Resident population in Portugal in working ages, according to migratory profiles, 2008
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Introduction

Portugal, traditionally characterized as an emigration country, in the last decade of the twentieth century and early years of the twenty-first century, reversed its net migration result, as a consequence of considerable volumes of immigration, although emigration remained relatively high.

Given the growing number of foreigners residents in Portugal, issues related to the labour market situation of immigrants assumes an emergent relevance.

This paper will focus the analysis on the situation of immigrants and their immediate descendants in the Portugal labour market, according to the results of the Portuguese Labour Force Survey 2008 ad hoc module.

Methods and data

In this paper we use data from the Portuguese Labour Force Survey (LFS) *ad hoc* module, held in the second quarter of 2008 (the most recent data available), as well as some other LFS variables (Table 1). The target population for the LFS survey was the resident population aged between 15 and 74 years. The sample contains data from 32 532 individuals.

The analysis is based on descriptive statistics and the key variable related to the migratory background of individuals – "immigrants"; "immigrant's descendents"; and, "no migratory background". The key concepts are immigrants, defined as all the respondents that were born abroad; immigrant's descendents, understood as individuals born in Portugal and having at least one parent born abroad; and individuals with no migratory background, representing respondents born in Portugal with both parents also native born.

Following a preliminary descriptive statistics, generalized linear models and decision trees were computed and analysed. Decision trees are a way of analysing data to discover important relationships and segments, allowing the analyst to identify the membership to certain groups and formulate rules for making predictions for new cases. Each tree starts with a simple node which contains all sample observations. As we progress in the analysis and interpretation of the tree, the data shatter into mutually exclusive subsets. This process is applied recursively to subsets, until the analysis is completed. In this work we used the CHAID (Chi-Squared Automatic Interaction Detector, and CRT (Classification and regression Trees) (Breiman *et al*, 1884). The CRT algorithm aims to maximize the homogeneity between nodes and allows us to recognize the effects that certain variables have on others (Breiman *et al*, 1884). One of the

main advantages of decision trees is the ease of reading the results. The structure shows a hierarchical data analysis in order to perform a task prediction / decision. It is a supervised classification method, where the dependent variable is explained by independent variables. This algorithm is a nonparametric regression model that establishes a relationship between the independent variables with a single dependent variable or response. The model is adjusted by successive divisions in the set of binary data to make sub-assemblies of the response variable data more homogeneous.

Table 1 - List of variables on study and number of valid observations

Variables	Valid N
Sex	32632
Age grupo (LFS)	32632
Citizenship (LFS)	32632
Country of birth (LFS)	32632
Occupation (LFS)	32632
Occupational status (LFS)	32632
Highest completed level of education (LFS)	32632
Activity status (LFS)	32632
Year of citizenship acquisition (2008 LFS module)	31588
Country of birth of father (2008 LFS module)	32632
Country of birth of mother (2008 LFS module)	32632
Total number of years of residence in the host country (2008 LFS module)	1930
Reason the person mostly had for migrating (last migration) (2008 LFS module)	1163
Whether the duration of the current resicent permit/visa/certificate is limited (2008 LFS module)	944
Whether current legal access to the labour market is restricted (2008 LFS module)	723
Use of facilities for establishing what highest qualification equates to in the host country system (2008 LFS module)	1492
Need to improve host country language skills to get an appropriate job (2008 LFS module)	1492
Main help received in the host country in finding the current job or setting up own business (2008 LFS module)	18939
Use of services for labour market integration in the 2 years following the last arrival (2008 LFS module)	628

Results

Alongside with the direct contribution of immigration in the Portuguese demographic growth, explicit on the number of foreign citizens in Portugal, its impacts are also made visible through their contribution to natality and, although on extent smaller scale, on mortality, as already stated in several studies on demography and immigration in Portugal (Mendes et al., 2010; Magalhães and Peixoto, 2008; Peixoto, 2008; Rosa et al., 2004).

Based on the country of birth of the respondents and their parents, the key variable “migratory background” of individuals computed: “immigrants” were defined as respondents born abroad;“immigrant’s descendents” are all respondents born in Portugal that have at least one parent born abroad; and “no migratory background” correspond to respondents born in Portugal and with both parents also native born.

Descriptive statistics show that 90.5% of individuals aged between 15 and 74 years old have no migratory background, 7.9% are immigrants and 1.6% are immigrant's descendents.

Comparing the distribution of "age group", "highest completed level of education", "activity status", and "main occupation" within each migratory profile, the results point to:

- Higher percentages on 25-34 and 35-44 age groups within immigrants; higher percentage of individuals aged between 15-24 on immigrant's descendents; and higher percentages of individuals above 45 years on no migratory background individuals;

Table 2 – Age group distribution (%) by migratory background

Age Group * Migratory background Crosstabulation

% within Migratory background

		Migratory background			
		no migratory background	immigrant	immigrant's descendent	Total
Age Group	15-24	14,6%	14,2%	44,1%	15,0%
	25-34	18,8%	32,1%	28,9%	20,0%
	35-44	18,7%	30,3%	7,2%	19,5%
	45-54	18,4%	14,1%	8,0%	17,9%
	55-64	16,3%	6,5%	6,8%	15,4%
	65 +	13,2%	2,8%	5,0%	12,2%
Total		100,0%	100,0%	100,0%	100,0%

- Higher percentages of individuals with secondary and higher education levels within immigrants; higher percentages of individuals with basic education/third cycle within immigrant's descendents; and higher percentages of individuals with no level of education and basic education/first cycle within the no migratory background profiles.

Table 3 - Highest completed level of education distribution (%) by migratory background

Highest completed level of education * Migratory background Crosstabulation

% within Migratory background

		Migratory background			
		no migratory background	immigrant	immigrant's descendent	Total
Highest completed level of education	No level of education	8,2%	3,0%	3,3%	7,7%
	Basic education - First cycle	31,1%	8,2%	9,3%	28,9%
	Basic education - Second cycle	16,8%	16,5%	15,2%	16,8%
	Basic education - Third cycle	19,5%	25,7%	36,1%	20,2%
	Secondary and post-secondary education	13,8%	27,3%	22,3%	15,0%
	Higher education	10,7%	19,4%	13,8%	11,4%
Total		100,0%	100,0%	100,0%	100,0%

- Higher percentages of employees within immigrants; higher percentages of students and unemployed within immigrant's descendents; and higher percentages of retired and other inactive among individuals with no migratory background; According to the Phi and Cramer test it cannot be excluded the hypothesis of relation between activity status and migratory profile. According to the Chi-square results there is a statistically significant association between activity status and migratory profile.

Table 4 – Activity status distribution (%) by migratory background

Activity status * Migratory background Crosstabulation

% within Migratory background

		Migratory background			
		no migratory background	immigrant	immigrant's descendent	Total
Activity status	employed	62,4%	72,7%	50,3%	63,0%
	unemployed	4,8%	6,9%	8,7%	5,0%
	students	8,9%	9,3%	30,3%	9,3%
	retired	14,4%	3,7%	5,7%	13,4%
	other inactive	9,5%	7,4%	5,0%	9,3%
Total		100,0%	100,0%	100,0%	100,0%

- Among the employed respondents, we found higher percentages of "Industry and construction skilled workers and craftsman" and "unskilled workers" within immigrants; higher percentages of "Intellectual and scientific activities specialists", "Technicians and associate professionals", "Clerical support workers" and "Personal service, protection and safety workers and sales persons" within immigrant's descendents; and higher percentages of "Legislative power and executive bodies representatives, leaders, directors and executive managers", "Industry and construction skilled workers and craftsman" and "Farmers and skilled agricultural, fishery and forestry workers" within individuals with no migratory background. According to the Chi-square results there is a statistically significant association between main occupation and migratory profile, and the Phi and Cramer's V p-values (0.122 and 0.71, respectively) both support the association between the variables, although not strong.

Table 5 – Main occupation (of employees) distribution (%) by migratory background

Main occupation (employed) * Migratory background Crosstabulation

% within Migratory background

		Migratory background			
		no migratory background	immigrant	immigrant's descendent	Total
Main occupation (employed)	Armed Forces occupations	,6%	,7%		,6%
	Legislative power and executive bodies representatives, leaders, directors and executive managers	6,0%	4,8%	3,9%	5,9%
	Intellectual and scientific activities specialists	8,6%	12,8%	14,2%	9,1%
	Technicians and associate professionals	9,4%	8,7%	14,3%	9,4%
	Clerical support workers	9,2%	8,4%	13,4%	9,2%
	Personal service, protection and safety workers and salespersons	14,9%	19,1%	22,8%	15,4%
	Farmers and skilled agricultural, fishery and forestry workers	10,4%	1,1%	5,4%	9,5%
	Industry and construction skilled workers and craftsman	20,2%	20,7%	11,3%	20,1%
	Plant and machine operators, and assemblers	7,8%	6,0%	7,0%	7,6%
	Not skilled workers	12,9%	17,6%	7,7%	13,2%
Total		100,0%	100,0%	100,0%	100,0%

However, the activity status and the main occupation may depend on other variables, such as level of education, sex or age group.

For example, relatively to the highest level of education and the activity status, the Phi and Cramer's V p-values (0.492 and 0.220, respectively) both support the strong association between the variables. Relatively to the highest level of education and the main occupation of employees, the association is even stronger (p-values of 0.932 and 0.417 on the Phi and Cramer's V tests).

Based on the analyse of decision trees the "activity status" is explained, in order of importance, by "age group", "highest completed level of education", sex", "country-of-birth", "migratory background", and "citizenship". Furthermore, the "main occupation" of employees is explained, in order of importance, by "highest completed level of education", "age group", "sex", "citizenship", "country-of-birth" and "migratory background".

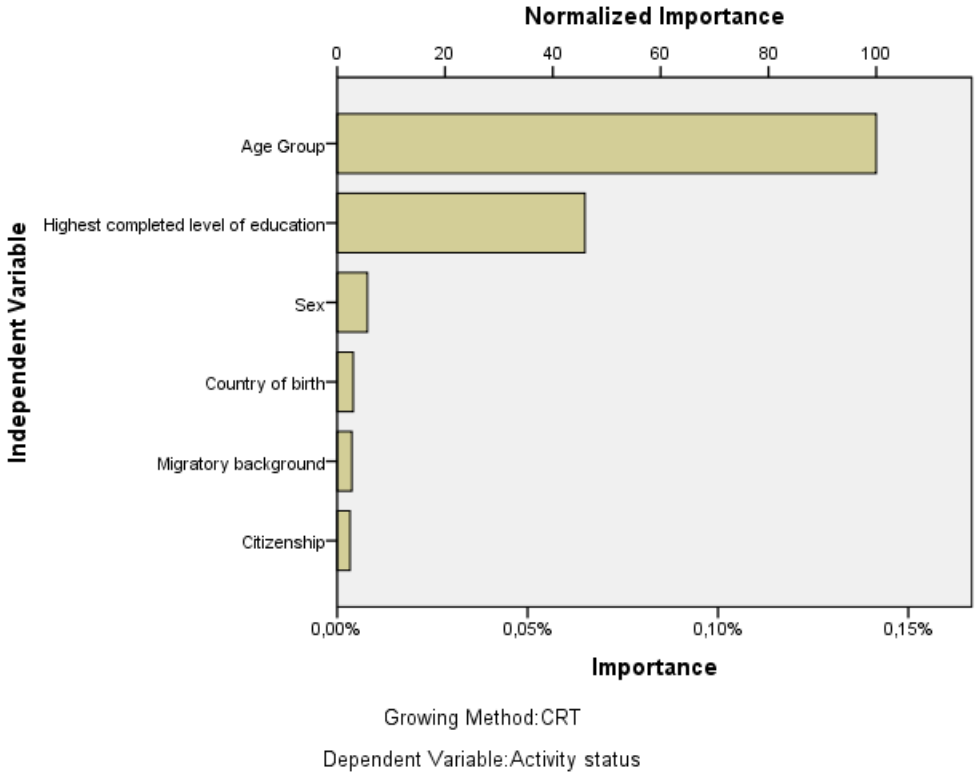

Figure 1 - Normalized importance of the independent variables sex, age, citizenship, country of birth, highest completed level of education and migratory background for activity status (growing method CRT)

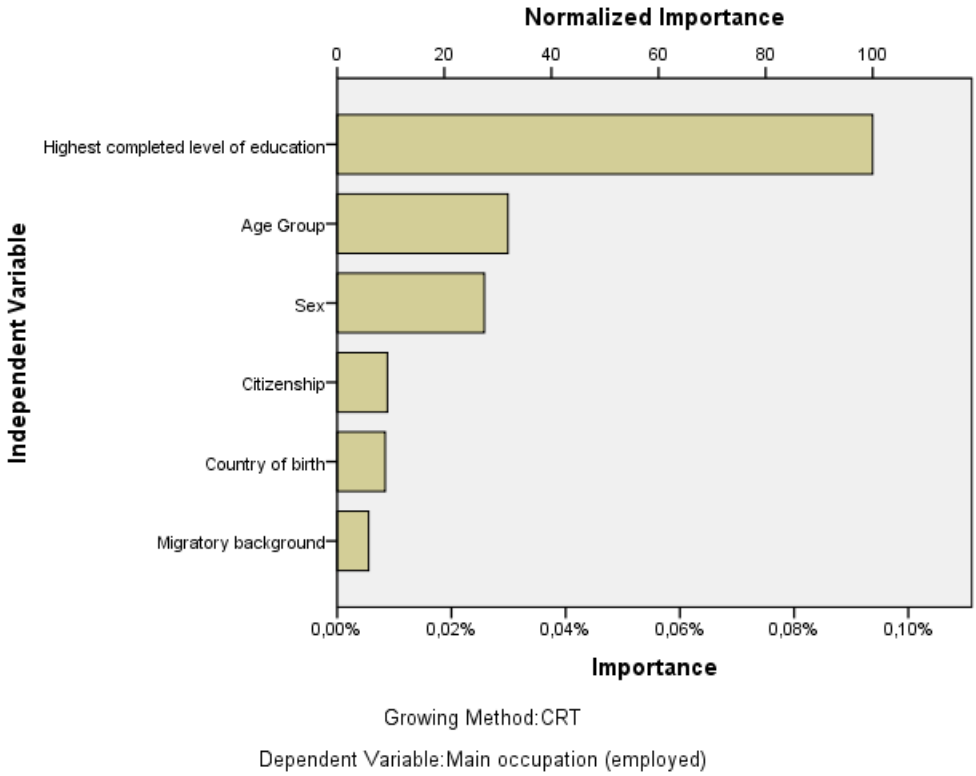

Figure 2 - Normalized importance of the independent variables sex, age, citizenship, country of birth, highest completed level of education and migratory background for main occupation (of employees) (growing method CRT)

It was shown that the activity status and the main occupation were both strongly dependent on other variables such as level of education, sex or age group, as opposed to the migratory profile. Moreover, the country of birth itself is more important to explain the differences on activity status than the migratory profile (we recall that this variable is defined not only by the respondent's country of birth, but also the country of birth of their parents), and the citizenship is more important to explain the differences on the main occupation of employees that the country of birth or the migratory profile.

According to the results, 4.0% of Portuguese resident population, aged between 15 and 74 years old, were foreign citizens and 96.0% were Portuguese citizens. On the other hand, 7.9% were foreign-born and 92.1% were native-born.

Noticeably, there were a not irrelevant percentage of individuals that have been born abroad and have Portuguese citizenship (4.1%). This fact could be explained either as an effect of Portuguese citizens born in the former Portuguese colonies (Portuguese citizenship at birth), or as an effect of the acquisition of Portuguese citizenship (it should be noted that, according to the LFS 2008 *ad hoc* module results, 1.6% of the Portuguese citizens, aged between 15 and 74 years old, have acquired the Portuguese citizenship).

Table 6 – Group of country of birth and group of citizenship crosstabulation

Country_of_birth_Group * Citizenship_Group Crosstabulation

			Citizenship_Group		
			Portuguese	Foreign	Total
Country_of_birth_Group	Portuguese	% within Country_of_birth_Group	99,9%	,1%	100,0%
		% within Citizenship_Group	95,9%	1,9%	92,1%
		% of Total	92,0%	,1%	92,1%
	Foreign	% within Country_of_birth_Group	50,4%	49,6%	100,0%
		% within Citizenship_Group	4,1%	98,1%	7,9%
		% of Total	4,0%	3,9%	7,9%
Total		% within Country_of_birth_Group	96,0%	4,0%	100,0%
		% within Citizenship_Group	100,0%	100,0%	100,0%
		% of Total	96,0%	4,0%	100,0%

Table 7 – Portuguese citizenship at birth or by acquisition distribution (%)

		Column N %
Citizenship_a	Portuguese at birth	98,4%
	Portuguese by acquisition	1,6%
	Total	100,0%

Main conclusions

Compared to group of individuals with no migratory background, the immigrants had higher percentages of (a) individuals in the active age groups, (b) employees and (c) individuals with secondary, post-secondary and higher education levels. However, it is noteworthy that the immigrant main occupations were mainly in the "Industry and construction skilled workers and craftsman" and in "unskilled workers" categories. Moreover, individuals with no migratory background had higher percentage in the older groups, retirees, and with lower educational levels – a consequence of an ageing population. Finally, when compared to the other two profiles, the immigrant's descendents had higher number of individuals in the younger age and student groups, as well as higher values of unemployment.

Although the activity status and the main occupation (of employees) illustrate differences within the migratory profiles, it was also recognized the effects of variables such as level of education, sex or age group, more relevant than the country of birth, citizenship or the migratory profile of the individuals.

If, on one hand, it's true that these results are important to establish migratory profiles and perform a first analysis of their situation on labour market, it's also true that further analyses are required. Furthermore, there are other available variables that only target part of the sample, based on citizenship and/or country of birth and/or age at the arrival in Portugal that have not been included on this study, despite their relevance for future research.

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