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When Immigrants Meet Exporters: A Reassessment of the Immigrant-Native Wage Gap*

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Abstract

We use French employer-employee data for the manufacturing sector from 2005 to 2012 to reassess the wage gap between native and foreign workers. In line with previous evidence, we find that immigrants earn less than natives and that exporters pay higher wages. New in this literature, we find that the nativity wage gap varies with the export intensity of the firm and the occupational group of the worker within the firm. We present a model with heterogeneous firms and workers to show that our findings are consistent with white-collar immigrant workers capturing an informational rent, as they provide exporters with valuable information to access foreign markets. We provide empirical evidence for this mechanism by analysing how the nativity wage gap varies with the complexity of firm export activity and with the group of origin of the immigrant workers.

Keywords: Exports, Firm; Heterogeneity; Immigrant workers; Wage inequality

JEL Codes: F14 F22 F16

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1 Introduction

This paper contributes to the discussion on trade and wage inequality by investigating whether the wage gap between native and immigrant workers depends on the export activity of the employing firm. On the one hand, labour economists have long shown that immigrant workers face wage inequalities with respect to natives (Anderson et al., 2019). These inequalities are striking at arrival and reduce with time, although some immigrant groups never reach wage equality with natives. Using OECD data for 2005, Dustmann and Glitz (2011) estimate the median wage gap to be 21% in the United States and 10% in France. On the other hand, trade economists have found that exporting manufacturing firms pay higher wages than domestic firms (Bernard et al., 1995; Schank et al., 2007), although trade generates wage inequalities within firms (Klein et al., 2013; Friedrich, 2015; Georgiev and Juul Henriksen, 2020). This paper positions itself at the intersection between the two aforementioned strands of literature by focusing on whether the immigrant wage gap interacts with the export activity of the firm. We find that the nativity wage gap is smaller and can turn in favour of immigrants for white-collar workers employed in exporting manufacturing firms.

Immigrant workers may gain more than native workers from an increase in export activity, thanks to the complementarity between their export-specific knowledge and the export activity of their firm. It is now well established that immigrant workers foster firm-level exports.[1] This could give rise to an *export premium* on wages of all workers involved. We propose that this premium interacts with the well-known *skill premium* and *immigrant discount* in shaping the entire wage distribution. Using French employer-employee panel data for the period 2005 to 2012, we confirm the existence of the three effects: (i) white-collar workers earn more than blue-collar workers (skill premium), (ii) immigrant workers earn less than native workers (immigrant discount), and (iii) exporting firms pay higher wages than non-exporting firms (export premium). We develop a theoretical model and an empirical strategy to rationalize how these three effects interact.

Our theoretical contribution relies on a Diamond (1982)-Mortensen (1982)-Pissarides (1985) (DMP hereafter) search and matching setting that yields an immigrant discount when natives face better labour market conditions (i.e., a lower job destruction rate) than immigrants, and a skill premium when a higher skill level translates into a higher marginal product for a certain type of labour. Firms are heterogeneous in productivity and face a fixed cost of exporting as in Melitz (2003), which creates a productivity cut-off level separating exporters from non-exporters.

[1] A number of papers show that immigrants foster exports through the reduction of transaction costs, intended as cultural and institutional differences, and by easing integration into business networks. Using data on service firms in the U.K., Ottaviano et al. (2018) find that an increase in the supply of immigrant workers fosters bilateral exports for language-intensive and culture-specific services. Andrews et al. (2016) for Germany and Hiller (2013) for Denmark show that immigrants help firms reduce their trade costs and foster export sales thanks to their destination-specific knowledge. A related strand of literature shows that immigrant workers foster trade by improving firm integration in the global value chain through their networks and through their knowledge on input quality (Bastos and Silva, 2012; Hatzigeorgiou and Lodefalk, 2016; Egger et al., 2019; Ariu et al., 2019).

The employment of high-skilled immigrants reduces the fixed cost of exporting, which creates an export premium for that particular factor. In equilibrium, the three aforementioned effects impact wages. The model highlights that high-skilled immigrants can obtain higher wages than natives by combining the skill and export premia in a way that offsets the immigrant discount.

We then evaluate how all three effects interact in the data. Our empirical results are obtained from a standard wage equation in which we introduce variables indicating the status of workers (native or immigrant, blue- or white-collar) and the export status of firms. To address endogeneity concerns regarding the wage-setting decision and the export activity of the firm, we instrument the firm export share with the world import demand for varieties that a firm produces, as proposed by Hummels et al. (2014). We find that immigrant workers earn less than natives. This wage gap does not vary with the export intensity of firms for blue-collar immigrant workers. However, we obtain very different results for the sample of white-collar workers. The gap reduces, or even reverses, in favour of immigrants employees working in firms with high export intensity. When employed by firms with a lower export intensity, white-collar immigrants earn less than their native counterparts. Our baseline specification allows us to quantify the exporting threshold: immigrant workers close their wage gap when working in firms that export more than 25% of their total revenue earn.[2] We interpret this result as evidence that the export premium interacts with the skill premium in shaping the resulting net nativity wage gap.

We rationalize our findings with the hypothesis that white-collar immigrant workers capture an informational rent because they provide exporters with valuable information to access foreign markets.[3] We provide evidence for this mechanism in three ways. First, we show that the wage gap varies with the complexity of the export activity of the firm, measured by the number of markets, products, and destinations served by the firm. As export costs increase with complexity, a positive relationship between the wages of immigrants and the export complexity suggests the presence of an informational rent held by immigrants. Second, we show that the average firm-level wage of workers from different origin groups (natives, rest of EU, non-EU) is differently affected by the share of exports sold in EU and non-EU countries. Assuming that immigrants of a particular group (e.g., EU citizens) possess a knowledge specific to their origin market (the European Union), they are better positioned than members of the other groups (non-EU immigrants and natives) to capture an informational rent when their firm exports more to that market than to the rest of the world. Third, we exploit the population census data, and we identify, for each French *département*, which is the main origin country of the immigrant workers. We then study whether the average wage of foreigners in a French department increases with

[2] The average company exports 23% of its total revenue.

[3] It is important to mention that immigrant workers may also affect firm-level performance through enhanced productivity. The literature has shown that immigrant workers affect productivity through knowledge externalities (Mitaritonna et al., 2017; Ottaviano et al., 2018), but also through their imperfect substitution with native workers that leads to a more efficient allocation of tasks within firms (Peri and Sparber, 2009). In this paper, we disregard any rent due to productivity. In fact, productivity gains are a collective outcome resulting from the presence of both natives and immigrants within a firm, so they could hardly be translated into a wage premium specific to immigrant workers.

the export activity of firms operating in that department, when the export destination coincides with the main country of origin of immigrant community in that department.

This paper joins a growing literature showing how trade affects wage inequality. The standard literature speaks of how the reward to different factors of production is differently affected by trade shocks, depending on the country's comparative advantage and how relative prices change (see for example Acemoglu, 2003). More recent literature has highlighted less apparent effects. For example, Verhoogen (2008) and Bøler et al. (2018) show how trade can affect wages of workers of different quality and gender, respectively.

Overall, by showing how the export premium can compensate for an immigrant discount, our results point to a new dimension through which trade can contribute to the reduction of wage inequalities. Our paper provides a new argument for the targeting of skill accumulation policies for immigrant minorities employed at exporting firms. This policy implication is particularly relevant for economies where exporting is a major activity for the average firm. Further research on the effect of the export premium on wage inequality in alternative contexts should be welcomed.

2 Data and Descriptive Evidence

2.1 Data Sources

We use three sources of confidential administrative data for French manufacturing firms from 2005 to 2012. We combine them using the *SIREN* code *(système d'identification du répertoire des entreprises)* which is a unique firm identifier used by the French administration.

Administrative data on employees. The first data source consists of annual employee declarations compiled by all wage-paying establishments located on the French mainland territory (Déclarations Annuelles des Données Sociales, DADS). All wage-paying legal entities established in France are required to fill payroll declarations [4]. The panel version of the DADS allows to follow all establishment-employee-contract spells when the employee was born in October. The sample contains 1/12th of the working population and all firms that employ at least one worker born in October. This dataset contains information on the characteristics of the workers such as their administrative district of residence, gender, and nativity (one can distinguish between French and foreign-born workers). Note that the dataset does not contain information on the country of birth of the immigrant worker. In this paper, we refer to immigrant workers as foreign-born individuals. Additionally, the dataset contains information on the characteristics of the job spell such as the type of contract (full-time and part-time), the gross and net annualised wage and the occupation.[5] The French classification of occupations *(Nomenclatures des professions et catégories socio-professionnelles)* allows us to identify blue- and white-collar workers. We define blue-collar workers as clerks and labourers, and white-collar workers as executives, higher

[4] Only establishments employing civil servants are excluded from filling such declarations.

[5] Our sample starts in 2005 as information on part- and full-time contracts is available from 2005 onward.

intellectual professions and intermediate occupations (including, for instance, sales and business executives). Additional information about the occupation codes are provided in Appendix A.1. We use low-skill (high-skilled) and blue collars (white collars) interchangeably.

Tax records. We then use balance-sheet data featuring tax reports filled in by firms located in France. This dataset combines two administrative sources: the FICUS data from 2005 to 2007 *(Fichier de comptabilité unifié dans SUSE)* and the FARE data from 2008 to 2012 *(Fichier approché des résultats d'Esane)*. This dataset covers the manufacturing and the service sectors, but excludes the agricultural and financial sectors. This dataset is exhaustive since there is no threshold on the number of employees for reporting to the French tax administration. It contains information on firms' sales, main industry, debt structure and other variables related to their accounting books.

Trade data. Information on the export activity of firms comes from the French customs data reporting shipments in value (euros) and in volume (tons) by NC8 product and origin/destination country.[6] The custom data provide information on the value of exports, as well as the number of products and destinations served by firms. Finally, to build the instrument approximating the world import demand faced by French firms, we use the Comtrade dataset that contains bilateral trade flows at the HS6 product level by origin and destination countries in U.S. dollars.[7]

2.2 Descriptive Statistics

Once all the data sources are combined, we obtain a sample of 1,739,786 worker-firm-year observations. We only keep workers with a full-time contract which reduces the sample to 1,325,470 observations. We do so in order to avoid differences in wages due to differences in the number of hours worked in a year. This choice could bias our estimations if, for example, immigrant workers were more likely to hold part-time positions than native workers, or if white-collar workers were more likely to hold part-time positions than blue collars. Yet, we find little difference between natives and immigrants: 12.58% of natives and 14.40% of immigrants hold part-time positions[8].

The sample contains 78,675 manufacturing firms, 38.66% of which export at least once over the studied period. More precisely, out of 270,593 firm-year combinations, only 106,146 display a positive export value. This confirms the well-known fact in the literature that most of the firms do not export. The sample confirms another important fact: exporters are large employers. Each

[6] Some thresholds apply for reporting to the customs office. Firms are required to report their shipments of goods to/from the EU only if larger than 150,000 euros and shipments to/from other countries only if larger than 1,000 euros or one ton. These thresholds eliminate only a small share of the total shipments (Berman et al., 2015).

[7] For more details, see: https://comtrade.un.org. To convert the Comtrade data in euros, we use the exchange rates from FRED that are available at https://fred.stlouisfed.org/tags/series?t=exchange+rate.

[8] Instead of relying on the yearly wage, one could use the hourly wage in order to keep part-time workers in the analysis. However, the information on the number of hours worked is often missing or misreported in the data.

year, approximately 75% of the workers are employed by an exporting firm. Table 1 presents an overview of the firm characteristics by export status. Not surprisingly, exporters are significantly larger along different dimensions such as revenues, total assets and number of establishments. The average skill intensity of workers is also higher for exporting firms. Additionally, exporters hire a larger share of foreign-born workers. Switching perspective, one can see how firms' export activity varies with the employment of immigrant workers (Table A.2, Appendix A.2). The data show that exporters employing immigrants display larger export values and larger export shares. They serve a larger number of export destinations and product varieties, as well as a significantly larger number of products-destination markets than their counterparts.

Table 1: Summary Statistics by Firm Export Status

	Non-Exporters			**Exporters**			
	Obs.	**Mean**	**Std. Dev.**	**Obs.**	**Mean**	**Std. Dev.**	Signif.
Total revenue (in thousand euros)	164,447	2,321.32	8,455.12	106,146	3.39e+04	2.53e+05	***
Assets (in thousand euros)	164,447	1,033.86	8,318.42	106,146	2.33e+04	2.51e+05	***
Nr. of establishments	164,435	16.32	35.56	106,146	112.55	404.68	***
Average nr. of employees	164,124	15.69	34.13	106,110	110.58	397.85	***
Share of employees in high-skilled occupations	151,264	0.202	0.358	105,358	0.328	0.344	***
Share of foreign-born	164,412	0.089	0.254	106,142	0.103	0.223	***

Note: This table reports descriptive statistics for two groups of firm-year observations. In each year, we identify firms displaying a null export value and firms displaying a positive export value.

The sample includes 423,981 workers among which 9.87% are immigrants. Immigrant workers represent 8.55% of the total employment of white collars and 10.39% of blue collars. The largest district is *Île-de-France* (Paris agglomeration) with 11,207 firms. 13.30% of the workers are employed in *Île-de-France*. However, this number hides a significant degree of heterogeneity between native and immigrant workers: while 12.78% of the natives work in *Île-de-France*, this number rises to 26.42% for immigrants.

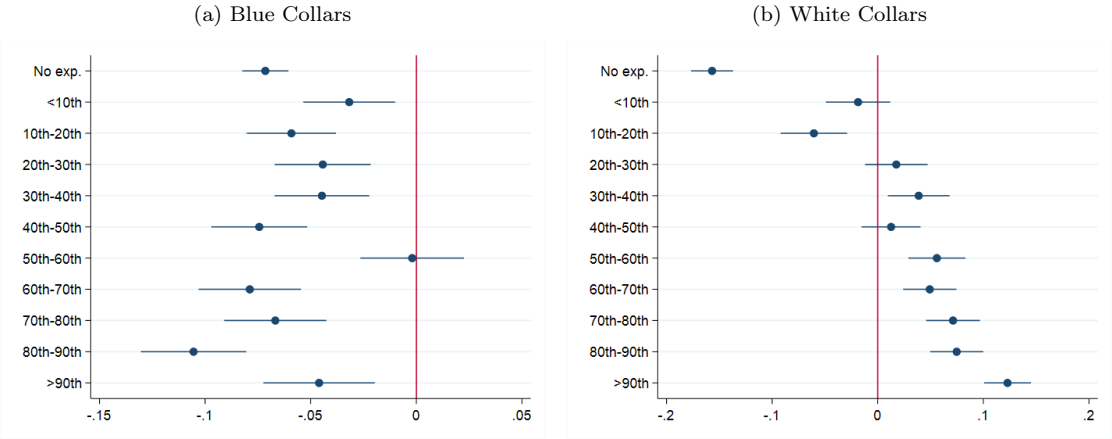
2.3 Stylised Facts

We provide some descriptive statistics on the three wage effects studied in this paper: the export premium, the skill premium and the immigrant discount. First, wage differences are correlated with a number of firm characteristics, in particular the export status of the employing firm: individuals employed by non-exporting firms earn about 0.47 log percentage points less than individuals employed by exporting firms (which is equivalent to 6,985 euros). Second, wage differences are correlated with individual characteristics such as gender, age and occupation of the individual. On average, an individual in a white-collar position earns about 0.75 log percentage point more than a blue-collar worker (about 14,907 euros). Third, we report a number of statistics on individuals by nativity status (Appendix A.2, Table A.3). Natives earn about 0.05 log percentage point more than immigrants (about 737 euros) which suggests the presence of an immigrant discount.

In this paper, we argue that the wage gap faced by immigrant workers in white-collar positions is lower, if not positive, when they are employed by exporting firms. Figure 1 plots the average wage differential between native and foreign workers in each percentile of the distribution of export share. Wage differentials are obtained from a wage equation, where we introduce a set of interaction terms between a dummy for foreign-born and another dummy for each percentile of the distribution of export shares. We distinguish between blue- and white collars on the left- and right-hand side of the figure respectively.

For the sample of blue-collar workers, we find that immigrant workers earn a lower or equal wage than native workers along the entire distribution of firm export share. For the sample of white-collar workers, foreign-born individuals earn a lower wage than natives at the beginning of the distribution, however, they earn higher wages than natives in firms whose export share belongs to the 30th and 40th percentile, and above. Therefore, the wage differential between white-collar natives and white-collar immigrants seems to be lower or even reversed (to the benefit of immigrants) when firms' export share increases.

Figure 1: Nativity Wage Gap and Exports by Occupation Groups



Note: The regressions include individual characteristics (gender, age, experience and experience squared), firm size as well as district-time and industry-time fixed effects.

3 Theoretical Framework

In this section, we present a theoretical framework highlighting the different effects driving the wage differential between native and immigrant workers. The model embeds a typical DMP search and matching process into a trade model with monopolistic competition and heterogeneous firms *à la* Melitz (2003), extended to allow for multiple factors of production.

The closest model to ours in the literature has been proposed by Chassamboulli and Palivos (2014). This model features a DMP setting with two labour markets, for skilled and unskilled

workers, in which natives and immigrants compete for jobs. We build on this model by adding firm heterogeneity and trade to it, in order to have both individual and firm characteristics determining wage inequalities.[9]

The model rationalises a higher wage for natives, *i.e.*, an *immigrant discount*, because native workers have a better outside option than immigrant workers. It also yields a *skill premium* when a higher skill level translates into higher marginal product. The theoretical framework features the well-known self-selection of the most productive firms into exporting as in Melitz (2003), but it allows for an *export premium* when one of the production factors contributes relatively more to increasing export profits. Our model allows the above forces to interact, showing that it is possible for high-skilled immigrants to obtain higher wages than natives when the skill and the export premia offset the immigrant discount.

3.1 Model Set-up

The model comprises one economy open to international trade and closed to financial capital movements and migration. The trading partner of our main economy is not explicitly modelled and is assumed to be symmetric in every way. Perfectly competitive firms produce intermediate inputs y_{ij} using only labour of type ij with $i = L, H$ (low-skill and high-skill respectively) and $j = I, N$ (immigrant and native respectively). Firms producing each intermediate have access to the same technology and are homogeneous. Intermediates are combined with capital (K) to produce different varieties $y(\omega)$ of a final good Y that is consumed. Firms producing final goods operate under monopolistic competition and are heterogeneous in their productivity level. There is free trade in the final good sector, while intermediate goods are not traded internationally. There is free entry into production of final and intermediate goods.

3.2 Consumers

Consumers are homogeneous in all economies. Preferences are CES across differentiated varieties ω and consumed as an aggregate good as follows:

$$Y = \left[\int_{\omega \in \Omega} y(\omega)^{\frac{\sigma-1}{\sigma}} d\omega \right]^{\frac{\sigma}{\sigma-1}} \tag{1}$$

with $\sigma > 0$ and Ω being the set of all varieties ω available. The following aggregate price can be derived:

$$P = \left[\int_{\omega \in \Omega} p(\omega)^{1-\sigma} d\omega \right]^{\frac{1}{1-\sigma}} \tag{2}$$

[9] Other important works introducing Melitz-type trade with heterogeneous firms into models with labour market frictions are Helpman et al. (2010), Felbermayr et al. (2011) or Amiti and Davis (2012). However, labour is an homogeneous factor in most of this literature. A notable exception is Sampson (2014), who introduces labour heterogeneity in one dimension. In the model presented here, workers are heterogeneous in two key dimensions: origin and skill level.

where $p(\omega)$ is the price of variety ω. The demand and the revenue function for each variety ω take the well-known expressions:

$$y(\omega) = Y\left[\frac{p(\omega)}{P}\right]^{-\sigma} \; ; r(\omega) = R\left[\frac{p(\omega)}{P}\right]^{1-\sigma} \tag{3}$$

with $R = PY = \int r(\omega)d\omega$.

Consumers of type ij work for a wage w_{ij}. All consumers obtain real returns ι over their savings. We normalize the mass of native workers to 1. Let λ be the exogenous share of native workers that are unskilled, and $1-\lambda$ be the exogenous share of native workers that are skilled. The masses of low-skilled and high-skilled immigrants are denoted by I_L and I_H, and are also exogenous to this model.

3.3 Firms

3.3.1 Final Good Producers

Final good producers pay a fixed cost ($f_E > 0$) to discover their productivity level ϕ in producing one single variety ω. Since each firm is characterized by a unique ϕ and a unique ω, we can identify firms with either parameter. The ex-ante distribution $g(\phi)$ and cumulative distribution $G(\phi)$ of firms are exogenous and known to all producers. Once their productivity is revealed, firms choose whether to enter the domestic market paying an additional fixed cost ($f_D > 0$).

A final good producer with productivity level ϕ operates according to the following production function:

$$y(\phi) = \phi\left[\sum_i \sum_j \alpha_{ij} y_{ij}(\phi)^\rho + \alpha_K K(\phi)^\rho\right]^{1/\rho} \tag{4}$$

with $0 < \rho < 1$, $\alpha_{ij} > 0$ and $\alpha_K = 1 - \sum \alpha_{ij} > 0$. This implies that the marginal cost function of a final good producer ϕ is:

$$c(\phi) = \frac{1}{\phi}\left[\sum_i \sum_j \left(\frac{\alpha_{ij}}{p_{ij}^\rho}\right)^{\frac{1}{1-\rho}} + \left(\frac{\alpha_K}{p_K^\rho}\right)^{\frac{1}{1-\rho}}\right]^{\frac{\rho-1}{\rho}} \tag{5}$$

where p_{ij} is the market price of factor ij, $\forall i = L, H$ and $\forall j = I, N$, and p_K is the price of capital.

3.3.2 Firms Selling Domestically

Dixit-Stiglitz competition in final goods gives a constant mark-up over marginal costs which implies that the more efficient firms charge lower prices:

$$p(\phi) = \frac{\sigma c(\phi)}{\sigma - 1} \tag{6}$$

Profits in the domestic market for a firm with productivity ϕ are:

$$\pi(\phi) = p(\phi)y(\phi) - \sum_i \sum_j y_{ij}(\phi)p_{ij} - K(\phi)p_K - f_D \tag{7}$$

There is perfect competition in the market for each intermediate input, so a firm with productivity ϕ demands factors following these marginal costs expressions:

$$c(\phi)\phi^{\rho-1}\alpha_{ij}\left[\frac{y(\phi)}{y_{ij}(\phi)}\right]^{1-\rho} = p_{ij} \tag{8}$$

$$c(\phi)\phi^{\rho-1}\alpha_{K}\left[\frac{y(\phi)}{K(\phi)}\right]^{1-\rho} = p_{K} = \iota \tag{9}$$

We can use these expressions to obtain the following conditional demand functions for intermediate inputs used to produce for the domestic market:

$$y_{ij}(\phi) = \frac{y(\phi)}{\phi}\left[\frac{\alpha_{ij}c}{p_{ij}}\right]^{\frac{1}{1-\rho}} \text{ and } y_K(\phi) = \frac{y(\phi)}{\phi}\left[\frac{\alpha_K c}{p_K}\right]^{\frac{1}{1-\rho}} \tag{10}$$

where $c = c(\phi)\phi$ and is independent of ϕ according to (5).

The previous conditions imply the following: [10]

Lemma 1 *High productivity firms use all factors with lower relative intensity, as they can use them with higher relative efficiency.*

$s(\phi)$ is the market share that a firm ϕ serves in the domestic market, and can be written as:

$$s(\phi) = \frac{1}{x}\left[\frac{\phi}{\tilde{\phi}}\right]^{\sigma-1} \tag{11}$$

where x represents the number of varieties available to domestic consumers and $\tilde{\phi}$ is the weighted average productivity level of firms operating in the market and will be further defined later on.

Using the above expression it is possible to see that more productive firms enjoy larger market shares. Larger shares, for a given size of the market, implies larger revenues. This, together with $p(\phi)$ being a decreasing function of ϕ, means that $y(\phi)$ depends positively on ϕ. We can also show that:

Lemma 2 *High productivity firms use all intermediate inputs in larger absolute quantities and produce larger volumes than low productivity firms.*

3.3.3 Exporting Firms

Let us assume that a firm decision to serve a foreign market is separable from its decision to serve its domestic market. We use "$*$" to denote variables related to exporting activities. Then y^*_{ij} is the usage of intermediate input ij in the production of a final good y^* that is to be exported.

Shipping goods internationally entails costs. We model variable costs in the form of an iceberg cost $\tau > 1$, which means that τ units are shipped for one unit to arrive to the destination market. Additionally, selling abroad entails a fixed cost that we assume to be firm specific. This fixed cost depends negatively on the level of $y^*_{HI}(\phi)$ used by the firm, *i.e.*, $\partial f_X(\phi)/\partial y^*_{HI}(\phi) = -\Psi$,

[10] All proofs are available in the Online Appendix to this paper.

where $\Psi > 0$ is a constant term. This is in line with recent empirical literature showing that firms hiring immigrant workers in high-skilled positions are more likely to be exporters.[11]

Profits made in the foreign market by a firm with productivity ϕ are:

$$\pi^*(\phi) = p^*(\phi)y^*(\phi) - \sum_i \sum_j y_{ij}^*(\phi)p_{ij} - K^*(\phi)p_K - f_X(\phi)$$

where the price is:

$$p^*(\phi) = p(\phi)\tau = \frac{\sigma c(\phi)\tau}{\sigma - 1} \tag{12}$$

Similarly, the conditional demands for the intermediate inputs needed to produce for exporting resemble Equations (10). The only exception is for the conditional demand of y_{HI}^*, which is:

$$y_{HI}^*(\phi) = \frac{y^*(\phi)}{\phi}\left[\frac{\alpha_{HI}c\tau}{p_{HI} - \Psi}\right]^{\frac{1}{1-\rho}} \tag{13}$$

The market share that a firm ϕ enjoys abroad is:

$$s^*(\phi) = \frac{1}{x}\left[\frac{\phi}{\tilde{\phi}\tau}\right]^{\sigma-1} \tag{14}$$

Equation (14) shows that a firm ϕ has a larger market share at home than abroad given the existence of an iceberg cost to export that increases the price it charges consumers.

As usual with Melitz-type frameworks, there exists a productivity threshold for producing domestically (ϕ_D) and abroad (ϕ_X). The weighted average of active firms' productivity can be defined as:

$$\tilde{\phi} = \left[\frac{\int_{\phi_D}^{\infty}\phi^{\sigma-1}g(\phi)d\phi + \tau^{1-\sigma}\int_{\phi_X}^{\infty}\phi^{\sigma-1}g(\phi)d\phi}{2 - G(\phi_D) - G(\phi_X)}\right]^{\frac{1}{\sigma-1}} \tag{15}$$

Comparing (10) with (13), it is straightforward to show that:

Lemma 3 *Exporting firms use intermediate inputs with the same intensity to export as to sell domestically. The only exception is for the intermediate input HI, which is used with a higher intensity for exporting.*

Intuitively, the fact that intermediate input HI can reduce fixed costs for exporting firms increases the value of its marginal product and creates an additional motive for demanding this input. This pushes up the demand for this input among exporting firms. Since there is no reason for non-exporters to demand less of this input at a given price, then at the aggregate level, the demand for the intermediate input produced with high-skill immigrant workers (y_{HI}), is higher than it would be in a situation where $\Psi = 0$. As a result, the input price (p_{HI}) is larger.

[11] This literature points to reduced market access costs as one of the main reasons why hiring immigrants in white-collar can boost the probability of exporting for a firm (Hiller, 2013; Andrews et al., 2016). Therefore, the model treats fixed export costs, as opposed to the alternative iceberg costs, as dependent on the use of the intermediate input embedding HI-type workers in our model.

Finally, we can define the following aggregate variables:

$$Y_{ij} = \int y_{ij}(\phi)d\phi = xy_{ij}(\tilde{\phi}) \quad , \quad K = \int K(\phi)d\phi = xK(\tilde{\phi})$$
$$P = x^{\frac{1}{1-\sigma}}p(\tilde{\phi}) \quad , \quad R = xr(\tilde{\phi}) \tag{16}$$

3.3.4 Intermediate Good Producers

All firms producing in each intermediate sector ij are homogeneous in productivity, and produce one unit of output y_{ij} using one unit of labour input ij. No other input is used. Firms of type ij meet with workers of that type in a separate labour market. This effectively means that there are four labour markets in our model. In each labour market ij unemployed workers (U_{ij}) and unfilled vacancies (V_{ij}) are matched through a stochastic matching technology $M(U_{ij}, V_{ij})$. Function $M(.)$ is at least twice continuously differentiable, increasing in its arguments, satisfies the Inada conditions and is homogeneous of degree 1. Using the latter condition, we define the flow rate of a match for an unemployed worker as $M(U_{ij}, V_{ij})/U_{ij} = m(\theta_{ij})$. Similarly, the flow rate of a match for a vacancy is $M(U_{ij}, V_{ij})/V_{ij} = q(\theta_{ij})$. Here, $\theta_{ij} = V_{ij}/U_{ij} = m(\theta_{ij})/q(\theta_{ij})$ is a measure of the tightness prevailing in labour market ij. It can be shown that the properties of $M(.)$ result in $m'(\theta_i) > 0$ and $q'(\theta_i) < 0$.

A firm of type ij can post at most one vacancy. A firm keeping a vacant position bears a recruitment cost in terms of output, C. For a worker of skill level i, remaining unemployed implies receiving a flow of income b_{ij}, representing the opportunity cost of employment. Finally, matches dissolve at rate $0 < \epsilon_{ij} < 1, \forall ij$, and we assume that $\epsilon_{iN} < \epsilon_{iI}$. The latter assumption implies that job duration will tend to be shorter for immigrants, relative to native workers of the same skill level.[12]

3.4 Steady State

3.4.1 Final Producers' Entry and Exit

For final good producers, productivity thresholds to produce for the domestic and export market (ϕ_D and ϕ_X respectively) exist, are unique, and are obtained by use of the following cutoff-conditions.

$$\frac{E}{\sigma}s(\phi_D) = f_D \tag{17}$$

$$\frac{E}{\sigma}s^*(\phi_X) = f_X(\phi_X) \tag{18}$$

A customary assumption in heterogeneous firm models is to impose $\phi_D < \phi_X$, as this replicates the fact that exporting firms belong to the subset of the most productive firms in production. In our setting, such assumption requires the exporting threshold to be sufficiently high. In particular, it requires $\phi_X > f_X^{-1}(f_D\tau^{1-\sigma})$.

[12] This assumption is in line with what is observed in our dataset (see Appendix A.2, Table A.3).

Free-entry in the production of final goods imposes the following condition:

$$\pi(\tilde{\phi}) = f_E \tag{19}$$

that is, ex-post expected profits are exactly equal to the costs of entry.

3.4.2 Value Functions of the Matching Process

At any time, workers can be either employed or unemployed, and positions either filled or vacant. Let us denote these states by $\kappa = E, U, F, V$. Define J_{ij}^{κ} as the present discounted value of state κ in labour market ij. The matching process requires that, at steady state, the flow value of each state κ must equal the expected value of remaining in that state for the corresponding agent. This gives the following value functions:

$$\iota J_{ij}^{V} = -C + q(\theta_{ij})[J_{ij}^{F} - J_{ij}^{V}] \tag{20}$$

$$\iota J_{ij}^{F} = p_{ij} - w_{ij} - \epsilon_{ij}[J_{ij}^{F} - J_{ij}^{V}] \tag{21}$$

$$\iota J_{ij}^{U} = b_{ij} + m(\theta_{ij})[J_{ij}^{E} - J_{ij}^{U}] \tag{22}$$

$$\iota J_{ij}^{E} = w_{ij} - \epsilon_{ij}[J_{ij}^{E} - J_{ij}^{U}] \tag{23}$$

Free-entry into production of intermediates imposes:

$$J_{ij}^{V} = 0 \tag{24}$$

3.4.3 Nash Bargaining

Once an unemployed worker and a vacant position of type ij are matched, a bargaining process establishes the wage rate paid to the worker such that the surplus created by the position is shared between the firm and the worker. Such surplus is known to all parties. As a result of Nash Bargaining, the wage rate for a worker of skill i and origin j comes from the following condition:

$$(1-\beta)[J_{ij}^{E} - J_{ij}^{U}] = \beta[J_{ij}^{F} - J_{ij}^{V}] \tag{25}$$

where $0 < \beta < 1$ represents the bargaining power of workers. The above equation establishes that workers obtain a fraction β of the surplus created by a match. Employers obtain the remaining $1 - \beta$.

3.4.4 Composition of the Labour Force

We focus on a steady state where the number of employed workers, unemployed workers, vacant positions and filled positions are all constant. This means that at steady state, the total number of workers moving out of unemployment, must equal the number of people going into such status in each market ij. Using this property, we obtain the following aggregate levels of employment

and therefore production of intermediate inputs:

$$\begin{aligned} Y_{HN} &= \frac{m(\theta_{HN})(1-\lambda)}{\epsilon_{HN}+m(\theta_{HN})} \quad , \quad Y_{HI} = \frac{m(\theta_{HI})I_H}{\epsilon_{HI}+m(\theta_{HI})} \\ Y_{LN} &= \frac{m(\theta_{LN})\lambda}{\epsilon_{LN}+m(\theta_{LN})} \quad , \quad Y_{LI} = \frac{m(\theta_{LI})I_L}{\epsilon_{LI}+m(\theta_{LI})} \end{aligned} \tag{26}$$

Similarly, we can derive the following unemployment levels for each market ij:

$$\begin{aligned} U_{HN} &= \frac{\epsilon_{HN}(1-\lambda)}{\epsilon_{HN}+m(\theta_{HN})} \quad , \quad U_{HI} = \frac{\epsilon_{HI}I_H}{\epsilon_{HI}+m(\theta_{HI})} \\ U_{LN} &= \frac{\epsilon_{LN}\lambda}{\epsilon_{LN}+m(\theta_{LN})} \quad , \quad U_{LI} = \frac{\epsilon_{LI}I_L}{\epsilon_{LI}+m(\theta_{LI})} \end{aligned} \tag{27}$$

Finally, using (21)-(25), we obtain the following expression for wages:

$$w_{ij} = (1-\beta)\iota J_{ij}^U + \beta p_{ij} \tag{28}$$

Wages are a weighted average of the outside option that a type-ij worker has (ιJ_{ij}^U) and the marginal product of the intermediate input y_{ij} that this type of worker produces (p_{ij}), with weights set by the bargaining power of workers and firms.

Expression (28) highlights the way in which the immigrant discount, the skill premium and the export premium coexist in this model, in a very straightforward way. The immigrant discount comes in the form of a better outside option for natives, which stems from matches lasting longer for them. The skill premium is driven by skilled workers being more productive, which constitutes a force rising the marginal product of this factor (p_{Hj}). The expression also fits the export premium for type-HI workers: because high-skill immigrants reduce fixed costs to export, the demand for that factor is pushed up by exporting firms which further increases the marginal product of this factor (p_{HI}).

4 Empirical Strategy

4.1 Empirical Specification

Following the insights provided by our theory, we now study whether the nativity wage gap varies with the export activity of the firms, conditional on the occupation of the individual. Our empirical strategy relies on a standard wage equation, where we relate the wage of workers employed in French manufacturing firms to the observed characteristics of both workers and firms as follows:

$$\begin{aligned} \ln \mathrm{w}_{i(j)t} =& \beta_0 + \beta_1 \mathrm{Foreign}_i + \beta_2 \mathrm{Export}_{jt} + \beta_3 \mathrm{White}_{it} \\ &+ \beta_4(\mathrm{Foreign}_i \times \mathrm{Export}_{jt}) + \beta_5(\mathrm{Foreign}_i \times \mathrm{White}_{it}) \\ &+ \beta_6(\mathrm{Export}_{jt} \times \mathrm{White}_{it}) + \beta_7(\mathrm{Foreign}_i \times \mathrm{Export}_{jt} \times \mathrm{White}_{it}) \\ &+ \gamma x_{jt} + \Gamma X'_{it} + \zeta_{dt} + \varepsilon_{it} \end{aligned} \tag{29}$$

The dependent variable is the (log) annualised real earnings of an individual i working in firm j at time t. Foreign_i denotes the nativity of worker i and equals one if she is foreign-born and zero otherwise. Export_{jt} denotes the export activity of firm j at time t and is approximated by its export share. White_{it} is a dummy variable indicating whether the worker holds a white-collar position and zero if she holds a blue-collar position at time t.

This specification includes the triple interaction between the nativity dummy, the export share and the white-collar dummy. It also includes the corresponding double interaction terms. Following our hypothesis, the wage gap should be lower in exporting firms because white-collar immigrant workers are able to capture an informational rent due to their superior knowledge of foreign destinations, which should, in turn (over-)compensate the wage discount. Therefore, in Equation (29), a positive sign of β_7 would mean that the nativity wage gap is lower in export intensive firms for white-collar occupations, while β_4 provides information on whether the wage gap for all the foreign born workers is lower in exporting firms.

We include the average number of employees in firm j at time t in order to control for the size of the firm (x_{jt}). We include a number of time-invariant and time-varying individual characteristics (X'_{it}), namely the gender of individual i, her experience in the firm at time t and its squared term, as well as her age at time t. Then, we include district-year fixed effects (ζ_{dt}) to control for unobserved time-varying factors at the district level, such as search costs, typically higher in less dense districts, and to control for the fact that some districts pay systematically higher wages. Depending on the specification, we include industry-year fixed effects that account for systematic variations in wages across industries. Exploiting the within-industry variation allows one to control for the fact that exporters may be concentrated in native- or immigrant-intensive industries. We include firm-year fixed effects to control for time-varying unobserved characteristics of firms. Finally, we use occupation-year and occupation-industry fixed effects to compare the wage differential between individual in the same 1-digit occupation (6 groups).

Errors are clustered at the firm-level to account for correlations across workers and within firms over time.

4.2 Endogeneity Concerns

The estimation of Equation (29) with OLS may be biased due to unobserved firm-level demand shocks as well as technological shocks that could simultaneously affect trade and wage-setting decisions (Hummels et al., 2014; Georgiev and Juul Henriksen, 2020). Reverse causality could be an issue if already exporting firms hire from an international labour market pool because the high productivity workers they need are hard to find in domestic markets. In this case, our estimation would only reflect differences in the workforce composition of exporting firms, and would not capture an informational rent.

We start by tackling these two identification concerns by means of an instrumental strategy. We follow the literature to instrument the firm export share with the world import demand faced by the firm (Georgiev and Juul Henriksen, 2020; Hummels et al., 2014; Berman et al., 2015). We

build the world import demand faced by a firm j at time t as follows:

$$\text{WID}_{jt} = \sum_{pc} \omega_{jpc} \times M_{pct} \forall c \neq \text{France} \tag{30}$$

where M_{pct} denotes the total imports of product p by country c at time t observed in the Comtrade database, excluding imports from France. Following Berman et al. (2015), ω_{jpc} is a time-invariant weight computed using the average share that the product-destination pair pc represents in firm j's total exports over the studied period. As Hummels et al. (2014) point out, a rise in the world import demand may result from demand shocks on product p in country c, or from a loss of comparative advantage by country c in serving product p. Therefore, the instrument is correlated with the firm's export activity but not with its productivity or wage-setting decisions. The effect of firm's export activity, and its interaction with the nativity dummy, on wages is then identified by an increase in import demand, and a consequent increase in the export activity of the firm.

5 A Reassessment of the Nativity Wage Gap

Before diving into the main results, we present a set of preliminary results aimed at corroborating that (i) immigrants earn, on average, less than natives if they are blue-collar workers, while the opposite is true for white-collar workers; and that (ii) exporters pay higher wages, especially to white-collar workers. We then build upon these results to investigate how the nativity wage gap varies with firm export intensity by broad occupation groups (Equation 29).

5.1 Preliminary Results

We start by studying the relationship between wages and the characteristics of individuals and the export status of firms. We present the results of Equation (29) without any interaction terms in Table 2. We find that foreign-born workers earn 4% less than their native counterparts (column 1). Introducing firm-year fixed effects into the specification, the wage differential becomes insignificant (column 2). It then drops to 2.9% and 2.7% when we exploit the within occupation and occupation-industry dimensions respectively (columns 3 and 4). Overall, the wage gap is negative and significant. In addition, exporters pay higher wages, white-collar workers earn higher wages, male earn more than female workers, experience shows a bell-shaped relationship with wages and larger firms pay higher wages. OLS results are reported in Appendix A.3, Table A.5 to assess the direction of the bias caused by the endogeneity of the measure of the firm export intensity.

Table 2: Wages and the Characteristics of Individuals and Firms

	$\ln w_{i(j)t}$			
	(1)	(2)	(3)	(4)
Foreign_i	-0.041***	-0.005	-0.029***	-0.027***
	(0.006)	(0.006)	(0.005)	(0.005)
Export_{jt}	0.256***		0.106***	0.156***
	(0.038)		(0.035)	(0.034)
White_{it}	0.563***	0.541***		
	(0.006)	(0.006)		
Gender (male)	0.236***	0.188***	0.206***	0.202***
	(0.004)	(0.004)	(0.004)	(0.004)
Age	0.017***	0.015***	0.015***	0.015***
	(0.000)	(0.000)	(0.000)	(0.000)
Experience	0.091***	0.088***	0.089***	0.089***
	(0.001)	(0.001)	(0.001)	(0.001)
Experience^2	-0.271***	-0.256***	-0.265***	-0.264***
	(0.004)	(0.005)	(0.004)	(0.004)
(log) Firm size	0.052***		0.051***	0.053***
	(0.003)		(0.003)	(0.003)
Observations	965,690	852,322	965,686	965,662
Method	IV-2SLS	OLS	IV-2SLS	IV-2SLS
R-squared	-	0.509	-	-
K-Paap F Stat.	1,121.79	-	1,258.48	1,378.40
District-year FE	yes	yes	yes	yes
Industry-year FE	yes	yes	yes	no
Firm-year FE	no	yes	no	no
Occupation-year FE	no	no	yes	no
Occupation-industry FE	no	no	no	yes

Note: This table reports second-stage IV-2SLS and OLS estimations. The dependent variable is the (log) annualised real earnings of an individual i working in firm j at time t. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses. First stage results are reported in Appendix A.3, Table A.4.

We then introduce the double interaction terms. We start by analysing heterogeneity in the nativity wage gap for blue- and white-collar workers in the French manufacturing sector. Results are reported in Table 3, columns (1) to (4). In all columns, we find that foreign-born individuals exhibit a wage discount when they hold blue-collar positions. Within-industry, blue-collar immigrant workers earn on average 7.4% less than their native counterparts. White-collar immigrants, however, earn on average 4.9% more than their native counterparts (column 1). In the within-firm specification, we estimate that blue-collar workers earn 3.8% less than the native counterpart, while there is a wage premium of 5.6% for white collars (column 2). Finally, when

we exploit the occupation-year and occupation-industry dimensions (columns 3 and 4), the wage discount of blue-collar immigrants remains stable (4.0% and 3.7% respectively) and this wage discount reduces to 0.4% for white-collar workers. Overall, this set of results points towards the presence of a wage discount for blue-collar immigrants, and a wage premium for white-collar immigrants within the industry and within the firm.

We pursue our analysis by studying the magnitude of the wage export premium, and how it differs across blue- and white-collar workers. Results are reported in Table 3, columns (5) to (8). In column (5), we find that, within an industry, the higher the export intensity of the employing firm, the higher the wages. In addition, the magnitude of the export premium is larger for white-collar workers. Blue-collar workers earn on average 20.8% more when employed by an exporting firm, and white-collar workers earn on average 41.3% more when employed by an exporting firm. In column (6), the use of firm-year fixed effects controls for unobserved factors which could drive selection into exporting. This specification corroborates the presence of a wage export premium for white-collar workers. Finally, the within occupation analysis (columns 7 and 8) confirms the presence of an export premium which is higher for white-collar workers. All in all, we find that blue-collar workers earn on average 10% to 20% more when they are employed by an exporting firm, and that this wage premium is roughly doubled for white-collar workers.

For each IV-2SLS regression, the Kleibergen-Paap F statistic is large enough to infer that the instruments are not weak. First-stage results are available upon request and show that the world import demand positively and significantly predicts the firm export intensity. Once interacted with the white-collar dummy or the export intensity, the instrumental variable correctly predicts the interaction term of interest.

Table 3: Nativity Gap and Export Premium

	$\ln w_{i(j)t}$							
	The nativity wage gap				The wage export premium			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Foreign_i$	-0.074***	-0.038***	-0.040***	-0.037***	-0.043***	-0.006	-0.030***	-0.028***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)
$White_{it}$	0.554***	0.534***			0.509***	0.511***		
	(0.006)	(0.006)			(0.008)	(0.010)		
$Export_{jt}$	0.257***		0.160***	0.156***	0.208***		0.133***	0.107***
	(0.038)		(0.035)	(0.034)	(0.043)		(0.038)	(0.039)
$Foreign_i \times White_{it}$	0.106***	0.094***	0.036***	0.033***				
	(0.011)	(0.012)	(0.009)	(0.009)				
$Export_{jt} \times White_{it}$					0.205***	0.101**	0.109***	0.179***
					(0.037)	(0.040)	(0.031)	(0.036)
Observations	965,690	852,332	965,686	965,662	965,690	852,332	965,686	965,662
Method	IV-2SLS	OLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
R-squared	-	0.509	-	-	-	-	-	-
K-Paap Stat.	1,123.65	-	1,260.48	1,380.21	630.45	1,110.26	688.12	715.61
Controls	yes	yes	yes	yes	yes	yes	yes	yes
District-year FE	yes	yes	yes	yes	yes	yes	yes	yes
Industry-year FE	yes	yes	yes	no	yes	yes	yes	no
Firm-year FE	no	yes	no	no	no	no	no	no
Occupation-year FE	no	no	yes	no	no	no	yes	no
Occupation-industry FE	no	no	no	yes	no	no	no	yes

Note: This table reports IV-2SLS second-stage and OLS estimations. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses. When compatible with our set of fixed effects, controls include the gender, age, experience and experience squared of the individual, and the (log) number of employees in the firm. First-stage results are available upon request to the authors.

5.2 Baseline Results

We now estimate the baseline specification (Equation 29) analysing whether the nativity wage gap varies with the export intensity of the firm in Table 4. In column (1), the triple interaction term (β_7) is positive and significant. Therefore, the magnitude of the nativity wage gap depends on both the occupation group of the workers as well as the export intensity of the employing firm. The wage gap can be expressed by means of the partial derivative of Equation (29) with respect to the nativity dummy (Foreign_i) for blue- and white-collar workers separately. Using these wage elasticities, we can then determine, for each occupation group, an export threshold below which immigrant workers earn less than native workers, and above which immigrant workers earn more than native workers.[13]

We start by analysing the results for blue-collar workers. In columns (1) to (4), we find that the immigrant discount exists along the entire distribution of export shares as none of the export threshold for blue-collar workers is significant. Regarding white-collar workers, we find that immigrants employed by firms that export less than 25% of their total revenue earn less than natives, while immigrants employed in firms that export more than 25% earn a wage premium (column 1). We then analyse the results obtained with alternative specifications. In column (2), we introduce firm-year fixed effects and find no significant threshold. Finally, in columns (3) and (4), we include occupation-year and occupation-industry fixed effects and find an export threshold equal to 36-37%.

In columns (1) to (4), the Kleibergen-Paap F statistic is high enough to infer that the instrumental variables are not weak. First stage results are available upon request to the authors and show that the world import demand and its interactions positively and significantly predict the firm export intensity and its interactions.

Overall, we find that within industry and within occupation, blue-collar immigrant workers face a wage discount with respect to their native counterparts, irrespective of the export intensity of their employing firm. In that respect, exporting has no beneficial impact on wage inequality across immigrants and natives. Then, the wage differential between immigrant and native white-collar workers depends on the export intensity of the employing firm. Immigrants earn less than natives at the lower end of the export distribution, while they earn more than natives at the upper end of it. The export share at which the wage differential changes sign ranges from 25% to 37%, depending on the specification. Hence, exporting does play a role in the determination of wage inequalities between immigrant and native white-collar workers.

[13] The threshold for blue-collar workers, $-\beta_1/\beta_4$, is obtained by setting the following partial derivative equal to zero: $\partial \ln w^{b}_{i(j)t}/\partial \text{Foreign}_i$. Similarly, the threshold for white-collar workers, $-(\beta_1+\beta_5)/\beta_4+\beta_7$, is obtained by setting the following partial derivative equal to zero: $\partial \ln w^{w}_{i(j)t}/\partial \text{Foreign}_i$.

Table 4: A Reassessment of the Nativity Wage Gap

	$\ln w_{i(j)t}$			
	(1)	(2)	(3)	(4)
(β_1) Foreign_i	-0.084***	-0.006	-0.052***	-0.050***
	(0.010)	(0.013)	(0.010)	(0.010)
(β_2) Export_{jt}	0.202***		0.126***	0.099**
	(0.044)		(0.039)	(0.039)
(β_3) White_{it}	0.508***	0.512***		
	(0.008)	(0.010)		
(β_4) $\text{Foreign}_i \times \text{Export}_{jt}$	0.053	-0.136***	0.061	0.064
	(0.044)	(0.050)	(0.042)	(0.042)
(β_5) $\text{Foreign}_i \times \text{White}_{it}$	0.002	-0.016	-0.022	-0.023
	(0.021)	(0.026)	(0.019)	(0.020)
(β_6) $\text{Export}_{jt} \times \text{White}_{it}$	0.182***	0.072*	0.098***	0.169***
	(0.037)	(0.040)	(0.032)	(0.036)
(β_7) $\text{Foreign}_i \times \text{Export}_{jt} \times \text{White}_{it}$	0.278***	0.346***	0.142**	0.135**
	(0.068)	(0.079)	(0.062)	(0.062)
Observations	965,690	852,322	965,686	965,662
Method	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
K-Paap F Stat.	316.15	208.84	345.02	359.00
Controls	yes	yes	yes	yes
District-year FE	yes	yes	yes	yes
Industry-year FE	yes	yes	yes	no
Firm-year FE	no	yes	no	no
Occupation-year FE	no	no	yes	no
Occupation-industry FE	no	no	no	yes
Export threshold for blue-collars	1.580	-0.042	0.853	0.782
	(3.926)	(0.082)	(1.641)	(1.255)
Export threshold for white-collars	0.250***	0.102	0.365***	0.369***
	(0.018)	(0.070)	(0.025)	(0.028)

Note: This table reports IV-2SLS second-stage estimations. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses. When compatible with our set of fixed effects, controls include the gender, age, experience and experience squared of the individual, and the (log) number of employees in the firm. First-stage results are available upon request to the authors. Thresholds of Export_{jt} have been bootstrapped (50 replications).

Finally, we present second-stage results obtained with the IV-2SLS strategy of a specification analogous to the one in equation (29), but that does not distinguish between blue- and white collars, in Appendix A.3, Table A.6. This specification provides information on the average wage differential along the distribution of firm export intensity. In column (1), we find that foreign-born workers employed in firms that do not export earn on average 14.5% less than

native workers. However, this wage gap is reduced when firms increase their export intensity, and reversed to a wage premium when the export share is above 65%. This threshold drops to 49% when we focus on the within-occupation dimension in columns (3) and (4). A different picture is given by column (2), where we exploit the within-firm dimension. This specification shows that the average nativity wage gap does not vary with the export activity of the firm, as the interaction term is not significant, and that the export threshold is consistently larger than unity.

5.3 Robustness Tests

In this section, we investigate the robustness of the estimation of Equation (29). We first discuss two additional threats to identification related to the workforce composition of firms and endogenous mobility patterns of individuals across firms. Then we use an alternative instrumental variable for the export intensity of the firm, and an alternative classification of a worker's occupations. All results are presented in Appendix A.3.

Workforce composition of firms. We cannot exclude that exporters may demand relatively more foreign workers because those workers possess characteristics (other than nativity) that firms find useful for their export activity. In that case, our estimates would reflect differences in the workforce composition across exporters and non-exporters, instead of wage differences across natives and immigrants.

To tackle this issue, we modify our baseline estimation by replacing the export activity variable with a dummy variable taking value one if the firm is an exporter at time t, and with the inclusion of firm fixed effects. We instrument this dummy variable with the world import demand faced by the firm, as in the baseline specification. In addition, we add a set of firm fixed effects which enables us to focus on firms that change their export status over time. In doing so, we study the change in immigrants' wages compared to the change in natives' wages as a firm becomes an exporter.[14]

We report second stage results obtained with the IV-2SLS strategy in Table A.7. We find results in line with our baseline specifications in which we used the export share of the firm (column 1). We then focus on the within firm specification which allows us to better tackle the threat to identification described above (column 2). We find that blue-collar immigrant workers face a wage discount that is larger when the firm exports. As for white-collar workers, the results suggest that immigrant workers benefit from a wage premium with respect to their native counterpart when they are employed by a firm that starts exporting.

Endogenous mobility patterns. We perform a diagnostic test to show that our sample is not subject to endogenous mobility patterns, following the studies by Card et al. (2013) and Bombardini et al. (2019). The purpose of this test is to discard the fact that some worker

[14] Bøler et al. (2018) offers a similar discussion on identification of wage gaps in light of firms' export activity.

characteristics are valued differently at different firms. For instance, immigrants may prove to be valuable for exporting as they gain more experience and reveal their productivity. In that case, they may benefit from rising wages and eventually move to a more export-intensive firm. The self-selection of immigrant workers into exporting firms would confound the effect of exports on wages for the worker. This test thus consists in assessing whether any mobility pattern can be associated to the variation in wages incurred by individuals around the time when they change employer.

We find that the variation in wages experienced by individuals switching firms is not systematically positive or negative. Out of 10,690 switchers observed in the sample at a given time t, 50.95% experience an increase in wages between time t and $t+1$, and 49.05% experience a decrease in wages. Then, we analyse the wage dynamic of individuals before and after they switch. We split firms into four bins based on their export share, within their industry of main activity. We are interested in analysing wage changes for workers switching from firms in a lower bin to firms in a higher bin of the export distribution. Results are presented in Appendix A.2, Figure A.1. We do not observe that individuals joining higher export-intensive firms experience a systematic wage gain prior the job switch. This finding holds true for both samples of native and foreign-born workers (see Appendix A.2, Figures A.2 and A.3 respectively). We can therefore conclude that our sample does not seem to be subject to endogenous mobility, thus alleviating any remaining concerns related to reverse causality.

Alternative instrumental variable. We pursue our analysis by using an alternative variable to instrument the export intensity of the firm. We build the world import demand faced by a firm j at time t as follows:

$$\text{WID}_{jt} = \sum_{pc} \omega_{jpct_0} \times M_{pct} \forall c \neq \text{France} \tag{31}$$

where ω_{jpct_0} denotes the share that the product-destination pair pc represents in firm j's total exports in 2004. Using the pre-sample year instead of an average over the studied period allows us to further ensure the exogeneity of the instrumental variable, yet it reduces the number of observations.

Second stage results obtained with the IV-2SLS strategy and this alternative IV are reported in Table A.8. The results are fully in line with our baseline results. We find that blue-collar immigrants always earn less than their native counterpart, along the whole distribution of export intensity. Then, we find that white-collar immigrants employed by firms that export less than 22% of their total revenue earn less than their native counterparts (column 1). Other specifications are also in line with our baseline findings.

Finally, we also exclude observations belonging to firms that never export and that, therefore, do not have any variation in the instrument. Results are consistent with the baseline specification and available upon request.

Alternative definition of occupation groups. The last part of our robustness analysis consists in using an alternative breakdown of workers into broad occupational groups. Instead of using individual occupations to group workers into blue- and white-collar categories, we now identify occupations for which individuals are likely to take decisions affecting trade activities. We then group workers into trade-related and non-trade-related occupation groups (see column 2 in Table A.1).

We report second stage results obtained with the IV-2SLS strategy in Table A.9. Columns (1) to (4) confirm that foreign-born workers employed in non-trade related occupations earn less than their native counterparts along the whole distribution of export activity. On the contrary, foreign-born workers employed in trade-related occupations see their wage gap reversed into a wage premium as soon as the firm exports at least 36% of its total revenues (column 1). Other columns provide similar results.

6 Underpinning Mechanisms

In this section, we explore the mechanisms behind the relationship of interest. Our working hypothesis is that white-collar immigrant workers experience a lower wage discount, if not a wage premium, in exporting firms because they provide valuable information on the foreign market served by the firm. For this reason, they might capture an informational rent that translates into higher wages. We perform two different exercises that provide evidence supporting this hypothesis.

6.1 Export Complexity

Our first exercise is based on the assumption that export costs increase with the complexity of the export activity. If this is so, the informational rent of immigrant workers should increase with the complexity of the export activity. We modify our baseline specification by replacing the export intensity measure by a proxy of export complexity (denoted Complexity_{jt}). We use three proxies to characterise the export complexity of the firm: the (log) number of product-destination pairs, products and destinations served by the firm. Note that we do not instrument these proxies.

In Table 5, we report OLS estimates obtained when we use the number of markets (product-destination pairs) served by the firm as a proxy for the export complexity. Regarding blue-collar workers, we find that immigrants earn on average less than their native counterparts, and that this wage discount does not depend on the export complexity of their employing firm. These results hold across the four specifications (columns 1 to 4). Regarding white-collar workers, we find that immigrants earn (less) more than natives when they are employed by firm serving (less) more than 11 markets ($e^{2.440}$) (column 1). Looking at the estimates across columns, we find that this threshold ranges from 11 to 63 markets (columns 1 to 4).

We find similar results when we use the number of destinations served by the firm (see results in Appendix A.3, Table A.10) and when we use the number of products served by the firm (Appendix A.3, Table A.11). In particular, blue-collar foreign-born workers always experience a wage gap relative to the native counterpart, but white-collar workers experience a lower wage discount (and even a wage premium) when the export complexity increases.

Overall, we find that the nativity wage gap observed among white-collar workers not only varies with the firm export intensity, but also with its export complexity. This set of results corroborates the hypothesis that white-collar immigrants help firms overcome export costs that are increasing with the export complexity.

Table 5: Nativity Wage Gap and Export Complexity - Nr of markets

	$\ln w_{i(j)t}$			
	(1)	(2)	(3)	(4)
$Foreign_i$	-0.048***	-0.012	-0.007	-0.009
	(0.015)	(0.016)	(0.015)	(0.015)
$Complexity_{jt}$	0.000		0.000	-0.001
	(0.004)		(0.003)	(0.003)
$White_{it}$	0.564***	0.522***		
	(0.013)	(0.014)		
$Foreign_i \times Complexity_{jt}$	-0.008*	-0.010**	-0.009**	-0.007*
	(0.005)	(0.005)	(0.004)	(0.004)
$Foreign_i \times White_{it}$	-0.014	-0.050*	-0.056**	-0.044**
	(0.026)	(0.028)	(0.023)	(0.022)
$Complexity_{jt} \times White_{it}$	0.003	0.004	-0.003	0.000
	(0.004)	(0.004)	(0.003)	(0.003)
$Foreign_i \times Complexity_{jt} \times White_{it}$	0.033***	0.036***	0.024***	0.021***
	(0.007)	(0.007)	(0.006)	(0.005)
Observations	721,360	693,523	721,354	721,328
Method	OLS	OLS	OLS	OLS
R-squared	0.334	0.470	0.387	0.393
Controls	yes	yes	yes	yes
District-year FE	yes	yes	yes	yes
Industry-year FE	yes	yes	yes	no
Firm-year FE	no	yes	no	no
Occupation-year FE	no	no	yes	no
Occupation-industry FE	no	no	no	yes
Threshold for blue-collars	-6.260*	-12.116	-0.715	-1.242
	(3.343)	(1.674)	(1.700)	(2.510)
Threshold for white-collars	2.440***	2.430***	4.143***	3.950***
	(0.311)	(0.433)	(0.384)	(0.365)

Note: This table reports OLS estimations. $Complexity_{jt}$ denotes the (log) number of markets. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses. When compatible with our set of fixed effects, controls include the gender, age, experience and experience squared of the individual, and the (log) number of employees in the firm. Thresholds of $Complexity_{jt}$ have been bootstrapped (50 replications).

6.2 Destination-Specific Export Costs

Our second exercise studies how the wage gap for immigrant workers from different origin groups varies with the firm's share of exports toward these same regions [15]. We then proceed in two different ways.

First, we analyse whether the average wage of french, other EU and non-EU workers change with the export share of the employing firm towards other EU and non-EU countries. If immigrant workers are able to capture an informational rent thanks to their better knowledge of the destination market, we should observe that the average wage of immigrant workers from EU (non-EU) countries is increasing, or increasing more, with the export share to EU (non-EU) countries. To test this hypothesis, we cannot rely on the French administrative panel data at the individual level (the DADS Panel) because it does not contain information on the group of origin of the immigrant workers. We therefore use the DADS *Poste*, which consists of pooled time series of administrative data that allows to follow firms over time (but not to follow individuals). This dataset contains individual-level information on wages, type of contract, occupations, birthplace and citizenship. We are therefore able to count, for each firm, the number of foreign-born workers who have an EU citizenship and those who have a non-EU citizenship. We impose the same restrictions as for the baseline analysis performed with the DADS Panel, by keeping only full-time workers in manufacturing firms, who work for the entire year. We then compute the average firm-level wage by foreign citizenship (EU, non-EU) and by occupational groups (white-collar *vs.* blue-collar). We estimate the following specification for each occupation group:

$$\ln \text{aw}_{jt}^{o} = \beta_0 + \beta_1 \text{Export}_{jt}^{\text{EU}} + \beta_2 \text{Export}_{jt}^{\text{non-EU}} + \Gamma X'_{jt} + \zeta_{dt} + \zeta_{st} + \varepsilon_{jot} \tag{32}$$

where aw_{jt}^{o} is the average wage of type-o workers with $o = \{\text{EU}, \text{non-EU}\}$ in firm j at time t, and $\text{Export}_{jt}^{\text{EU}}$ and $\text{Export}_{jt}^{\text{non-EU}}$ denote the share of exports to EU and non-EU countries respectively. Similarly to the baseline specification, we instrument the export intensity of the firm following Equation (30), modified as to consider the export share towards a subset of destinations (EU or non-EU countries).[16] This specification includes district-year and industry-year fixed effects. Finally, errors are clustered at the firm level.

Second-stage IV-2SLS results are reported in Table 6. We find that an increase in the share of exports towards EU countries is positively associated with the average wage of white-collar workers from both origin groups, but the effect is higher for the group of immigrant workers from EU countries (column 1) than for immigrant workers from non-EU countries (column 2). When focusing on the share of exports towards non-EU countries, we obtain a very similar picture: there is a positive relationship between the share of exports sold in these countries and the average wage of non-EU immigrants, and this is larger than for the other group of immigrant

[15] We use broad groups of origin countries because the data does not provide any information on the exact country of origin of the individuals.

[16] The weights have been computed to reflect the average importance of the destination-product pair pc in firm j's total export towards EU or non-EU countries.

workers. In addition, columns(3) and (4) show that the share of exports towards EU and non-EU countries has no significant effect on the average wage of immigrant blue-collar workers. This lends support to our working hypothesis, since blue-collar immigrants are less likely to provide valuable information regarding export markets than white-collar workers and, therefore, are not able to capture any informational rent.

Table 6: Average Wage by Origin Group

	White-collars		Blue-collars		White-collars	Blue-collars
	$\ln aw_{jt}^{EU}$	$\ln aw_{jt}^{non\text{-}EU}$	$\ln aw_{jt}^{EU}$	$\ln aw_{jt}^{non\text{-}EU}$	$\ln aw_{jt}^{for}$	$\ln aw_{jt}^{for}$
	(1)	(2)	(3)	(4)	(5)	(6)
$Export_{jt}^{EU}$	0.332***	0.242***	0.002	0.032		
	(0.055)	(0.055)	(0.027)	(0.020)		
$Export_{jt}^{non\text{-}EU}$	0.212***	0.434***	0.075	0.042		
	(0.096)	(0.080)	(0.051)	(0.034)		
$Export_{jt}^{main}$					1.036***	-0.624**
					(0.228)	(0.252)
$Export_{jt}^{other}$					0.339***	0.090***
					(0.027)	(0.014)
Observations	28,573	26,182	55,809	83,202	57,536	127,285
Method	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
K-Paap F Stat.	263.746	301.284	447.378	712.905	275.908	315.429
Controls	yes	yes	yes	yes	yes	yes
District-year FE	yes	yes	yes	yes	yes	yes
Industry-year FE	yes	yes	yes	yes	yes	yes

Note: This table reports IV-2SLS second stage estimations. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. The dependent variable in columns (1) and (3) and in columns (2) and (4) is the average firm-level wage of EU and non-EU immigrant workers, respectively. The dependent variable in columns (5) and (6) is the average firm-level wage of immigrant workers. Note that we distinguish between white-collar (columns 1, 2 and 5) and blue-collar workers (columns 2, 4 and 6). Robust standard errors clustered at the firm level are reported in parentheses. Controls include the (log) number of employees in the firm, the age of the firm and its squared term.

Lastly, we perform an alternative exercise consisting in analysing whether the average wage of foreigners in a French department increases with the export activity of firms operating in that department, when the destination of exports coincides with the origin country of the main immigrant community in that department. To do so, we use the population census (*Recensement de la Population*). This census covers, every year, 20% of the municipalities with less than 10,000 inhabitants and 8% of the households of the municipalities with more than 10,000 inhabitants. Over a five-year period, the census covers all the small municipalities and 40% of the large ones. It contains yearly information on the share of immigrant workers by country of origin and main occupation (white- and blue-collars) at the district level. We compute for each department-year, the share of immigrant workers by country of origin, distinguishing between the main origin

country of white- and blue-collar workers. We are then able to identify the most important origin country for each department, every year [17]. We then assume that the wage of the immigrant workers that we observed in the data and are employed in the firms in a given department-year come from this main origin country.

If immigrants possess export knowledge specific to their origin countries, then their average wage should react more to an increase in exports toward the main origin country of immigrant workers in the district of their firm, than to an increase in exports to other destination countries. We estimate the following specification for each occupation group:

$$\ln \text{aw}_{jt}^{\text{for}} = \beta_0 + \beta_1 \text{Export}_{jt}^{\text{main}} + \beta_2 \text{Export}_{jt}^{\text{other}} + \Gamma X'_{jt} + \zeta_{dt} + \zeta_{st} + \varepsilon_{jot} \tag{33}$$

where aw_{jt}^{for} is the average wage in firm j at time t, $\text{Export}_{jt}^{\text{main}}$ denotes the share of exports to the main origin country of immigrants in the district of firm j at time t, and $\text{Export}_{jt}^{\text{other}}$ is the share of exports to other destinations served by firm j at time t. The export intensity of the firm is instrumented as in Equation (30), modified as to consider the export share towards a subset of destinations (main origin country of immigrants and other countries).[18] This specification includes district-year and industry-year fixed effects, and errors are clustered at the firm level.

Results are presented in columns (5) and (6) of Table 6. We find that the wage of white-collar immigrants reacts more to an increase in exports toward the main origin country of white-collar immigrants in the district of their firm, than to an increase in exports toward other destination countries (column 5).

7 Conclusions

This paper uses employer-employee data for the French manufacturing sector from 2005 to 2012 to show that the magnitude and sign of the nativity wage gap depends on firms and workers characteristics. We find that the wage differential of white-collar workers varies with the employing firm's export activity: White-collar immigrants employed by low (high)-exporting firms earn less (more) than their native counterparts. The same is not true for blue-collar workers.

We provide a theory to rationalise our findings. We propose that three previously highlighted effects (the skill premium, the immigrant discount, and the export premium) co-exit and shape factor payments with different intensities, varying with the export intensity of the firm and the qualification level of workers.

Our results show that white-collar immigrants premium is positively related to complexity (approximated by the number of markets, products and destinations served by the firm). In addition, we show that the relative wage of workers from a certain origin responds positively to the export activity of the firm in those specific markets. We interpret these results as supporting the

[17] At most, we observe that 38% of white-collar immigrants and 70% of blue-collar immigrants come from the same origin country in a district-year.

[18] The weights have been computed to reflect the average importance of the destination-product pair pc in firm j's total export towards the main origin country or other countries.

hypothesis that immigrant workers can capture an informational rent when occupying decision-level positions in exporting firms.

From a policy perspective, our findings show that both the skill heterogeneity of individuals as well as the export intensity of their employers are important to assess the magnitude and scope of the wage gap in the French manufacturing sector. Our results also imply that, to some extent, trade reduces wage inequality across workers. This last result is important given that trade is often decried as a vector of inequalities.

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A Appendix

A.1 Additional Information on the Data

Table A.1: French classification of occupations

CS code	Occupation (French)	Occupation (English)	(1)	(2)
1	**Agriculteurs exploitants**	**Farmers**		
11	Agriculteurs sur petite exploitation	Farmers on small farms	-	-
12	Agriculteurs sur moyenne exploitation	Farmers on medium-sized farms	-	-
13	Agriculteurs sur grande exploitation	Farmers on large farms	-	-
2	**Artisans, commerçants et chefs d'entreprise**	**Craftsmen, traders and business leaders**		
21	Artisans	Craftsmen	-	-
22	Commerçants et assimilés	Traders and similar persons	-	-
23	Chefs d'entreprise de 10 salariés ou plus	Entrepreneurs with 10 or more employees	-	T
3	**Cadres et professions intellectuelles supérieures**	**Executives and Higher Intellectual Professions**		
31	Professions libérales	Liberal professions	W	-
33	Cadres de la fonction publique	Public Service executives	W	-
34	Professeurs, professions scientifiques	Professors, scientific professions	W	-
35	Professions de l'information, des arts et des spectacles	Information, arts and entertainment occupations	W	-
37	Cadres administratifs et commerciaux d'entreprise	Corporate administrative and commercial executives	W	T
38	Ingénieurs et cadres techniques d'entreprise	Engineers and business technical executives	W	-
4	**Professions Intermédiaires**	**Intermediate Occupations**		
42	Professeurs des écoles, instituteurs et assimilés	Teachers of schools, teachers and assimilated	W	-
43	Professions intermédiaires de la santé et du travail social	Intermediate health and social work occupations	W	-
44	Clergé, religieux	Clergy, religious	W	-
45	Professions intermédiaires administratives de la fonction publique	Intermediate administrative professions in the public service	W	-
46	Professions intermédiaires administratives et commerciales des entreprises	Intermediate administrative and commercial professions in companies	W	T
47	Techniciens	Technicians	W	-
48	Contremaîtres, agents de maîtrise	Foremen, supervisors	W	-
5	**Employés**	**Clericals**		
52	Employés civils et agents de service de la fonction publique	Civilian employees and public service employees	B	-
53	Policiers et militaires	Police and military	B	-
54	Employés administratifs d'entreprise	Corporate Administrative Employees	B	T
55	Employés de commerce	Commercial employees	B	T
56	Personnels des services directs aux particuliers	Direct service personel to individuals	B	-
6	**Ouvriers**	**Labourers**		
62	Ouvriers qualifiés de type industriel	Industrial Skilled Workers	B	T
63	Ouvriers qualifiés de type artisanal	Skilled craft workers	B	T
64	Chauffeurs	Drivers	B	-
65	Ouvriers qualifiés de la manutention, du magasinage et du transport	Skilled workers in handling, storage and transport	B	-
67	Ouvriers non qualifiés de type industriel	Unskilled industrial workers	B	-
68	Ouvriers non qualifiés de type artisanal	Unskilled craft workers	B	-
69	Ouvriers agricoles	Agricultural workers	B	-

Column (1) classifies occupations into blue- and white-collar occupations (respectively denoted B and W). Column (2) denotes occupations that are possibly related to trade activities (T).

A.2 Additional Descriptive Statistics

Table A.2: Firm Export Activity by Employment of Immigrant Workers

	All	**No foreign-born worker**	**At least 1 foreign-born worker**	Signif.
Export value (in thousand euros)	1.09e+04	2668.91	2.80e+04	***
Export sh.	0.226	0.201	0.278	***
Nr. of destinations	11.75	8.84	17.78	***
Nr. of products	11.21	7.98	17.91	***
Nr. of markets	41.36	24.40	76.61	***

Note: This table reports descriptive statistics for the full sample of firm-year observations as well as for two subsamples. In each year, we identify firms employing at least one immigrant worker and firms employing none.

Table A.3: Worker Characteristics by Nativity

	All	**Native workers**	**Foreign-born workers**	Signif.
(log) Annualised wage	9.72	9.72	9.68	***
Age	39.67	39.34	43.03	
Sh. of male workers	0.726	0.726	0.726	
Sh. of white-collar workers	0.353	0.358	0.301	***
Job spell	5.98	6.04	5.30	***
Job spell of white-collar workers	6.65	6.71	5.93	***
Job spell of blue-collar workers	5.98	6.06	5.23	***

Note: This table reports descriptive statistics for the full sample of worker-year observations as well as for native-year and immigrant-year observations.

A.3 Additional Results

Table A.4: Wages and the Characteristics of Individuals and Firms - First-stage estimations

	Export_{jt}		
	(1i)	(3i)	(4i)
Foreign_i	0.011***		0.012***
	(0.003)		(0.003)
White_{it}	0.008***		
	(0.002)		
WID_{jt}	0.011***	0.011***	0.011***
	(0.000)	(0.000)	(0.000)
Gender (male)	-0.003	-0.003	-0.005
	(0.002)	(0.002)	(0.002)
Age	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)
Experience	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)
Experience^2	-0.006***	-0.006***	-0.006***
	(0.002)	(0.002)	(0.002)
(log) Firm size	0.021***	0.022***	0.022***
	(0.003)	(0.003)	(0.003)
Observations	965,690	965,686	965,662
Method	IV-2SLS	IV-2SLS	IV-2SLS
District-year FE	yes	yes	yes
Industry-year FE	yes	yes	no
Firm-year FE	no	no	no
Occupation-year FE	no	yes	no
Occupation-industry FE	no	no	yes

Note: This table reports first-stage IV-2SLS estimations. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses. Columns (1i) reports the first stage results for specification (1) in Table 3, and so forth.

Table A.5: Wages and the Characteristics of Individuals and Firms - OLS estimations

	$\ln w_{i(j)t}$		
	(1)	(2)	(3)
$Foreign_i$	-0.039***	-0.028***	-0.026***
	(0.006)	(0.006)	(0.005)
$Export_{jt}$	0.077***	0.069***	0.069***
	(0.014)	(0.011)	(0.011)
$White_{it}$	0.565***		
	(0.006)		
Gender (male)	0.234***	0.205***	0.202***
	(0.004)	(0.004)	(0.004)
Age	0.017***	0.015***	0.015***
	(0.000)	(0.000)	(0.000)
Experience	0.092***	0.090***	0.089***
	(0.001)	(0.001)	(0.001)
$Experience^2$	-0.273***	-0.266***	-0.264***
	(0.004)	(0.005)	(0.004)
(log) Firm size	0.061***	0.056***	0.057***
	(0.002)	(0.002)	(0.002)
Observations	965,690	965,686	965,662
Method	OLS	OLS	OLS
R-squared	0.337	0.379	0.384
District-year FE	yes	yes	yes
Industry-year FE	yes	yes	no
Occupation-year FE	no	yes	no
Occupation-industry FE	no	no	yes

Note: This table reports OLS estimations. The dependent variable is the (log) annualised real earnings of an individual i working in firm j at time t. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses.

Table A.6: A Reassessment of the Nativity Wage Gap - Reduced model

	$\ln w_{i(j)t}$			
	(1)	(2)	(3)	(4)
$Foreign_i$	-0.145***	-0.053***	-0.054***	-0.052***
	(0.010)	(0.013)	(0.009)	(0.009)
$Export_{jt}$	0.353***		0.148***	0.144***
	(0.043)		(0.035)	(0.034)
$Foreign_i \times Export_{jt}$	0.223***	0.043	0.109***	0.107***
	(0.037)	(0.042)	(0.031)	(0.031)
Observations	965,825	852,450	965,821	965,797
Method	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
K-Paap F Stat.	565.16	1,273.12	629.67	689.70
Controls	yes	yes	yes	yes
District-year FE	yes	yes	yes	yes
Industry-year FE	yes	yes	yes	no
Firm-year FE	no	yes	no	no
Occupation-year FE	no	no	yes	no
Occupation-industry FE	no	no	no	yes

Note: This table reports IV-2SLS second stage and OLS estimations. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses. When compatible with our set of fixed effects, controls include the gender, age, experience and experience squared of the individual, and the (log) number of employees in the firm. First stage results are available upon request to the authors.

Table A.7: A Reassessment of the Nativity Wage Gap - Export dummy

	$\ln w_{i(j)t}$	
	(1)	(2)
$Foreign_i$	-0.087***	-0.005
	(0.011)	(0.013)
$Export_{jt}$	0.027***	-0.002
	(0.008)	(0.007)
$White_{it}$	0.491***	0.460***
	(0.009)	(0.009)
$Foreign_i \times Export_{jt}$	0.020	-0.039**
	(0.013)	(0.015)
$Foreign_i \times White_{it}$	-0.014	-0.048*
	(0.023)	(0.026)
$Export_{jt} \times White_{it}$	0.081***	0.073***
	(0.012)	(0.012)
$Foreign_i \times Export_{jt} \times White_{it}$	0.146***	0.153***
	(0.027)	(0.029)
Observations	965,690	951,278
Method	IV-2SLS	IV-2SLS
K-Paap F Stat.	2.7e+04	6439.45
Controls	yes	yes
District-year FE	yes	yes
Industry-year FE	yes	yes
Firm FE	no	yes

Note: This table reports IV-2SLS second stage estimations. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses. When compatible with our set of fixed effects, controls include the gender, age, experience and experience squared of the individual, and the (log) number of employees in the firm. First stage results are available upon request to the authors.

Figure A.1: Wage Changes for Firm Switchers Along the Distribution of Export Intensity

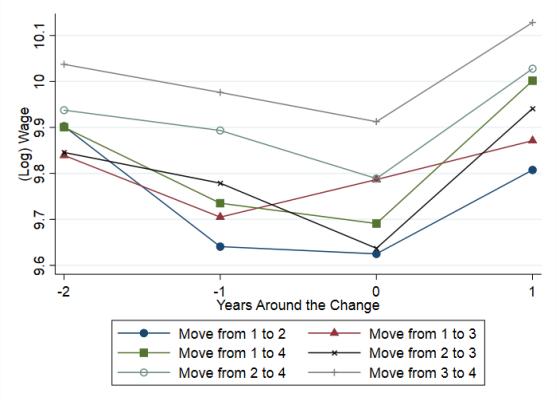

Figure A.2: Wage Changes for Natives Firm Switchers Along the Distribution of Export Intensity

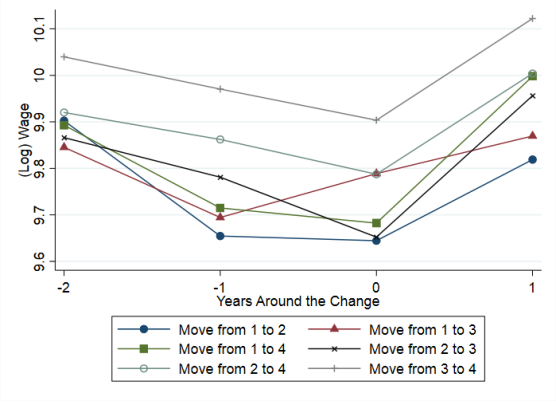

Figure A.3: Wage Changes for Foreign-born Firm Switchers Along the Distribution of Export Intensity

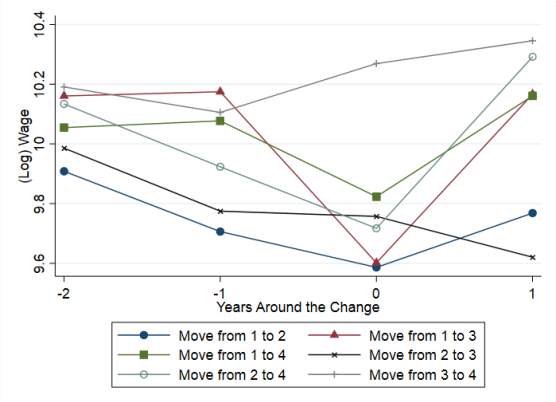

Table A.8: A Reassessment of the Nativity Wage Gap - Alternative instrumental variable

	$\ln w_{i(j)t}$			
	(1)	(2)	(3)	(4)
$Foreign_i$	-0.085***	-0.007	-0.052***	-0.050***
	(0.011)	(0.013)	(0.010)	(0.010)
$Export_{jt}$	0.163***		0.114***	0.085**
	(0.040)		(0.036)	(0.036)
$White_{it}$	0.508***	0.509***		
	(0.008)	(0.010)		
$Foreign_i \times Export_{jt}$	0.036	-0.133***	0.043	0.046
	(0.042)	(0.048)	(0.041)	(0.040)
$Foreign_i \times White_{it}$	0.004	-0.011	-0.021	-0.023
	(0.021)	(0.027)	(0.020)	(0.020)
$Export_{jt} \times White_{it}$	0.181***	0.080**	0.087***	0.155***
	(0.037)	(0.040)	(0.031)	(0.035)
$Foreign_i \times Export_{jt} \times White_{it}$	0.305***	0.344***	0.165***	0.160***
	(0.066)	(0.077)	(0.060)	(0.060)
Observations	891,207	785,605	891,200	891,177
Method	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
K-Paap F Stat.	388.34	141.30	421.69	430.00
Controls	yes	yes	yes	yes
District-year FE	yes	yes	yes	yes
Industry-year FE	yes	yes	yes	no
Firm-year FE	no	yes	no	no
Occupation-year FE	no	no	yes	no
Occupation-industry FE	no	no	no	yes

Note: This table reports IV-2SLS second stage estimations. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses. When compatible with our set of fixed effects, controls include the gender, age, experience and experience squared of the individual, and the (log) number of employees in the firm. First stage results are available upon request to the authors.

Table A.9: A Reassessment of the Nativity Wage Gap - Trade-related occupations

	$\ln w_{i(j)t}$			
	(1)	(2)	(3)	(4)
$Foreign_i$	-0.096***	-0.023*	-0.055***	-0.054***
	(0.010)	(0.013)	(0.010)	(0.010)
$Export_{jt}$	0.108**		0.115***	0.095**
	(0.042)		(0.037)	(0.037)
$Info_{it}$	0.291***	0.370***		
	(0.009)	(0.010)		
$Foreign_i \times Export_{jt}$	0.024	-0.131***	0.054	0.051
	(0.040)	(0.045)	(0.038)	(0.038)
$Foreign_i \times Info_{it}$	0.009	0.004	-0.004	-0.005
	(0.024)	(0.032)	(0.022)	(0.022)
$Export_{jt} \times Info_{it}$	0.804***	0.468***	0.166***	0.236***
	(0.039)	(0.040)	(0.034)	(0.042)
$Foreign_i \times Export_{jt} \times Info_{it}$	0.218***	0.306***	0.152**	0.160**
	(0.073)	(0.089)	(0.067)	(0.067)
Observations	965,825	852,450	965,821	965,797
Method	IV-2SLS	IV-2SLS	IV-2SLS	IV-2SLS
K-Paap F Stat.	280.475	151.828	320.708	360.629
Controls	yes	yes	yes	yes
Department-year FE	yes	yes	yes	yes
Industry-year FE	yes	yes	yes	no
Firm-year FE	no	yes	no	no
Occupation-year FE	no	no	yes	no
Occupation-industry FE	no	no	no	yes

Note: This table reports IV-2SLS second stage estimations. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses. When compatible with our set of fixed effects, controls include the gender, age, experience and experience squared of the individual, and the (log) number of employees in the firm. First stage results are available upon request to the authors.

Table A.10: Nativity Wage Gap and Export Complexity - Nr of destinations

	$\ln w_{i(j)t}$			
	(1)	(2)	(3)	(4)
Foreign_i	-0.047***	-0.012	-0.007	-0.008
	(0.015)	(0.016)	(0.014)	(0.014)
Complexity_{jt}	0.008*		0.007*	0.004
	(0.005)		(0.004)	(0.004)
White_{it}	0.565***	0.530***		
	(0.012)	(0.013)		
$\text{Foreign}_i \times \text{Complexity}_{jt}$	-0.011*	-0.014**	-0.013**	-0.011**
	(0.006)	(0.006)	(0.005)	(0.005)
$\text{Foreign}_i \times \text{White}_{it}$	-0.029	-0.064**	-0.060***	-0.052**
	(0.026)	(0.028)	(0.023)	(0.023)
$\text{Complexity}_{jt} \times \text{White}_{it}$	0.004	0.003	-0.005	0.001
	(0.005)	(0.005)	(0.004)	(0.004)
$\text{Foreign}_i \times \text{Complexity}_{jt} \times \text{White}_{it}$	0.051***	0.055***	0.035***	0.032***
	(0.009)	(0.009)	(0.008)	(0.008)
Observations	721,360	693,523	721,354	721,328
Method	OLS	OLS	OLS	OLS
R-squared	0.335	0.470	0.387	0.393
Controls	yes	yes	yes	yes
District-year FE	yes	yes	yes	yes
Industry-year FE	yes	yes	yes	no
Firm-year FE	no	yes	no	no
Occupation-year FE	no	no	yes	no
Occupation-industry FE	no	no	no	yes

Note: This table reports OLS estimations. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses. When compatible with our set of fixed effects, controls include the gender, age, experience and experience squared of the individual, and the (log) number of employees in the firm.

Table A.11: Nativity Wage Gap and Export Complexity - Nr of products

	$\ln w_{i(j)t}$			
	(1)	(2)	(3)	(4)
$Foreign_i$	-0.054***	-0.018	-0.013	-0.014
	(0.014)	(0.015)	(0.014)	(0.014)
$Complexity_{jt}$	0.000		-0.001	-0.002
	(0.005)		(0.004)	(0.004)
$White_{it}$	0.575***	0.531***		
	(0.012)	(0.013)		
$Foreign_i \times Complexity_{jt}$	-0.008	-0.012**	-0.010*	-0.008
	(0.006)	(0.006)	(0.006)	(0.005)
$Foreign_i \times White_{it}$	0.003	-0.031	-0.043**	-0.032
	(0.025)	(0.027)	(0.022)	(0.022)
$Complexity_{jt} \times White_{it}$	0.000	0.003	-0.006	0.000
	(0.005)	(0.006)	(0.004)	(0.004)
$Foreign_i \times Complexity_{jt} \times White_{it}$	0.040***	0.043***	0.029***	0.025***
	(0.009)	(0.009)	(0.008)	(0.007)
Observations	721,360	693,523	721,354	721,328
Method	OLS	OLS	OLS	OLS
R-squared	0.334	0.470	0.387	0.393
Controls	yes	yes	yes	yes
District-year FE	yes	yes	yes	yes
Industry-year FE	yes	yes	yes	no
Firm-year FE	no	yes	no	no
Occupation-year FE	no	no	yes	no
Occupation-industry FE	no	no	no	yes

Note: This table reports OLS estimations. ***, ** and * respectively denote significance at the 1%, 5% and 10% level. Robust standard errors clustered at the firm level are reported in parentheses. When compatible with our set of fixed effects, controls include the gender, age, experience and experience squared of the individual, and the (log) number of employees in the firm.