

PORTUGUESE IMMIGRATION: LABOR MARKET ASSIGNMENT

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Abstract

This research explores the integration of foreign workers in the Portuguese labor market. It develops two subjects: on the one hand, the position of foreign work in the general employment pattern. On the other, the impact of foreigners on the sector wage-skill schedule, i.e., on log earnings regressions. Special importance is given to job qualification, both foreign and total – partly due to data availability. Some evidence on job segmentation between foreign and locals was found. Immigrants seem to have, if any, had a positive influence in total resident earnings.

JEL Classification: F22. J61. J31. J79.

Keywords: Immigrant Labor, Portugal.

1. Introduction

In 2000, Portugal, there were 207607 foreigners with legally established residence, representing 2.03% of the resident population; 47.6% of the former were African (mostly from PALOP's), 29.7% European and 10.7% Brazilian. It is believed that illegal residents may more than double the immigrant stock. The Portuguese Labor Ministry published data on foreign employment for the first time in their yearly publication of 2000. It has edited an overview of foreign immigration and the labor market in 2002. It is the purpose of this research to use the published data to shed some extra light on the integration of foreigners in the Portuguese Labor market. Traditionally, Portugal was a migration source. With development, it became a migration destiny, with a migration pattern that may resemble that of some advanced economies. Immigrants are mainly coming from Portuguese speaking countries, even if recently also from eastern and central european economies; they mainly locate in Lisbon Metropolitan area. Their hiring seems to have been fostered by demand shortages and low national employment regional mobility – and a low unemployment rate, a small unemployment pool in which firms can rely on – and low economic conditions in their home countries. Their presence appears well tolerated – they are expected to be younger on average than nationals and to promote the stabilization of the age dependency ratio. They are occupied in low paying jobs and sectors ¹ – such as domestic service, building and restoration, internationally nontradeables ² -, have lower skills than nationals, and have a lower job attachment, also because their stay, associated to a visa permit, may be temporary. They may therefore not be good substitutes for nationals' employment – and are not believed to have caused a reduction in the nationals' wages or employment ³. Given that immigrants have different contracts than nationals, one could claim a dual labor market effect; one could argue that they respond to existence of

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¹ Some employment of scientific, technical and liberal professions is also registered See MSST/DEPP (2002), p. 63

² The theory recognizes a trade-off between international trade and migration. Recent agreements lowering tariffs have been expected to reduce migration - see Freeman (2006) and Hatton (2007).

³ The same is found for the USA – see Freeman (2006).

efficiency wages and firing costs associated with nationals' contracts and thus promote some labor market flexibility⁴. Or just that they add to the "secondary" sector – with low pay and job-holding protection - employment.

The exposition proceeds as follows: we start by providing a data summary in section 1. Section 2 provides evidence on the employment pattern. Section 3 forwards log-earnings regression results. Some concluding words end the research.

1. Portuguese Labor Immigration – Some Descriptive Statistics

. Our data source is the 2000 "Quadros de Pessoal" annual synthesis, providing information on sector monthly and hourly wages, earnings, employment, hours of workweek, overtime for total employment, and foreign workers by job qualification level – data set variables and observation coding are contained in Appendix 1. Out of 2370575 Workers (Not self employed) 27550 (1.16%) were foreigners; of these 15381 (55.8%) were male 12169 (44.2%) female. These are most likely legal residents and our analysis and conclusions might change if illegal immigration was added to the sample.

Table 1.1 – Industry Employment							
Sector	TTCO%	TESTRAN%	TPROESTR%	IQUAL	IQUALEST	TPROMUL%	TPRMUEST%
Total	100.00	100.00	1.16	5.21	5.51	43.69	44.17
1	1.70	0.87	0.60	6.13	5.80	41.85	38.17
2	0.17	0.10	0.67	4.70	4.31	15.53	11.11
3	0.58	0.27	0.55	5.22	5.30	8.86	6.67
Manuf.	33.34	16.68	0.58	5.44	5.17	46.68	38.40
4	3.37	1.38	0.48	5.41	5.39	46.43	43.95
5	9.06	1.34	0.17	5.52	5.37	74.34	67.66
6	2.43	0.81	0.39	5.80	4.90	61.85	47.75
7	1.66	0.37	0.26	5.75	5.68	27.25	18.81
8	1.80	0.67	0.43	4.81	4.83	34.87	37.84
9	0.00	0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
10	0.91	0.32	0.41	4.44	3.76	35.29	20.22
11	0.91	0.32	0.41	5.44	4.62	32.15	20.22
12	2.66	1.65	0.72	5.60	5.96	34.25	16.48
13	3.30	3.40	1.20	5.43	4.94	18.94	16.12
14	1.53	0.82	0.62	5.24	5.25	17.28	19.82
15	1.76	2.22	1.47	5.39	5.16	54.55	55.72
16	1.91	2.75	1.68	5.22	4.96	36.85	58.89
17	2.05	0.62	0.35	5.61	5.81	29.57	34.30
18	0.64	0.13	0.24	4.11	2.65	16.96	22.22
19	10.91	18.12	1.93	5.25	5.59	7.58	2.74
20	19.39	9.59	0.58	5.22	5.23	44.80	46.46
21	6.23	11.38	2.12	5.45	5.63	61.37	61.28
22	5.93	2.34	0.46	4.53	4.42	22.54	23.84
23	3.43	1.66	0.56	3.86	3.08	38.53	39.39
24	9.18	30.97	3.92	5.23	6.17	53.19	62.13
25	0.15	0.00	0.00	4.67	#DIV/0!	38.25	#DIV/0!
26	1.98	1.95	1.14	3.81	2.81	71.82	68.10
27	3.95	2.87	0.84	5.26	4.90	87.61	82.28
28	2.43	3.06	1.46	5.00	4.79	58.18	42.64
29	0.00	0.01	18.75	3.69	1.67	75.00	66.67

⁴ See Saint-Paul (1996) for a survey. Also Lindbeck and Snower (1988).

Table 1.1 summarizes the proportion of foreign workers, the average job qualification (Inversely related to IQUAL and IQUALEST), of total sector and of foreign workers, the proportion of women in sector employment and the proportion of women in foreign workers. A higher proportion of foreign workers than average is registered for sectors 29 (international organizations), 24 (real estate and service to firms), 21 (restoration and lodging) 19 (construction), 16 (transportation material manufacturing), 15 (electric and optic Equipment) and 13 (heavy metallurgy and metallic products); only the first four register a higher than 1.9% rate. Women are well represented – employment share is similar for total residents and foreigners. On average, the qualification of foreigners is lower than that of the total and therefore of nationals and women seem to be in slightly higher proportion than nationals. Otherwise, sector qualification ranking of nationals and foreigners is quite similar.

Descriptive statistics of variables used in the estimation are provided in Table 1.2. Only 27 sectors – 9 and 25 are excluded: 9, Coke, has no employment, 25, Public Administration, has no foreign employment - are used and calculations were weighted by the total sector employment, TTCO – unweighted correlations are presented in Appendix 2.

Table 1.2 – Descriptive Statistics

Variable	Mean	STDV	Minim.	Maxim.	Variable	Mean	STDV	Minim.	Maxim.
TTCO	197566	150795	16	459584	TDDCI	0.511	0.377	0	1.8
TTESTRAN	2293	2553	3	8531	TGANBAS	145496	48948	94973	312632
TPROESTR	0.0116	0.0109	0.0017	0.18750	TGANREM	1.1710	0.0842	1.0775	1.4642
IQUAL	5.20	0.454	3.69	6.13	TGANHOMU	1.2836	0.1791	0.9748	1.7964
IQUALEST	5.18	0.746	1.67	6.17	EDUCM	8.79	1.59	6.11	13.05
TPROMUL	0.437	0.2161	0.0758	0.8761	EXP	21.79	2.50	16.09	31.31
TPRMUEST	0.424	0.2226	0.0274	0.8228	IDAD	36.58	2.11	33.56	43.73
NEMPR	26950	29604	3	81692	ANTIG	6.99	2.46	3.19	18.28
NEST	31389	35476	3	98282	TEMPAR	0.0295	0.03319	0	0.1144
DIMEMP	16.69	18.12	4.89	135.69	SEMTER	0.7245	0.07368	0.5545	0.9482
DIMEST	13.14	12.42	4.66	82.36	GRTTCO	1.0381	0.06695	0.8718	1.3333
IDEMP	13.35	2.34	5.25	20.77	GRNEMPR	1.0976	0.07298	0.9720	1.5000
IG	0.402	0.169	0.0761	0.893	GRNEST	1.0894	0.0641	0.9724	1.5000
TDCNOR	38.56	1.097	34.1	39.2					

Table 1.3 provides the correlation between several variables and those of Table 1.1. The first three columns contrast total sector employment (TTCO), foreign employment (TESTRAN) and the ratio between the two (TPROESTR). The first column characterizes the overall Portuguese employment pattern: industries with higher total employment have also higher foreign employment (TESTRAN), are concentrated in sectors of higher number (NEMPR, NEST) and smaller size (DIMEMP, DIMEST) of firms and plants but low concentration (IG), lower experience (EXP), age (IDAD), and tenure (ANTIG) workers. The third column shows that sectors with a higher proportion of foreign employment have lower foreign qualification (higher IQUALEST), young enterprises (IDEMP), low tenured workers (ANTIG), rely more heavily on part-time labor (TEMPAR) and on low permanent contracts (SEMTER) and are fast growing sectors (GRTTCO, GRNEMPR, GRNEST). There is no significant correlation with industry

average qualification. The correlations of IQUAL and IQUALEST with all other variables is very similar – not surprisingly once the correlation between both is 0.809. The same can be said for the last two columns – the correlation between TPROMUL and TPRMUEST is 0.984. Qualification is highest in concentrated industries (IG), larger firms (DIMEMP), lower full time working hours (TDCNOR), higher earnings (TGANBAS), higher earnings over basic salary (TGANREM), higher education (EDUCM), age (IDAD) and tenure (ANTIG). Overall foreign employment appears to respond to sector increases – to employment demand rises - and is spread in younger enterprises with low tenured workers; foreigners are in sectors of low employment protection or attachment; they have lower qualification than nationals but the gap is homogeneous across industries.

Table 1.3 – Correlations *

Variable	TTCO	TESTRAN	TPROESTR	IQUAL	IQUALEST	TPROMUL	TPRMUEST
TTCO	1.000	0.400	-0.004	0.086	0.256	-0.018	0.059
TESTRAN	0.400	1.000	0.889	0.075	0.549	-0.134	0.007
TPROESTR	-0.004	0.889	1.000	0.044	0.468	-0.043	0.091
IQUAL	0.086	0.075	0.044	1.000	0.809	0.141	0.074
IQUALEST	0.256	0.549	0.468	0.809	1.000	-0.009	0.023
TPROMUL	-0.018	-0.134	-0.043	0.141	-0.009	1.000	0.948
TPRMUEST	0.059	0.007	0.091	0.074	0.023	0.948	1.000
NEMPR	0.956	0.351	-0.016	0.092	0.222	-0.079	-0.003
NEST	0.953	0.327	-0.039	0.062	0.187	-0.062	0.019
DIMEMP	-0.413	-0.343	-0.168	-0.347	-0.507	-0.009	0.060
DIMEST	-0.408	-0.341	-0.126	0.032	-0.166	0.089	0.145
IDEMP	-0.264	-0.719	-0.603	-0.230	-0.500	-0.012	-0.029
IG	-0.406	-0.112	0.066	-0.543	-0.452	0.051	0.146
TDCNOR	0.353	0.136	0.008	0.793	0.743	-0.063	-0.058
TDDCI	-0.021	0.105	0.153	-0.216	-0.029	-0.377	-0.199
TGANBAS	-0.165	-0.001	0.059	-0.835	-0.618	-0.254	-0.146
TGANREM	-0.230	-0.238	-0.205	-0.672	-0.577	-0.363	-0.307
TGANHOMU	-0.110	-0.179	-0.030	0.197	0.057	0.714	0.657
EDUCM	0.133	0.175	0.188	-0.795	-0.548	0.134	0.264
EXP	-0.543	-0.447	-0.332	0.136	-0.073	-0.295	-0.418
IDAD	-0.542	-0.396	-0.251	-0.438	-0.499	-0.247	-0.295
ANTIG	-0.450	-0.785	-0.686	-0.406	-0.678	-0.027	-0.093
TEMPAR	0.300	0.750	0.725	-0.101	0.274	0.304	0.451
SEMTer	-0.314	-0.872	-0.850	-0.292	-0.655	-0.147	-0.269
GRTTCO	0.252	0.776	0.724	-0.038	0.334	-0.160	-0.060
GRNEMPR	0.119	0.640	0.578	-0.353	0.094	-0.407	-0.318
GRNEST	0.171	0.689	0.623	-0.182	0.279	-0.367	-0.295

* For 27 observations, significance at the 5% level is reached with 0.381; at 10%, 0.323

2. Immigration in the Overall Employment Pattern

Principal components are uncorrelated linear combination of the original variables such that they explain decreasing variance of that set of variables. We applied the method to the standardize variables and present the correlations between the components and each variable (the factor loadings). For each row, we shade dark the highest loading and light the second highest.

Table 2.1 – Principal Components *

Variable	PC1	PC2	PC3	PC4	PC5	PC6
EigenValue	7.7042471	6.5450411	3.3128573	2.8246613	1.8749435	1.2134091
% Variance	0.28534248	0.52775141	0.65044983	0.75506692	0.82450927	0.86945035
TTCO	0.54255	0.24079	0.40145	0.58569	0.14209	0.26281
TESTRAN	0.60417	0.10618	0.37061	0.42107	-0.066554	-0.45152
TPROESTR	0.51826	-0.65843	-0.22313	-0.16914	-0.34524	0.066509
IQUAL	0.12632	0.89285	-0.027872	-0.11779	-0.23350	0.012361
IQUALEST	0.18941	0.89345	0.095833	0.074761	-0.16595	-0.15791
TPROMUL	0.51318	-0.21513	0.26601	-0.59126	0.32952	0.12843
TPRMUEST	0.48153	-0.24588	0.45117	-0.50207	0.22535	0.044670
NEMPR	0.57025	0.25662	0.28137	0.61149	0.16865	0.28582
NEST	0.54554	0.22278	0.30472	0.61832	0.20276	0.30171
DIMEMP	-0.67956	-0.34949	0.42430	0.084325	-0.14448	-0.0067759
DIMEST	-0.47021	0.020439	0.56892	-0.32349	-0.45467	0.018832
IDEMP	-0.62172	0.39564	0.20594	-0.16800	0.15958	0.027701
IG	-0.65848	-0.26531	0.63588	0.10562	-0.026698	-0.13234
TDCNOR	-0.060526	0.87698	0.078401	0.093376	-0.32122	-0.020348
TDDCI	-0.36116	-0.0017303	0.61953	0.14291	-0.54435	-0.14412
TGANBAS	-0.38180	-0.83058	0.15485	0.25238	0.052196	-0.057588
TGANREM	-0.66582	-0.39894	0.22646	0.41617	-0.031412	-0.028907
TGANHOMU	-0.066153	0.30904	0.47907	-0.49803	0.33208	-0.049770
EDUCM	0.12138	-0.85217	0.35448	-0.019414	0.21998	0.0039206
EXP	-0.53439	0.36230	-0.52218	0.23160	0.16522	-0.28862
IDAD	-0.58343	-0.14164	-0.40553	0.27601	0.36006	-0.35811
ANTIG	-0.88405	-0.20310	0.14650	0.14631	0.11483	0.11291
TEMPAR	0.55745	-0.029532	0.33757	0.053744	0.43979	-0.55590
SEMTER	-0.78775	-0.29547	-0.27285	0.14239	0.12898	0.33947
GRTTCO	0.61905	-0.48774	-0.079454	0.014317	-0.28563	-0.13120
GRNEMPR	0.43507	-0.76133	-0.16959	0.23697	-0.23746	-0.077110
GRNEST	0.67067	-0.58054	-0.23526	0.045023	-0.29385	-0.039000

* For 27 observations, significance at the 5% level is reached with 0.381; at 10%, 0.323

The industry employment pattern is represented by 6 components. The first (most important) is associated positively with total foreigners (TESTRAN), part-time work (TEMPAR) and growth of employment (GRTTCO) and of plant (GRNEST); negatively with firm size (DIMEMP), firm age (IDEMP), concentration (IG), earnings over wages (GANREM), worker experience (EXP), age (IDAD), tenure (ANTIG), no fixed-term contracts (SEMTER).

The second component is positively associated to IQUAL and IQUALEST (negatively with skill), Hours of work (TDCNOR); negatively with proportion of foreign workers (TPROESTR), Earnings, (TGANBAS), schooling (EDUCM), and growth of firms (GRNEMPR).

The third is positively associated with plant size (DIMEST), and overtime (TDDCI).

The fourth component is positively associated with sector size (TTCO, NEMPR and NEST) and negatively associated with women's employment (TROPUL, TPRMUEST) and earnings differential (TGANHOMU). It would represent female employment.

The first 2 components are plot in Fig. 1

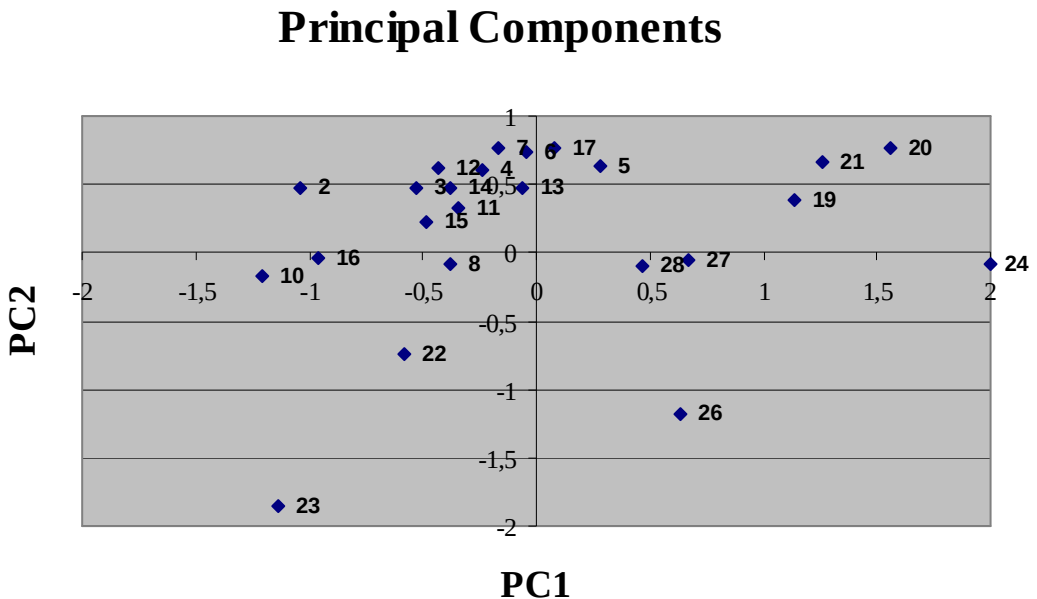


Fig. 1

A first cluster of variables have null values for the first component and positive second component – they belong to manufacturing observations (4 to 17) and include mining, 3 and possibly 1 (Agriculture) and 2 (Fishing).

A second cluster is formed by 19 (Construction), 21 (Restoration and Lodging) and 20 (Wholesale and Retail Trade), linked to 28 (Other Collective and Personal Services) and 27 (Health and Social Services) and 24 (Real Estate).

10 (Chemical Industries and Synthetic Fibers), 16 (Transportation Material Manufacturing), 8 (Paper and Publishing) and 22 (Transportation and Communications) are close together. 18 (Electricity, Gas and Water Supply) and 23 (Banking and Finance) are in the same quadrant.

26 (Education) and 29 (International Organizations) are isolated in the second quadrant.

. We also used the set of variables for each we have qualification level information (225 useable observations).

Table 2.2 – Principal Components *

Variable	PC1	PC2	PC3	PC4	PC5	PC6	PC7	PC8
EigenValue	6.6413	4.5715338	2.8079234	2.1524964	1.7455851	1.4970442	1.14493	1.0077
% Variance	0.2459	0.41529207	0.51928924	0.59901133	0.66366263	0.71910871	0.76151	0.7988
TCO	0.3718	0.20545	0.18434	0.20695	0.57025	0.10179	0.0176	0.4563
ESTRAN	0.3862	0.24949	0.18778	0.23220	0.30870	0.21541	0.3685	0.4094
PROESTR	0.1166	0.33938	-0.18552	0.16477	-0.55513	0.17240	-0.3049	0.4344
IQUAL	0.4933	-0.73356	0.23022	0.077547	-0.096651	0.12613	0.02067	0.0368
IQUALEST	0.6318	-0.56762	0.23149	0.19201	-0.037942	0.10163	0.14747	-0.1174
PROMUL	0.2355	0.38600	0.14623	-0.74289	0.11120	0.13637	0.0197	0.1278
PRMUEST	0.2189	0.46069	0.19037	-0.61737	0.12956	0.22390	-0.0109	0.03767
NEMPR	0.6460	0.20282	0.074672	0.30182	0.42249	-0.34800	-0.2399	-0.1024
NEST	0.6079	0.23583	0.075378	0.29123	0.44396	-0.37084	-0.2495	-0.1058
DIMEMP	-0.7619	0.17651	0.36452	0.15529	0.070261	0.051808	0.0341	0.0950
DIMEST	-0.5095	-0.10766	0.71325	0.028274	-0.17712	0.046479	0.0483	0.0735
IDEMP	-0.5786	-0.29205	0.19033	-0.26885	0.12240	-0.21759	-0.0739	-0.1029
IG	-0.7162	0.37420	0.40609	0.12565	0.078963	0.029715	0.14438	-0.0246
DCNOR	0.3152	-0.63369	0.28453	0.15873	0.088411	0.10955	0.0067	0.0044
DDCI	-0.3345	0.076644	0.56032	0.36135	-0.00212	0.32970	0.0769	-0.2962
GANBAS	-0.3711	0.21619	-0.17611	0.38755	-0.31192	-0.53892	0.1213	0.0825
GANREM	-0.5962	0.30334	-0.01006	0.30583	0.28307	0.18603	0.0542	-0.19859
GANHOMU	-0.1105	-0.18752	-0.02798	-0.04337	-0.08143	-0.53939	0.5459	0.2858
EDUCM	-0.2717	0.88196	0.094286	-0.13719	0.0053774	-0.19081	-0.0115	-0.1028
EXP	-0.2367	-0.53301	-0.63442	0.069624	0.21322	0.25106	0.2349	-0.0251
IDAD	-0.4709	-0.039794	-0.70000	-0.009818	0.26057	0.17217	0.2751	-0.1006
ANTIG	-0.8924	0.029157	-0.050106	0.032358	0.22559	0.028850	-0.1095	0.0918
TEMPAR	0.5105	0.53548	0.0084518	-0.21301	0.011424	-0.11482	0.4285	-0.2543
SEMTER	-0.7862	-0.14425	-0.34245	0.028076	0.24349	0.019165	-0.2796	0.1989
GRTCO	-0.1784	0.18568	0.26654	0.26207	-0.22260	0.050807	0.1145	0.0526
GRNEMPR	0.2275	0.69076	-0.32260	0.38862	-0.096134	0.26000	0.05405	-0.0596
GRNEST	0.5403	0.54831	-0.25080	0.26785	-0.26364	0.23145	0.0263	-0.0824

* For 225 observations, significance at the 5% level is reached (using the normal) with 0.130 at 10%, 0.109.

Now eight components show eigenvalue larger than 1. The first component is positively associated with number of enterprises (NEMPR) and number of plants (NEST), part-time employment (TEMPAR). It is negatively correlated with foreign qualification (IQUALEST), firm size (DIMEMP), firm age (IDEMP), employment concentration (IG), earnings over base wages (GANREM), tenure (ANTIG) and non-fixed term labor contracts (SEMTER).

The second component represents skill level. It is positively related to qualification (negatively to IQUAL) and education (EDUCM), growth rate of firms (GRNEMPR) and plants (GRNEST); negatively with hours of work (DCNOR).

The third component is positively associated to plant size (DIMEST), overtime (DDCI), and sector employment growth rate (GRTCO); negatively with worker experience (EXP) and age (IDAD). It may represent the response of the economy to demand shocks.

The fourth component is positively associated with earnings (GANBAS) and negatively associated with female employment, both total (PROMUL) and foreign (PRMUEST). The seventh component only represents gender earnings differential (GANHOMU). Interestingly, foreign employment is the main contributor to the fifth and eighth component. The fifth component opposes total sector employment (TCO) and proportion of foreign employment (PROESTR). The effect of total foreign employment (ESTRAN) is isolated in the eighth component as the most important loading. This would support a segmentation effect.

3. Log- Earnings Regressions

In this section we present – in Table 3 - the results of log-earnings regressions we used the large data set with observations for each qualifying level in models (1) to (6) and the “averaged” data set in columns (7) and (8).

Variable	(1)	(2)**	(3)	(4)**	(5)	(6)**	(7)	(8)
TCO	-.194874E-05 (.001)	-.197393E-05 (.000)						
PROESTR	.076488 (.686)	1.34677 (.046)	.056564 (.767)	1.06834 (.084)	-.088310 (.585)	.843331 (.097)	4.099 (.000)	3.9356 (.000)
IQUAL							-.0733 (.221)	
QUALI1	-.178083 (.000)	-.171950 (.000)	-.180792 (.000)	-.175214 (.000)	***	***		
PROMUL	-.417693 (.000)	-.420390 (.000)	-.433232 (.000)	-.445899 (.000)	-.381474 (.000)	-.374724 (.000)		-.58189 (.000)
TPRMUEST							-.5568 (.000)	
NEST	.146973E-05 (.054)	.218358E-05 (.008)						
IG	.445583 (.000)	.513797 (.000)	.401867 (.000)	.441306 (.000)	.409426 (.000)	.450183 (.000)	.65847 (.000)	.47075 (.003)
DCNOR							.05787 (.009)	
EDUCM	.065147 (.000)	.063984 (.000)	.069654 (.000)	.069170 (.000)	.066678 (.000)	.065199 (.000)	.16214 (.000)	.15043 (.000)
EXP	.012018 (.026)	.015116 (.007)	.012207 (.022)	.013558 (.000)	.012273 (.006)	.013645 (.002)	.03250 (.000)	.02954 (.001)
ANTIG	.030513 (.001)	.029150 (.001)	.027777 (.001)	.023699 (.005)	.028427 (.000)	.024785 (.000)		.01102 (.293)
GRNEMPR	-.936094 (.015)	-1.04412 (.010)	-.816340 (.022)	-.751709 (.043)	-.782473 (.009)	-.713471 (.019)	-.3328 (.175)	-.39226 (.198)
GRNEST	1.85747 (.000)	1.58947 (.002)	1.65750 (.000)	1.25643 (.014)	1.65991 (.000)	1.27792 (.002)		
n	247	238	247	238	247	238	27	28
SSR	6.92335	6.20447	7.27131	6.58032	4.89738	4.24730	.0819	.1418
RSQ	.890918	.897019	.885436	.890780	.922839	.929504	.9722	.9522
SER	.171642	.165691	.175159	.169885	.145921	.138631	.06747	.0842
LM het. test	2.26121 (.133)	3.77748 (.052)	1.64507 (.200)	2.83799 (.092)	1.93175 (.165)	2.35981 (.124)	.11942 (.730)	.79E-02 (.929)

* p-values in parenthesis.** PROESTR instrumented with GRTCO, IQUALEST, IDEMP TEMPOR and SEMTER.*** Run with 8 qualification dummies.

For each model we report the regression coefficients, their p-value, sum of squared residuals, R-square, the standard error of the regression, and an heteroscedasticity test. The latter suggests absence of heteroscedasticity at the 5% level and we therefore do not weight the regressions.

Our theoretical departure is the Mincerian regression: earnings are a function of education (EDUC), experience (EXP) and tenure (ANTIG) – insuring equilibrium in the human capital market. Discrimination or unobserved characteristics would explain an effect of female employment (PROMUL). Rent-sharing with uncompetitive product market firms would suggest a positive effect of industry concentration (IG).

Efficiency wages would suggest a possible effect of plant (or firm) size.

The first two regressions include total employment and number of plants, even if not the ratio (regression dictated by data). It is likely that multicollinearity between firm and plant size with IG eliminates the importance of the former.

Proportion of foreigners seem relevant in the “average” data set; it is non-significant in the other unless instrumented. The effect is positive: foreign presence in industry raises earnings. As we have seen the growth rate of sector employment, firms and plants is positively correlated with foreign employment. It is possible that idiosyncratic industry booms raise wages and the need for employment, partly solved with foreigners – or to which foreigners respond too. Alternatively, we can expect that given all other variables, including job qualification, foreigners may have higher wage than nationals – they are more productive and industrious or motivated than equivalent nationals, reason why they had the initiative to migrate.

That is, we found no evidence that foreigners are discriminated against, nor that they depress wages.

4. Conclusion

Apparently, legal foreign employment in Portugal is mostly located in service to firms, restoration and building. Foreigners are assigned a lower job-qualification than nationals but with compatible relative pattern. They seem to respond to specific labor shortages or sector increase in employment demand and do not seem to have depressed locals' wages. If any they seem to have had a positive effect on earnings – possibly allowing nationals to have climbed to better positions⁵, being assimilated and more motivated than nationals⁶, or being a proxy for positive product demand shocks.

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⁵ See Bhagwati (1983), page 50.

⁶ See Borjas (1999).

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Appendix 1. A. Variables – from “QUADROS DE PESSOAL”, 2000

i) General and Immigration

$NEMPR_i$ – Number of Firms in the industry (Table 13.)

$NEST_i$ – Number of Plants in the industry (Table 17.)

TCO_{it} – Number of Partial Time and Full-Time Workers in the industry (Table 37.) and category

$TTCO_i$ – Number of Partial Time and Full-Time Workers in the industry (Table 37.)

$ESTRAN_{it}$ – Number of Foreign Workers in the industry (Table 61.) and category

$TESTRAN_{it}$ – Number of Foreign Workers in the industry (Table 61.)

$PROESTR_{it} = ESTRAN_{it}/TCO_{it}$

$TPROESTR_i = TESTRAN_i/TTCO_i$.

ii) Qualification / Skill Level Index

$QUALI1_{it}$ - Ordinal skill level (varying inversely with the skill level: $QUALI1_{it} = 1$ for highest skill level, to $QUALI1_{it} = 8$ for the lowest. Skill level is attributed according to earnings levels.

Unknown skill level is given a level 3.)

$IQUAL_i$ – Average qualification skills of workers employed in the industry (From Table 37)

assigning: Highly Technical Professionals – 1; Medium Technical Professionals – 2; Foremen – 4; Highly Skilled Professionals – 3; Skilled Professionals – 5; Medium-Skilled Professionals – 6; Unskilled Professionals – 7; Apprentices – 8; Unknown – (ignored)

$IQUALEST_i$ - Average qualification skills of foreign workers employed in the industry (From Table 61)

iii) Schooling and other employed workers characteristics

$EDUC_i$ – Average years of education of workers employed in the industry (From Table 34),

assigning: Inferior to 1º Cycle – 2 years; Habilitados with 1º Cycle – 4 years; Habilitados with 2º Cycle – 6 years; Habilitados with 3º Cycle – 9 years; Ens. Sec. Cursos e Escolas Profissionais – 12 years; Bacharelato – 15 years; Licenciatura – 17 years.)

$EDUCM_i$ – Average years of education of workers employed in the industry (From Table 34),

assigning: Inferior to 1º Cycle – 2 years; Habilitados with 1º Cycle – 5 years

Habilitados com o 2º Cycle – 7.5 years

Habilitados com o 3º Cycle – 10.5 years

Ens. Sec. Cursos e Escolas Profissionais – 13.5 years

Bacharelato – 16 years

Licenciatura – 17 years.

$ANTIG_i$ – Average years of tenure of workers employed in the industry (From Table 36, assigning

Less than 1 year – 0.5 years; 1 to 4 years – 2.5 years; 5 to 9 years – 7.5 years; 10 to 14 years – 12.5 years; 15 to 19 years – 17.5 years; 20 and more years – 27.5 years.)

$IDAD_i$ - Average age of workers employed in the industry (From Table 45), assigning

Less than 15 years – 14 years; 15 to 24 years – 20 years; 25 to 34 years – 30 years; 35 to 44 years – 40 years; 45 to 54 years – 50 years; 55 to 64 years – 60 years; 65 and more years – 67.5 years.)

$EXP = IDAD - EDUCM - 6$.

$TEMPAR_i$ – Proportion of part-time workers in the industry (From Table 55).

$SEMTER_i$ – Proportion of workers with no-term contracts in the industry (approximating permanent) (From Table 49).

iv) Female Employment

$PROMUL_{it}$ – Proportion of Women in Industry Employment (From Tables 37 and 39.)

$TPROMUL_i$ – Proportion of Women in Industry Employment (From Tables 37 and 39.)

$TPRMUEST_i$ – Proportion of Women in Foreign Employment (From Tables 61 and 62.)

v) Working Hours

$DCINOR_{it}$ – Average Standard Work Week Hours, Partial Time and Full-Time Workers, (Table 69.)

$TDCINOR_{it}$ – Average Standard Work Week Hours, Partial Time and Full-Time Workers, (Table 69.)

$DCNOR_{it}$ – Average Standard Work Week Hours, Full-Time Workers, (Table 70.)

$TDCNOR_i$ – Average Standard Work Week Hours, Full-Time Workers, (Table 70.)

$DCITOT_{it}$ – Average Total Work Week Hours, Partial Time and Full-Time Workers (Table 71.)

$TDCITOT_i$ – Average Total Work Week Hours, Partial Time and Full-Time Workers (Table 71.)

$DDCI_{it} = DCITOT_{it} - DCINOR_{it}$

$TDDCI_i = TDCITOT_i - TDCINOR_i$.

$PERTHEX_{it}$ – Percentage of Workers With Overtime Relative to Industry Total (Table 74.)

$DUREXT_{it}$ – Average Hours Length of Weekly Overtime Work (Table 75)

vi) Earnings and Salaries

$REMBAS_{it}$ – Standard Work Monthly Base-Wages (Table 84, Portuguese escudos)

$TREMBAS_i$ – Standard Work Monthly Base-Wages (Table 84, Portuguese escudos)

$GANBAS_{it}$ – Total Monthly Earnings (Table 87, Portuguese escudos, it includes overtime, tenure-related premiums, etc.)

$TGANBAS_i$ – Total Monthly Earnings (Table 87, Portuguese escudos)

$RHORBAS_{it}$ – Standard Work Hourly Base-Wages (Table 94, Portuguese escudos)

$TRHORBAS_i$ – Standard Work Hourly Base-Wages (Table 94, Portuguese escudos)

$GANREM_{it} = GANBAS_{it} / REMBAS_{it}$.

$TGANREM_i = TGANBAS_i / TREMBAS_i$.

$GANHOMU$ – Male / Female total monthly earnings (Tables 88 and 89).

vii) Industrial Organization

$IDEMP_i$ – Average age of firms in the industry (From Table 31, assigning

Less than 1 year – 0.5 years; 1 to 4 years – 3 years; 5 to 9 years – 7.5 years; 10 to 19 years – 15 years; 20 to 49 years – 35 years; 50 and more years – 60 years.)

$DIMEMP_i$ – Average firm size in the industry in number of workers employed (From Tables 13 and 15.)

$DIMEST_i$ – Average plant size in the industry in number of workers employed (From Tables 17 and 19.)

IG_i – Industry concentration measured by the Gini coefficient on the distribution of employment by firm size (From Tables 13 and 15.)

viii) Sector Importance Growth Rates

$GRTCO_{it}$ – Yearly Growth rate plus 1 of sector workers from year 1999 to year 2000 (i.e. of TCO).

$GRTTCO_i$ – Yearly Growth rate plus 1 of sector workers from year 1999 to year 2000 (i.e. of TTCO).

$GRNEMPR_i$ – Yearly Growth rate plus 1 of firms from year 1999 to year 2000 (i.e. of NEMPR), 2000.

$GRNEST_i$ – Yearly Growth rate of plants plus 1 from year 1999 to year 2000 (i.e. of NEST), 2000.

B. Observations: The observation classification comes from CAE “Classificação de Actividades Económicas” used in Quadros de Pessoal for 99-00: (Total Manufacturing includes 4 to17)

- 1 – Agriculture, Forestation and Quarry.
- 2 – Fishing
- 3 – Mining
- 4 – Food, Beverages and Tobacco Manufacturing Industries
- 5 – Textiles and Clothing
- 6 – Leather and Leather Products
- 7 – Wood and Cork Manufacturing Industries
- 8 – Paper, Graphical Arts and Publishing
- 9 – Chemical Industries from Oil and Coke, and Nuclear Fuels
- 10 – Chemical Industries and Synthetic Fibres
- 11 – Rubber and Plastic Manufactures
- 12 – Other Non Metallic Ore Manufacturing
- 13 – Heavy Metallurgy and Metallic Products
- 14 – Machinery and Engineering Manufactures
- 15 – Electric and Optic Equipment
- 16 – Transportation Material Manufacturing
- 17 – Other Manufacturing Industries
- 18 – Electricity, Gas Fuel, Steam and Water Supply
- 19 – Construction and Public Infrastructure
- 20 – Wholesale and Retail Trade, Vehicle Maintenance
- 21 – Restoration and Lodging
- 22 – Transportation, Storage and Communications
- 23 – Banking, Insurance and Other Monetary and Financial Institutions
- 24 – Real Estate and Service to Firms
- 25 – Public Administration, Defense and Social Security
- 26 – Education
- 27 – Health and Social Services
- 28 – Other Collective and Personal Services
- 29 – International Organizations

Appendix 2 at the journal Website: <http://www.usc.es/economet/eaat.htm>

Appendix 2. Correlations

Table A.2.1 presents the unweighted correlations. Tables A.2.2 and A.2.3 present the weighted (by TCO) and unweighted correlations for the discriminated sample. Notice that correlations between averaged data by averaged data – in columns IQUAL and IQUALEST - had rather be found significant for the 27 (or similar) observations significant level.

Table A.2.1 – Correlations *							
Variable	TTCO	TESTRAN	TPROESTR	IQUAL	IQUALEST	TPROMUL	TPRMUEST
TTCO	1.000	0.619	-0.105	0.173	0.338	0.113	0.173
TESTRAN	0.619	1.000	0.091	0.123	0.371	0.048	0.155
TPROESTR	-0.105	0.091	1.000	-0.415	-0.490	0.343	0.322
IQUAL	0.173	0.123	-0.415	1.000	0.899	-0.073	-0.103
IQUALEST	0.338	0.371	-0.490	0.899	1.000	-0.167	-0.139
TPROMUL	0.113	0.048	0.343	-0.073	-0.167	1.000	0.925
TPRMUEST	0.173	0.155	0.322	-0.103	-0.139	0.925	1.000
NEMPR	0.929	0.563	-0.048	0.176	0.302	0.049	0.095
NEST	0.928	0.541	-0.052	0.138	0.267	0.055	0.106
DIMEMP	-0.259	-0.215	-0.160	-0.322	-0.396	-0.205	-0.044
DIMEST	-0.250	-0.206	-0.142	0.042	-0.037	-0.057	0.109
IDEMP	-0.265	-0.406	-0.664	0.136	0.165	-0.303	-0.303
IG	-0.121	-0.047	-0.334	-0.316	-0.233	-0.162	-0.004
TDCNOR	0.220	0.140	-0.491	0.828	0.823	-0.313	-0.299
TDDCI	0.029	0.083	-0.174	0.028	0.099	-0.264	-0.050
TGANBAS	-0.230	-0.118	0.297	-0.841	-0.759	-0.154	-0.081
TGANREM	-0.128	-0.172	-0.222	-0.427	-0.336	-0.438	-0.326
TGANHOMU	-0.033	-0.035	-0.299	0.247	0.243	0.405	0.331
EDUCM	-0.012	0.071	0.456	-0.834	-0.737	0.352	0.409
EXP	-0.286	-0.300	-0.470	0.228	0.184	-0.505	-0.553
IDAD	-0.367	-0.325	-0.270	-0.296	-0.284	-0.385	-0.406
ANTIG	-0.319	-0.486	-0.436	-0.309	-0.350	-0.347	-0.315
TEMPAR	0.368	0.674	0.023	-0.094	0.101	0.397	0.469
SEMTER	-0.397	-0.693	-0.185	-0.354	-0.477	-0.350	-0.403
GRTTCO	0.128	0.343	0.728	-0.288	-0.294	0.303	0.299
GRNEMPR	0.086	0.252	0.799	-0.549	-0.520	0.185	0.199
GRNEST	0.126	0.276	0.873	-0.372	-0.330	0.302	0.276

* For 27 observations, significance at the 5% level is reached with 0.381; at 10%, 0.323

Table A.2.2 – Correlations (weighted by TCO) *

Variable	TCO	ESTRAN	PROESTR	IQUAL	IQUALEST	PROMUL	PRMUEST
TCO	1.000	0.421	-0.044	0.078	0.161	-0.068	-0.047
ESTRAN	0.421	1.000	0.780	0.057	0.389	-0.141	-0.071
PROESTR	-0.044	0.780	1.000	0.033	0.371	-0.007	0.050
IQUAL	0.078	0.057	0.033	1.000	0.808	0.121	0.027
IQUALEST	0.161	0.389	0.371	0.808	1.000	-0.014	-0.085
PROMUL	-0.068	-0.141	-0.007	0.121	-0.014	1.000	0.913
PRMUEST	-0.047	-0.071	0.050	0.027	-0.085	0.913	1.000
NEMPR	0.629	0.218	-0.014	0.090	0.220	-0.072	-0.048
NEST	0.623	0.195	-0.032	0.060	0.185	-0.056	-0.030
DIMEMP	-0.270	-0.240	-0.130	-0.339	-0.497	0.003	0.096
DIMEST	-0.255	-0.230	-0.099	0.035	-0.162	0.080	0.145
IDEMP	-0.194	-0.549	-0.479	-0.233	-0.506	-0.011	0.015
IG	-0.306	-0.103	0.055	-0.540	-0.445	0.050	0.133
DCNOR	0.237	0.145	0.040	0.686	0.664	-0.034	-0.056
DDCI	-0.125	0.135	0.196	-0.209	-0.080	-0.260	-0.134
GANBAS	-0.236	-0.219	-0.084	-0.501	-0.392	-0.300	-0.268
GANREM	-0.093	-0.138	-0.172	-0.603	-0.512	-0.294	-0.189
GANHOMU	-0.039	-0.157	-0.006	0.119	0.065	0.381	0.271
EDUCM	0.008	0.051	0.150	-0.795	-0.548	0.120	0.187
EXP	-0.303	-0.242	-0.262	0.143	-0.065	-0.256	-0.292
IDAD	-0.353	-0.248	-0.197	-0.433	-0.492	-0.213	-0.204
ANTIG	-0.275	-0.557	-0.547	-0.400	-0.673	-0.016	0.026
TEMPAR	0.100	0.447	0.575	-0.104	0.272	0.266	0.252
SEMTER	-0.153	-0.589	-0.676	-0.286	-0.651	-0.125	-0.095
GRTCO	-0.027	0.066	0.093	-0.113	-0.055	-0.070	-0.089
GRNEMPR	0.072	0.501	0.461	-0.350	0.102	-0.356	-0.328
GRNEST	0.108	0.539	0.494	-0.187	0.274	-0.327	-0.322

* For 225 observations, significance at the 5% level is reached (using the normal) with 0.130 at 10%, 0.109.

Table A.2.3 – Correlations *

Variable	TCO	ESTRAN	PROESTR	IQUAL	IQUALEST	PROMUL	PRMUEST
TCO	1.000	0.579	-0.023	0.047	0.135	0.126	0.160
ESTRAN	0.579	1.000	0.052	0.038	0.183	0.076	0.117
PROESTR	-0.023	0.052	1.000	-0.152	-0.215	0.040	0.039
IQUAL	0.047	0.038	-0.152	1.000	0.878	-0.118	-0.150
IQUALEST	0.135	0.183	-0.215	0.878	1.000	-0.133	-0.133
PROMUL	0.126	0.076	0.040	-0.118	-0.133	1.000	0.787
PRMUEST	0.160	0.117	0.039	-0.150	-0.133	0.787	1.000
NEMPR	0.448	0.272	-0.025	0.134	0.282	0.060	0.093
NEST	0.448	0.261	-0.026	0.092	0.241	0.071	0.103
DIMEMP	-0.132	-0.112	-0.060	-0.356	-0.478	-0.113	-0.065
DIMEST	-0.134	-0.109	-0.049	-0.003	-0.115	-0.076	-0.049
IDEMP	-0.222	-0.287	-0.286	-0.179	-0.254	-0.114	-0.139
IG	-0.082	-0.035	-0.131	-0.489	-0.454	-0.007	0.037
DCNOR	0.078	0.061	-0.176	0.633	0.605	-0.189	-0.183
DDCI	-0.009	0.047	-0.065	-0.048	-0.018	-0.199	-0.051
GANBAS	-0.214	-0.156	0.159	-0.318	-0.291	-0.389	-0.288
GANREM	-0.011	-0.058	-0.100	-0.467	-0.400	-0.189	-0.096
GANHOMU	-0.096	-0.062	-0.105	0.047	0.025	-0.012	-0.148
EDUCM	0.028	0.061	0.159	-0.817	-0.688	0.316	0.353
EXP	-0.172	-0.176	-0.172	0.157	0.055	-0.307	-0.329
IDAD	-0.189	-0.170	-0.099	-0.369	-0.404	-0.154	-0.155
ANTIG	-0.189	-0.287	-0.174	-0.459	-0.581	-0.157	-0.134
TEMPAR	0.164	0.327	-0.005	-0.186	0.013	0.398	0.395
SEMTER	-0.190	-0.357	-0.058	-0.342	-0.523	-0.224	-0.234
GRTCO	0.005	0.022	0.118	-0.099	-0.110	-0.085	-0.039
GRNEMPR	0.158	0.248	0.397	-0.370	-0.178	0.059	0.155
GRNEST	0.187	0.275	0.465	-0.143	0.098	0.125	0.195

* For 225 observations, significance at the 5% level is reached (using the normal) with 0.130 at 10%, 0.109.