



Centre d'Estudis Demogràfics

**THE IMPACT OF INTERNATIONAL MIGRATIONS
IN THE DEMOGRAPHIC CHARACTERISTICS
OF ACTIVITY SECTORS IN SPAIN:
RECENT CHANGES AND GEOGRAPHICAL PATTERNS**

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Resum

L'objectiu de l'article és estudiar les tendències divergents, però també el paper complementari, de les poblacions de nacionalitat espanyola i estrangera ocupades en el mercat de treball espanyol, mitjançant una anàlisi sociodemogràfica i territorial dels diversos sectors d'activitat. Els autors argumenten que el "boom" immigratori experimentat a Espanya durant la darrera dècada és complementari amb la promoció social, laboral i educativa de la mà d'obra nacional. Utilitzant dades de l'EPA (Encuesta de Población Activa), aquest treball analitza les característiques socioeconòmiques, tant dels treballadors nacionals com dels estrangers, entre els anys 2000 i 2007, amb l'objectiu de diferenciar tres categories de sectors d'activitat: 1) aquells on la mà d'obra nacional es troba "reemplaçada" per l'immigrant; 2) aquells on es dona un creixement simultani del nombre de treballadors espanyols i estrangers; i finalment 3) aquells "reservats" per als ocupats autòctons, que augmenten més que els forans. Aquestes tres categories són definides a nivell nacional i després analitzades a escala regional a fi de trobar patrons geogràfics.

Paraules clau.- Immigració internacional, població estrangera, mercat de treball, anàlisi territorial, demografia, Espanya.

Resumen

El objetivo de este artículo es estudiar las tendencias divergentes, pero también el papel complementario, de las poblaciones de nacionalidad española y extranjera ocupadas en el mercado de trabajo español, mediante un análisis sociodemográfico y territorial de los diversos sectores de actividad. Los autores argumentan que el "boom" inmigratorio experimentado en España en la última década, es complementario con la promoción social, laboral y educativa de la mano de obra nacional. Utilizando datos de la EPA (Encuesta de Población Activa), este trabajo analiza las características socio-económicas de los trabajadores nacionales y de los extranjeros entre los años 2000 y 2007, con el objetivo de diferenciar tres categorías de sectores de actividad: 1) sectores de actividad en los que la mano de obra nacional es "reemplazada" por la inmigrante; 2) sectores en los que hay un crecimiento simultáneo del número de trabajadores españoles y extranjeros; y 3) sectores "reservados" para los autóctonos, que aumentan más que los foráneos. Estas tres categorías son definidas a nivel nacional y después analizadas a nivel regional para hallar patrones geográficos.

Palabras clave.- Inmigración internacional, población extranjera, mercado de trabajo, análisis territorial, demografía, España.

Abstract

This paper focuses on diverging trends and complementary roles of workers of Spanish and foreign nationality in the Spanish labour market. We conduct a sociodemographic and territorial analysis of labour sectors. We argue that the “immigration boom” experienced by Spain in the last decade is complementary to the educational, labour and social advancement of the national workforce. Using the EPA survey (Spanish labour force survey), this study attempts to analyse the socio-demographic characteristics of both the national and the immigrant labour force in Spain between 2000 and 2007. We identify three categories of activity sectors: 1) those where national workers are “replaced” by immigrant workers; 2) those where there is a simultaneous increase of both Spanish and foreign workers; and finally, 3) those “reserved” for the native workforce. These three categories are first defined at the national level and then analysed regionally in order to identify geographical patterns.

Keywords.- International immigration, foreign population, labour market, spatial differences, demography, Spain.

Résumé

L’objectif de cet article est l’étude des tendances divergentes mais aussi du rôle complémentaire des populations de nationalité espagnole et étrangère occupées sur le marché du travail espagnol, à travers une analyse sociodémographique et territoriale des différents secteurs d’activité. Les auteurs argumentent que le “boom” migratoire vécu en Espagne pendant la dernière décennie est complémentaire de la promotion sociale, occupationnelle et éducative de la main d’œuvre nationale. Ce travail utilise des données de l’EPA (enquête espagnole sur la population active) pour analyser les caractéristiques socio-économiques autant des travailleurs autochtones que des étrangers durant la période 2000-2007, avec la finalité de définir trois catégories de secteurs d’activité : 1) secteurs où la main d’œuvre nationale est « remplacée » par l’immigrante ; 2) secteurs où il y a une croissance parallèle du nombre de travailleurs espagnols et étrangers ; et finalement 3) secteurs « réservés » pour la force de travail autochtone, qui augmente plus que l’allochtone. Ces trois catégories sont d’abord définies au niveau national et ensuite étudiées à l’échelle régionale pour élaborer des modèles géographiques différenciés.

Mots clés.- Immigration internationale, population étrangère, marché du travail, analyse territoriale, démographie, Espagne.

CONTENTS

1.- The territorial dimension of “complementarity”: an analysis which is still to be carried out	1
2.- Data used and paper’s structure	3
3.- Examining Spanish and foreign worker “complementarity”	3
4.- Spanish or foreign workers: concurrence or substitution? An analysis by sectors	9
5.- Socio-demographic analysis of complementarity: age, sex, and education level structure by sector	13
6.- Territorial analysis of complementarity	19
7.- Summary and conclusions	22
References	24

TEXT FIGURES

1-8.- Age and sex structure and education attainment by sector. Spain, 2007	15
9.- Cluster of Spanish regions depending on the structure of employment of Spanish male and female nationals. Spain, 2000	20

TEXT TABLES

1.- Number of the foreigners and Spanish nationals employed, by sectors. Spain, 2000-2007	4
2.- Spanish and foreign nationals employed by sex and education attainment. Spain, 2000-2007	6
3.- Number of Spanish and foreign nationals employed by occupational class. Spain, 2000-2007	8
4.- Real and estimated change of the number of Spanish and foreign nationals employed by activity sectors. Results of the Sector Segregation Index (SSI). Spain 2000-2007	12
5.- Evolution of Spanish and foreign nationals employed by sector and sex. Spain, 2000-2007	14
6.- Evolution of Spanish and foreign nationals employed by sector and sector segregation index (ISS) for the four groups of autonomous communities. Spain, 2000-2007	21

**THE IMPACT OF INTERNATIONAL MIGRATIONS
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1.- The territorial dimension of “complementarity”: an analysis which is still to be carried out

Studies focusing on foreign citizens’ participation in the Spanish labour market have not only underlined their increasing volume, but also the qualitative aspects of this incorporation by activity sector (Colectivo IOE, 2002; R. Carrasco, 2003; C. Carrasco and C. García, 2004; L. Garrido and L. Toharia, 2004; J. Oliver, 2007). Socio-demographic differences between foreigners and Spanish nationals have been used as a starting point to explain how the former have been inserted in the labour market, underlining their complementary role with respect the autochthonous population (A. Domingo and R. Houle, 2004).

This “complementarity” would not be basically due to the Spanish recent demographic evolution³, but to the Spanish labour market characteristics, market by segmentation –as explained by Lorenzo Cachón (1997), following Michael J. Piore’s work (1979). This process is particularly visible when focusing on how young (mainly female) Spanish

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³ As shown by the paper by Andreu Domingo, Fernando Gil Alonso and Elena Vidal (2006), the Spanish demographic evolution presents some specificities within a European context marked by a rapidly ageing

nationals, who have attained a much higher education level than older generations, get socially promoted when incorporating the labour market (A. Domingo and F. Gil Alonso, 2007).

Even though this situation is not new, and has already been experienced and studied in other countries (W.T. Dickens and K. Lang, 1988; M. E. Enchautegui, 1998; D. Coleman and R. Rowthorn, 2004), the Spanish case –which has been analysed, among other authors, by U. Martínez Veiga, 1999; L. Abad, 2002; R. Carrasco, J.F. Jimeno and A.C. Ortega, 2004; H.J. Simón, R. Ramos and E. Sanromá, 2007– is particularly interesting due to the big volume and the great speed of the immigration growth generated by this process. These trends are partly due to socio-demographic factors related to female education level improvement and the extension of two salary households in a context of unequal household reproductive task distribution among men and women. Therefore, older generations within the family are increasingly carrying these tasks out (L. Garrido, 1992; J. MacInnes and J. Pérez, 2008). When this is not possible, they are externalised into the market, as the Welfare State is very weak in comparison with other EU countries. This has favoured an internationalisation of domestic work, including both child and elderly care, and household work.

The concept of “complementarity” is used here to describe the role of foreign immigration in the social promotion of Spanish nationals. This concept does not only concern the labour market. It should be also explored in other contexts implying social mobility and which are susceptible of being understood as markets, such as, for example, the marriage market or the residential one. However, we will focus on the labour market because, even though it is not the only element shaping the potential attraction for foreigners of a given territory, it plays a major role in it and it is also one of the most obvious.

In a first step, the process will be analysed by activity sectors, as there are sectors where the foreign population is virtually substituting the autochthonous one, other sectors where there is concurrence between the two populations, independently from whether they compete or not for the same jobs, and finally others which have nearly become, for legal or other reasons, exclusive niches for the Spanish nationals. Following these three categories (substitution, competition and predominance of the Spanish workers), the territorial dimension –at regional (*autonomous community*) level– of complementarity will be

population and the arrival of less numerous cohorts to the labour market, as Spain had its baby boom later. Hence, the evolution of the autochthonous population has had less impact on the demand of foreign workers,

explored through the predominant activity sectors in each region, as this process does not develop in the same way throughout the territory.

2.- Data used and paper's structure

The Spanish labour force survey or *Encuesta de Población Activa* (EPA) has been the data source used in this paper. This is a survey which has been carried out by INE every three months since 1964 to obtain data on both the labour force and its different components (employed and unemployed), and on the inactive population. Initially, the sample has 65,000 families each three months, which, in practical terms, are reduced to about 60,000 interviewed families, that is to say, about 200,000 people. This can be considered a reasonable sample size for the paper's aim.

Two waves of the EPA, separated seven years from each other, have been used to analyse the growing impact of foreigners in the active population. The first one (cycle 111), corresponds to the second quarter of the year 2000, and the second one (cycle 139) gives data on the second quarter of the year 2007. The first years of the 21st century were precisely those in which foreign immigration grew and, hence, data will allow us to fulfil the four targets which are reflected in the four sections of the paper. In the first place (section 3), we will study how this process has changed the volume and the characteristics of labour force participation, both in the autochthonous and the foreign populations. Then (section 4), complementarity between the two groups of workers will be analysed at greater depth. A new set of indicators will allow us to explain the diverse dynamics existing between the foreign and the local populations in the activity sectors and therefore permit building a typology. Section 5 will focus on the basic socio-demographic elements characterising the two populations (age, sex and education level) taking the analysis further than the mere evolution of numbers in each sector. Finally, section 6 will describe the territorial patterns of this phenomenon allowing to group regions with similar behaviour. Conclusions and main results will be summarised in section 7.

3.- Examining Spanish and foreign worker “complementarity”

According to the EPA, there were 15.5 million employed workers in Spain, in 2000, and nearly 20.4 in 2007 (Table 1). There are similar proportions of Spanish (about 2.6 million) and foreign (about 2.3 million) workers in this growth (4.9 million people). As volume of

the latter is much smaller, they have therefore relatively grown much more: 549% in front of a 17%. However, a growth in 2.6 million national workers cannot be considered irrelevant. Moreover, as a first conclusion: the massive growth in foreigner occupation took place while the local workforce was not dwindling, much on the contrary, it was also growing and so significantly was its employment level. Hence, the simplistic idea that immigrants have come to occupy the jobs that the increasingly older and reduced Spanish workforce can no longer undertake should be abandoned. As we have formerly shown (A. Domingo, F. Gil Alonso and E. Vidal, 2006; A. Domingo and F. Gil Alonso, 2007), though this is true for certain European countries, it is not really so much like that in Spain or in other Mediterranean countries or Ireland.

Table 1.- Number of the foreigners and Spanish nationals employed, by sectors. Spain, 2000-2007

SECTORS	Nationality	2000		2007		variation 2000-2007			Mean age		
		Employed	%	Employed	%	Abs. growth	rel. growth(%)	variation %	2000	2007	variation
Agriculture, forestry and fishing	Spanish	997.478	6,6	747.385	4,2	-250.093	-25,1	-2,4	42,4	44,2	1,7
	Foreign	37.776	8,9	173.605	6,3	135.829	359,6	-2,6	32,6	32,8	0,2
	Total	1.035.254	6,7	920.990	4,5	-114.264	-11,0	-2,2	42,1	42,0	0,0
Industry and transport	Spanish	3.932.340	26,1	4.042.287	22,9	109.947	2,8	-3,2	38,0	39,5	1,5
	Foreign	65.759	15,5	398.956	14,5	333.197	506,7	-1,0	35,0	34,5	-0,5
	Total	3.998.100	25,8	4.441.243	21,8	443.143	11,1	-4,0	38,0	39,1	1,1
Construction	Spanish	1.660.965	11,0	2.046.399	11,6	385.433	23,2	0,6	37,2	38,0	0,7
	Foreign	44.780	10,6	667.336	24,2	622.556	1390,3	13,7	34,9	34,5	-0,4
	Total	1.705.745	11,0	2.713.735	13,3	1.007.990	59,1	2,3	37,2	37,1	-0,1
Wholesale and retail trade, hotels and restaurants	Spanish	3.404.051	22,6	3.856.459	21,9	452.408	13,3	-0,7	36,6	38,4	1,8
	Foreign	127.924	30,2	709.460	25,8	581.535	454,6	-4,4	36,3	33,5	-2,8
	Total	3.531.975	22,8	4.565.918	22,4	1.033.943	29,3	-0,4	36,6	37,6	1,1
Finance and real estate	Spanish	1.496.369	9,9	2.296.319	13,0	799.949	53,5	3,1	37,2	39,0	1,8
	Foreign	35.657	8,4	205.568	7,5	169.911	476,5	-0,9	41,3	36,4	-4,9
	Total	1.532.026	9,9	2.501.887	12,3	969.860	63,3	2,4	37,3	38,8	1,5
Public administration, education and health	Spanish	2.609.104	17,3	3.487.969	19,8	878.865	33,7	2,5	40,2	41,7	1,5
	Foreign	28.735	6,8	110.129	4,0	81.395	283,3	-2,8	39,8	39,7	-0,1
	Total	2.637.839	17,1	3.598.098	17,7	960.260	36,4	0,6	40,2	41,6	1,4
Other services, including domestic services	Spanish	945.685	6,3	1.136.711	6,5	191.025	20,2	0,2	38,4	39,8	1,4
	Foreign	83.213	19,6	488.733	17,7	405.521	487,3	-1,9	36,5	35,9	-0,6
	Total	1.028.898	6,7	1.625.444	8,0	596.546	58,0	1,3	38,3	38,7	0,4
Overall	Spanish	15.045.993	100,0	17.613.528	100,0	2.567.535	17,1		38,2	39,7	1,5
	Foreign	423.843	100,0	2.753.787	100,0	2.329.944	549,7		36,3	34,7	-1,6
	Total	15.469.836	100,0	20.367.315	100,0	4.897.479	31,7		38,2	39,0	0,8

Source: built from the Encuesta de Población Activa (EPA).

Note: categories by sector and nationality which have grown above the period's mean have been shaded.

Hence, “complementarity” between immigrants and the Spanish labour force can not continue to be explained strictly in terms of demographic volume. As Piore (1979) explained some years ago, labour market segmentation has a dominant role, and this would not only be in terms of nationality, but also by sex, age or education attainment; variables which are not only intimately interrelated but, as we will see in the next section, condition both Spanish and immigrant differential participation in the activity sectors.

It is true however that there has been a relative ageing process of Spanish nationals in the workforce (the mean age increasing from 38.2 in 2000 to 39.7 in 2007), particularly in the primary sector. This has indeed been partly mitigated by the arrival of immigrants, who have a younger mean age which has moreover diminished in 1.6 years (from 36.3 to 34.7), the youngest of which can be found in the primary sector (Table 1). This ageing process is partly due to the incorporation of Spanish women to the labour market. Though they have a slightly younger mean age than their male colleagues, they have gone, during this period, through a grater relative ageing process.

However, though the variable “sex” has had certain influence on the workforce age, it has had a much greater impact on its volume, as nearly 1.7 million Spanish women incorporated employment (numbers, for men, only reached 0.9 million) in addition to another million foreign females. Despite the fact that among foreigners, men have increased more (1.3 million) than women in absolute terms, female employment has increased more in relative terms, and this is so both for Spanish nationals (+30.6% compared to +9.3%) and foreign ones (+592% against +521%, see Table 2). Hence, mass immigration has happened in a context of progressive feminisation of the Spanish labour market. In 2007, women already represented 41% of the employed, while seven years before they were only 37%.

As it can be seen in table 2, ageing, feminisation and a significant improvement of their education attainment are the main characteristics of the national employed workforce, particularly among women. More than 1.9 million, out to the 2.6 million Spanish workers who incorporated the labour market between 2000 and 2007, had higher education, 60% of which were women. And nearly half of the 1.8 million who had secondary education were women. Moreover, those who had less than secondary education fell in 1.2 million. However, it should be noted that these were mainly men (3 out of 4), as women with low education levels generally belong to elderly generations who abstain from incorporating the labour market. By contrast, immigrant’s education attainment has decreased, as the proportion of those arriving with higher education has grown less than those reaching this country with secondary education or less. By sex, more arriving men than women have higher education. Women have particularly grown among those with secondary education, the category which has increased more. Finally, the bottom group has also grown more among foreign women.

Tabla 2.- Spanish and foreign nationals employed by sex and education attainment. Spain, 2000-2007

Nationality	Sex	Education level	2000		2007		variation 2000-2007			distr. Sex
			Employed	%	Employed	%	Abs. Growth	rel. growth (%)	variation %	
Spanish	Men	Less than secondary	2,965,289	31.0	2,056,348	19.7	-908,941	-30.7	-11.3	74.6
		Secondary	4,271,269	44.7	5,219,175	50.0	947,906	22.2	5.3	51.0
		Higher	2,314,907	24.2	3,162,570	30.3	847,663	36.6	6.1	44.0
		Total	9,551,465	100.0	10,438,094	100.0	886,629	9.3		34.5
	Women	Less than secondary	1,293,103	23.5	982,866	13.7	-310,237	-24.0	-9.8	25.4
		Secondary	2,360,154	43.0	3,271,106	45.6	910,952	38.6	2.6	49.0
		Higher	1,841,272	33.5	2,921,463	40.7	1,080,191	58.7	7.2	56.0
		Total	5,494,528	100.0	7,175,434	100.0	1,680,906	30.6		65.5
	Both sexes	Less than secondary	4,258,392	28.3	3,039,214	17.3	-1,219,178	-28.6	-11.0	100.0
		Secondary	6,631,422	44.1	8,490,281	48.2	1,858,858	28.0	4.1	100.0
		Higher	4,156,179	27.6	6,084,033	34.5	1,927,854	46.4	6.9	100.0
		Total	15,045,993	100.0	17,613,528	100.0	2,567,535	17.1		100.0
Foreign	Men	Less than secondary	91,507	36.2	447,162	28.5	355,654	388.7	-7.7	64.4
		Secondary	99,573	39.4	813,641	51.8	714,069	717.1	12.4	54.1
		Higher	61,596	24.4	308,803	19.7	247,207	401.3	-4.7	53.8
		Total	252,675	100.0	1,569,605	100.0	1,316,930	521.2		56.5
	Women	Less than secondary	34,642	20.2	230,848	19.5	196,206	566.4	-0.7	35.6
		Secondary	82,771	48.4	687,449	58.1	604,678	730.5	9.7	45.9
		Higher	53,755	31.4	265,885	22.5	212,130	394.6	-9.0	46.2
		Total	171,168	100.0	1,184,182	100.0	1,013,014	591.8		43.5
	Both sexes	Less than secondary	126,149	29.8	678,009	24.6	551,860	437.5	-5.1	100.0
		Secondary	182,344	43.0	1,501,090	54.5	1,318,746	723.2	11.5	100.0
		Higher	115,351	27.2	574,688	20.9	459,337	398.2	-6.3	100.0
		Total	423,843	100.0	2,753,787	100.0	2,329,944	549.7		100.0

Source: built from the Encuesta de Población Activa (EPA).

Key: Higher education level (categories 51 to 61 of EPA's NFORMA variable); Secondary education (categories from 23 to 41); Less than secondary (categories from 11 to 22, 36 and 80).

Note: categories by education level and sex which have grown above the period's mean have been shaded.

Therefore, as the Spanish education level increased, elderly generations with low education and low labour participation were substituted by younger more educated groups in which a rise in female education has implied an important increase (above the mean) in their labour force participation. This relative improvement of the Spanish workforce conditions, especially among women, disrupted the labour participation structure in general and employment by occupational categories and sectors in particular, attracting, under a "vacuum cleaner" effect, foreign nationality workers to the less qualified jobs in sectors in which Spanish nationals do no longer prefer to work. In addition, new labour niches, like ethnic shops, have been created by this arrival. This would all lead to the conclusion that there is "complementarity" between the labour dynamics of the two groups of workers.

These dynamics can clearly be observed in table 3, showing the evolution of foreign and Spanish workers between 2000 and 2007 by occupational category in absolute and relative figures. As it can be seen, Spaniards have increased both the quantity and quality of their jobs and hence have improved their relative position in the labour market. Out of the 2.6

million supplementary employed Spanish workers, a quarter million are senior officials and managers in either businesses or the public administration. A million and a half have been categorised as professionals, technicians and associated professionals. Within this group, growth has been more significant for women (+0.9 million) than for men (650.000). In contrast, absolute figures of those inscribed under the categories “farmers and skilled workers in the primary sector” and “elementary occupations” (unskilled workers) has fallen.

Differences by sex should be underlined. Though there is a slight growth in the number of male craft and related trades workers and skilled manual workers in industry and construction, the number of women in this category has diminished (in spite of their already symbolic presence). The opposite can be observed among the unskilled workers, as the number of women occupied in this area increases, though only slightly, while the presence of men significantly falls. Finally, it should be noted that the number of jobs in the category “service and sales workers” has increased for both sexes, but especially for women.

In conclusion, female employment has had such a strong increase between 2000 and 2007 that their presence, in absolute figures, has risen both in intermediate-high and low categories, and especially so in the former, as their highest growth, both in absolute and relative terms, has been in the professionals and technicians categories.

On the contrary, immigrants of both sexes have particularly grown in low occupational categories and specially the unskilled one (see elementary occupations in Table 3). Immigrant men have increased relatively more than women in clerical jobs and in industrial jobs (categories “craft and related trade workers and skilled manual workers” and “plant and machine operators and assembly workers”). The opposite case has occurred in jobs linked to the service sector.

In summary, as the Spanish workforce, particularly women, have relatively improved their position, foreign nationality workers have been attracted to occupy the less qualified, less remunerated and more unstable jobs, which Spanish workers try to avoid as they have been able to climb the labour ladder, due to their better education. This is the process the authors have called “complementarity”.

Table 3.- Number of Spanish and foreign nationals employed by occupational class. Spain, 2000-2007

Nationality	Type of occupation	Sex	Year		Variation	
			2000	2007	Absolute	Relative (%)
Spanish	Senior officials and managers in businesses and public administrations	Men	800.833	959.934	159.101	19,9
		Women	366.196	441.995	75.799	20,7
		Total	1.167.029	1.401.929	234.900	20,1
	Professionals	Men	902.085	1.149.006	246.921	27,4
		Women	845.977	1.279.860	433.883	51,3
		Total	1.748.062	2.428.865	680.804	38,9
	Technicians and associate professionals	Men	879.911	1.285.699	405.788	46,1
		Women	577.044	1.055.185	478.141	82,9
		Total	1.456.955	2.340.885	883.930	60,7
	Clerks	Men	602.409	614.019	11.610	1,9
		Women	895.346	1.139.176	243.829	27,2
		Total	1.497.755	1.753.195	255.439	17,1
	Service and sales workers	Men	911.137	965.693	54.556	6,0
		Women	1.212.266	1.638.051	425.785	35,1
Total		2.123.403	2.603.744	480.341	22,6	
Farmers and skilled workers in the primary sector	Men	513.833	360.257	-153.576	-29,9	
	Women	175.172	107.628	-67.545	-38,6	
	Total	689.005	467.885	-221.120	-32,1	
Craft and related trade workers and skilled manual workers in industry, construction and mining	Men	2.382.787	2.580.287	197.500	8,3	
	Women	190.212	177.497	-12.715	-6,7	
	Total	2.572.999	2.757.784	184.785	7,2	
Plant and machine operators, assembly workers	Men	1.374.331	1.477.089	102.758	7,5	
	Women	242.707	231.507	-11.200	-4,6	
	Total	1.617.037	1.708.596	91.559	5,7	
Elementary occupations	Men	1.108.390	971.572	-136.817	-12,3	
	Women	984.625	1.095.223	110.598	11,2	
	Total	2.093.015	2.066.796	-26.219	-1,3	
OVERALL	Men	9.551.465	10.438.094	886.629	9,3	
	Women	5.494.528	7.175.434	1.680.906	30,6	
	Total	15.045.993	17.613.528	2.567.535	17,1	
Foreign	Senior officials and managers in businesses and public administrations	Men	28.487	66.542	38.055	133,6
		Women	15.489	32.017	16.528	106,7
		Total	43.976	98.559	54.583	124,1
	Professionals	Men	21.131	61.081	39.950	189,1
		Women	12.849	49.236	36.386	283,2
		Total	33.980	110.316	76.336	224,6
	Technicians and associate professionals	Men	17.652	65.478	47.825	270,9
		Women	9.342	40.947	31.606	338,3
		Total	26.994	106.425	79.431	294,3
	Clerks	Men	3.949	33.809	29.860	756,2
		Women	17.828	79.966	62.138	348,5
		Total	21.776	113.774	91.998	422,5
	Service and sales workers	Men	39.719	168.846	129.127	325,1
		Women	44.749	371.711	326.963	730,7
Total		84.467	540.557	456.090	540,0	
Farmers and skilled workers in the primary sector	Men	9.204	30.519	21.315	231,6	
	Women	547	2.439	1.892	346,2	
	Total	9.751	32.958	23.207	238,0	
Craft and related trade workers and skilled manual workers in industry, construction and mining	Men	46.591	567.772	521.180	1118,6	
	Women	6.757	23.217	16.460	243,6	
	Total	53.348	590.989	537.641	1007,8	
Plant and machine operators, assembly workers	Men	18.922	141.586	122.664	648,3	
	Women	3.996	22.282	18.287	457,7	
	Total	22.918	163.868	140.950	615,0	
Elementary occupations	Men	67.020	431.185	364.165	543,4	
	Women	59.613	561.932	502.319	842,6	
	Total	126.633	993.117	866.484	684,2	
OVERALL	Men	252.675	1.569.605	1.316.930	521,2	
	Women	171.168	1.184.182	1.013.014	591,8	
	Total	423.843	2.753.787	2.329.944	549,7	

Source: built from the *Encuesta de Población Activa* (EPA).

Note: categories by occupation and sex which have grown above the period's mean have been shaded.

At the same time, it has implied a basic gender role redefinition: the arrival of foreign migrants (both men and women) has allowed Spanish women to quickly accomplish their potential capacity to enter the labour market. However, this has not been in part time jobs, like in other countries, but in full time ones, as their male colleagues. Consequently, domestic work have been externalised, and carried out, to a large extent, by (female) immigrants. Hence, as it will be explained in the following paragraphs, the structure of autochthonous and foreign labour force participation has been completely modified.

4.- Spanish or foreign workers: concurrence or substitution? An analysis by sectors

How did “complementarity” come about? Which sectors have been abandoned by some and been occupied by others? Is substitution the only mechanism present or are there sectors in which the numbers of workers of both origins have increased? And finally, are there sectors exclusively for native workers? Following the framework proposed by Feld (2000), four categories, combining increase and fall in Spanish and foreign employment, have been created to distinguish the existing dynamics by sector. As foreign employment has grown throughout all areas between 2000 and 2007, categories have been modified the following way:

- *Sectors with a substitution dynamics:* in them, the numbers of Spanish nationals have dwindled either in absolute or relative terms while that of foreigners has increased.
- *Sectors with concurrence dynamics:* that is to say, in which both the numbers of foreign and Spanish workers has grown in absolute and relative terms.
- *Sectors where Spanish nationals predominate:* in other words, these are sectors in which Spanish nationals have specialized, as have been considered as “niches” for them, practically inaccessible to immigrants. Though the numbers of the latter have increased in absolute terms in this period, have lost weight in the relative terms as Spanish workers have grown much more than foreign ones.

The analysis by activity °sectors groups all types of economic activities in nine categories (table 1). As it can be observed in the formerly mentioned table, the only sector which loses employment in absolute terms is the primary one (agriculture, forestry and fishing),

as the loss of 250,000 Spanish workers is not compensated by the arrival of more than 135.000 foreigners. Hence, the sector has gone from representing 6.7% of the employment in 2000 to a 4.5% in the year 2007. Moreover, it has experienced an important ageing process (Spanish actives in the sector were a mean of 1.7 older in 2007 than seven years before), and therefore is presently the oldest⁴, with a mean age of 44.2 in 2007. Employment of Spanish nationals in industry and transport, and in wholesale and retail trade, hotels and restaurants have increased in absolute number, but also lost presence in relative terms. In 2000, 26.1% of the Spanish employed workers belonged to the industrial sector and this proportion diminished to 22.9% in 2007; in other words, there was a reduction in 3.2 points. On the other hand, Spanish workers employed in trade, hotels and restaurants dwindled in 0.7 points in the same period and represented, in 2007, 21.9% of the total employment.

These three sectors, in which foreign employment has increased more than the local one, are those in which there has been what we have described as a substitution dynamics. Construction, on its side, would be the paradigmatic case in which there has been a parallel growth of both populations; an increase above the average growth rate for both collectivites. The Spanish nationals employed in this sector have gone from representing 11% of the total employment in 2000 to 11.6% in 2007, increasing in 385.000 new jobs. Foreigners have gone from being 10.6% in 2000 to a remarkable 24.2% seven years later, with 620.000 new jobs. Ageing of the sector's Spanish workers has been relatively small (0.7 years, the weakest of all sectors). Hence, we can observe a generational renovation process among the Spanish workers.

Finally, sectors with the highest added value and earnings, like financial and real estate and those with a high amount of civil servants (public administration, education, health) are those with highest increments of Spanish workers (+800.000 and +879.000 respectively), even above that of foreigners, who have lost weight in relative terms. In other words, the proportion of Spanish workers employed has been a higher. They have gone from representing a 10% to a 13% in the first case and from a 17.3% to a 19.8% in the second one. Activities grouped under "other services" have also had a relative increase of Spanish

⁴ It should also be mentioned, that farming is the only sector in which foreign workers have also experienced an ageing process. However, age has only increased in 0.2 years, reaching a mean age of 32.8 in 2007. It is therefore the sector in which foreigners are still the youngest. In the rest of the sectors, Spanish workers have become older (with a mean age of 38-41 in 2007), while the foreign ones are now younger (34-36 years old in 2007).

workers, which have risen in 0.2 points, while foreigners have had a relative decrease in 1.9 points. However, the picture is more complex in this sector: the number of foreigners employed has more than doubled that of Spanish ones in absolute terms.

To avoid confusions, and define more clearly which is the dominant trend in each sector among the three defined, an index, which has been called “foreign and Spanish worker Sector Segregation Index” (SSI), has been developed. The period total employment growth rate of each of the two groups⁵ has been respectively applied to 2000 Spanish and foreign workers. Hence, the estimate numbers of Spanish and foreign workers in each sector have been obtained for 2007 through a sort of indirect standardisation. Results indicate how employment in each sector would have grown if they had all increased at the same rate (i.e. with the growth quotient calculated for each of the two populations all sectors included). By dividing the real number of 2007 workers in a given sector by those estimated following this method, a growth index (GI) for each sector and nationality is found. If the GI is more than one, it indicates that employment in that sector and for that nationality has grown more than employment for that nationality in general. If results are less than one, this means that employment for that sector and nationality has increased less than the mean or has fallen (See table 4, one but last column).

Combining Spanish and foreign growth rates, the SSI is obtained. If it is negative, it would mean that Spanish workers in that sector are being substituted by foreign ones. Hence, the more negative the result, the stronger the substitution process would be. If the SSI is positive, but smaller than one, it would mean that employment predominantly growing is that of Spanish nationals, and that of foreigners is losing weight. The closer the result is to one, the more Spanish employment would grow, and the nearer to 0, the higher the equilibrium between the two populations. Finally, if the SSI is positive and above 1, this would mean that employment would have risen in both groups in absolute and in relative terms. The SSI would be increasingly higher, the more the growth of both groups would add. Results of the SSI between 2000 and 2007 are presented in the last column of table 4.

⁵ Among the different ways of calculating the 2000-2007 period growth rate, the simplest one (dividing 2007 employed by the 2000 ones) has been chosen here. Results give 1.17, that is to say, a growth of 17% for Spanish workers and 6.497, or what is the same 549.7% in the case of the foreign ones. Obviously, if the SSI

Table 4.- Real and estimated change of the number of Spanish and foreign nationals employed by activity sectors. Results of the Sector Segregation Index (SSI). Spain 2000-2007

SECTORS	Nationality	2000 Employed	2007		Difference real-estimated	GROWTH INDEX	SECTOR SEGREGATION INDEX
			Employed Real	Employed Estimated			
Agriculture, forestry and fishing	Spanish	997.478	747.385	1.167.694	-420.309	0,640	-1,067
	Foreign	37.776	173.605	245.437	-71.832	0,707	
Industry and transport	Spanish	3.932.340	4.042.287	4.603.378	-561.091	0,878	-1,056
	Foreign	65.759	398.956	427.250	-28.294	0,934	
Construction	Spanish	1.660.965	2.046.399	1.944.402	101.997	1,052	3,346
	Foreign	44.780	667.336	290.942	376.394	2,294	
Wholesale and retail trade, hotels and restaurants	Spanish	3.404.051	3.856.459	3.984.937	-128.479	0,968	-0,886
	Foreign	127.924	709.460	831.147	-121.688	0,854	
Finance and real estate	Spanish	1.496.369	2.296.319	1.751.718	544.600	1,311	0,424
	Foreign	35.657	205.568	231.669	-26.101	0,887	
Public administration, education and health	Spanish	2.609.104	3.487.969	3.054.337	433.633	1,142	0,552
	Foreign	28.735	110.129	186.693	-76.564	0,590	
Other services, including domestic services	Spanish	945.685	1.136.711	1.107.062	29.648	1,027	0,123
	Foreign	83.213	488.733	540.648	-51.915	0,904	
Overall	Spanish	15.045.993	17.613.528	17.613.528			
	Foreign	423.843	2.753.787	2.753.787			

Source: built from the *Encuesta de Población Activa* (EPA).

To check whether the Spanish and foreign growth index (GI), obtained from the EPA sample and used to build the SSI, are significantly different, a T-test for independent samples has been applied in pairs, that is to say, by activity sectors. In all cases, the T (bilateral) has come out as significant for a p equal or less than 0.05. Therefore, as differences in employment growth between the Spanish and the foreign population are significant, results by sector have been analysed. Construction is the only one in which both groups of nationalities grow vigorously and simultaneously. In contrast, the primary sector, followed by industry and transport, are those in which more Spanish labour force is being substituted by the foreign one. This can also be observed, though to a much smaller extent, in wholesale and retail trade, hotels and restaurants, where the situation is much more equilibrated. "Other services" also present a certain trend towards equilibrium, though Spanish workers have relatively grown more than the foreign ones. Finance and real estate and particularly public administration (including health and education) are the more attractive sectors for Spanish workers and are hence becoming protected niches in which the Spanish workforce is specialising, particularly the last, as foreigners have limited access to many posts. It should be emphasised that this is the sector which is receiving a great part of the women who are lately incorporating the labour market. More

evolution was to be analysed for the individual years, the cumulated annual growth rate should be used instead. However, here we only wanted to compare the evolution between the period's two end years.

than half a million Spanish women occupied post in the public administration, education and health between 2000 and 2007.

5.- Socio-demographic analysis of complementarity: age, sex, and education level structure by sector

This last figure leads the discussion into the field of participation structure by sector and sex (table 5). Results show that gender employment patterns of Spanish nationals are more similar than those for foreigners. In the first case, both sexes have significantly concentrated in the public sector, in the financial and real estate one and in construction. Men have also entered in “other services”. In absolute figures, the increase in Spanish females employment is particularly visible in the public sector (including education and health), and in the real estate and financial one (1.1 million new employments in both big sectors). On the other hand, the 700,000 new male employments in construction and the financial real-estate sector should also be stressed.

There is more specialisation by sex among foreigners. Male employment has concentrated in construction (more than 610,000 new employments, that is to say, nearly half of the 1.3 million new foreign male employments). However, new female employment has a more diverse origin. Most jobs have concentrated in two sectors. “Other services”, including domestic service, gained in more than 365,000 jobs, which mean 1 in 3 new employments (however, as it has grown less than female employment as a whole, it has lost weight in relative terms). Wholesale and retail trade, hotels and restaurants represent another third of the total. Foreign female employment has also had a strong growth, though only in relative terms, is the primary sector, construction and finance and real estate. However, particularly the first two, were very small in 2000 and continue to be so.

Despite differences in the evolution of employment between Spanish and foreign workers, there is, in both cases, a clear trend towards a masculinisation or feminisation of certain sectors. Construction is the sector where the percentage of males is higher (9 out of 10 are men), followed by industry and transport, and the primary sector (3 out of 4 workers are men, though there is a slight increase of female participation levels). On the female side, the highest percentage of women can be found in “other services”, including domestic service, particularly among foreigners (nearly 9 out of 10 foreigners in the sector are women), followed by the public sector, education and health (in this case, 6 out of 10 are

women). Trade, hotels and restaurants, and finance and real estate are much more equilibrated by sex. While there are slightly more Spanish men employed, there are some more foreign women.

Table 5.- Evolution of Spanish and foreign nationals employed by sector and sex. Spain, 2000-2007

Nationality	SECTORS	Sex	2000		2007		variation 2000-2007	
			Employed	sex distrib.	Employed	sex distrib.	absolute	relative (%)
Spanish	Agriculture, forestry and fishing	Men	729.729	73,2	544.650	72,9	-185.079	-25,4
		Women	267.749	26,8	202.735	27,1	-65.014	-24,3
	Industry and transport	Men	3.031.487	77,1	3.047.184	75,4	15.698	0,5
		Women	900.854	22,9	995.103	24,6	94.249	10,5
	Construction	Men	1.577.882	95,0	1.904.505	93,1	326.623	20,7
		Women	83.083	5,0	141.894	6,9	58.811	70,8
	Wholesale and retail trade, hotels and restaurants	Men	1.881.611	55,3	1.942.633	50,4	61.022	3,2
		Women	1.522.439	44,7	1.913.825	49,6	391.386	25,7
	Finance and real estate	Men	825.064	55,1	1.192.478	51,9	367.414	44,5
		Women	671.305	44,9	1.103.841	48,1	432.536	64,4
	Public administration, education and health	Men	1.164.540	44,6	1.384.739	39,7	220.200	18,9
		Women	1.444.564	55,4	2.103.230	60,3	658.666	45,6
	Other services, including domestic services	Men	341.152	36,1	421.905	37,1	80.752	23,7
		Women	604.533	63,9	714.806	62,9	110.273	18,2
Overall	Men	9.551.465	63,5	10.438.094	59,3	886.629	9,3	
	Women	5.494.528	36,5	7.175.434	40,7	1.680.906	30,6	
Foreign	Agriculture, forestry and fishing	Men	34.775	92,1	131.799	75,9	97.024	279,0
		Women	3.001	7,9	41.806	24,1	38.805	1293,1
	Industry and transport	Men	45.713	69,5	304.924	76,4	259.211	567,0
		Women	20.046	30,5	94.032	23,6	73.986	369,1
	Construction	Men	44.218	98,7	655.702	98,3	611.484	1382,9
		Women	562	1,3	11.634	1,7	11.072	1969,6
	Wholesale and retail trade, hotels and restaurants	Men	80.189	62,7	304.969	43,0	224.779	280,3
		Women	47.735	37,3	404.491	57,0	356.756	747,4
	Finance and real estate	Men	21.060	59,1	81.694	39,7	60.635	287,9
		Women	14.597	40,9	123.874	60,3	109.276	748,6
	Public administration, education and health	Men	10.205	35,5	35.246	32,0	25.041	245,4
		Women	18.529	64,5	74.883	68,0	56.354	304,1
	Other services, including domestic services	Men	16.515	19,8	55.271	11,3	38.756	234,7
		Women	66.697	80,2	433.462	88,7	366.765	549,9
Overall	Men	252.675	59,6	1.569.605	57,0	1.316.930	521,2	
	Women	171.168	40,4	1.184.182	43,0	1.013.014	591,8	

Source: built from the *Encuesta de Población Activa* (EPA).

Note: categories which have grown above the period's mean have been shaded.

The pyramids showing the population structure of Spanish and foreign workers by age, sex and education attainment are represented in the figure 1, presenting all activity sectors together, and in the figures 2 to 8, showing each of the sectors. As it can be seen in Figure 1, males, and particularly young ones, are predominant among the Spanish employed population, but even more among the foreign one, which have a younger age structure given that they have less mature workers. Secondary education represents the predominant level of both male and female foreign workers. However, the amount of them (especially

males) with low education attainment is higher than the proportion of those who have it among young Spanish workers, who have attained a higher education level than foreigners of the same age, and than Spanish older generations. This improvement is precisely what allows us to talk about “complementarity”. As young Spanish generations have increased their education, social and labour status, foreign immigrants occupy the vacancies this process has left empty or has created *de novo*.

Figures 1 to 8.- Age and sex structure and education attainment by sector. Spain, 2007

FIGURE 1 OVERALL

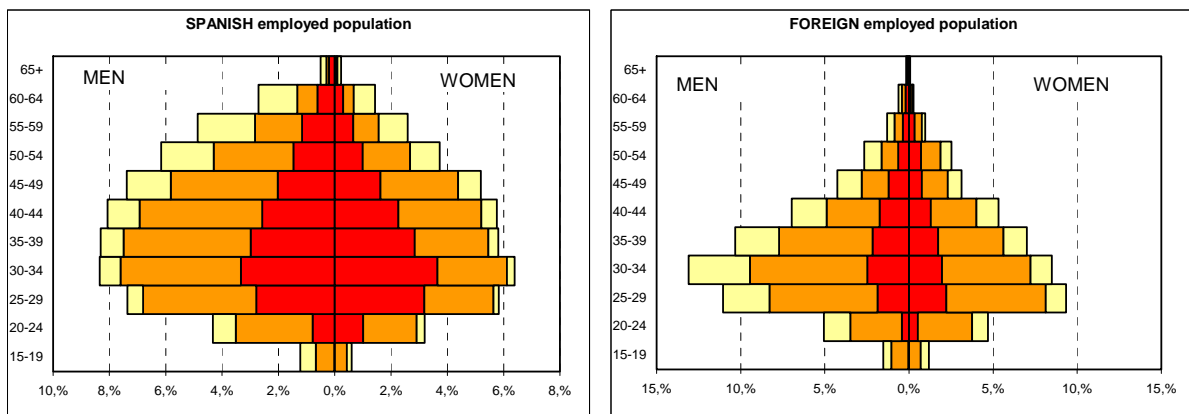


FIGURE 2 AGRICULTURE, FORESTRY AND FISHING

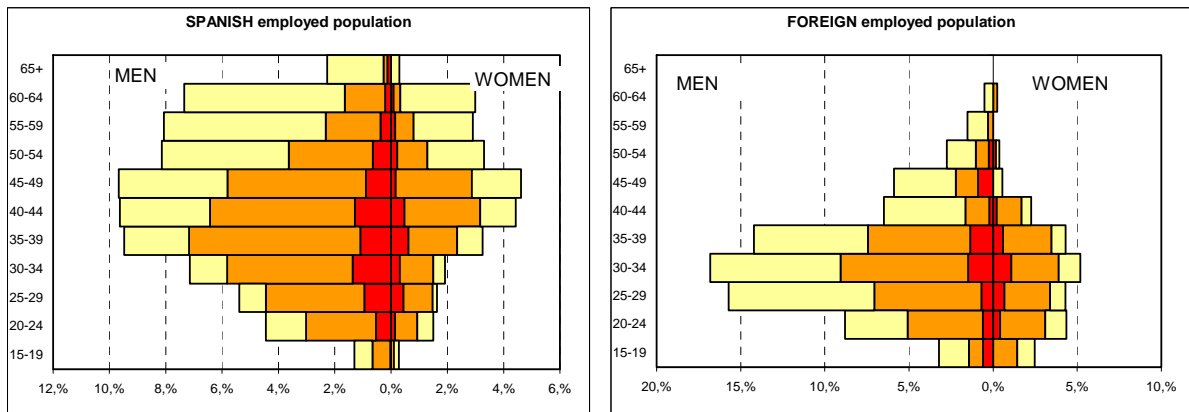


FIGURE 3 INDUSTRY AND TRANSPORT

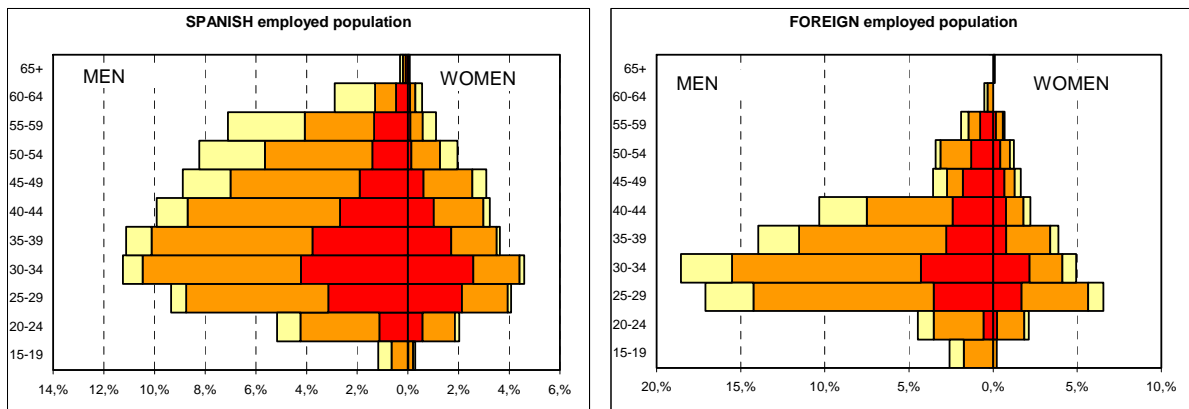


FIGURE 4 CONSTRUCTION

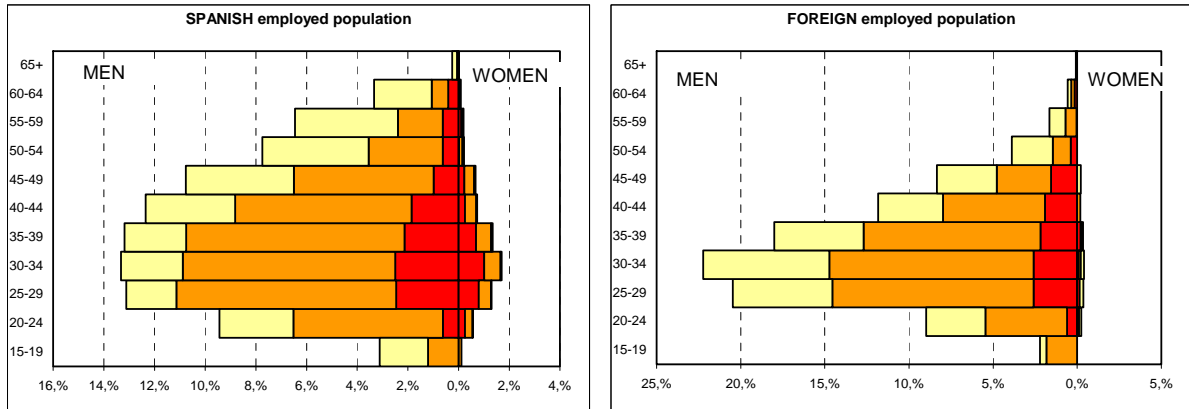


FIGURE 5 WHOLESALE AND RETAIL TRADE, HOTELS AND RESTAURANTS

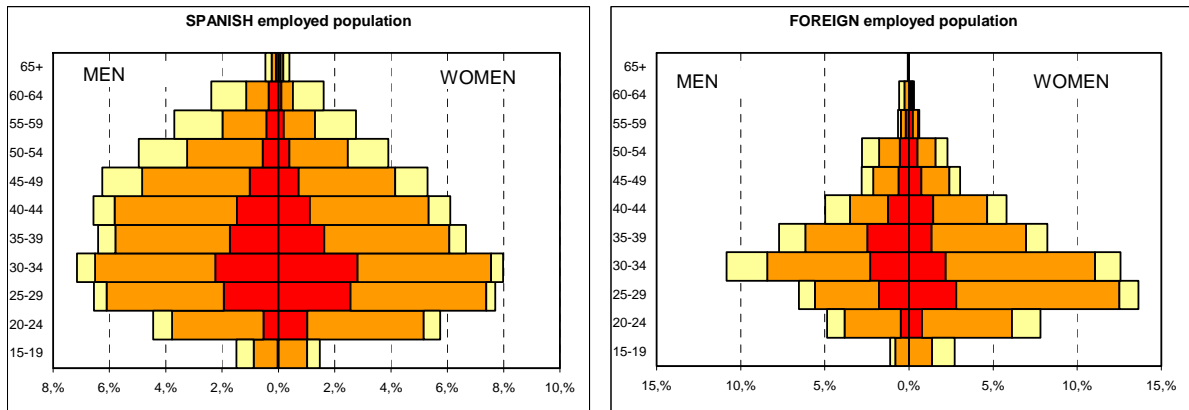


FIGURE 6 FINANCE AND REAL ESTATE

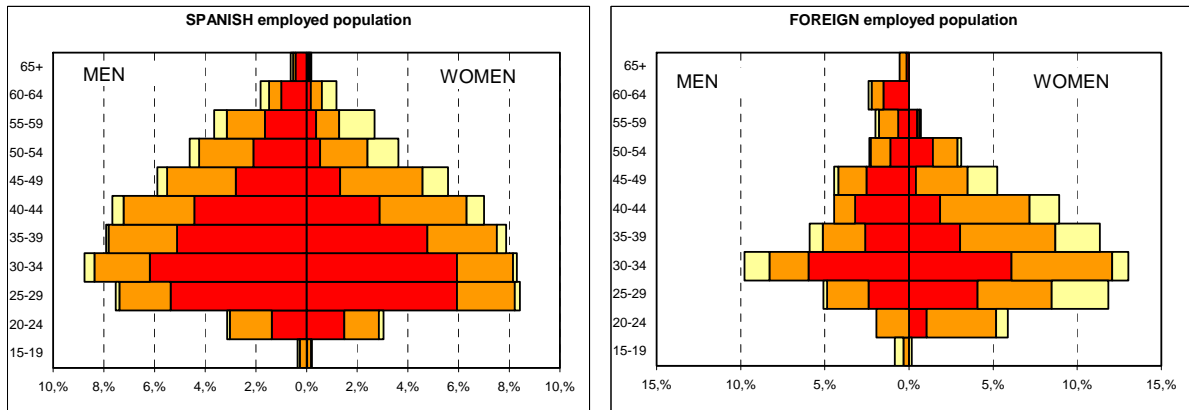


FIGURE 7 PUBLIC ADMINISTRATION, EDUCATION AND HEALTH

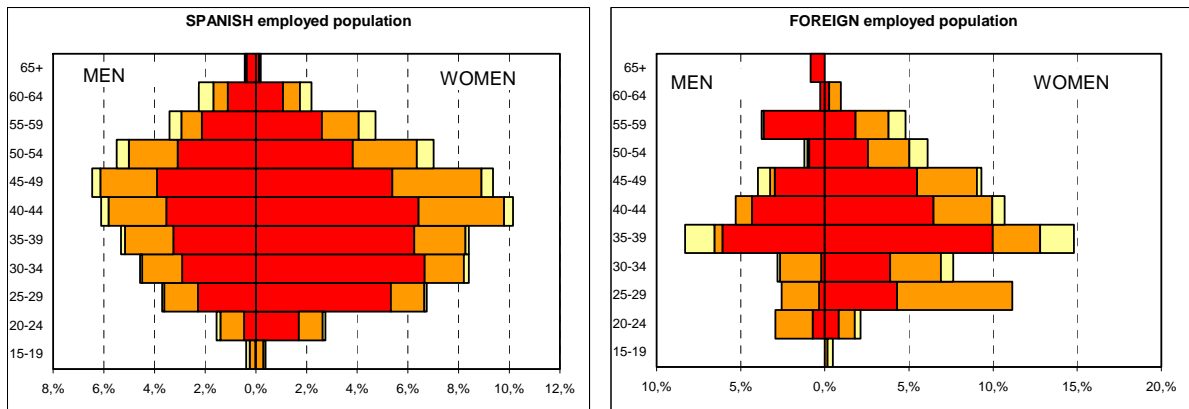
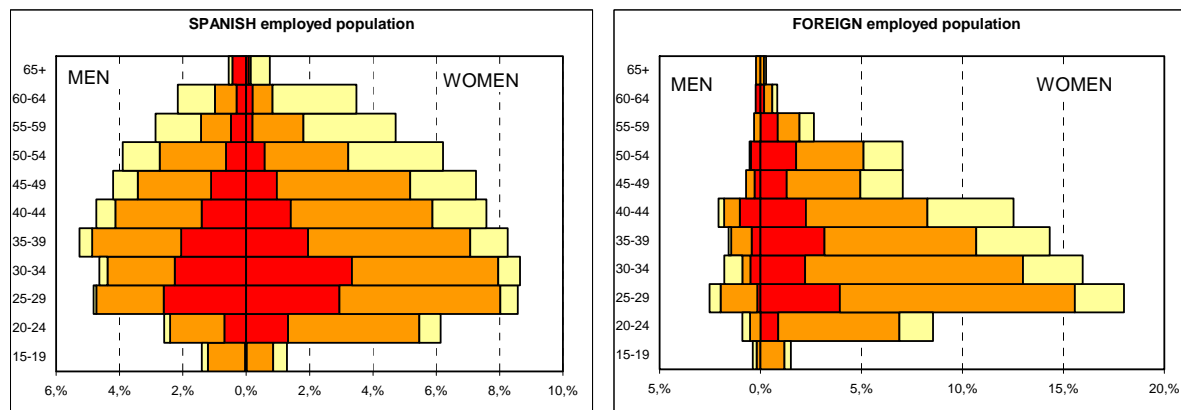


FIGURE 8 OTHER SERVICES



Source: built from the *Encuesta de Población Activa* (EPA).

Key: RED: High education level (categories 51 to 61 of EPA's NFORMA variable); ORANGE: secondary education (categories from 23 to 41); YELLOW: less than secondary (categories from 11 to 22, 36 and 80)

Nevertheless, as it has already been explained, “complementarity” acts differently in each sector and can adopt substitution or concurrence dynamics, or can even favour the preponderance of Spanish workers. All this can be seen in the sector pyramids produced for Spanish and foreign workers. Figure 2 corresponds to agriculture, forestry and fishing. This is the paradigmatic case in which ageing Spanish workers (with a mean age which has increased from 42.4 years in 2000 to 44.2 in 2007⁶) are being substituted by foreign ones. As it can be observed, Spanish workers, mainly male, belong to cohorts which are more than 40 years old and which, as age goes up, have an increasingly low education level. They are being substituted by younger (aged less than 40) foreigners, also generally males, who also have medium-low education standards. The dwindling number of Spanish workers of that age entering the sector and who have attained a higher education level are probably occupying the best posts in the sector.

As shown by pyramids in figure 4, construction is the paradigmatic case of a sector in which both populations have grown, in absolute and relative terms. Both pyramids are extremely masculine and have a very young age structure, as workers are aged predominantly under 40. It is the only one with a concurrence dynamics. Why is it so?

⁶ A similar tendency among females can also be observed within the domestic service sector. In this case, the ageing process is stronger as the sector has gone from a mean age of 43 to 45.5 in 2007. This is a paradigmatic case with little generational renovation among Spanish workers, as these are mature low educated women which compete with much younger foreigners who, in some cases, have better education. This competition is much stronger when it takes place in the informal economy, as it generally occurs. (M. Baldwin-Edwards and J. Arango, 1999).

Between 2000 and 2007, there was a construction boom in Spain, which was able to generate an important male employment growth independently from nationality and education attainment of those employed, and hence to attract both national men with a low level of education, as well as immigrants. Due to the increasing education level of the Spanish population, the former subgroup has dwindled but is particularly concentrated in this sector. In other words, if 23.8% of the low educated Spanish workers were employed in construction the year 2000 this percentage had risen to 30% seven years later. As observed in table 1, it is the sector with the youngest and less ageing national workers. Hence, there has been a generational renovation process. This situation leads us to question ourselves on the results of the sector's present crisis. Which will be the most affected workers, Spanish low educated ones or foreigners?

The clearest example of a sector in which Spanish employment is growing more than the foreign one is public administration, education and health (Figure 7). Female employment, particularly women with higher education, has particularly concentrated in it (+660,000 jobs in seven years). Though Spanish males also had a good education standard, they were more stable (+220.000). Foreigners, on their hand, are much less present and those who are, have particular characteristics which should be underlined. Most of them have higher education and are of a mature age, especially women. Hence, at least some of them belong to former immigration waves, and not just to the last fifteen year ones.

Finally, though the other figures correspond to sectors which have a much less clear pattern in terms of their structure by sex, age and education attainment, some characteristics can be pointed out, like the predominance of well-educated Spanish workers in finance and real estate, of young foreign women in "other services" (including domestic service), and of young males in the industrial sector, and particularly among foreigners.

In summary, within a context where the foreign and the Spanish workforce are complementary, sectors with substitution, concurrence dynamics or even with niches for Spanish workers have been found. These trends have marked the demographic structure of both populations. In the following section we will study how they are distributed throughout the Spanish territory and analyse whether they explain why there are more migrants in certain regions (*autonomous communities*) and less in others.

6.- Territorial analysis of complementarity

Using the “complementarity” hypothesis (i.e. the arrival of new immigrants depends on local workforce characteristics) as starting point, Spanish workers in each of the 17 autonomous communities have been classified in the above mentioned seven big sectors. Given the different characteristics of male and female employment, they have been analysed separately. A cluster analysis (figure 9) has been applied to the 14 variables obtained and four big groups of autonomous communities have come out:

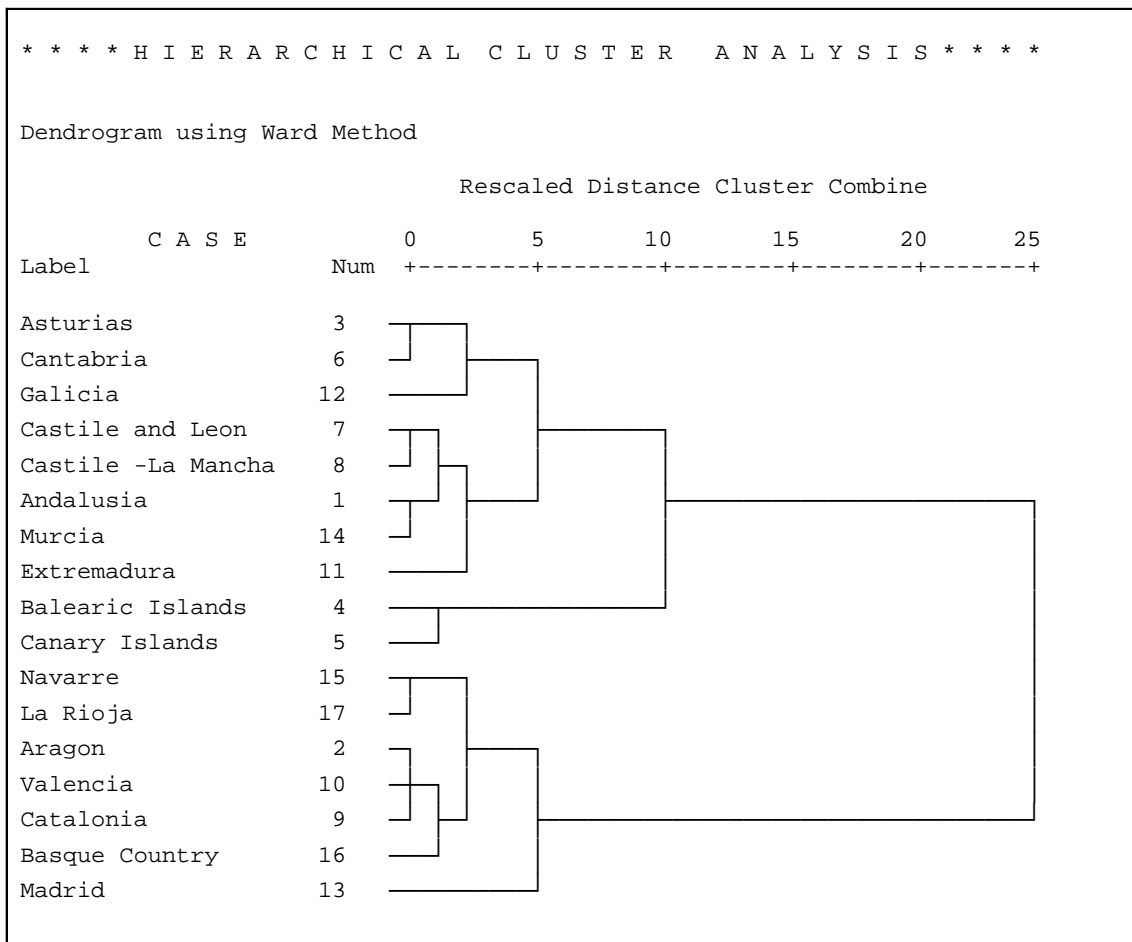
- *Madrid*⁷, *the Basque Country, Catalonia, Valencia, Aragon, La Rioja and Navarre* (GROUP 1): employment is generally well distributed throughout all the sectors, combining a relatively strong industry with a well developed service sector.
- *The Balearic and Canary Islands* (GROUP 2) are characterised by the importance of jobs in the retail, hotel and restaurant sectors, particularly linked to tourism.
- The rest of autonomous communities, where farming has relatively more weight, can be divided into two groups. In *the two Castiles, Andalusia, Murcia and Extremadura* (GROUP 3) the public sector, education and health are relatively more relevant than in *Asturias, Cantabria and Galicia* (GROUP 4).

The evolution of Spanish nationals and foreigners working in the different sectors between 2000 and 2007, and of the relative weight of each sector during that period, have been analysed by calculating the growth indexes (GI) and the sector segregation index (SSI), taking into account the above mentioned classification, as it has already been done for Spain as a whole. We consider results eloquent (table 6):

- As it can be seen, the greatest relative employment growth among Spanish workers has occurred in GROUP 3 regions, that had the highest unemployment rates, the lowest activity ones and, therefore, had wide workforce reserves. Foreigner employment has particularly grown in GROUP 4 autonomous communities, where the presence of foreigners in the labour market was relatively scarce. Their lowest increase, though important, would be found in the Balearic and Canary islands (GROUP 2) with relatively more foreign workers in the year 2000.

⁷ Though the public sector, education and health are much more relevant in Madrid than in the rest of regions in the group, they have all been considered as a unit to avoid making a single autonomous community group.

Figure 9.- Cluster of Spanish regions depending on the structure of employment of Spanish male and female nationals. Spain, 2000



Source: built from the *Encuesta de Población Activa* (EPA) using SPSS application.

- Analysing Spanish and foreigner employment growth by sector and the resulting sector segregation indexes, the conclusion is reached that, in the autonomous communities of GROUP 1, Spanish employment has concentrated in practically two sectors: finance and real estate, and public administration, education and health. In the former, there has also been foreign employment growth, and therefore, a concurrence dynamics has taken place. However, the latter has become a niche for Spanish nationals, as the relative weight of foreigners has dwindled. In the rest of sectors, there was less Spanish employment or it had increased less than that of foreigners. Therefore, we can speak of the existence of a substitution dynamics, particularly in construction.

Table 6.- Evolution of Spanish and foreign nationals employed by sector and sector segregation index (ISS) for the four groups of autonomous communities. Spain, 2000-2007

	GROUP 1	GROUP 2	GROUP 3	GROUP 4
Spanish employed -2000	7.985.298	993.609	3.796.941	2.227.328
Spanish employed -2007	9.037.055	1.168.435	4.811.058	2.554.016
Foreign employed -2000	257.382	63.784	84.177	19.235
Foreign employed -2007	1.766.274	281.193	567.707	137.273
Growth rate - Spanish	1,132	1,176	1,267	1,147
Growth rate - Foreigners	6,862	4,408	6,744	7,137
G.I. Agr - Spanish	0,701	0,639	0,608	0,596
G.I. Agr - Foreigners	0,806	0,718	0,637	0,493
G.I. Indust - Spanish	0,865	0,847	0,916	0,943
G.I. Indust - Foreigners	0,894	0,881	1,338	0,772
G.I. Constr - Spanish	0,986	1,079	1,146	1,008
G.I. Constr - Foreigners	1,967	1,886	5,819	2,120
G.I. Hotel & Rest - Spanish	0,967	0,918	0,951	1,027
G.I. Hotel & Rest - Foreigners	0,854	1,019	0,791	1,054
G.I. Real estate - Spanish	1,276	1,423	1,409	1,399
G.I. Real estate - Foreigners	1,059	0,656	0,483	3,476
G.I. Public Adm - Spanish	1,155	1,202	1,084	1,170
G.I. Public Adm - Foreigners	0,616	0,484	0,561	0,571
G.I. Other Serv - Spanish	0,993	0,916	1,106	1,073
G.I. Other Serv - Foreigners	0,858	1,016	0,977	0,894
SSI Agr	-1,105	-1,079	-1,029	-0,897
SSI Indust	-1,029	-1,034	-1,422	-0,829
SSI Constr	-1,981	2,965	6,965	3,128
SSI Hotel & Rest	-0,887	-1,102	-0,839	2,082
SSI Real estate	2,335	0,766	0,925	4,875
SSI Public Adm	0,540	0,718	0,523	0,599
SSI Other Serv	-0,865	-1,101	0,129	0,179

Source: built from the *Encuesta de Población Activa* (EPA).

Note: Number of Spanish and foreigners employed in 2000 and in 2007; Growth rate (employed in the year 2007 over those employed in 2000); G.I. (growth index or quotient between those really employed in 2007 and those estimated for that year under the Table 4 criteria); SSI (sector segregation index, following Table 4 criteria).

- In contrast, construction has had a relatively positive evolution for Spanish employment in the two archipelagos (GROUP 2), though it is also true that foreign migrants have had a higher increase. Therefore, there is a concurrence dynamics. However, in the finance and real estate sector, as well as in the public one, Spanish workers are increasingly dominant. In the rest of sectors, there is a progressive substitution of Spanish workers by foreign ones.
- In GROUP 3 regions, the situation is similar to that of the former group. There is a remarkable increase in both Spanish and foreign workers in construction which should be underlined. There are three sectors in which Spanish workers dominate:

the financial and real estate, the public and, as a novelty, “other services”, including domestic service. Their predominance in these sectors is probably due to the fact that, in these regions, there were important and increasing workforce reserves as they had high unemployment and low activity, particularly female, rates. Substitution processes only appear in the industry and transport and farming sectors, and to a lesser extent in trade, hotels and restaurants.

- Finally, the number of Spanish workers grows in most of the sectors of the autonomous communities in GROUP 4, except in two: farming, where there is an enormous fall in numbers, and the industrial one, where the decrease is small. Therefore, they are the only sectors where there is a substitution dynamics. Apart from construction, there is concurrence between Spanish and foreign nationals in trade, hotels and restaurants and the financial and real estate sectors. The sectors where Spanish people predominate are therefore only the public administration and “other services”.

Obviously, this is a static picture of a dynamic situation. In fact, these four groups do not only represent regional categories, but stages in the same development process. First, arriving immigrants substitute Spanish workers in those sectors which have harder and less paid jobs. Then, foreigners expand and compete with Spanish workers (particularly those with less education) in the rest of sectors, with very few exceptions. Finally, Spanish employment ends up growing only in the better paid jobs (finance and real estate) or in those with the best conditions. This is the case of the civil service, where non-nationals have a restricted access. Hence, even in group 3 and 4 regions, Spanish workers will gradually avoid the worst paid or harder sectors –such as construction, trade, hotels and restaurants, and other services–, when immigrants arrive to occupy these posts, as it has already occurred in the leading ones, i.e. those in Group 1. However, the recently started economic crisis mainly affecting the construction sector, might alter these dynamics and therefore produce changes in the trend.

7.- Summary and conclusions

According to the EPA, the recent foreign immigration wave to Spain has produced, from a labour market point of view, an increase in 4.9 million new jobs from 2000 to 2007; 2.3

would have been occupied by foreigners and nearly 2.6 million by Spanish workers. This means that the massive increase in immigrant employment has been accompanied by a parallel development of Spanish employment. Hence, attention should focus less on role of demography in the arrival of migrants and more on other factors influencing the way the Spanish labour market functions, characterised by dualism and segmentation.

The Spanish employed population has increasingly more women who have a substantially better education level. In contrast, the education attainment of new immigrants is relatively worse than that of the previous waves. This is logical as the posts that the Spanish labour market offers them are those with low qualification requirements. This is how the arrival of foreign labour force has become complementary to Spanish youth and female labour market insertion. Indeed, as the autochthonous work force, particularly women, has improved its education level, they have, in the first place, been able to massively enter the labour market and then risen in the labour ladder, attracting foreign nationality workers who enter in it by the base. However, this “complementarity” is clearly uneven as immigrants mainly find jobs in sectors requiring a low skilled workforce. These are also the hardest, worst paid and more unstable posts. The labour market externalisation of the reproductive work, which was carried out before by Spanish women in the family without remuneration, has accelerated the process. Therefore, there are new employment niches where foreigners are overrepresented.

The most negative version of this uneven entry has generalised a “subordinated” perception of foreigner insertion in the labour market. However, non-national labour itineraries and the diversity of ways in which “complementarity” has taken place in each sector should be taken into account –and we propose it as a new research line to be developed in the future. Construction is the only sector which has strongly and simultaneously grown in both origin groups. The agrarian sector, followed by industry and transport, has the highest proportion of Spanish workers being substituted by foreigners. The financial and real estate sectors, and particularly public administration (including health and education), are those with a greater capacity to attract Spanish workers, and are especially inaccessible to foreigners. Therefore, they have been transformed into niches for the Spanish workforce, and particularly women. Finally, there is a more equilibrated growth in wholesale and retail trade, hotels and restaurants and other services, which includes many and very diverse sub-sectors.

This diverse situation by sector, which is reflected in the pyramids by age, sex, nationality and education, has also influenced the territorial distribution of immigrants, and partially explains why some regions have many more foreigners than others⁸. In the territories with a more diverse economy, where the growing service sector is combined with a strong industrial one and a dynamic construction, the important affluence of foreign immigrants has run parallel to a high increase of Spanish employment in the best remunerated jobs (mainly in the finance and real estate sector) or in the best conditions (public administration, particularly women). Nearly in all the rest of sectors there exists a substitution dynamics⁹. The less dynamic regions, with a greater Spanish workforce supply and which have attracted less foreign immigrants are in the other extreme are. Here, local origin workers have increased in most of the sectors. Therefore, substitution can only be observed in farming and the industrial sector, that is to say, the first that Spanish workers seem to abandon. In conclusion, the four categories of regions are really four stages of a dynamic process affecting the insertion of the Spanish and immigrant stocks into the labour market, and this evolution could only be interrupted by the emerging economic instability affecting Spain.

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⁸ Another territorial analysis of foreign female migration distribution in Spain, which uses a different methodology (factor analysis) can be found in E. Vidal, F. Gil Alonso and A. Domingo (2007).

⁹ Spatial results are similar to those recently obtained by J. I. Conde-Ruiz, J. R. García and M. Navarro (2008), who have demonstrated that those regions that have received the highest number of immigrants are those where native employment and female labour participation has increased more.

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