*			-8.328**	
		(5.797)			(3.491)	
Immigrant Inflows with Tertiary Edu			-21.515			-7.793***
			(13.864)			(2.875)
IV:						
Immigrant Inflows with Less HS Edu	3.505			0.820		
	(35.097)			(5.519)		
Immigrant Inflows with HS Edu		-3.057			-4.384	
		(16.130)			(5.470)	
Immigrant Inflows with Tertiary Edu			-9.118			-2.487
			(40.533)			(5.619)
Observations	624	624	624	624	624	624
R-squared	0.339	0.347	0.348	0.132	0.144	0.138
Provincial FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES	YES	YES
Education FE	NO	NO	NO	NO	NO	NO
First-stage F	38.54	73.38	160	197.6	12.89	14.74
Mean dep. var.	-190.3	-190.3	-190.3	-166.4	-166.4	-166.4
Std. dep. var.	3323	3323	3323	1702	1702	1702

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the number of workplace accidents per 100,000 foreign-born workers in a (r,g) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province, year, and gender fixed-effects. The weights used are the number of immigrant employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of Workplace Accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Figure A2: Occupational Distribution by Education and Nationality



Notes: This figure shows the distribution of nationals and immigrants in the different occupations by level of education. *Source*: Spanish Labor Force Survey (2003-2009).

Table A7: Workplace Accidents of Immigrant Workers by Level of Severity

	Change Workplace Accidents per Immigrant Worker $(\frac{WA(t)_{rgs}}{E(t)_{rg}} - \frac{WA(t-1)_{rgs}}{E(t-1)_{rg}} * 100,000)$			
	Mild		Severe	
	2004-2009	2010-2015	2004-2009	2010-2015
	(1)	(2)	(3)	(4)
OLS:				
Immigrant Inflows	-15.807***	-6.121**	-0.109	-0.074
	(5.360)	(2.910)	(0.105)	(0.050)
IV:				
Immigrant Inflows	-1.281	-0.716	0.120	-0.045
	(19.576)	(1.939)	(0.267)	(0.063)
Observations	1,872	1,872	1,872	1,872
R-squared	0.348	0.136	0.161	0.052
Provincial FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES
Education FE	YES	YES	YES	YES
First-stage F	60.50	52.50	60.50	52.50
Mean dep. var.	-182.2	-163	-8.095	-3.463
Std. dep. var.	3259	1675	107.8	49.14

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), 12 years (subscripted t), and 2 levels of severity (subscripted s). The dependent variable is the annual change in the number of workplace accidents per 100,000 foreign-born workers in a (r,g,s) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province, year, gender, and education fixed-effects. The weights used are the number of immigrant employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of Workplace Accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table A8: Workplace Accidents of Immigrant Workers by Economic Activity

	Change Workplace Accidents per Immigrant Worker ($\frac{WA(t)_{rga}}{E(t)_{rga}} - \frac{WA(t-1)_{rga}}{E(t-1)_{rga}} * 100,000$)							
	Agriculture		Industry		Construction		Services	
	2004-2009	2010-2015	2004-2009	2010-2015	2004-2009	2010-2015	2004-2009	2010-2015
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
OLS:								
Immigrant Inflows	-5.556	-44.309**	-7.744	-5.044	-35.874***	-10.928	-7.650***	-4.799**
	(24.757)	(19.988)	(39.223)	(7.717)	(11.646)	(11.911)	(2.801)	(1.904)
IV:								
Immigrant Inflows	106.833	-67.692	17.469	-2.602	-50.322	11.113	4.660	-4.125***
	(76.806)	(57.033)	(88.325)	(16.778)	(46.320)	(11.915)	(6.426)	(1.384)
Observations	1,872	1,872	1,872	1,872	1,872	1,872	1,872	1,872
R-squared	0.158	0.080	0.187	0.122	0.262	0.167	0.219	0.108
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES	YES	YES	YES	YES
First-stage F	197	10.71	42.28	59.60	44.75	193.8	68.92	45.31
Mean dep. var.	199.1	145.9	175.5	-435.4	-269.9	-189.5	-54.40	-136.8
Std. dep. var.	7379	7184	12885	6975	10771	4254	3544	1703

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), 12 years (subscripted t), and 4 economic activities (subscripted a). The dependent variable is the annual change in the number of workplace accidents per 100,000 foreign-born workers in a (r,g,a) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province, year, gender, and education fixed-effects. The weights used are the number of immigrant employees in a (r,g,a) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of Workplace Accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table A9: Employment of National Individuals between 2004 and 2009 by Type of Occupation

	Change in Total Number of Spanish-born Workers ($\frac{E(t)_{rgo}}{Pop(t)_{rg}} - \frac{E(t-1)_{rgo}}{Pop(t-1)_{rg}} * 100,000$)								
	High Rank Armed Forces (1)	Low-Med Rank Armed Forces (2)	Public adm. or. $>$ 10 workers (3)	Manag. with with $<$ 10 workers (4)	Professionals (5)	Technicians and associate professionals (6)	Administrative type employees (7)	Catering, personal, protection and sellers (8)	Workers in Agriculture (9)
OLS:									
Immigrant Inflows	0.064	-2.367***	-5.523	6.495**	-4.115	14.486**	-3.499	-0.451	3.177***
	(0.238)	(0.600)	(4.328)	(2.582)	(2.661)	(5.608)	(3.183)	(2.468)	(1.177)
IV:									
Immigrant Inflows	0.169	-3.151***	-9.063	7.085*	-2.471	17.727***	-0.235	-3.132	2.445*
	(0.306)	(0.766)	(6.422)	(4.158)	(4.038)	(5.308)	(3.651)	(2.223)	(1.363)
Observations	624	624	624	624	624	624	624	624	624
R-squared	0.066	0.118	0.066	0.064	0.081	0.154	0.156	0.086	0.046
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES	YES	YES	YES	YES	YES
First-stage F	410.3	410.3	410.3	410.3	410.3	410.3	410.3	410.3	410.3
Mean dep. var.	3.592	90.84	58.28	-41.78	205	360.2	145.6	409.2	-87.13
Std. dep. var.	133.9	1148	774.3	1482	1928	1918	1727	2095	1006

	Change in Total Number of Spanish-born Workers ($\frac{E(t)_{rgo}}{Pop(t)_{rg}} - \frac{E(t-1)_{rgo}}{Pop(t-1)_{rg}} * 100,000$)							
	Workers in agrarian, farming and fishing (10)	Project managers and team leaders (11)	Construction workers (12)	Workers in the metallurgy, machine construction and ass. (13)	Workers of the extractive industry (14)	Operators and assemblers (15)	Domestic employees (16)	Other non-qualified workers (17)
OLS:								
Immigrant Inflows	-2.664*	0.298	-3.433	1.688	-0.632*	0.713	-8.722***	0.994
	(1.406)	(0.698)	(4.066)	(1.994)	(0.332)	(2.747)	(1.844)	(2.403)
IV:								
Immigrant Inflows	-3.605**	1.997***	-5.386	2.654	-0.723**	-0.628	-8.540***	1.980
	(1.441)	(0.703)	(3.309)	(2.756)	(0.327)	(3.666)	(2.443)	(2.114)
Observations	624	624	624	624	624	624	624	624
R-squared	0.028	0.030	0.136	0.077	0.052	0.125	0.082	0.055
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES	YES	YES	YES	YES
First-stage F	410.3	410.3	410.3	410.3	410.3	410.3	410.3	410.3
Mean dep. var.	-55.29	7.312	-183.5	-73.88	-16.21	-55.58	27.06	-130.3
Std. dep. var.	1037	463.4	1673	1380	311.8	1783	1209	1717

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 6 years (subscripted t), and 17 types of occupations (subscripted o). The dependent variable is the annual change in the total number of Spanish-born workers divided by the Spanish-born population in a (r,g,o) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g) cell. All specifications include province, year, and gender fixed-effects. The weights used are the total population the year before in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Spanish Labor Force Survey (2003-2009), and Census (1991).

Table A10: Employment of National Individuals between 2010 and 2015 by Type of Occupation

	Change in Total Number of Spanish-born Workers ($\frac{E(t)_{rgo}}{Pop(t)_{rg}} - \frac{E(t-1)_{rgo}}{Pop(t-1)_{rg}} * 100,000$)							
	High Rank Armed Forces (1)	Low-Med Rank Armed Forces (2)	Public adm. or. (3)	Professionals (4)	Technicians and associate professionals (5)	Administrative type employees (6)	Catering, personal, protection and sellers (7)	Workers in Agriculture (8)
OLS:								
Immigrant Inflows	0.380	-2.996*	-2.583	-5.016	-16.486	0.589	3.800	1.022
	(0.783)	(1.607)	(7.335)	(9.821)	(12.071)	(7.019)	(14.221)	(2.787)
IV:								
Immigrant Inflows	-0.237	-0.761	-0.626	28.224***	-65.844***	8.809	-16.175	4.635
	(0.630)	(1.224)	(6.129)	(3.673)	(8.390)	(10.491)	(30.185)	(3.286)
Observations	624	624	624	624	624	624	624	624
R-squared	0.098	0.062	0.414	0.095	0.146	0.147	0.226	0.041
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES	YES	YES	YES	YES
First-stage F	53.68	53.68	53.68	53.68	53.68	53.68	53.68	53.68
Mean dep. var.	40.55	-20.17	155.2	228.7	-374.4	96.41	649.4	13.36
Std. dep. var.	495.4	620	1188	2058	2088	1728	2616	859.8

	Change in Total Number of Spanish-born Workers ($\frac{E(t)_{rgo}}{Pop(t)_{rg}} - \frac{E(t-1)_{rgo}}{Pop(t-1)_{rg}} * 100,000$)					
	Workers in agrarian, farming and fishing (9)	Construction workers (10)	Workers in the metallurgy, machine construction and ass. (11)	Operators and assemblers (12)	Domestic employees (13)	Other non-qualified workers (14)
OLS:						
Immigrant Inflows	-0.255	4.536	-4.697	-1.237	0.845	7.003
	(1.480)	(4.567)	(3.905)	(5.901)	(3.991)	(4.506)
IV:						
Immigrant Inflows	0.352	16.219*	-14.556	6.990*	-0.209	21.760***
	(1.774)	(8.980)	(9.319)	(4.249)	(5.426)	(5.925)
Observations	624	624	624	624	624	624
R-squared	0.037	0.199	0.176	0.056	0.035	0.049
Provincial FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Gender FE	YES	YES	YES	YES	YES	YES
First-stage F	53.68	53.68	53.68	53.68	53.68	53.68
Mean dep. var.	-46.92	-307.1	117.9	-224.4	-61.26	-104.2
Std. dep. var.	737.7	1288	1453	1530	1245	1688

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 6 years (subscripted t), and 14 types of occupations (subscripted o). The dependent variable is the annual change in the total number of Spanish-born workers divided by the Spanish-born population in a (r,g,o) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g) cell. All specifications include province, year, and gender fixed-effects. The weights used are the total population the year before in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Spanish Labor Force Survey (2010-2015), and Census (1991).

Table A11: Workplace Accidents of Spanish-born Workers Aged 25-45

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$					
	2004-2009			2010-2015		
	All	Men	Women	All	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
OLS:						
Immigrant Inflows	-3.967***			3.745**		
	(1.368)			(1.725)		
Immigrant Inflows of Men		-5.882***			6.123*	
		(1.858)			(3.498)	
Immigrant Inflows of Women			-3.737***			0.931*
			(1.145)			(0.495)
IV:						
Immigrant Inflows	-12.864***			1.295		
	(2.675)			(0.806)		
Immigrant Inflows of Men		-17.692***			0.484	
		(3.426)			(1.667)	
Immigrant Inflows of Women			-9.736***			-1.069
			(2.391)			(0.924)
Observations	1,872	936	936	1,872	936	936
R-squared	0.479	0.600	0.422	0.540	0.620	0.556
Provincial FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Gender FE	YES	NO	NO	YES	NO	NO
Education FE	YES	YES	YES	YES	YES	YES
First-stage F	54.09	63.08	36.72	33.52	162	10.44
Mean dep. var.	-65.67	-120.6	-10.75	-94.66	-148.8	-40.55
Std. dep. var.	794.1	1008	490.5	433.4	538.1	283.7

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g) cell. The main explanatory variable is the annual change in the "imputed" immigration population in an (r,g,e) cell. All specifications include province, year, and education fixed-effects. The weights used are the number of national employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of workplace accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table A12: Workplace Accidents of Spanish-born Workers Aged 25-65

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$					
	2004-2009			2010-2015		
	All	Men	Women	All	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
OLS:						
Immigrant Inflows	-2.226**			2.752***		
	(0.975)			(0.982)		
Immigrant Inflows of Men		-3.393***			5.067***	
		(1.254)			(1.683)	
Immigrant Inflows of Women			-1.524			0.027
			(1.100)			(0.395)
IV:						
Immigrant Inflows	-7.256***			2.191***		
	(1.509)			(0.647)		
Immigrant Inflows of Men		-10.547***			2.151	
		(2.197)			(1.449)	
Immigrant Inflows of Women			-4.441***			-1.005
			(1.630)			(0.936)
Observations	1,872	936	936	1,872	936	936
R-squared	0.503	0.626	0.400	0.621	0.708	0.613
Provincial FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Gender FE	YES	NO	NO	YES	NO	NO
Education FE	YES	YES	YES	YES	YES	YES
First-stage F	70.21	57.95	69.45	11589	244.1	88.06
Mean dep. var.	-53.94	-110	2.153	-67.08	-119.2	-14.97
Std. dep. var.	671.8	821.9	470.4	341.9	404.3	255

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g) cell. The main explanatory variable is the annual change in the "imputed" immigration population in an (r,g,e) cell. All specifications include province, year, and education fixed-effects. The weights used are the number of national employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of workplace accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table A13: First Stage Regressions with Controls

	Change Immigrant Population $(M(t)_{rge} - M(t-1)_{rge})$											
	2004-2009						2010-2015					
	All	Men	Women	HS Dropouts	HS Graduates	Tertiary Edu Graduates	All	Men	Women	HS Dropouts	HS Graduates	Tertiary Edu Graduates
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Instrument $(Z(t)_{erg})$	0.779***						1.071***					
	(0.105)						(0.148)					
Instrument for Men $(Z(t)_{erg})$		0.853***						1.186***				
		(0.134)						(0.045)				
Instrument for Women $(Z(t)_{erg})$			0.698***						0.990***			
			(0.094)						(0.298)			
Instrument for HS Dropouts $(Z(t)_{erg})$				0.738***						1.140***		
				(0.117)						(0.068)		
Instrument for HS Graduates $(Z(t)_{erg})$					0.971***						0.691***	
					(0.086)						(0.209)	
Instrument for Tertiary Edu Graduates $(Z(t)_{erg})$						0.721***						0.963***
						(0.054)						(0.289)
Observations	1,872	936	936	624	624	624	1,872	936	936	624	624	624
R-squared	0.655	0.630	0.709	0.665	0.780	0.690	0.292	0.338	0.260	0.417	0.214	0.406
Provincial FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Gender FE	YES	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES
Education FE	YES	YES	YES	NO	NO	NO	YES	YES	YES	NO	NO	NO
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
F-test	55.48	40.27	55.02	39.75	126.7	176.2	52.24	680	11.05	277.9	10.89	11.08
Mean dep. var.	1.617	1.622	1.612	2.118	1.993	0.739	-0.222	-0.333	-0.110	-0.394	-0.263	-0.00698
Std. dep. var.	5.459	5.647	5.268	6.289	6.145	3.319	4.115	4.295	3.925	4.764	4.298	3.098

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the actual immigration population in a (r,g,e) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province and year fixed-effects. We control for the percentage of Spanish-born workers in the the agriculture, industry, construction and services sector, the percentage of Spanish individuals working in high-skilled, semi-skilled white, semi-skilled blue and low-skilled occupations, and the percentage of Spanish individuals with less than a high-school degree, with a high-school degree and college education in each year (2003-2015) and province. The weights used are the total population the year before in a (r,g,e) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Spanish Labor Force Survey (2003-2015), and Census (1991).

Table A14: Workplace Accidents of Spanish-born workers with Controls

	Change Workplace Accidents per Spanish-born Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$					
	2004-2009			2010-2015		
	All	Men	Women	All	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
OLS:						
Immigrant Inflows	-2.214			2.446*		
	(1.405)			(1.269)		
Immigrant Inflows of Men		-3.478*			4.241*	
		(1.814)			(2.364)	
Immigrant Inflows of Women			-2.608			0.359
			(1.641)			(0.351)
IV:						
Immigrant Inflows	-8.513***			1.224		
	(2.008)			(0.769)		
Immigrant Inflows of Men		-11.636***			1.232	
		(2.525)			(1.199)	
Immigrant Inflows of Women			-6.083***			-1.181*
			(2.100)			(0.708)
Observations	1,872	936	936	1,872	936	936
R-squared	0.502	0.619	0.465	0.643	0.730	0.672
Provincial FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Gender FE	YES	NO	NO	YES	NO	NO
Education FE	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES
First-stage F	70.91	57.01	62.64	49.13	257.8	12.44
Mean dep. var.	-57.62	-113.1	-2.130	-81.27	-127	-35.56
Std. dep. var.	704.4	873.4	473.1	363.4	445.7	247.9

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the number of workplace accidents per 100,000 Spanish-born workers in a (r,g) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province, year, and education fixed-effects. We control for the percentage of Spanish-born workers in the the agriculture, industry, construction and services sector, the percentage of Spanish individuals working in high-skilled, semi-skilled white, semi-skilled blue and low-skilled occupations, and the percentage of Spanish individuals with less than a high-school degree, with a high-school degree and college education in each year (2003-2015) and province. The weights used are the number of national employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of workplace accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).

Table A15: Workplace Accidents of Immigrant Workers with Controls

	Change Workplace Accidents per Immigrant Worker $(\frac{WA(t)_{rg}}{E(t)_{rg}} - \frac{WA(t-1)_{rg}}{E(t-1)_{rg}} * 100,000)$					
	2004-2009			2010-2015		
	All	Men	Women	All	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
OLS:						
Immigrant Inflows	-17.883***			-5.846*		
	(4.452)			(2.946)		
Immigrant Inflows of Men		-21.048*			-7.912	
		(10.911)			(5.185)	
Immigrant Inflows of Women			-10.924***			-2.926***
			(3.662)			(1.063)
IV:						
Immigrant Inflows	-5.586			-0.538		
	(18.083)			(2.244)		
Immigrant Inflows of Men		-9.803			-0.869	
		(28.922)			(3.681)	
Immigrant Inflows of Women			-8.391			-2.207*
			(6.108)			(1.229)
Observations	1,872	936	936	1,872	936	936
R-squared	0.357	0.422	0.528	0.145	0.200	0.242
Provincial FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
Gender FE	YES	NO	NO	YES	NO	NO
Education FE	YES	YES	YES	YES	YES	YES
Controls	YES	YES	YES	YES	YES	YES
First-stage F	46.04	37.61	36.15	55.76	198.5	13.93
Mean dep. var.	-190.3	-340.4	-40.18	-166.4	-268.6	-64.27
Std. dep. var.	3321	4551	1143	1701	2356	467.6

Notes: There are 52 provinces (subscripted r), 2 genders (subscripted g), 3 levels of education (subscripted e), and 12 years (subscripted t). The dependent variable is the annual change in the number of workplace accidents per 100,000 foreign-born workers in a (r,g) cell. The main explanatory variable is the annual change in the "imputed" immigration population in a (r,g,e) cell. All specifications include province, year, and education fixed-effects. We control for the percentage of Spanish-born workers in the the agriculture, industry, construction and services sector, the percentage of Spanish individuals working in high-skilled, semi-skilled white, semi-skilled blue and low-skilled occupations, and the percentage of Spanish individuals with less than a high-school degree, with a high-school degree and college education in each year (2003-2015) and province. The weights used are the number of immigrant employees in a (r,g) cell. Standard errors clustered by province are in parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%. *Source*: Register of workplace accidents (2003-2015), Spanish Labor Force Survey (2003-2015), and Census (1991).