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Third demographic transition and demographic dividend: An application based on panel data analysis

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Abstract. The third demographic transition, barely mentioned by some authors and implicit for others, refers to changes in the demographic structures of the most developed countries promoted by the most recent migratory flows, with repercussions in aspects such as age structure or the composition of the labour market. The concept of the third demographic transition revolves around the increasing presence of foreigners, many of whom take up jobs that nationals reject, as well as other more skilled posts. Using the panel data methodology, we try to explain the third demographic dividend whose impact can be seen in the labour market. The results enable us to conclude that the foreign worker differential puts downward pressure on salaries, which affects other groups. If workers are available and policies are constructive, this leads to positive results and social wealth.

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1. Introduction

The theory of the demographic transition is the framework sustaining the basis of the debate on what is known as the demographic dividend associated with the growth of the potential workforce and, more specifically, the reduction in the rate of dependence. The first demographic dividend would be characteristic of countries starting to consider the decline in birth rates within a context of low mortality, associated with an increase in a mostly very young workforce; the second dividend appears in countries at the end of the demographic transition, with aged populations and a declining workforce that is beginning to generate work for older people (Lesthaeghe, Karel, 2002). In recent decades, the development of demographic methods and techniques and the availability of more statistical information has made it possible to analyse more accurately the impact of changes in structure by age or sex on the labour market, welfare, education or health, that is, on the economy. It is in this scenario that the key concept of demographic dividend appears. This is the favourable relationship between the potential workforce (adults) and the passive or dependent population (the elderly and young) (Erikson, 1981; Carstensen, Fried, 2011; Fried, 2015).

Thus, the third demographic transition, with repercussions in aspects such as age structure or the composition of the labour market, contemplates complementarity and substitution in the labour market (Dribe et al., 2017). The third demographic transition revolves around the increasing presence of immigrants, and its most worrying aspect is, for different authors, the immigrants' impact on the destination labour market (Marozzi, 2016).

In this paper, we used Eurostat statistics for large age groups to estimate the dependence rate. The main aim is to measure the impact of immigrant workers on the salaries of the population as a whole. These salaries constitute one of the indicators of the dividend attributed to immigrants as we believe that salaries are one of the underlying causes of current migratory movements. We also consider economic growth, labour, level of education and ageing (Notestein, 1953; Pew Research Center, 2015).

Thus, demographic transition and demographic dividend are two closely linked concepts. Scientific literature portrays them as being parallel phenomena. The first demographic transition generates a demographic dividend with its own characteristics (the bonus of economic growth due to a constant increase in the working age population group). The second demographic transition is fostered by qualitative improvement in the working age group generated by the increasing proportional importance of older workers.

Our aim is to analyse the correlation between transitions and demographic dividends with the support of scientific production. We attempt to deal with the relationship between what some authors (Coleman, 2006) refer to as the third demographic transition and a potential third demographic dividend. We understand that the third dividend should correspond to the driving idea behind this new transitional cycle: the main engine is immigration, and therefore the triggering force is not population growth but the sustained arrival of immigrants from developing countries who fill gaps in the labour market resulting from accumulated years of low birth rates in the local population (Szreter, 2015).

The study comprises three parts. The first is a theoretical approach to the concepts of demographic transition and demographic dividend; we consider these terms to be intrinsically related and in continuous evolution, since patterns in structural changes in the population imposed by each transitional model can be applied to different models of the demographic dividend. The second part is an empirical analysis of Western European countries, considering the third demographic dividend on the basis of the evolution of distribution between foreign and domestic populations in cohorts of the working-age population during 2006–2014. The third part is an analysis of panel data regression based on two scenarios, and a study of the resulting model.

2. Theoretical framework

The concept of the demographic dividend derives from the theory of the demographic transition, one of the most important theoretical contributions of demography, traditionally inclined towards quantitative methods (Kirk, 1996).

The first outlines of the demographic transition can be found in the identification of regularities and the corresponding proposals for country taxonomies, regarding the evolution of population size in different countries (Thompson, 1929; Landry, 1934), though the term itself was still not used at the time. F. Notestein (1945) established the basis of the transnational theory.

Between 1950 and 1990, theoretical development focused on what might be called the first demographic transition in which the transition towards levels of greater socioeconomic development were accompanied by changes in demographic behaviour (Coale, 1973, 1984). Different rhythms, followed by the descending evolution of mortality and fertility, at different rates, resulted in stages of large accumulated volumes of demographic excess. As it entered the labour market, this demographic surplus brought about a demographic dividend, or at least what became known as the first dividend, due to its analogy with the first demographic transition.

In the field of migration and mobility a model analogous to the demographic transition was presented. The mobility transition hypothesis posed by W. Zelinsky (1971) describes this process in the populations of developed countries in four stages (the pre-modern traditional society, the early transitional society, the late transitional society and the advanced society) which synthesize regularities observed in the spatial mobility of the population following a process parallel to the standard transitional theory. This theory detected regularities for international migration in agrarian colonisation processes in border areas, population movement from the country to the city and inter- and intraurban migration. Zelinsky ended his proposal with the projection of an ulterior phase (a future superadvanced society) in which he established forecasts that predicted events such as waves of unqualified labour force migration from developing countries or increasing control of population mobility.

The demographic dividend refers to extra economic growth strictly attributable to the population; it cannot therefore be considered the same as productivity gains associated with technological (innovations) or institutional (changes in modes of social organisation) changes. This added value associated with demography was, at least originally, conceived as an increasing number of young workers joining the workforce as a result of periods when fertility exceeded mortality (transitional period). This first demographic dividend coincides with the conventional theory of the first demographic transition and is currently valid, though limited to developing and, to a lesser extent, emerging countries, i.e. countries still immersed in the demographic transition or at the end of it, where higher levels of fertility over mortality ensure that the flow of new job applicants continues to rise. Scientific literature focuses on questions associated with fertility (Bloom et al., 2009; Moultrie et al, 2012) and on differential mortality by age cohorts (Canudas-Romo, Guillot, 2015; Masquelier et al., 2014; Timaeus, 2004). Issues that concern this current are related to economic development (Bloom, 2003; Bloom. et al., 2013), mainly in Sub-Saharan Africa and South Asia, where the majority of countries that have not concluded the transitional stage are located. Such issues also include cases in which the first dividend is coming to an end, for example, China. These studies mainly deal with the precise conditions required for converting the spurt of potential economic growth associated with the dividend into real growth given the institutional weaknesses existing in many developing countries (Bloom et al., 2007 in Sub-Saharan Africa; James, 2008 and Chandrasekhar et al., 2006 for India; Wongboosin et al., 2005 for Thailand). They also deal with the implications that the transient nature of this dividend has on the sustainability of the growth model in some countries, such as China, facing drastic changes in age structure (Fang , Wen, 2012; Wang, 2007), and which is linked to the emergence of a second dividend (Cai, 2010).

In its first stages, the transition theory soon met with new processes that undermined its explanatory power with regard to contemporary populations. The heterogenous nature of the demographic paths of different populations and complexity of demographic phenomena limit the explanatory value of this theoretical framework (Kreager, 2009), opening up a new approach that refers to an ulterior second demographic transition in industrialised countries since 1960, this time supported by both changes in basic demographic magnitudes, e.g. fertility, and by the appearance of new family models (Van der Kaa, 2002, 2004).

These changes imply a new perspective of the demographic dividend, not so much concerned

with the contributions of working age groups as with older age cohorts. New contributions have deepened and expanded the concept of the demographic dividend (Mason , Lee, 2006; Mason, 2007). They acknowledge two different stages in the demographic transition (first and second transitions) as a result of different levels of socio-economic development in different countries. Logically, this implies a split in the concept of the dividend: one demographic dividend corresponding to a higher rate of growth in the working age population (net producer) in comparison with the dependent population (net consumer); a second dividend associated with the increasingly ageing working population, which results in increased production as the strengthened group of older workers strive to build assets to have a more financially comfortable retirement (Lee,Mason, 2006). As these studies refer to demographic transitions that have almost ended, developed countries and emerging powers experiencing rapid demographic change, such as East Asia or Latin America, are chosen as empirical cases. Relevant issues no longer focus on economic development, but on developed countries with populations in the advanced stages of the demographic transition. They concern matters such as intergenerational transfers (Mason, Lee, 2007, for Taiwan; Phang, Mason, 2007, for the Republic of Korea), sustainability of pension systems (Turra, Queiroz, 2007, for Brazil) and, although formally addressing the first demographic dividend, they also analyse the repercussions of possible demographic ageing (Mejia Guevara et al., 2010, for Mexico).

2.1. A third transition and a third demographic dividend? The effects of migration and tensions in the labour market and the welfare state

David Coleman (2006) proposed a thought-provoking theory: Western Europe and the United States are undergoing a decisive change in their demographic composition associated with growing immigration. This transformation is fundamentally ethnic and cultural, and in the not too distant future the native population will be progressively displaced by groups from other countries which, in many cases, will be culturally distant. This mutation would have severe consequences on a social and cultural level; a true shock that is incipiently starting to be felt especially, but not only, in European countries. These consequences, whilst interacting with the migratory tradition in each country, affect the disparity of the migration policies of different states (Bauer et al., 2000). Leaving aside the social repercussions of immigration, clearly seen in tensions occurring in some important aspects of the welfare state (Huber, Oberdabering, 2015), we shall focus on the labour market.

The growing presence of immigrants will multiply friction with the national population in relation to sensitive issues, such as the labour market or some components of welfare. This, together with identity and culture shock, will cause tension leading to situations of maximum stress and trigger episodes of maximum violence, as occurred with the open doors policy in Germany after the 2015 Syrian refugee crisis (Jäckle , König, 2016).

Scientific evidence seems to sustain the theory of a dual national population: when immigrant workers are less qualified than the national labour force, the latter is in a more favourable position, whereas the opposite occurs when the situation is reversed (Mayda, 2006). Assuming this to be true, a brief observation would be appropriate.

Gang and Rivera-Batiz (1994) estimated complementary and substitution relationships between the resident and immigrant labour force in both the USA and the European Union at the time. The method applied considered subjective aspects of the work force (low-skilled employment, education, work experience). The impacts of immigration depend on the magnitude of migratory flows and on the relative levels of the mentioned attributes, and also on the degree of complementarity and substitutability amongst immigrants and nationals. The conclusions reached by the authors at the time pointed to the complexity of the impact of immigrants on residents' salaries which were very unequal; though small in absolute terms. Thus, when immigrant labour complements national labour (they diverge as far as training or experience are concerned), salaries increase. However, if they are substitutive (the mentioned attributes coincide or are similar), salaries decrease.

With regard to the response of the labour market to economic cycles, Dustmann et al. (2010) analysed the cases of Germany and the UK. They concluded that different types of behaviour existed in both cases, as the diminution of employment amongst immigrants occurs more rapidly during times of recession and hiring occurs equally as rapidly during times of recovery. However, the case of the UK is asymmetrical because in times of economic growth there are discrepancies in the creation of jobs between both groups. More jobs are created for foreigners than nationals. Also, with regard to the German labour market, in this case restricted to the federate states composing former Western Germany, D´Amuri et al. (2010) studied the impact of immigration throughout the 1990s, and pointed out that during this period it was not the native workers who were negatively affected by the arrival of foreigners, but immigrants that had settled in the previous decades, due to a large extent to the high level of substitution between the two groups within a context of marked rigidity in the labour market. However, Glizt (2012), based on the peculiar treatment by the authorities of the large influx of immigrants with German ancestors from western Europe (they were channelled towards certain regions according to family and work criteria), detected that during the 1990s and the start of this century the presence of immigrants had a significant effect on increased unemployment in the local population, though not on salaries.

One specific case is Spain (Carrasco et al., 2008). This country, until recently one of emigration, has become the destination for large volumes of immigrants since the second half of the 1990s. In this particular case, after analysing both legal and illegal immigration, the authors found no evidence of negative impacts on employment rates or on the salaries of nationals.

Competition between immigrants and nationals can also be seen in the impact on employment levels amongst the latter, attributable to immigration. Jean and Jiménez (2011) investigated this in OECD countries and found no permanent effect of immigration on unemployment amongst nationals. They discovered that changes in the percentage of immigrants in the workforce may have a temporary effect on unemployment in the national population. In any case, the impact is weak when analysed at skills level.

Another particular case is Israel. Cohen-Goldner and Paserman (2011) studied the impact of massive immigration into the country from Russia during the 1990s, based on the assumption that immigrants are good substitutes of the local workforce. The effect may not be noticeable to begin with but it increases in time as they acquire the skills and competence of the local population. The authors concluded that the effect of this migratory episode was minimal in terms of employment. However, in terms of salary, a negative correlation was detected as the high level of education of the newcomers had no effect on the salaries they received in their first employment. The imbalance was corrected over time and the salaries of both groups became similar as immigrants began to occupy posts that were on a par with their level of education.

Regarding the difference in salary between immigrants and nationals, Islam and Parasnis (2016) studied the case of Australia, distinguishing between the salaries of white- and blue-collar workers. The authors observed how in the case of highly qualified white-collar posts, the salaries of immigrants were even higher than those of nationals; the complete opposite occurred in the case of blue-collar workers.

The impact of immigration is not only felt in terms of employment but also in different levels of employment and salaries. Borjas (2006) studied the impacts of immigration on the labour market in the United States and changed the perspective on this issue, pointing to the adjustment mechanisms that the native population adopts to avoid the adverse effects of immigration in this respect. One of these adjustments is migratory movements. There is evidence that the main areas receiving foreign immigrants are characterised by a reduction in the number of immigrants from other parts of the United States and by natives emigrating to other parts of the country.

The idea of an eventual demographic dividend, similar to that seen in the first and second demographic transitions, is not suggested by any of the above authors; neither do they refer to the concept of the third demographic transition mentioned by Coleman. However, they do address the repercussions of immigration on labour market variables

(salaries, employment) or on social and political tension occurring between the local population and immigrants.

3. Stylised facts: immigration in European countries

There are 20 European Union countries in the Organisation for Economic Co-operation and Development (OECD) and the impact of the presence of a foreign population on the population as a whole and on labour differs in each one. Figure 1 represents the overall percentage of foreigners in the total number of population for 2006 and 2014. The graph is divided by a diagonal line starting from zero. In the countries to the left, the percentage of foreigners is higher in 2014 than in 2006 and the opposite occurs in those to the right. The vast majority of countries are situated above or along the line, with very few below it; Estonia is possibly the most significant case due to the progressive naturalization of its Russian minority, but slight decreases have also been observed for Germany and Greece. Thus, the foreign population is undeniably dynamic, reaching estimable percentages of growth in countries such as Austria, Belgium and, in particular, Luxemburg, where it has surpassed one tenth of the total population (reaching almost 45% in the third dividend). The foreign population in Estonia and Spain has also gained considerable importance. However, contrary to the previously-mentioned countries, in Estonia there is a constant withdrawal of immigrants and in Spain the situation reached a peak at some time during the study period and there is now a certain ebb in the immigration tide. In other territories, such as Denmark, France, Italy, Sweden and the UK, levels have reached an intermediate magnitude of between 5% and 10%, with a positive dynamic throughout the period; however, in Germany and Greece, with similar figures, there has been a significant slowdown with regard to the foreign population. At the other end of the scale, Hungary, Slovakia and Poland have hardly any foreigners inside their borders.

Figure 2 shows analogous information, though it is restricted to the working population segment. The graph reading is identical to that of Figure 1. As in the case of the population as a whole, the period in question also witnessed an increase in the number of foreigners in the labour force subgroup. The exceptions are Estonia, for the previously-mentioned reasons, and Spain and Portugal, due to the

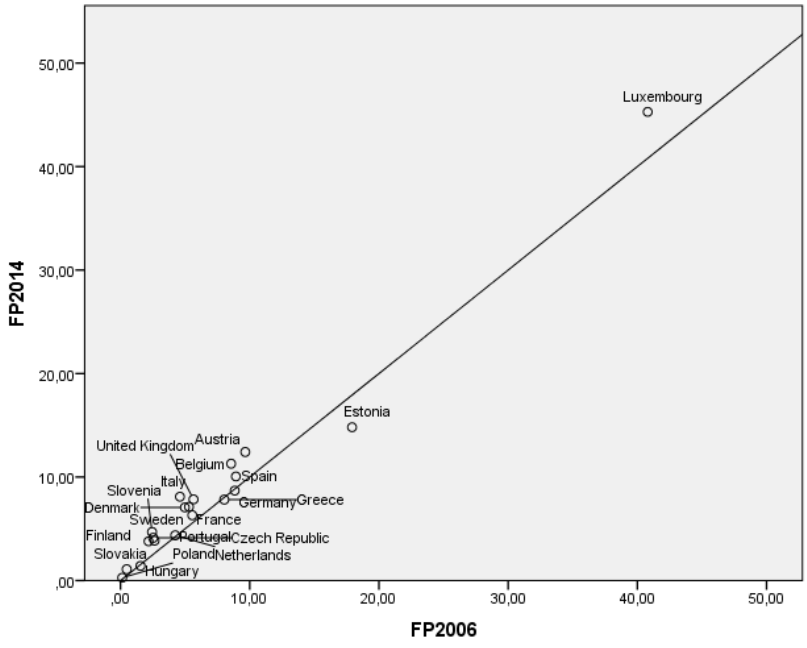

Fig. 1. Participation rate of foreigners in the total population in 2006 (FP2006) and 2014 (FP2014)
Source: Eurostat. Own compilation

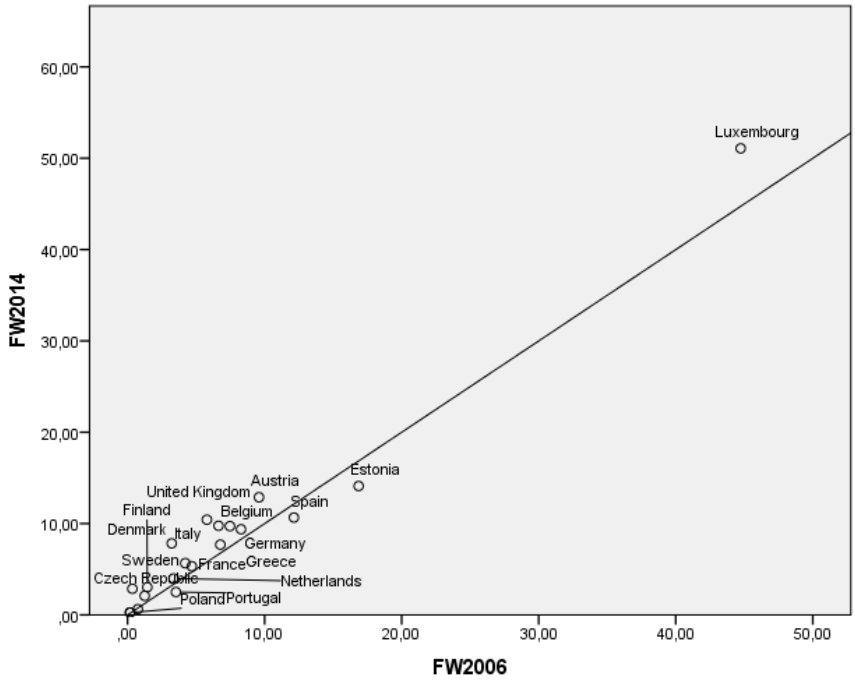

Fig. 2. Participation rate of foreigners in the total labour force in 2006 (FW2006) and 2014 (FW2014)
Source: Eurostat. Own compilation

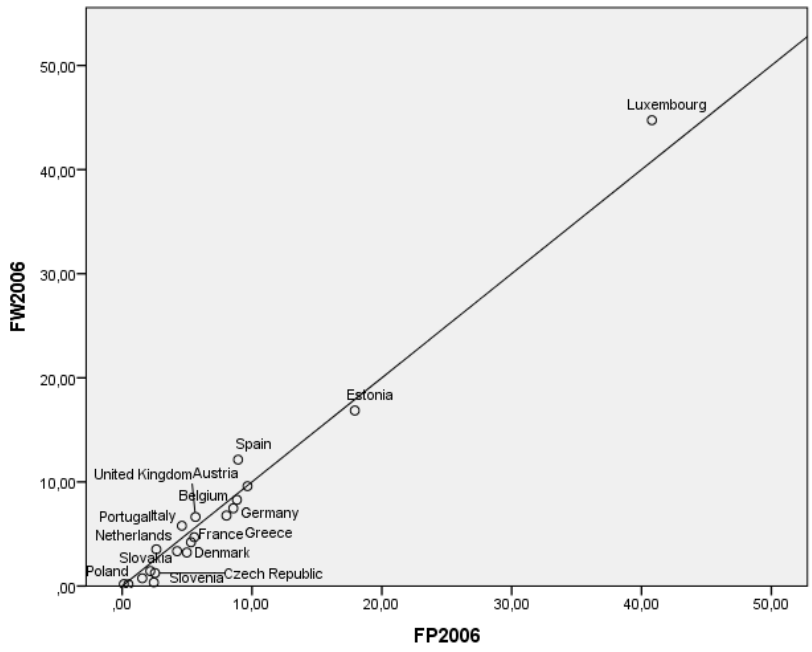

Fig. 3. Relationship between the number of foreigners in the total population (FP2006) and the labour force (FW2006)
Source: Eurostat. Own compilation

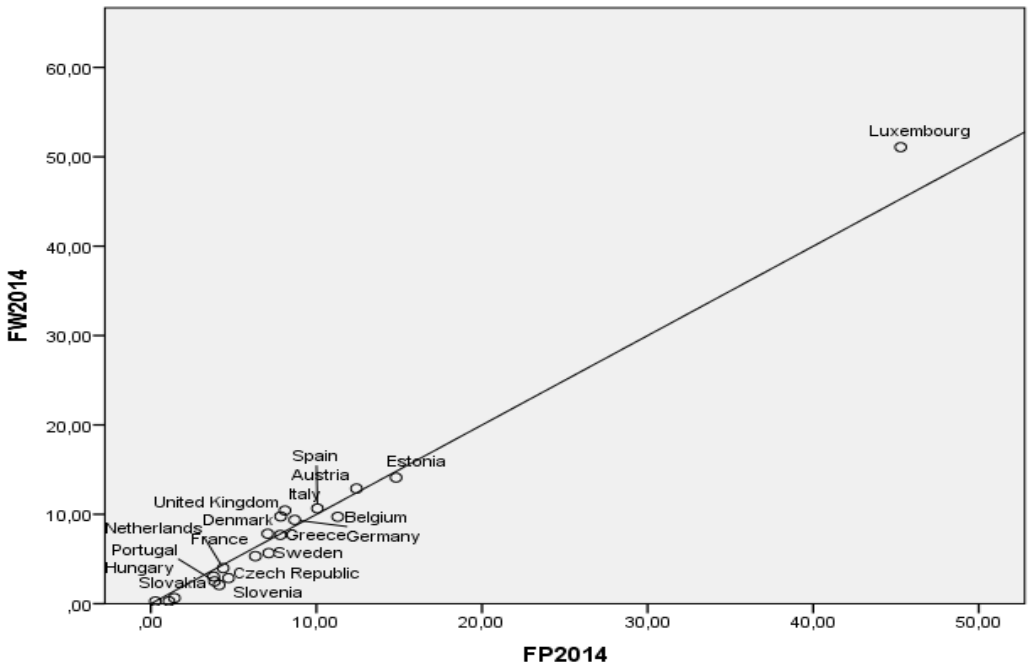

Fig. 4. Relationship between the number of foreigners in the total population (FP2014) and the labour force (FW2014)
Source: Eurostat. Own compilation

severe recession affecting both countries. At the end of the study period, the weight of foreign workers is overwhelming in Luxembourg, where it exceeds 50%; significant in Austria, Estonia, Italy and Spain, where it exceeds one tenth; or in Belgium, Germany and the United Kingdom, slightly below the above-mentioned level.

Economic theory highlights motivation to work as the main cause of immigration, with an expected higher number of foreigners in the labour force than in the population as a whole. Figures 3 and 4 link both percentages for 2006 and 2014 respectively. Points above the diagonal line imply that the fraction of foreigners is higher in the labour market than in the total population. With the exception of Luxembourg, the percentages are close to each other, with some convergence throughout the studied period. This effect would be influenced by financial difficulties at the time, via a decrease in the number of foreigners in the formal labour market, or by the activation of family reunification processes.

The fact that 'immigrant' is not synonymous with 'foreigner' means that in many countries processes for granting citizenship tend to underestimate the importance of immigration associated with the condition of being foreign. For this reason, different authors have decided to consider persons born abroad as a criterion for measuring the real impact of immigration (Coleman, 2006). In this study, for reasons derived from the structure of the sources, we have opted for the nationality criterion as Eurostat provides data for 2006 and 2014, just before the wave of migration in 2015. Figure 5 relates percentages of the total population of foreign citizens with persons born in other countries. The points above the diagonal line on the map indicate countries where the percentage of foreigners exceeds the percentage of the foreign-born population, an unusual and anecdotal situation, brought about by specific situations such as small nations and strong employment areas close to their borders (Luxembourg fits this profile quite well; the situation in the Czech Republic is more difficult to explain).

In the balance between both percentages, four factors favour a greater difference between the foreign-born population and foreign citizens: the first, which affects some countries, is the result of the eventful history of Europe and the forced movement of people following the latest global conflagration, which still has implications in countries such as Germany (Douglas, 2012), and has generally left its mark on practically all of Europe (Rei-

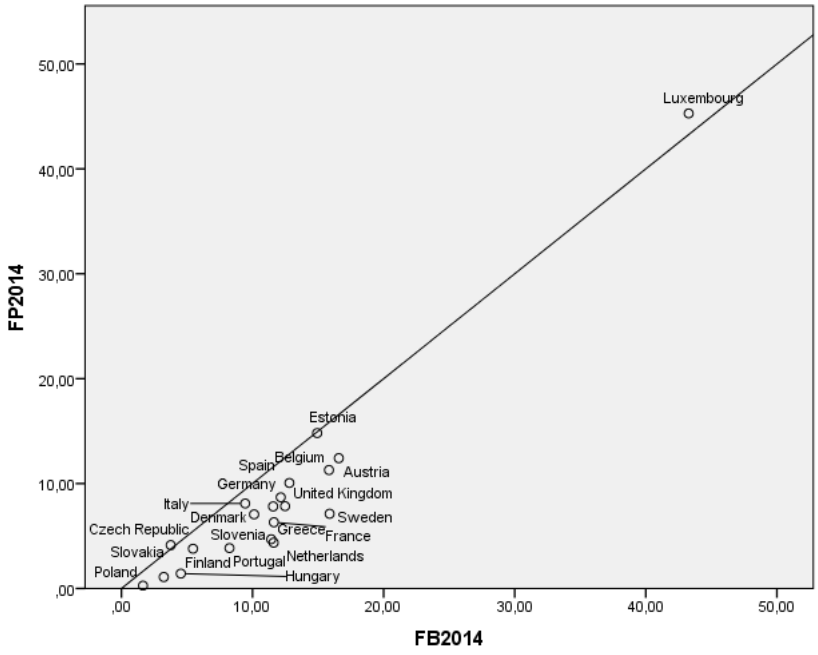

Fig. 5. Foreigners (FP 2014) versus those born in other countries (FB 2014)
Source: Eurostat. Own compilation

nisch ,White, 2011); repatriations following the emancipation of former colonies, as in the case of France and Algeria (Jordi, 2002) or the United Kingdom and the Commonwealth (Hansen, 2002); the wave of migrants from south to south east Europe towards countries in the north and west of the continent, encouraged by the strong demand for labour during the economic boom in 1950 and 1970 (Messina, 2007); the disparate generosity of national legislations in granting citizenship. Logically, the incidence of any of these factors would have a lower impact in the present day, especially movements following the Second World War, but could be decisive in countries where immigration is currently scarce, such as Eastern European countries. On the contrary, those that have only recently acquired the role of immigration countries (Spain, Italy) are situated on the equiproportionality line, the difference between the birth and citizenship criteria increasing only by applying the mechanisms of naturalisation.

Figure 6 shows the variation in the percentage of foreign workers aged 30–39, 40–49 and 50–59. Finland, Italy, the Czech Republic and the United Kingdom can be seen as the leading countries in the growth of this group in all age ranges. In the case of the Czech Republic, the data are misleading as they are based on derisory percentages; in the case of Italy, the fact that it is the first country on the central Mediterranean routes of irregular immigration, is significant. In Finland, there was a modest proportion of foreigners in 2006, which has increased due to the growing attraction of Nordic countries. Many of these immigrants are refugees (as in the case of Sweden, where rapid growth in the number of younger foreigners can be seen). Finally, amongst countries that traditionally receive immigrants, only the United Kingdom remains as one of the destinations with the highest level of growth due to the labour market and attractive cultural environment for immigrants. At the other end of the scale are the countries where a decrease in the immigrant population is highlighted, particularly Estonia and Denmark, though with nuances (Bench, Mouritsen, 2013): in the first case, specific tensions associated with its wide Russian minority could have led to part of this group being naturalised; in the second case, we believe that a restrictive policy with regard to the entry of foreigners may be behind these data. With regard to the other cases, only Spain appears in the 30 to 39-year-old group, where the severity of the crisis has put a stop to the flow of mostly young immigrants; no new cas-

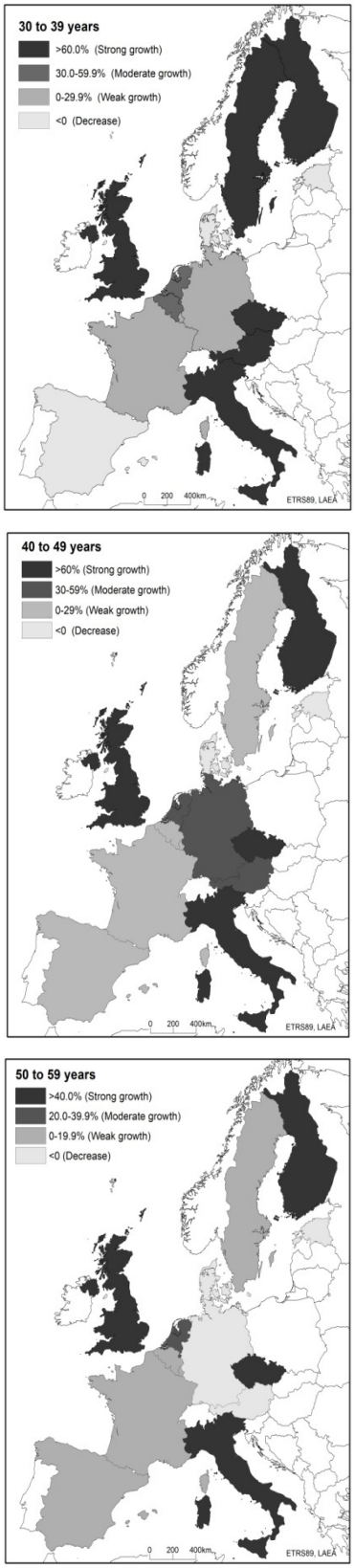

Fig. 6. Variation in the representativeness of foreign workers
Source: Eurostat. Own compilation

es have been mentioned for the 40 to 49-year-old group. Finally, Austria and Germany, which have been receiving immigrants for decades, appear in the 50 to 59-year-old group. Nationalization may be the cause of the variation observed.

From the perspective of spatial contrasts, this approximation enables our essentially economistic theses to be modulated. The cases of Italy, Estonia and even Finland or Sweden underline the importance of other motivations: the pursuit of a better future means that these countries, either because of their geographical location on immigration routes or their positive attitude to asylum for humanitarian reasons (for the case of Sweden, see vid. G. Lemaitre -2007-), receive large numbers of immigrants who care little about differences in salary in one labour market or another.

4. Empirical approach

We selected a number of indicators that quantify the impact of the workforce on one of the main elements defining the labour market: salaries. We propose a methodology based on the analysis of regression with panel data, using a combination of the fraction of foreign workers organized by age groups, and the measurement of disparities between foreigners and nationals for different attributes. Finally, we propose two approaches: a strictly linear one and another in which the reciprocal transformation of determined variables is used to give more relevance to countries where fewer differences exist between local and foreign population attributes.

4.1. Data

Twenty countries belong both to the European Union and the OECD. However, there are gaps in the disaggregated information available in the Eurostat data base for 2006 and 2014 in certain countries, specifically Greece, Hungary, Poland, Portugal, Slovakia and Slovenia. In this context, countries with the lowest incomes and levels of immigration are not included in the analysis. These gaps have also led to the study of impacts on groups of workers being restricted. National specificities regarding ac-

cess to and withdrawal from the labour market are reflected in disparate initial and final intervals. Cohorts of workers aged between 30 and 59 were taken into account to avoid problems with statistical consistency.

Thirteen variables were selected (Table 1), four of which measure the impact of migration on society as a whole, and nine are indicators of migration itself.

All of the variables collected for the impact of the foreign population are dependent and correspond to the annual average pay of full-time work by age group (SAL3039, SAL4049, SAL5059). This information, originally expressed in euros, was transformed into common logarithms, mitigating the distorting effect of extreme variables on the results obtained. We can only access this information every four years.

Immigration in the world of labour was quantified by the percentage of foreign workers in comparison with the total work force. Together with salaries, it is the only information that has been particularized by age groups (EXT3039, EXT4049, EXT5059). It is calculated based on four-monthly observations, annual data being obtained as the weighted average of the percentage of foreigners in each quarter.

The final block, generically labelled by the prefix GAP, consists of a succession of variables used to quantify discrepancies for determined attributes among foreigners and nationals in each country. These variables acquire the *proxis* value to introduce the effect of the differential between the two groups on the dependent variables that do not discriminate them (the information on annual salaries supplied by Eurostat refers to total amounts). The calculation procedure is homogenous.

$$GAP_{it} = X_{it}^{ext} - X_{it}^{nac} \quad (1)$$

where X is a percentage relative to any variable. It denotes an observation in country i and at time t, ext represents the foreign population, and nac the national population of the country in question. The resulting values may be positive or negative, implying different situations with regard to the position of foreigners in the host society as a whole.

These variables refer to three different fields, level of education, poverty risk amongst workers and unemployment. The estimation procedure consists

Table 1. Dependent and independent variables

Variable	Type	Description
SAL3039	Dependent	Mean annual salaries of full-time workers aged between 30 and 39. Expressed in logarithms
SAL4049	Dependent	Mean annual salaries of full-time workers aged between 40 and 49. Expressed in logarithms
SAL5059	Dependent	Mean annual salaries of full-time workers aged between 50 and 59. Expressed in logarithms
EXT3039	Independent	Percentage of foreign workers aged between 30 and 39
EXT4049	Independent	Percentage of foreign workers aged between 40 and 49
EXT5059	Independent	Percentage of foreign workers aged between 50 and 59
GAPEDU02	Independent	Difference between the percentage of foreign and national workers with basic studies (levels 0 to 2)
GAPEDU34	Independent	Difference between percentages of foreign and national workers with intermediate studies (levels 3 and 4)
GAPEDU58	Independent	Difference between percentages of foreign and national workers with higher studies (levels 5 to 8)
GAPRPW	Independent	Difference between percentages of foreign and national workers at risk of poverty
GAPUNEMP1539	Independent	Difference between percentages of unemployed foreign and national workers aged between 15 and 39
GAPUNEMP	Independent	Difference between percentages of foreign and national workers

Source: Own compilation

of calculating the difference corresponding to percentages that represent a specific attribute between foreigners and nationals in each country. A positive value implies higher values for the mentioned attribute amongst foreigners, and a negative one the opposite. Statistics provided by Eurostat enable the level of education to be disaggregated in three strata: primary (GAPEDU02), secondary (GAPEDU34) and higher studies (GAPEDU58). If foreigners have a positive differential in primary studies, we can infer that they compete for unskilled jobs. If this occurs in the case of secondary studies it would imply greater competition for "blue collar" posts, whereas in the case of overqualification (a higher percentage of foreigners with higher education) they will presumably compete more for "white collar" posts.

Generally speaking, the integration of immigrants is difficult. This is particularly true in first generations, above all in the case of those who have not acquired nationality. A good indicator of the degree of integration is the number of workers at risk of poverty, salaries somehow reflecting the difficulties faced by immigrants when trying to improve their position in the labour market.

Unemployment is the last element in the set of indicators depicting differences between the two groups. The idea is to measure the incidence of unemployment in the immigrant population, for both the working population as a whole (GAPUNEMP) and younger age groups (GAPUNEMP1539).

The statistical descriptions are shown in table 2. The percentage of foreigners decreases with age and there is a broad spread amongst the data for the different countries, and also amongst practically all of the variables, as indicated by the values for standard deviation. Immigrants have a better primary level of education than nationals, noticeably lower at intermediate level and similar with regard to higher education; in this series of indicators, some countries can be highlighted for different reasons: in primary studies the positive differential is maximum in Germany, France, Finland (2014) and Sweden (2014), whereas Estonia and Spain show negative values; the differentials for higher studies are positive for the Czech Republic, Denmark, Luxemburg, Sweden and the United Kingdom (the latter in 2014 only), which are now destinations for highly qualified immigrants. They are also poorer than nationals, the risk of poverty being very similar only in Holland (2006, 2014) and the Czech Republic (2014). Finally, unemployment rates are higher, particularly amongst young people; unemployment is higher in both population groups only in the Czech Republic.

4.2 Methodology

Scientific literature dealing with the impact of immigration on the labour market, as seen in section 2, focuses on its influence on employment and salaries. Also, generally speaking, works that use regressions on existing data employing fixed effects predominate (Carrasco et al., 2008; Glitz, 2012; Borjas, 2006; Cohen-Goldner, Paserman, 2011;

Table 2. Statistical descriptions

	N	Minimum	Maximum	Mean	Standard deviation
SAL3039	42	9.165	10.929	10.410	0.460
SAL4049	42	9.016	11.088	10.503	0.521
SAL5059	42	8.878	11.156	10.510	0.561
EXT3039	42	1.34	57.88	12.44	13.10
EXT4049	42	0.84	52.47	9.68	11.19
EXT5059	42	0.46	42.46	8.24	10.12
GAPEDU02	42	-8.30	28.30	7.58	10.09
GAPEDU34	42	-24.80	14.50	-7.43	11.02
GAPEDU58	42	-12.20	19.70	-0.13	8.08
GAPRPW	42	-0.50	26.90	9.41	5.86
GAPUNEMP1539	42	-4.70	17.60	5.66	4.49
GAPUNEMP	42	-2.80	15.30	6.41	3.95

Source: Eurostat. Own compilation

Dustman et al., 2010) in comparison with other alternatives such as panel-type data regressions with random effects (Islam, Parasnis, 2016), analyses of substitution elasticities (Gang et al., 1994; D´Amuri et al., 2010), and analyses of delays in time series (Jean, Jimenez, 2011). In this paper, pooled OLS fixed effects have also been used, as well as heteroskedasticity-robust HAC errors. The general model employed has the following specification:

$$y_{it} = \alpha + \beta X_{it} + \gamma_j Z_{jit} + \varepsilon_{it} \quad (2)$$

where y is the different target variable for each regression (salaries per age group), is the constant term, X is a different independent variable according to the dependent variable used (percentage of foreign workers per age group), and Z is a pool of j variables that vary in time and with each transversal unit, but do not change for the different regressions (relative variables at training, risk of poverty and unemployment level). Finally, is the error term so that.

This model was particularised based on two approaches to the data for differences between foreign and national workers: the first considers that these variables are linear, whereas in the second they are considered non-linear by their transformation into a reciprocal model. The former is not difficult to read, the effect of the regressor is proportional to the field of variation of the variable, depending on the final sign of the product of the coefficient signs and the variation of the variable. The reciprocal model is more complex to interpret because although the coefficients are linear, the result of the transformation is not. The field of variation has a basic characteristic, it asymptotically tends towards zero, so that the effects of high values tend to disappear whereas low values have a very large impact; logically, the magnitude of the impact on the Dependent variable depends on the coefficient of regression which is constant. The reason justifying this is the nature of the information provided by the >GAP variables: they measure discrepancies between the foreign and local populations, considering that their real impact on salaries becomes less noticeable as it increases, until both variables become independent because, generally, in extreme cases they would refer to small marginal groups (for example, if we record the existence of extreme overqualification, i.e. a very high positive value of foreigners with higher education, this very likely reflects the existence of a very small minority pool of immigrants, usually employed in universities or research centres; conversely, when there is a very strong positive differential for foreign workers with basic studies, this could be related to minority groups with a very low impact on the labour market due to precariousness). In other words, we tend to magnify the impacts of immigration on salary when the status of the immigrant is similar to that of the national worker, and minimize it in the opposite case.

Considering both specifications the general model was particularised as follows:

A. Non-transformed GAP variables:

$$SAL3039_{it} = \propto + \beta EXT3039_{it} + \theta_j + Z_{it} + u_{it} \quad (3)$$

$$SAL4049_{it} = \alpha + \beta EXT4049_{it} + \theta_j Z_{it} + v_{it} \quad (4)$$

$$SAL5059_{it} = \alpha + \beta EXT5059_{it} + \theta_j Z_{it} + w_{it} \quad (5)$$

where

$$\theta_j = \theta_1 GAPEDU02_{it} + \theta_2 GAPEDU34_{it} + \theta_3 GAPEDU58_{it} + \theta_4 GAPRPW_{it} + \theta_5 GAPUNEMP1539_{it} + \theta_6 GAPUNEMP_{it} \quad (6)$$

B. Transformed GAP variables:

$$SAL3039_{it} = \alpha + \beta EXT3090_{it} + \gamma_j z_{it}^{rec} + u_{it}^{rec} \quad (7)$$

$$SAL4049_{it} = \alpha + \beta EXT4049_{it} + \gamma_j z_{it}^{rec} + v_{it}^{rec} \quad (8)$$

$$SAL5059_{it} = \alpha + \beta EXT5059_{it} + \gamma_j z_{it}^{rec} + w_{it}^{rec} \quad (9)$$

where

$$\gamma_j z_{it}^{rec} = \gamma_1\left(\frac{1}{GAPEDU02_{it}}\right) + \gamma_2\left(\frac{1}{GAPEDU34_{it}}\right) + \gamma_3\left(\frac{1}{GAPEDU_{it}}\right) + \gamma_4\left(\frac{1}{GAPRPW_{it}}\right) + \gamma_5\left(\frac{1}{GAPUNEMP1539_{it}}\right) + \gamma_6\left(\frac{1}{GAPUNEMP_{it}}\right) =$$
$$= \gamma_1 GAPEDU02_{it}^{rec} + \gamma_2 GAPEDU34_{it}^{rec} + \gamma_3 GAPEDU58_{it}^{rec} + \gamma_4 GAPRPW_{it}^{rec} + \gamma_5 GAPUNEMP1539_{it}^{rec} + \gamma_6 GAPUNEMP_{it}^{rec} \quad (10)$$

rec indicating that the variable was transformed by applying the reciprocal model, and are coefficients of regression, whereas u, v and w refer to errors, so that .

The specifications will undergo transformations because as the coefficients are estimated, restricted equations will be designed, eliminating statistically insignificant variables (18 models were estimated, ten if the original values were maintained and eight for the transformed results).

4.3. Results

Tables 3 and 4 show the results of the estimation of the models, the first using original GAP variables, the second transforming them using the reciprocal model. Each table consists of three panels, each corresponding to a different dependent variable. The columns inside each panel correspond to a different specification, the column with estimations on the far left are unrestricted models, whilst those on the left are models successively restricted to the statistically significant parameters. The rows show the results of the estimations. The upper one shows the constant of the regression, the seven rows immediately below the estimation of the coefficients of regression correspond to the independent variables; whereas the four lower rows include parameters for goodness of fit (coefficient of determination –R squared LSVF, R squared intra-), suitability of the specification (AIC, Akaike information criterion) and correlation between independent variables and the error term (Durbin-Watson criterion).

Fourteen different specifications, seven models for each of the two procedures used, were estimated. Non-statistical significance of the percentage of foreign workers in comparison with the whole labour force is the element common to all of them, thus the analysis focuses on differentials between foreigners and nationals in the country in question (the variables assigned GAP).

The regressions using non-transformed GAP variables show different results depending on whether salaries of workers aged between 30 and 39 years or those of older workers are taken as the regressand. In the first case, the education differential does not seem to be important in the variation in salaries, which explains why a second regression was made to estimate the coefficients of the unemployment differentials (in the restricted specification GAPUNEMP1539 is significant at 0.05, whereas GAPUNEMP is significant at 0.10; both are significant at 0.01 in the restricted model). The explanatory capacity of specifications (1) and (2) is moderate in the first case but decreases substantially in the second (see R-squared intra), the lower quality of the restricted model translates into a risk of correlation between the independent variables and errors, albeit the quality of information is slightly better. Adhering to the explanatory variables, higher unemployment amongst young foreigners implies a decrease in salaries; on the other hand, a higher rate of unemployment in the group of foreigners as a whole implies slight increases in salaries. However, according to economic theory, the larger pool of the unemployed increases the number of job opportunities and therefore salaries tend to decrease, although some caution is required when interpreting the variable in model (1) due to its little significance.

Salaries in older age groups, 40 to 49 and 50 to 59, give substantially different results. Focusing on the salaries of middle-aged workers, three models—(3), (4) and (5)—were estimated. The first is unlimited, with a noticeably higher explanatory capacity than its restricted versions, greater informative quality, and there are no consistent signs of correlation with errors. The significant variables in the first ver-

Table 3. Results of the regressions with non-transformed GAP variables

Dependent variable: SAL_30_39	**(1)**	**(2)**	
Constant	10.08***	10.292***	
	(0.188522)	(0.027001)	
EXT3039	0.0953141		
	(0.113916)		
GAPEDU02	0.253868		
	(0.113916)		
GAPEDU34	0.259801		
	(0.239494)		
GAPEDU58	0.259531		
	(0.291695)		
GAPRPW	0.00954191		
	(0.00688716)		
GAPUNEMP1539	-0.336836**	-0.0538157***	
	(0.0160626)	(0.0117341)	
GAPUNEMP	0.0414868*	0.0658394***	
	(0.0209098)	(0.0118298)	
R2 LSDV	0.972605	0.967359	
R2 Intra	0.372266	0.252059	
AIC	-56.12573	-58.76705	
Durbin-Watson	1.363284	1.266606	
Dependent variable: SAL_40_49	(3)	(4)	(5)
Constant	10.2141***	10.449***	10.4475***
	(0.188594)	(0.0657088)	(0.0534241)
EXT4049	0.0790542		
	(0.127983)		
GAPEDU02	0.449033*	0.610904**	0.610632**
	(0.252562)	(0.218446)	(0.219531)
GAPEDU34	0.45346*	0.60492**	0.604668**
	(0.248197)	(0.216979)	(0.217987)
GAPEDU58	0.455302*	0.606348**	0.606142**
	(0.249933)	(0.219864)	(0.220854)
GAPRPW	0.0110262		
	(0.00773521)		
GAPUNEMP1539	-0.0362213*	-0.000302315	
	(0.0195158)	(0.0058792)	

Table 3. Continuation

	0.0417558		
GAPUNEMP			
	(0.0253846)		
R2 LSDV	0.971970	0.961494	0.961493
R2 Intra	0.356473	0.115957	0.115926
AIC	-44.70351	-37.36680	-39.36530
Durbin-Watson	1.310305	1.3424413	1.343636
Dependent variable: SAL_50_59	(6)	(7)	
	10.268***	10.4624***	
Constant			
	(0.141557)	(0.0525686)	
	0.075835		
EXT5059			
	(0.107202)		
	0.434271**	0.538798**	
GAPEDU02			
	(0.169056)	(0.231929)	
	0.439654**	0.53367**	
GAPEDU34			
	(0.163946)	(0.230132)	
	0.443782**	0.536568**	
GAPEDU58			
	(0.164546)	(0.232335)	
	0.0102547		
GAPRPW			
	(0.00752463)		
	-0.0371733		
GAPUNEMP1539			
	(0.0264311)		
	0.0418272		
GAPUNEMP			
	(0.0264311)		
R2 LSDV	0.978857	0.971470	
R2 Intra	0.338368	0.107219	
AIC	-50.283311	-45.690856	
Durbin-Watson	1.356342	1.389672	

(1), (3) and (6), unrestricted models; (2), specifications restricted to GAPUNEMP1539 and GAPUNEMP; (4), only GAP variables relative to the level of education and GAPUNEMP1539 are considered; (5) and (7), only the three GAP variables relative to studies are considered to be regressors. Note: ***p < 0.01, ** p < 0.05, * p < 0.10

Source: Own compilation

sion are the three relative to the education level differential and GAPUNEMP1539, all of which are at 0.10. Having considered the four significant variables, we specified a new model (4), in which only the differentials in education (all at 0.05) detract influence from the statistics perspective; the exclusion of non-significant variables in the unrestricted model implies a significant decrease in explanatory power (R^2 intra of 0.116), and, although the Durbin-Watson coefficient does not imply the existence of correlation between regressors and errors, it is on the limit. The final model for this regression, (5), implies that only the three education differentials, which are still significant at 0.05, are considered; however, the quality of the results remains at very discreet levels because despite the goodness of fit being close to that of model (4), the value for the Durbin-Watson coefficient indicates correlations with the error term. Adhering to the reading for the statistically significant coefficients, overqualification of foreigners in comparison with nationals implies higher salaries at any level; similarly, a higher rate of

unemployment amongst young foreigners has an indirect effect on the salaries of middle-aged workers, which decrease. However, this effect is quite weak, as exemplified by the trajectory of this coefficient in successive estimations.

Two models, (6) and (7), were calculated for the incomes of workers aged 50 to 59. In this case, the only variables that have an effective impact on salaries are those related to discrepancies between the level of studies reached by foreigners and nationals (they are significant at 0.05 in both the unrestricted and restricted variant). The exclusion of four regressors in the restricted version implies a sharp drop in the goodness of fit of the model (R-squared intra is 0.338 in the unrestricted specification and 0.107 in the restricted one), not compensated for by better quality information or by greater significance of the coefficients, though in both cases there is no clear evidence of correlation with errors. As in the case of middle-aged workers, a higher level of education amongst foreigners in comparison with nationals implies higher salaries, even though values for the coefficients are slightly lower.

Different levels of education play a major role in the salaries of older groups of workers. The more highly-qualified the foreign worker is at any level of education, the more salaries increase. This effect can be seen from two perspectives: a standard explanation would indicate that a higher number of better-educated foreigners implies a greater supply of workers and therefore a negative impact on salaries should be expected, which is not the case in the light of these results. The alternative explanation carries the greatest weight. The higher the level of education amongst foreigners, the greater their contribution to productivity, the higher the company's income and therefore the higher salaries are. According to these data, the second explanation would appear to be more feasible.

Table 4 shows the results of regressions obtained from the reciprocal transformation of variables relative to differences between attributes of foreigners and nationals in each country. This approach implies overweighting observations in which both groups are close to each other (the section of values between -1 and 1 tend to infinity as differences between them are annulled, whilst they asymptotically tend to zero between 1 and -1). A comprehensive approach enables us to reach an initial conclusion: the incidence of disparities in basic and average levels of education are not significant. However, over- or underqualification in terms of higher education are important as they determine salaries. Another regularity comes in the form of discrepancies in unemployment amongst young people, which, except in the case of salaries of younger workers, do not have a very significant impact on the regressands. Generally, the explanatory power of the regressions using this procedure is substantially lower, at least in the case of the unrestricted specifications. This does not occur with the models restricted to statistically significant variables which produce slightly lower results from the point of R^2 intra.

Effects on the salaries of workers aged between 30 and 39 are shown in models (8) and (9). As previously mentioned, the regression has a low R^2 intra, specifically, 0.233 in the complete specification and 0.120 in the restricted one. Both models have similar informative quality, though the former has a slightly more favourable Durbin-Watson value in the restricted specification (the risk of positive correlation between independent variables and errors is lower). The impact of variations in the regressors on salaries is only significant in GAPEDU58 and GAPUMEMP1539 (both at 0.05 significance), FAPRPW and GAPUNEMP (at 0.10); this significance increases in the restricted model (with the exception of youth unemployment which is significant at 0.10; 0.01 in the remaining regressors). The impact of variations in these independent variables is negative, except for youth unemployment, the impact of divergences on the risk of poverty being particularly noticeable. On the other hand, and discordantly with economic theory, a higher level of youth unemployment increases the salaries of unskilled workers aged between 30 and 39.

The effect of the independent variables on the salaries of workers aged between 40 and 49 is described in three models, with specifications that are the result of subsequent restrictions based on the statistical significance of the regressors. Model (10), which is unrestricted, determines that only the higher education differential (significant at 0.01), and, to a lesser extent, the risk of poverty and unemployment rates have an impact (the three coefficients corresponding to these indicators are significant at 0.10). In model (11), taking into account only the significant exogenous variables in specification (10),

Table 4. Results of the regression using reciprocal transformations of GAP variables

Variable Dependent: SAL3039	**(8)**	**(9)**	
Constant	10.252***	10.4191***	
	(0.23731)	(0.00430422)	
EXT3039	0.094617		
	(0.101056)		
GAPEDU02rec	0.0171654		
	(0.030359)		
GAPEDU34rec	0.116277		
	(0.0687299)		
GAPEDU58rec	-0.00745803**	-0.00963019***	
	(0.00292487)	(0.00271379)	
GAPRPWrec	-0.163624*	-0.06966634***	
	(0.0888689)	(0.0242508)	
GAPUNEMP1539rec	0.0259396**	0.00890515*	
	(0.0111406)	(0.00482128)	
GAPUNEMPrec	-0.097482*	-0.0495105***	
	(0.0509853)	(0.0132106)	
R2 LSDV	0.966539	0.961616	
R2 Intra	0.233262	0.120460	
AIC	-47.72455	-47.95989	
Durbin-Watson	1.495400	1.336127	
Variable Dependent: SAL4049	(10)	(11)	(12)
Constant	10.3658***	10.5206***	10.5159***
	(0.274561)	(0.00389974)	(0.00463913)
EXT4049	0.100832		
	(0.132307)		
GAPEDU02rec	0.0268465		
	(0.0281198)		
GAPEDU34rec	0.126842		
	(0.0796851)		
GAPEDU58rec	-0.0101865***	-0.012456***	-0.0115176***
	(0.00186916)	(0.00134848)	(0.00239513)
GAPRPWrec	-0.201209*	-0.084647***	-0.0980548***
	(0.1005508)	(0.0217038)	(0.0249552)
GAPUNEMP1539rec	0.0238189*	-0.000141514	
	(0.0133055)	(0.00220955)	

Table 4. Continuation

	-0.108362*	-0.0533368***	-0.0630282***
GAPUNEMPrec			
	(0.0593293)	(0.0111554)	(0.013333)
R2 LSDV	0.967541	0.972376	0.962779
R2 Intra	0.254783	0.135554	0.145462
AIC	-38.54163	-45.05314	-40.79247
Durbin-Watson	1.385944	1.271084	1.248976
Variable Dependent: SAL5059	(13)	(14)	
	10.4782***	10.5206***	
Constant			
	(0.222403)	(0.00396965)	
	0.0474597		
EXT5059			
	(0.127142)		
	0.0217663		
GAPEDU02rec			
	(0.0277805)		
	0.109568		
GAPEDU34rec			
	(0.0810588)		
	-0.0127196***	-0.01246446***	
GAPEDU58rec			
	(0.00217412)	(0.00130956)	
	-0.178687*	-0.0846281***	
GAPRPWrec			
	(0.0929647)	(0.0214739)	
	0.0162651		
GAPUNEMP1539rec			
	(0.014948)		
	-0.0975466*	-0.0533379***	
GAPUNEMPrec			
	(0.0528241)	(0.0111633)	
R2 LSDV	0.974684	0.972376	
R2 Intra	0.207795	0.135553	
AIC	-42.71842	-47.05308	
Durbin-Watson	1.412180	1.271137	

(8), (10) and (13), unrestricted models; (9) and (11), models restricted to GAPEDU58, GAPRPW, GAPUNEMP3539 and GAPUNEMP; (12) and (14), only consider variables GAPEDU58, GAPRPW and GAPUNEMP. Note: ***p < 0.01, ** p < 0.05, * p < 0.10

Source: Own compilation

they all have statistically significant coefficients at 0.01, with the exception of differences in employment amongst young people. Model (12) confirms, in essence, the conclusions obtained by specification (11). The explanatory power of the restricted version is low (R^2 intra of 0.255), but the decline in this coefficient of determination is lower than its non-transformed equivalent in the exogenous variables, since for models (11) and (12) it is quantified at 0.136 and 0.145, respectively. Analogically, the informative quality of these models is better in the restricted versions, which have a lower Akaike value (the minimum corresponds to specification (11)). The risk of correlation between regressors and errors is always present: although we cannot affirm that it exists in the unrestricted regression, the Durbin-Watson values indicate that it hampers the restricted versions. Generally, the coefficients of regression operate by reducing salaries; the effect of overqualification on higher studies in foreigners tends to reduce salaries, which is consistent with the economic theory because the supply of workers in-

creases; the same occurs in the case of the greater risk of poverty amongst foreign workers and a higher rate of unemployment among them, these results being expected: the first indicator refers to groups of population with a lower wage-bargaining power, the second group, again, has the effect of an increase in job offers.

The final regression corresponds to the salaries of workers aged between 50 and 59. The results of its specifications have lower explanatory values (the unrestricted version has an R^2 intra of 0.208, and the restricted one, 0.136) contrasting results being observed for the quality of information and risk of correlation of errors: model (13), which is unrestricted, has a higher Akaike value (it offers less information) than the restricted one (14); on the other hand, the Durbin-Watson index points to the presence of correlation with errors in the restricted version, whereas this cannot be affirmed in the unrestricted one. Focusing on the coefficients, a fairly similar situation to estimations made for the salaries of middle-aged workers was found. The same exogenous variables are statistically significant in the unrestricted version, with the exception of unemployment amongst young people. In model (13), the GAPEDU58rec variable is significant at 0.01, and GAPRPWrec and GAPUNEMPrec at 0.1. Including these three variables only in the restricted model, they all become significant at 0.01. As in the regression proposed for the salaries of workers aged between 40 and 49, once again, negative relationships are found: an inversely proportional impact is observed when disparity between foreigners and nationals is higher.

5. Conclusions

During the last 100 years, investment in social welfare has transformed our life expectancy. Now, almost all societies have passed the "first demographic dividend" of the transition from high mortality in an agrarian society to one with a lower infant mortality rate. Most societies are now in different stages of the second demographic dividend, promoting the accumulation of capital and more individual savings. If employment is available and policies are constructive, this will lead to positive financial results and increased social wealth (Lee, Mason, 2006).

As we approach a world in which life expectancy at birth is 76 globally, we have achieved something unprecedented in history: we have added a new 30-year stage to human existence.

Evidence suggests that the second demographic dividend does not capture all the potential of this demographic change. Sustainable benefits could be possible if we design and create significant roles for older adults that greatly benefit society. We could build a new stage of human development, a "third demographic dividend"; a dividend in which the roles and responsibilities of older adults in the last third of life bring new sustained social capital to satisfy social needs and create better social welfare beyond the second demographic dividend (Fried, 2016).

Many of our politicians believe that this additional stage of life is an obstacle in every sense of the word, with the elderly devouring disproportionate parts of our public and financial resources at the expense of younger generations. Political leaders worldwide are concerned about the "rate of old-age dependency" and the balance between working-age taxpayers and those who have retired and are "dependent" on society and use public sector resources. The main engine of this transitional cycle will be immigration. Migratory movements may come to represent the principal force governing the evolution of the economy in this century. We should therefore be aware of international migratory movements, structural changes and new demographic trends.

The set of regressions that we have made under the assumption of a linear relationship shows a clear disparity between the response of salaries of younger workers and those of middle-aged and older workers. In the former case, the factors most influencing variations in salaries are related to higher or lower levels of unemployment amongst foreigners in comparison with nationals from the country in question. As can be seen, this impact is negative in the case of unemployment which has a direct effect on this group, and on the contrary, it is positive with regard to differences in unemployment affecting all workers, regardless of their age. The first result is almost to be expected, a higher

level of unemployment amongst foreign youths implying that this group forces salaries down.

We have seen that the impact on the third dividend is caused by immigration which would fill the gaps in the labour market; therefore, the triggering force will be the continuous arrival of people from other countries. This is due to the low natural growth rate in the countries in this study.

Regressions under the assumption of inverse relationships indicate a specific characteristic of these transformations, which imply important nuances when reading the coefficients: if they are positive or negative, the reading has the usual interpretation (positive values imply growth in the regressand when the change in direction of the regressor is positive). This does not occur with the intensity of growth of the independent variable; that is, if the difference between the levels of basic education amongst foreigners in comparison with nationals of the country in question is positive and the coefficient is negative, the impact on salary is negative, but this repercussion is maximum when the levels of education in both groups are similar and lower when the difference is more obvious, until it disappears (it should be remembered that reciprocal models asymptotically tend towards zero).

If the difference in the level of higher studies between foreigners and nationals increases, pointing to either overqualification or underqualification, this displacement would indicate a reduction in salaries in the former case and an increase in salaries in the latter. The regressions that used exogenous non-transformed variables and found the impact of overqualification on the level of education in middle-aged and older workers relevant, gave positive results. A possible explanation for this could be the impact of the work factor on productivity; but it was also indicated that overqualification due to this concept producing negative coefficients associated to possible excess demand for work would be equally plausible. In other words, to the impact that the extra labour supply brought about by foreign workers has on salaries. Similar explanations can be found for the other two explanatory variables: the differential of foreign workers outside the system, poor workers, with lower wage-bargaining power, promote lower salaries; a greater discrepancy between the supply and demand of workers in the labour market, directly influenced by a higher rate of unemployment amongst foreigners, means lower salaries. The explanations in this paragraph are valid for the remuneration of other age groups.

We end our conclusions by indicating that this paper has focused on salaries, which is an exogenous variable. This strategy implies that we have put other equally relevant indicators to one side from the perspective of demand in the labour market. These would include the rate of job creation, , or other reasons such as aspiring to improve the living conditions of many immigrants from developing countries, or the phenomenon of refugees from countries torn by war or persecution on ideological or religious grounds. We are aware of the implications of a limited number of observations in a statistical analysis of the panel, which was due to the time sequencing of some relevant variables in the Eurostat data base, thus limiting our analysis to a short panel (three years and 14 countries). Therefore, there is a risk that the coefficients may not be robust. On the one hand, the sources used, and on the other, the deliberate choice of economic variables rather than other social or even cultural ones, limit the scope of this paper which should necessarily be enhanced by other future papers that may overcome shortcomings implicit in this study.

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