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DISPARIDAD ENTRE NATIVOS Y MIGRANTES RESPECTO A LA CALIDAD DEL TRABAJO: ANÁLISIS DEL CONTEXTO FRANCÉS USANDO MÉTODOS DE DESCOMPOSICIÓN

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RESUMEN

Durante las últimas décadas, el concepto de calidad del trabajo y la integración de inmigrantes en el mercado laboral ha sido muy debatido en el ámbito de las ciencias sociales.

Este artículo pretende contribuir a esta nueva área de investigación sobre indicadores subjetivos de la calidad del trabajo como medida de la integración de los inmigrantes en el mercado laboral francés, evaluando así las diferencias entre trabajadores nativos y migrantes.

Al centrarnos en la brecha entre trabajadores nativos e inmigrantes en el contexto del mercado laboral francés, evaluamos la calidad del trabajo con indicadores subjetivos relacionados con el entorno laboral, tales como la posible implicación de las tareas laborales en riesgos para la salud, tensiones físicas u otros inconvenientes.

Palabras Clave: calidad del trabajo, condiciones de trabajo, integración de inmigrantes, métodos de descomposición

The native-migrant gap in job quality: an analysis of the French context using decomposition methods

ABSTRACT

During the last decades the concept of job quality (JQ) and immigrant's assimilation in the labour market has been highly debated in the social science.

This paper aims to contribute to this emerging body of research on subjective job quality indicators as a measure of immigrants' integration in the French labour market through estimation of the differential between native and migrant workers.

Focussing on the gap between native and immigrant workers in the French labour market context, we evaluate job quality with subjective indicators related to the working environment, such as whether or not the job tasks entail health risks, physical strains or other drawbacks.

Keywords: job quality, working conditions, immigrant's integration, decomposition methods

Clasificación JEL: C10, I31, J16

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1. INTRODUCTION

During the last decades, the evaluation of the inequalities among workers in the labour market has gained a growing interest among economists, sociologists and psychologists. For immigrant workers, labour market outcomes and job quality have been recognised as two important areas of integration. Not only access to employment but also working conditions are fundamental for evaluating the degree of social integration of migrants (Huddleston et al., 2013).

The concept of job quality (JQ) is highly debated in the social science, even if in this field there is no comprehensive measure of it (Kalleberg and Vaisey 2005).

This paper aims to contribute to this emerging body of research on subjective job quality indicators as a measure of immigrants' integration in the French labour market through estimation of the differential between native and migrant workers.

Focussing on the gap between native and immigrant workers in the French labour market context, we evaluate job quality with subjective indicators related to the working environment, such as whether or not the job tasks entail health risks, physical strains or other drawbacks.

France is traditionally a country of immigration due to its colonial history. Recent estimates point that at least 25% of the population has had some immigration background (Akgüç and Ferrer, 2015) and half of immigrants were born in a former colony.

Since the November 2005 riots, the integration of immigrants has become a burning issue in France, to the point that during the last years, the governments built a large part of their assimilation policies on labour market issues.

A distinctive trait of this research is the use of the 2013 Working Condition French survey. This is a French nationally representative dataset with information on workers' earnings and also on aspects of the quality of work, (encompassing its organization and its conditions, cooperation, work rhythms, physical efforts or risks) that are not usually measured by traditional surveys at European level.

For the first time, in 2013, this survey included a module on of work environment and work-related risks enabling us to carry out an in-depth analysis of work conditions covering various aspects such as organization of working hours, work rates, work content, physical strain and risks (Algava and Vinck, 2015).

From a methodological point of view, in order to account for the differences in job quality between native and migrant workers, we use a series of count indicators regarding specific aspects of job quality. The method used is an extension of the Oaxaca-Blinder decomposition for count data models (Sinning et al., 2008).

Following this approach, the observed difference in group proportions or counts is additively decomposed into characteristics (or endowments) component and coefficients (or effects) component. Moreover, a detailed decomposition is provided, allowing for an assessment of the contribution of each explanatory variable to the main effects.

The remainder of this paper is organised as follows. Section 2 reviews the literature on job satisfaction with reference to its main determinants. Section 3 reports the data and the construction of the subjective job quality indicators, Section 4 briefly describes the decomposition method for count data, while section 5 presents the estimation results. Section 6 concludes the study.

2. LITERATURE REVIEW

2.1. Job quality as a measure of well-being and integration

Promoting employment and improving working conditions are central objectives of the EU since 2000 (European Commission, 2001a). With the inclusion of "quality in work" indicators in the European Employment Strategy (European Commission, 2001a), job quality became a relevant economic policy issue at international level. High job quality improves working conditions, increases the workers' development and skills, reduces unemployment, increases firm productivity, thus

enhancing individual and social well-being in an increasingly globalised environment (Davoine et al. 2008; Dahl et al. 2009).

During the last decades several factors have contributed to the definition of "better job conditions" and "equality in job conditions": the global change and work-related vulnerabilities of European countries, the structural evolution of the labour market, the rise in job insecurity and instability of the European employment rate.

The inclusion of job quality into the policy agenda has impacted also the economic policies implying structural changes in globalization, technological progress and changes in unionization rate. In addition to policy initiatives at EU level, by national authorities and social partners, progress can also be achieved through workplace practices and policies at the company level. These initiatives lead to the achievement of the Europe 2020 Strategy for 'improving the quality of work and working conditions'.

The concept of job quality (JQ) is highly debated in the social science, even if in this field there is no comprehensive measure of it (Drobnič, Beham, and Präg 2010; Dahl et al., 2009; Kalleberg and Vaisey 2005). The studies on JQ are often approached in a different way by economist, sociologist and psychologist. Labour economists define the quality of work mainly in terms of wages, hours of work, and fringe benefits (especially health insurance or retirement benefits). Wages and salaries are generally considered the most important factors defining job quality, although it is recognised that the quality of work goes beyond monetary awards including other aspects such as job security (Clark 2005a). For this reason, sociologists include in the framework of JQ also the occupational prestige or status within a system of social stratification as well as the autonomy, control and personal development (see, among others, Argyle 1989; Kalleberg and Vaisey 2005; Green 2006; Rethinam 2008). In this field of research, skills are central, and they involve both complex operations and autonomy of worker. Finally, following the psychologists' approach, JQ includes also non-economic aspects of work, they focused on the importance of workers' trust in their job: the workplace is seen as a social arena and they stress the relevance of having good social relations (Faragher, et al., 2005; Dahl et al., 2009).

JQ is not only a key determinant of the well-being of individuals and households in which they live (an end in its own right) but can also be an important driver for increasing labour force participation, productivity and aggregate economic performance.

The concept of JQ can be evaluated at a micro and macro level perspective (Crespo et al., 2017). The macro level approach is mainly followed by international institutions to implement the topics of the international agenda. The micro level approach focuses on the socio-economic characteristics of the workers and on the work-related characteristics. Following this approach, it is common to assume the multidimensionality of job quality. To deal with the multidimensional nature of job quality, different international organizations and researchers have contributed to the definition of the concept of job quality by considering several different dimensions e.g., pay, autonomy, intensity, job security, physical working conditions, health.

According to Sunal et al. (2011), working environments, physical workers' conditions and health risk associated to the job tasks are the most important factors to predict job quality. Physical risk factors, such as repetitive movements, carry on heavy loadings, exposure to hot or cold temperature have been associated with cardiovascular disease (Burgard et al., 2013; Da Costa and Viera, 2010).

Theorell et al. (2016) found evidence that employees, who report specific occupational exposures, have an increased incidence of ischemic heart disease (IHD), a form of cardiovascular disease. On the other hand, recent studies found that over the last decade, in the EU28 this indicator has had an uneven improvement (Eurofound, 2017).

2.2. Immigrants assimilation in the French context

The influx of immigrants in France and its integration services date backs the earlier 1920s. France experienced significant flows of "guest worker" type migration between the 1950s and the early 1970s with a high number of migrants from Italy, Spain, Portugal and North Africa in order to satisfy low-skilled labour needs after the industrial expansion. After the first oil crisis in 1973, these movements halved, but large inflows of family migrants, with low levels of education, continued (OECD, 2015).

However, the elements of a systematic introduction program for new arrivals were only put in place in the 1990s and formalised in the Reception and Integration Contract for new arrivals in 2005. The November 2005 riots, occurring simultaneously in various poor suburbs of large cities where immigrants were over-represented, suddenly highlighted the problem of discriminations in the labour market. These riots naturally raised the issue of the integration - and potential discrimination – of immigrants' in the labour market. Since this period, the integration of immigrants has become a burning issue and governments have built a large part of their assimilation policies on labour market issues.

Due to its republican tradition, France has generally adopted assimilationist policies. In the French society, there is no ethnic or racial differentiation (Simon, 2003), therefore it rejects ethnicity, culture and religion as a basis for political organization. This model paradoxically allows discrimination. Regarding the centralization of labour and capital, France shows a coordinated wage bargaining system between employers and unions with low levels of wage inequalities. Union membership is low in France, but collective agreements cover a high share of workers. Economists suggest that this coordinated system creates more non-employed labour market over-represented by migrants (Meurs et al., 2006).

Recent estimates point that at least 25% of the population has had some immigration background (Akgüç and Ferrer, 2015) and half of immigrants were born in a former colony.

Despite the long history of immigration and integration policies, in France the amount of studies on immigrants' work integration is particularly meagre in literature due to the lack of appropriate detailed data and/or nationally representative surveys. For more than forty years, economists and econometricians have developed theoretical and empirical tools to study employment rate differentials and wage gaps between individuals of different national origins. Aeberhardt and Pouget (2007) were the first researchers who studied the wage gap of French workers with foreign origin.

An extensive literature has examined the differences between natives and immigrants in terms of employment, educational attainment, hourly wages. Some studies show that immigrants perform worse than the native-born population (Algan et al., 2010; Meurs et al. 2006; Aeberhardt et al. 2010).

The high unemployment rate of immigrants in France has triggered an intense debate about structural barriers they face in the labour market. The French labour market can be especially hostile to new immigrants because of its restrictions on foreign nationals working in several professions. Indeed, immigrants face several barriers to accessing work: limited language proficiency, few professional contacts and difficulty to demonstrate skills and experience on the field. While the access to employment is a primary key of integration, the kind of job yields a more comprehensive picture of the nature of an immigrant's place in the labour market.

3. DATA

3.1. The French Working Conditions Survey

We use data drawn from the 2013 wave of the French Working Conditions Survey, a French nationally representative dataset with information on workers' earnings. This survey represents the largest source for obtaining comparable statistics on income, job characteristics, job quality and living conditions at country level.

The Working Conditions Surveys have been organized and operated by DARES[•] since 1978, in collaboration with INSEE[•]. They are renewed every seven years: 1984, 1991, 1998, 2005 and finally 2013[•]. Respondents are asked about their perceived working conditions through face-to-face interviews. The survey units are all employed workers in every sector, including the civil service. The questions regarding JQ refer to a concrete description of the work, its organization and its conditions, from various angles: room for manoeuvre, cooperation, work rhythms, physical effort or risks. The first wave of the survey (carried out in the 1978) was focussed on the analysis of physically painful work. However, its scope was widened in the successive waves: in 1998 some questions have been introduced on work injuries and in 2005 questions on the prevention of work-related risks have been added.

The dataset contains, among the others, variables from the household questionnaire describing the characteristics of all interviewed individuals, their housing and their household. For the first time, in 2013, the survey covered four overseas departments (i.e. Martinique, Guyana, Guadeloupe and Reunion).

By using this source of data, we can analyse work conditions with reference to various aspects such as organization of working hours, work rates, work content, physical strain and risks.

The last survey, carried out in 2013, has been conducted on a representative sample of 33,673 respondents aged 15 and over, irrespective of their activity sector, excluding those in military occupations. We focused on employees[•] (i.e., anyone who receives compensation in the form of wage, salary, payment by result or in kind), aged 15–65.

The final dataset, net of missing values in every investigated variable, includes 26,449 individuals, with 2,114 (8%) immigrants and 24,335 (92%) native-born workers, both living in France.

Table1 includes both socio-demographic variables and work-related characteristics considered in the analysis.

[•] DARES (Directorate for Research, Studies and Statistics) produces statistics and analyses useful to the Ministry in charge of labour, employment, vocational training and social dialogue and to economic and social actors (Social partners, regional councils, public employment service, economic and social press, etc.).

[•] INSEE (National Institute for Statistics and Economic Studies) collects, produces, analyzes and disseminates information on the French economy and society.

[•] http://dares.travail-emploi.gouv.fr/dares-etudes-et-statistiques/enquetes-de-a-a-z/article/conditions-de-travail-edition-2013.

[•] The choice to consider only employees derives from differences in the personal and work characteristics of self-employed workers (Hamilton, 2000; Parker 2004; Castellano and Punzo 2013) and the different reported income.
With the aim of assessing whether the exclusion of self-employed people would lead to distortion from selection, we estimate the Heckman selection model. From the results, we can conclude that the data do not suffer from sample selection (results of the Heckman model are available upon request).

Table 1
Explanatory variables included in the models

Socio-demographic characteristics	
Name	Description
Native status	=1 for native-born; =0 for foreign-born
Gender	=1 for male; =0 for female
Age	=1 for16-30; =2 for 31-40; =3 for 41-50; 4=for >50;
Educational level	=1 for lower secondary; =2 for upper secondary; =3 for tertiary
Marital status	=1 for not married; =0 for married or in a civil union
Health status	=1 for fair, bad or very bad health; =0 for good or very good health
Limitations due to chronic illnesses or disabilities	=1 for yes; =0 for no limitations
With children	1= yes; 0=no
Work-related characteristics	
Name	Description
Sector in employment	=1 for Agriculture; =2 Industry; =3 for Construction, 4=for tertiary sector
International standard of occupation	=1 for high skilled non-manual; =0 for high skilled manual, 3=for low skilled non-manual, 4=for low skilled manual;
Type of contract	=1 for permanent; =0 for fixed term
Full-time worker	=1 for yes; =0 for part-time worker
Firm size	=1 for small size (<50); =0 for big size (≥50)
Union membership	=1 for yes; =0 for no

Source: Authors' elaboration from French Working Conditions Survey 2013 data

3.2. Constructing count indicators for job quality

In this paper we considered indicators representing different dimensions of job quality: Physical Environment, Drawbacks in the Workplace and Health Risks. These dimensions were selected on the basis of their impact on the health and well-being of workers.

The Physical Environment indicators assess physical risks in the workplace (i.e. stand up for long time or carry on or move heavy loads).

The Drawback in the Workplace indicators assess the exposure to other ambient risks –i.e. high temperatures, low temperatures.

The Health Risks indicators assess the exposition to inhaling smoke and toxic vapours and handling chemical products and infectious materials.

Since structural inequalities and differences in labour market are still significant among categories of workers, the aim of our work is to identify how many times each worker points to some strains, drawbacks or health risks in the working environment and to assess whether there are differences between native and migrant workers.

In this way, we can evaluate whether any gap could be explained by differences in socio-economics characteristics or whether it is mainly due to behavioral differences.

In order to characterize the working conditions, we selected a set of variables capturing the experience of employed persons regarding their work. Each selected variable contributes to the construction of an overall picture of work experience.

To obtain a simplified representation of each dimension of job quality, we considered three groups of variables (three modules) capturing physical strains, drawbacks in the workplace and health risk in the workplace, respectively.

The first module on physical strains is composed of 6 indicators, the second module on environmental conditions includes 8 indicators and the third module on health risks is composed of 5 indicators. Table 2 shows the questions included in each module. All the questions included in each module allow for a binary response: 1 if the worker reports to suffer from that strain, drawback or risk, 0 otherwise•.

Table 2
List of questions in each module

Physical	pa1	stand up for long time
	pa2	long time in painful position
	pa3	walk for long distance
	pa4	carry on or move heavy loads
	pa5	undertake painful or tiring movements
	pa6	endure jolting or vibration
Drawbacks in the workplace	pb1	Dirtiness
	pb2	Damp
	pb3	Draughts
	pb4	Unpleasant smells
	pb5	High temperatures
	pb6	Low temperatures
	pb7	No toilets
	pb8	No outside views
Health risks	pc1	Breathe smoke or dust
	pc2	Contact with hazardous products
	pc3	Exposed to infection risk
	pc4	Risk of injury or accident
	pc5	Risk of traffic accident when working

Source: Authors' elaboration from French Working Conditions Survey 2013 data

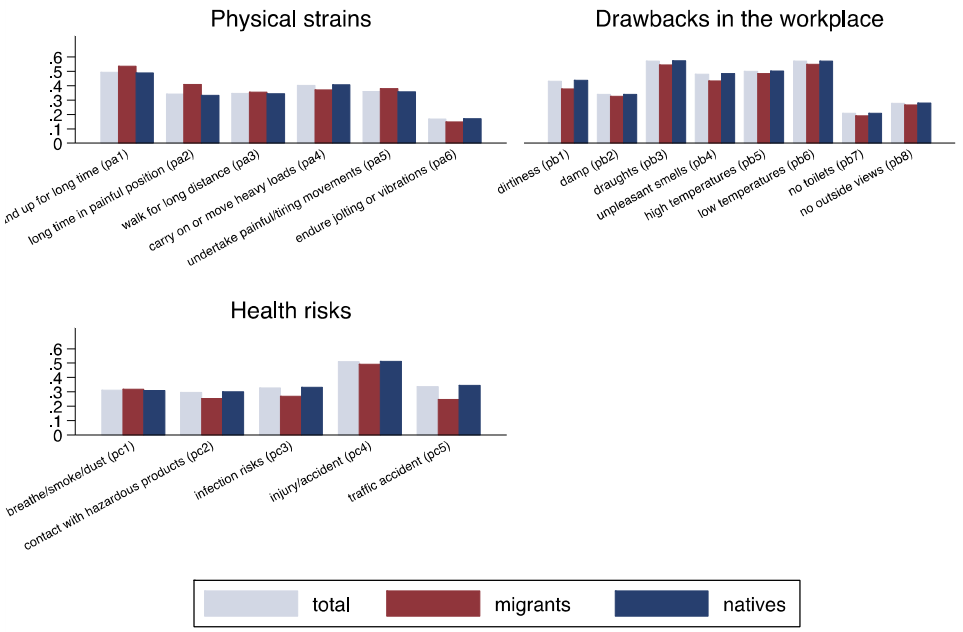
Figure 1 shows the frequencies of the "yes" responses to each variable included in the three modules for each group of workers (natives and migrants). For the Physical Strains module, the highest percentage has been reported for pa1 indicator (stand up for long time) with a share of 51%. For the Drawbacks in the workplace module, the highest percentage (54%) has been reported for pb3 variable (draughts in the workplace). For Health Risks module, the highest percentage is associated with pc4 indicator (risk of injury or accidents) with a share of 51%.

Furthermore, this figure shows the differences in each indicator among the two groups of workers. Regarding the P module, migrants are more likely to be exposed to physical strains than native workers except for situation referring to carrying on or moving heavy loads and enduring jolting or vibrations. As for the Drawback in the Workplace module, the situation for migrants is better than for their native counterpart: indeed, migrants declare better environmental conditions of the workplace than natives for every investigated aspect. Finally, regarding the Health Risks module, breathing smoke or dust is the only risk to which migrants appear more exposed than natives.

• The questions show also some missing values (coded as 8 for "don't know" and 9 for "don't want to answer"). The share of missing values were 0.17%, 0.38% and 0.62% for the three modules. Due to these small amounts, we decided to drop the observations with missing values.

Figure 1

Frequency distributions of" yes" responses to each indicator



Source: our elaboration form French Working Conditions Survey 2013

From the single indicators of each domain, we create a unique count indicator. A count variable indicates how many times something has happened, in our specific case, it takes into account the number of times when these uncomfortable work situations occur.

The new count indicator called "Physical strains" (hereafter P) assumes values ranging from 0 to 6. It is 0 if the interviewee declares that he or she does not observe any uncomfortable situation regarding difficulties, physical strains and risks in the workplace; while it assumes its maximum value of 6 when the interviewee observes all the discomfort situations. The values of the new count indicator called "Drawback in the work place" (hereafter D) range from 0 to 8. It is 0 if the interviewee declares that he or she does not observe any uncomfortable situation regarding the workplace; while it assumes its maximum value of 8 when the interviewee declares all the discomfort situations. The new count indicator called "Health risk" (hereafter H) assumes values ranging from 0 to 5. It is 0 if the interviewee declares that he or she does not observe any dangerous situation regarding the workers' health; while it assumes its maximum value of 5 when the interviewee observes all the health dangerous situations. In Figure 2 the frequencies associated with every value of the count indicators are shown, for both native and migrant workers.

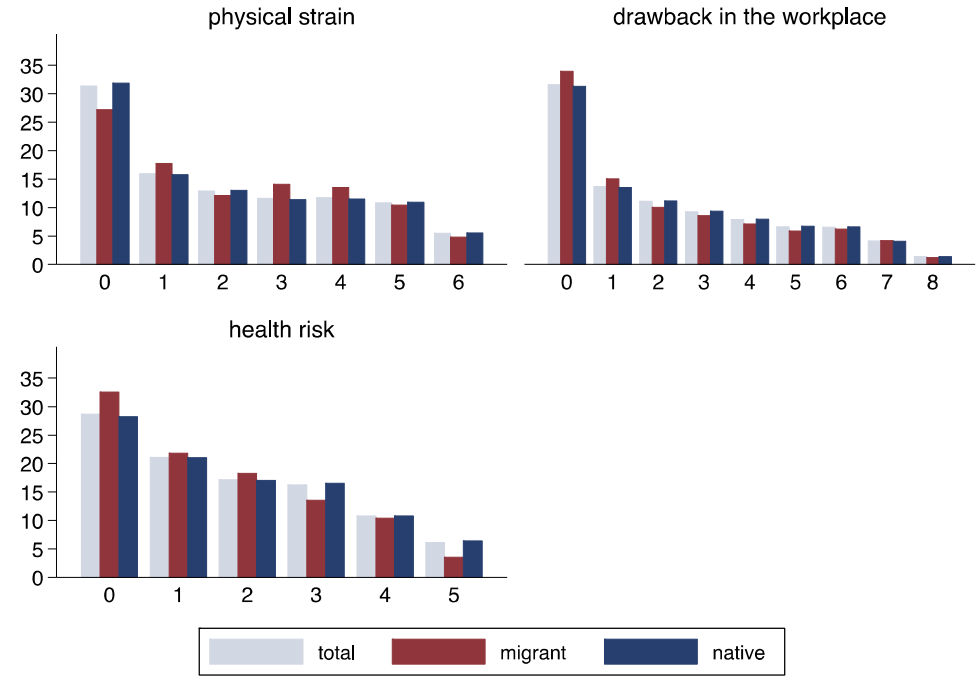
For all indicators, the most frequent modality is the absence of discomfort situations: the count indicators assume zero value for approximately 30% of cases. When we consider the indicator associated to the drawback in the workplace, this proportion rises to 34% for migrant workers.

Regarding the count indicator of physical strains, migrant workers are more likely to observe a higher average number of discomfort situations compared to their native counterpart whereas natives are more likely not to report any discomfort situation. Conversely, for indicators regarding drawbacks in the workplace and health risks, native workers are more likely to observe a higher average number of discomfort situations compared to their migrant counterpart whereas migrants are more likely not to declare any discomfort situation.

Using every count indicator as a dependent variable, we want to estimate count regression models with the aim of decomposing the observed gap in the working conditions between native and migrant workers.

Figure 2

Frequency distributions of count indicators



Source: our elaboration from French Working Conditions Survey 2013

4. METHODOLOGY: DECOMPOSITION METHODS FOR COUNT DATA

To investigate the native–migrant differences in working conditions, we apply Oaxaca-Blinder decomposition, which allows for the decomposition of the differences between the two groups in the count indicators into a part that derives from observable characteristics and a part that is explained by differences in estimated coefficients. Since our outcome variable is a count indicator, the application of the conventional Oaxaca-Blinder decomposition for linear models is not appropriate. We therefore apply the derived Oaxaca-Blinder -type decomposition method for count data models (Bauer et al., 2007), which uses either Poisson regression model (PRM) or Negative Binomial regression model (NBRM).

Consider the following linear regression model, which is estimated separately for the groups $g = m, n$:

$$C_{i,g} = X_{i,g}\beta_g + \varepsilon_{ig} \quad (1)$$

where $C_{i,g}$ represent the count indicator for individual $i(i = 1, \dots; N_g)$ in group g, $X_{i,g}$ is a vector of observable characteristics, β_g denotes a vector of parameters to be estimated and ε_{ig} is a standard error term. For these models, Oaxaca (1973) and Blinder (1973) propose the following decomposition:

$$\bar{C}_n - \bar{C}_m = \left[E_{\beta_n}(C_{in}|X_{in}) - E_{\beta_n}(C_{im}|X_{im})\right] + \left[E_{\beta_n}(C_{im}|X_{im}) - E_{\beta_m}(C_{im}|X_{im})\right] \quad (2)$$

where $\bar{C}_g = N_g^{-1}\sum_{i=1}^{N_g} C_{ig}$ and $E_{\beta_g}(C_{ig}|X_{ig})$ refers to the conditional expectation of C_{ig} evaluated at the mean of the parameter vector β_g.The first term in square bracket on the right-hand side of Equation (2) displays the difference in the outcome variable between the two groups that is due to differences in observable characteristics, whereas the second term shows the differential that is due to differences in coefficient estimates.

In a linear regression model, Equation (2) reduces to the well-known formula for the Oaxaca-Blinder decomposition:

$$\bar{C}_n - \bar{C}_m = \Delta^{OLS} = (\bar{X}_n - \bar{X}_m)\hat{\beta}_n + (\hat{\beta}_n - \hat{\beta}_m)\bar{X}_m \quad (3)$$

where $\bar{X}_g = N_g^{-1} \sum_{i=1}^{N_g} X_{ig}$ (g=m,n). When the outcome variable (C_{ig}) is a count data variable, the decomposition results from the linear regression model may lead to biased estimates of the parameters. We consider Poisson and Negative binomial regression models and we derive a decomposition method for count data regression models. The Poisson regression model (P) assumes that the dependent variable C_{ig} conditional on the covariates X_{ig} is Poisson distributed with density:

$$f(C_{ig}|X_{ig}) = \frac{exp(-\mu_{ig})\mu_{ig}^{C_{ig}}}{C_{ig}!}, \quad C_{ig} = 0,1,2,\ldots \tag{4}$$

and conditional expectation:

$$E(C_{ig}|X_{ig}) = \mu_{ig} = \exp(X_{ig}\beta_g^P). \tag{5}$$

Using the equation (2), based on equation (5), it is possible to derive an Oaxaca-Blinder type decomposition for count data models. Defining a sample counterpart S(.) of the conditional expectation of C_{ig}evaluated at β_g,

$$E_{\beta g}(C_{ig}|X_{ig}) = S(\hat{\beta}_g; X_{ig}) \tag{6}$$

the components of Equation (2) can be estimated by:

$$\hat{\Delta} = \left[S(\hat{\beta}_n; X_{in}) - S(\hat{\beta}_n; X_{im})\right] + \left[S(\hat{\beta}_n; X_{im}) - S(\hat{\beta}_m; X_{im})\right] \tag{7}$$

For the Poisson model, the sample counterpart of $E_{\beta g}(C_{ig}|X_{ig})$ is:

$$S(\hat{\beta}_g^P; X_{ig}) = \bar{C}_{g;\hat{\beta}_g^P} = \frac{1}{N_g}\sum_{i=1}^{N_g} exp(X_{ig}\hat{\beta}_g^P) \tag{8}$$

The decomposition model for the Poisson is as follows:

$$\hat{\Delta}^P = \left[\frac{1}{N_n}\sum_{i=1}^{N_n} exp(X_{in}\hat{\beta}_n^P) - \frac{1}{N_m}\sum_{i=1}^{N_m} exp(X_{im}\hat{\beta}_n^P)\right] + \left[\frac{1}{N_m}\sum_{i=1}^{N_m} exp(X_{im}\hat{\beta}_n^P) - \frac{1}{N_m}\sum_{i=1}^{N_m} exp(X_{im}\hat{\beta}_m^P)\right] \tag{9}$$

The assumption of the Poisson model is that the dependent variable has the same mean and variance $\mu_{ig} = \exp(X_{ig}\beta_g^P)$.

A more flexible model is the negative binomial regression model (NBRM), which assumes the same form of the conditional mean as the Poisson model but relaxes the assumption of equality between the conditional mean and the variance of the dependent variable.

The relationship between the variance and the mean is quadratic:

$$V(C_{ig}|X_{ig}) = \mu_{ig} + \alpha\mu_{ig}^2 \tag{10}$$

where α is a scalar parameter to be estimated together with $\hat{\beta}_g^{Nb}$. The sample counterpart of the conditional mean of NBRM is:

$$S(\hat{\beta}_g^{Nb}, X_{ig}) = \bar{C}_{g,\hat{\beta}_g^{Nb}} = \frac{1}{N_g}\sum_{i=1}^{N_g} exp(X_{ig}\hat{\beta}_n^{Nb}) \tag{11}$$

The decomposition equation of the NBRM is similar to Equation (9) of the Poisson model.

5. RESULTS

5.1. Results from Negative Negative Binomial Regression Models (NBRM)

In this first part of the analysis we investigated which variables included in the analysis play a significant role on the number of time each worker points to Physical strain, Drawbacks in the workplace or Health risk. These analyses are made separately for native and migrants.

To choose the count models that fit well the data, we run the Poisson Regression Model (PRM) and Negative Binomial Regression Model (NBRM) separately for native and migrant workers and then we tested the differences between the models.

We started our analysis by running the PRM for each count indicator separately for native and migrant workers. The PRM allows each observation to have a different value of the mean μ. More formally, the PRM assumes that the observed count for observation i is drawn from a Poisson distribution with mean μi, where μi is estimated from observed characteristics.

One of the main drawbacks of the PRM is that this model rarely fits the over dispersion. A formal test of the null hypothesis of equi-distribution, $Var(x|y) = E(y|x)$, against the alternative of over-dispersion can be based on the equation:

$$Var(x|y) = E(y|x) + \alpha^2 E(y|x)$$

which is the variance function for the NBRM. We test $H_0: \alpha = 0$ against $H_1: \alpha > 0$.

The test can be implemented by running an auxiliary regression of the generated dependent variable, $\{(y - \hat{\mu})^2 - y\}/\hat{\mu}$ on $\hat{\mu}$, without an intercept term, and performing a t-test of whether the coefficient of $\hat{\mu}$ is zero•. We performed this test for each count indicator, for both natives and migrants.

The results of PRM for each indicator, limited to the estimate of $\hat{\mu}$ and the corresponding p-value are reported in Table 3.

Table 3
Poisson Regression Models. Test of over-dispersion

		P	D	H
Natives	$\hat{\mu}$	0.151	0.149	0.218
	p-value	0.000	0.000	0.000
Migrants	$\hat{\mu}$	0.159	0.164	0.272
	p-value	0.000	0.000	0.000

Note: * p<0.10; ** p<0.05; ***p<0.01.
Source: Elaborations from the French Working Conditions Survey, 2013

We can see that, for each indicator the estimated $\hat{\mu}$ is always different from zero, and the corresponding p-value is always equal to 0. The results indicate the presence of significant over dispersion in all the three PRMs considered. If there is over dispersion, estimates from the PRM are inefficient with standard errors that are biased downward. One way to model this feature is to use the NBRM.

For this reason, we estimated the NBRM for native and migrant workers for each count indicators.

The results of NBRMs are reported in Table 4 for natives and Table 5 for migrants.

We can interpret the estimated parameters as factor changes in the rate: when the dummy covariate xk equals 1, the expected count changes by a factor of exp(bk) in comparison with the reference category when xk equals 0, holding all other variables constant. The percent change is shown in the tables together with the corresponding coefficient.

For the native group, all the variables included in the three NBRMs are significant, the only exception is made for the working hours variable (full-time vs part-time workers). For the migrant group, marital status, age, industry sector, full-time contract, permanent contract, small firm size and having children are not significant.

For each indicator both for natives and migrants, all the variables have a positive impact. As exceptions, for natives only, the industry sector plays a negative role when confronted with the tertiary sector on the number of physical strains as well as low skilled manual occupations play a negative role on the number of health risks in comparison with high skilled non-manual occupations.

For each indicator and for both groups, the number of reported drawbacks decreases with the educational level. For the native group, the highest increase in the expected value of the three count indicators is observed for the workers with primary education level: with respect to the workers with a

• See Cameron and Trivedi (2005) pages 670-671, for details.

tertiary educational attainment, the expected count increases by 96% for P indicator, 80% for D indicator and 71% for H indicators. For the migrant group, the largest effect for the expected count of the three indicators is observed when low skilled workers are compared with high skilled non-manual workers. Specifically, for low skilled manual workers the expected count of P indicator increases by 144%, which confirms that low skilled occupation entails much more physical strain than high skilled non-manual occupations. Additionally, working in agriculture or construction sector rather than in the tertiary sector is a penalizing factor especially when the environmental working conditions are considered. Indeed, the expected count of D indicator for native workers increases by 66% and 51% when agriculture and construction are compared with the tertiary sector, respectively. The corresponding changes are equal to 55% and 76% for migrant workers.

Union membership plays a significant role on the expected count of drawbacks: for workers who are members of a trade union the expected count of all the indicators is higher than for those who are not enrolled (the differences range from 20% to 30%). Bad health status and chronic limitations have a positive and significant role. Nevertheless, their impact is not significant for migrants when the H indicator is considered.

Table 4

Negative Binomial regression models for natives

	P			D			H		
	coef	sig.	% change in outcome var	coef	sig.	% change in outcome var	coef	sig.	% change in outcome var
Male	0.096	***	10.1	0.222	***	24.9	0.312	***	36.6
Not married	0.047	**	4.8	0.082	***	8.5	-0.005		-0.5
16-30 years old	0.362	***	43.6	0.334	***	39.6	0.259	***	29.6
31-40 years old	0.236	***	26.6	0.294	***	34.2	0.181	***	19.9
41-50 years old	0.14	***	15.1	0.176	***	19.3	0.099	***	10.4
Primary education	0.674	***	96.2	0.59	***	80.3	0.536	***	70.9
Secondary education	0.382	***	46.5	0.343	***	40.9	0.336	***	39.9
Agriculture	0.268	***	30.7	0.506	***	65.8	0.187	***	20.6
Industry	-0.113	***	-10.7	0.053	*	5.5	0.013		1.3
Construction	0.184	***	20.3	0.414	***	51.3	0.196	***	21.6
Full-time worker	0.005		0.5	-0.011		-1.1	0.021		2.1
High skilled manual	0.242	***	27.4	0.131	***	14	-0.123	***	-11.6
Low skilled non-manual	0.645	***	90.6	0.525	***	69	0.348	***	41.7
Low skilled manual	0.63	***	87.8	0.492	***	63.6	0.352	***	42.2
Permanent contract	0.027		2.7	0.142	***	15.2	0.119	***	12.7
Small firm size	0.02		2	0.138	***	14.8	0.054	***	5.6
Union membership	0.174	***	19.1	0.159	***	17.2	0.193	***	21.3
Bad health status	0.189	***	20.9	0.225	***	25.3	0.108	***	11.4
Chronic limitations	0.18	***	19.7	0.15	***	16.2	0.128	***	13.7
With children	0.021		2.2	0.015		1.5	0.047	**	4.9
Constant	-0.432	***		-0.551	***		-0.465	***	
ln alpha	-1.4742	***		-0.6144	***		-3.931	***	
alpha	0.229			0.541			0.020		
log likelihood	-32872249			-34928548			-30062724		
lr test	945271.43			4428717.4			7966.81		

Note: * p<0.10; ** p<0.05; ***p<0.01. Source: Elaborations from the French Working Conditions Survey, 2013

Table 5
Negative Binomial Regression models for migrants

	P			D			H		
	coeff	sig.	% change in outcome var	coeff	sig.	% change in outcome var	coeff	sig.	% change in outcome var
Male	0.051		5.3	0.185	**	20.4	0.269	***	30.9
Not married	0.046		4.7	0.083		8.7	0.028		2.8
16-30 years old	0.112		11.9	-0.048		-4.6	-0.09		-8.6
31-40 years old	0.006		0.6	0.025		2.5	-0.008		-0.8
41-50 years old	0.08		8.4	-0.124		-11.6	0.106		11.2
Primary education	0.434	***	54.3	0.297	**	34.6	0.39	***	47.7
Secondary education	0.378	***	45.9	0.283	**	32.7	0.337	***	40.1
Agriculture	0.259	**	29.6	0.436	***	54.6	-0.134		-12.6
Industry	-0.011		-1.1	0.031		3.1	-0.025		-2.4
Construction	0.373	***	45.3	0.568	***	76.4	0.308	***	36.1
Full-time worker	-0.001		-0.1	0.111		11.8	0.043		4.4
High skilled manual	0.519	***	68	0.24	**	27.2	0.113		12
Low skilled non-manual	0.734	***	108.3	0.748	***	111.2	0.489	***	63.1
Low skilled manual	0.894	***	144.4	0.634	***	88.4	0.431	***	53.9
Permanent contract	0.093		9.7	0.081		8.5	0.084		8.7
Small firm size	-0.034		-3.4	0.075		7.7	0.1	*	10.6
Union membership	0.187	***	20.5	0.251	***	28.6	0.188	***	20.7
Bad health status	0.147	***	15.9	0.229	***	25.7	0.08		8.3
Chronic limitations	0.186	***	20.4	0.206	***	22.9	0.089		9.3
With children	0.046		4.7	0.007		0.7	0.059		6.1
Constant	-0.355	***		-0.421	**		-0.548	***	
ln alpha	-2.9783	***		-0.5088	***		-2.5395		
alpha	0.0509			0.6012			0.0789		
log likelihood	-3425231			-3591026			-3069128		
lr test	7458.277			492670.47			10269.429		

Note: * p<0.10; ** p<0.05; ***p<0.01. Source: Elaborations from the French Working Conditions Survey, 2013

5.2. Results from the count data decomposition methods

The results from the decomposition methods for Negative Binomial Regression Models (NBRM) count data allow us to investigate the differences between native and migrants in the working conditions measured through the three indicators previously created.

For the analysis we use the STATA software[•]. For the decomposition analysis, we have weighted the endowment component by the native group's coefficients whereas we have used the observed characteristics of the migrants group as weights in the coefficient component[•].

Table reports the results of the decomposition analysis for the NBRM count data model. Specifically, Table underlines the decomposition effects due to characteristics and coefficients and the raw differential.

Regarding the P indicator, migrants suffer more physical strains than their native counterpart. This is highlighted by the negative raw differential (-0.093). The result underlines that almost the whole gap is explained by differences in characteristics (-0.086). Only a small part is due to differences in coefficients (-0.007), and this effect is not significant.

With reference to D and H indicators, the opposite situation is observed. The count indicators show a disadvantage for the natives, which is highlighted by positive raw differentials (0.149 and 0.219, respectively). For both indicators, the largest part of the outcome difference is explained by differences in coefficients; this disadvantage for native workers is slightly attenuated by the characteristics effects that show negative signs (-0.059 and -0.041, respectively). Both components are significant. In summary, the aggregate decomposition of the native/migrant gap in all of the three indicators show that the characteristics effect has a negative sign. The characteristics effect results from the comparison between the actual native workers and the counterfactual distribution of migrant workers with the same beta coefficients as the natives. A negative sign for the characteristics effect means that, because of their characteristics, migrant workers endure worse working conditions than native workers. In other words, if the two groups differed only in the covariates' level and not in their effects on the outcome variable, migrants would undergo worse working conditions than natives according to each count indicators. The coefficients effect is not significant in the decomposition of the gap in the P indicator, whereas it is significantly positive in the decomposition of the gap in D and H indicators. This means that if migrants had the same characteristics than natives, the only difference being in the regression coefficients of the count models, the gap would become not significant when P indicator is considered whereas it would reverse to the advantage of migrants when the working conditions are measured by D and H indicators.

The heterogeneity in native-migrant differences in working conditions found in the previous analysis suggests that natives and migrants may have different opportunities for being exposed to better working conditions.

Figure 3 shows the results of the decomposition of the native-migrant differences in the working quality indicators where the characteristics component is in turn split into two sub-components. The blue bars represent the native-migrant gap in working conditions related to differences in the work characteristics, such as sector and occupation. The orange bars represent the native-migrant gap in working conditions related to differences in the personal characteristics,

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• The nldecompose command of STATA performs the Oaxaca- Blinder decomposition of the mean outcome differential of linear and nonlinear regression models (Sinning et al., 2008).

• By fixing the coefficients in the composition component to the native group, we assess the contribution to the differential that would have occurred if the behavioural responses to the characteristics were fixed to the values in the natives group. Additionally, through the mvdcmp package of STATA, we performed a detailed decomposition (Powers et al., 2011).

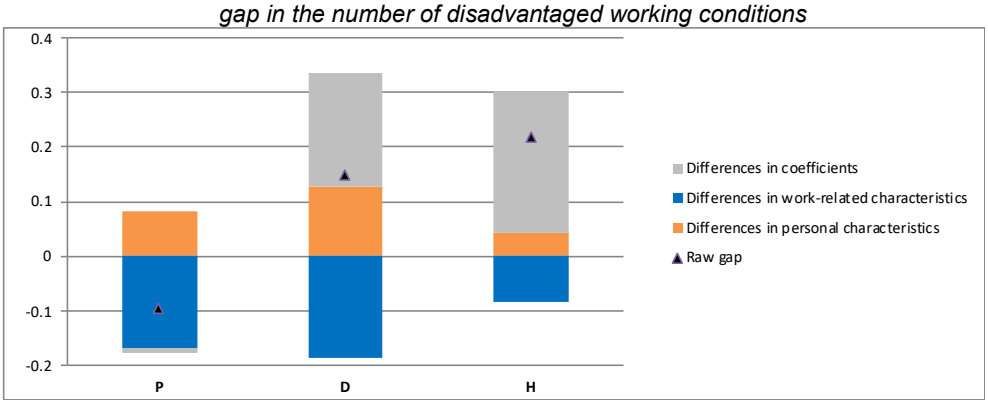
such as age, educational level and marital status. For every indicator the two components are of opposite sign: from the point of view of the migrants, the differences in personal characteristics constitute an advantage, whereas the differences in the work-related characteristics represent a penalizing factor.

The grey bars represent the extent to which the different "endowments" of native and migrant workers are associated with job quality, that is the extent to which native and migrant workers have different "returns" to their characteristics. These differences are not relevant in the first indicator considered (physical strains). The triangle symbol is the sum of the values represented by the three bars previously explained; it corresponds to the raw gap.

The sign of the raw gap is negative for the physical strain indicator and positive for the drawbacks in the workplace and health risks.

Figure 3

Personal, work related characteristics and coefficients effect in the decomposition of the native-migrant gap in the number of disadvantaged working conditions



Source: Authors' elaborations from the French Working Conditions Survey, 2013

As for the detailed decomposition of the characteristics effect, Table 7 shows the impact of the covariates and the corresponding percent share.

Table 6

Aggregate decomposition of the native/migrant gap in the number of disadvantaged working conditions

		Characteristics	Coefficients	Raw gap
P	coef.	-0.086	-0.007	-0.093
	sig.	***		**
	%	93%	7%	100%
D	coef	-0.059	0.208	0.149
	sig.	***	***	**
	%	-39%	139%	100%
H	coef.	-0.041	0.26	0.219
	sig.	***	***	***
	%	-19%	119%	100%

Note: * p<0.10; ** p<0.05; ***p<0.01

Source: Elaborations from the French Working Conditions Survey, 2013

Table 7

Detailed decomposition of the native/migrant gap in the number of disadvantaged working conditions: characteristics and coefficients effects

Characteristics	P		H		D
	coeff	%	coeff	%	coeff
Gender	-0.004	0.05	-0.016	0.27	-0.015
Marital status	0.019	-0.23	0.053	-0.89	-0.002
Age	0.095	-1.1	0.138	-2.34	0.073
Education level	0.012	-0.14	0.02	-0.35	0.02
Sector	-0.036	0.41	-0.051	0.87	-0.018
Full time worker	0	0	0	0	0
Occupation	-0.14	1.63	-0.173	2.94	-0.087
Contract	0.003	-0.03	0.022	-0.37	0.013
Firm size	0.001	-0.01	0.01	-0.17	0.003
Union membership	0.004	-0.05	0.006	-0.1	0.005
Health conditions	-0.029	0.34	-0.054	0.91	-0.018
Chronic limitations	-0.007	0.08	-0.009	0.16	-0.006
With children	-0.004	0.04	-0.004	0.07	-0.009
Total	-0.086		-0.059		-0.041
Coefficients	P		H		D
	coeff	%	coeff	%	coeff
Gender	0.026	-3.75	0.038	0.18	0.04
Marital status	0.001	-0.08	-0.001	0	-0.023
Age	0.125	-17.97	0.39	1.87	0.179
Education level	0.12	-17.23	0.28	1.35	0.115
Sector	-0.033	4.73	-0.019	-0.09	-0.001
Full time worker	0.005	-0.73	-0.194	-0.93	-0.033
Occupation	-0.139	19.91	-0.18	-0.86	-0.175
Contract	-0.061	8.79	0.098	0.47	0.053
Firm size	0.04	-5.75	0.081	0.39	-0.055
Union membership	-0.002	0.31	-0.028	-0.14	0.001
Health conditions	0.013	-1.88	-0.002	-0.01	0.014
Chronic limitations	-0.001	0.11	-0.013	-0.06	0.008
With children	-0.016	2.3	0.009	0.05	-0.012
Constant	-0.085	12.25	-0.251	-1.2	0.148
Total	-0.007		0.208		0.26

Note: * p<0.10; ** p<0.05; ***p<0.01. Source: Elaborations from French Working Conditions Survey, 2013

Additionally, Figure 4 allows for a comparison of the effects of the covariates. For covariates with more than two categories, the impact results from the sum of the effects associated with every category. From the descriptive analysis of the differences between the samples of natives and migrant workers, we know that migrant workers are penalized in the comparison with native workers for having worse health conditions, for working more often than natives in agriculture and construction and for having the lowest occupations. All these characteristics entail worse working conditions according to every count indicator. Therefore, if the migrants could fill the

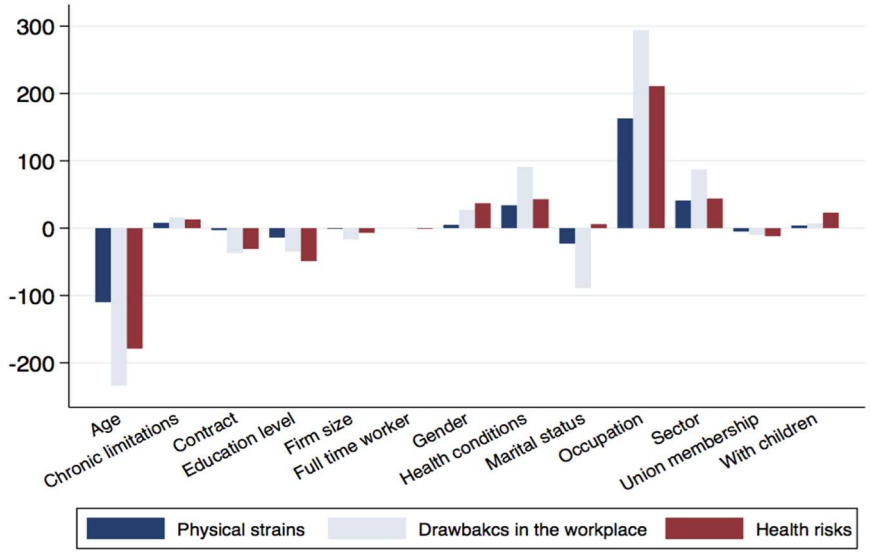
gap in the above listed characteristics, they would see an improvement in their working conditions. The covariates that refer to the occupation, sector and health conditions, indeed, show the largest weights (of the same sign as the raw differential) in the detailed decomposition of the effect due to differences in the characteristics.

Conversely, migrants benefit more than natives for having a lower share of workers in the class age 16-30 and a lower share of not married individuals. Therefore, if they had the same characteristics as the natives, their gap would increase further. Indeed, age and marital status show the largest effects (of opposite sign with respect to the raw differential) in the detailed decomposition for the component explained by the characteristics. Nevertheless, for H indicator, marital status has not a significant effect.

As for the detailed decomposition of the unexplained effect (Table 7), many coefficients are not significant and nevertheless, for categorical covariates with more than two categories, the results depend arbitrarily on the choice of the reference group (Oaxaca and Ransom, 1999). For these reasons, we do not comment further these findings. In Figure 4 we represent the effect exerted by the characteristics for the three indicators. Considering the opposite sign with respect to the raw differential, the main effect is given by age and marital status. Considering the same sign with respect to the raw differential, the main effect is given by occupation, sector and bad health status.

Figure 4

Detailed decomposition of the native/migrant gap in the number of disadvantaged working conditions: estimated effect of covariates on characteristics component



Source: Our elaboration from French Working Conditions Survey, 2013

6. CONCLUSIONS

Integration of immigrants in their host countries has become a crucial policy issue. Job quality has been recognised as an important area of assimilation: not only access to employment but also working conditions are fundamental for evaluating the degree of social integration of migrants. The inclusion of job quality and the integration of immigrants into the policy agenda impact also on economic policies because they imply structural changes in globalization, technological progress and changes in unionization rate.

Bearing in mind the issue of immigrants' assimilation in the labour market of the host country, this paper contributed to explore the gap among native and migrant workers in the French labour market context by using several indicators of job quality based on data from the 2013 French Working Conditions Survey.

Specifically, we studied how subjective working conditions vary between natives and migrant workers.

We referred to the French context for two main reasons: first, for its socio-demographic background and long history on the migrants' integration policy; second, for the availability of a very detailed dataset, which includes items not usually collected in traditional surveys at the EU level, therefore allowing us to carry out an in-depth analysis on aspects related to the quality of work.

Immigrants tend to have different characteristics than their native-born counterparts. Regarding human capital, the immigrants group tends to cluster at the highest and the lowest levels of education. Regarding demographic characteristics, there are differences in the characteristics of their families: immigrants in France are more likely than natives to be married and to live with their children. These patterns in the demographic characteristics affect employment and earnings, since being married and having children tend to have a detrimental effect on the labour market outcomes, especially in the lower part of the income distribution. Also, the job characteristics between migrants and native-born are quite different, which have implications for inequalities. Immigrants group in the French context is relatively unlike to work in the tertiary sector, whereas they have a higher share of workers involved in the construction sector. Not surprisingly, immigrants group is more likely than native-born workers to have a temporary contract and a low skilled occupation.

Through the decomposition analyses of immigrant/native gap in subjective indicators of job quality, we tried to assess whether and to what extent the observed differences in labour market outcomes across groups are due to compositional differences in human capital, demographics and job characteristics.

We used several subjective indicators of job quality referring to such dimensions as physical strains, drawbacks in the workplace and health risk.

A count indicator has been defined for each dimension of job quality. In a second phase, an extension of the Oaxaca-Blinder decomposition to nonlinear regression models developed by Sinning et al. (2008) was used.

The raw differential for the physical strain indicator is in favor of native workers whereas the remaining indicators signal a gap to the advantage of migrant workers.

In summary, the aggregate decomposition of the native/migrant gap in all of the three indicators show that the characteristics effect has a negative sign. This finding means that, because of their characteristics, migrant workers endure worse working conditions than native workers.

From the point of view of migrants, the differences in personal characteristics constitute an advantage, whereas the differences in the work-related characteristics represent a penalizing factor: migrant workers are penalized in the comparison with native workers for working more often than natives in agriculture and construction and for having the lowest occupations. This result points to the issue of access to employment by migrant workers, in particular to those occupations that could assure higher wages and better working conditions in general.

Although France has long history on immigrants inflow, the government initiatives on integration policy are relatively new. In France, immigration has been largely shaped by flows of low-educated individuals, the so-called "guest workers", facing several integration issues related to low levels of employment and education and higher relative poverty rates (Amossé and Chardon, 2006; Meurs et al., 2006).

Due to the characteristics of immigrants in France, in order to improve equality among native and migrant workers it is necessary to develop a greater regulation and social protection in the welfare state that could lead to a higher migrants' participation in the labour market with a lower gap.

In this framework, if policy makers implement a stressing labour market demand, we might expect that migrants perform better than natives and hence contribute to the growth and the performance of the economy. Conversely, if strict criteria are required in order to obtain a work, we might expect that the labour market conditions would be harder for migrants.

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