Immigration Patterns in Portugal: An Analysis of the Effect of Immigration on Unemployment and Wages Among Different Demographic Groups

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Franziska Kiesl

April 4, 2022

-Abstract-

English

This paper gives an overview of the demographic structures among the native and immigrant population in Portugal and how those structures may determine the effect of immigration on unemployment and wages. The analysis is based on data of the Portuguese Labour Force Survey, using the data sets of 1998-2010 and 2011-2019. It seems that immigrants in Portugal tend to show higher education levels than natives. Yet, immigrants seem to be more prone to be employed in professions not requiring skills compared to natives. This indicates a mismatch between education and workplace of immigrants in Portugal. On an individual level, being an immigrant seems to have at most a small positive effect on the employment probability and no effect on wages. On a regional level, immigration tends to have no significant effect on overall unemployment rates or unemployment among natives. Overall wages and wages of natives do not seem to be significantly affected either. The analysis is conducted using a 'spatial correlations' approach. Demographic structures among the native and immigrant population may be determining factors of the effect immigration has on labour market outcomes in the receiving country. Consequently, the analysis additionally focuses on the effect of increased immigration on different demographic subgroups.

Padrões de Imigração em Portugal: Uma Análise do Efeito da Imigração no Desemprego e Salários entre Diferentes Grupos Demográficos

Franziska Kiesl

April 4, 2022

-Abstract-

Portuguese

Este documento dá uma visão geral das estruturas demográficas entre a população nativa e imigrante em Portugal e como essas estruturas podem determinar o efeito da imigração no desemprego e nos salários. A análise baseia-se nos dados do Inquérito às Forças de Trabalho Português, utilizando os conjuntos de dados de 1998-2010 e 2011-2019. Parece que os imigrantes em Portugal tendem a mostrar níveis de educação superiores aos dos nativos. No entanto, os imigrantes parecem ser mais propensos a serem empregados em profissões que não requerem competências, em comparação com os nativos. Isto indica um desajuste entre a educação e o local de trabalho dos imigrantes em Portugal. A nível individual, ser imigrante parece ter, no máximo, um pequeno efeito positivo sobre a probabilidade de emprego e nenhum efeito sobre os salários. A nível regional, a imigração tende a não ter um efeito significativo nas taxas globais de desemprego ou desemprego entre os nativos. Os salários globais e os salários dos nativos também não parecem ser significativamente afectados. A análise é conduzida utilizando uma abordagem de "correlações espaciais". As estruturas demográficas entre a população nativa e imigrante podem ser factores determinantes do efeito que a imigração tem nos resultados do mercado de trabalho no país de acolhimento. Consequentemente, a análise foca adicionalmente o efeito do aumento da imigração em diferentes subgrupos demográficos.

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1. Introduction

Immigration in European countries has strongly increased in recent years and is expected to remain high. Further immigration inflows towards Europe may be expected in the future. A potential driver might be changing life conditions due to climate change. The debate on how to handle huge immigration inflows belongs to the most discussed topics in many European countries.

Natives often express their concerns regarding the accommodation of too many immigrants. They are worried that incoming immigrants will have a negative impact on their labour market outcomes. However, also positive effects of migration on the host countries' labour markets are conceivable. High diversity may come along with increased productivity and may thus have a positive impact on the economy. Referring to Alesina & La Ferrara (2005), this is the case for the US for example. However, they also stress that the effect of immigration on productivity is strongly dependent on the countries' characteristics. If immigration inflows result in a fragmentation of society this seems to rather bring costs than benefits for productivity. To derive adequate immigration and labour market policies it is important to understand the labour market dynamics induced by an immigration inflow.

Dustmann & Frattini (2011) analyse immigration patterns across different European countries. They provide, among other factors, an analysis of the skill structures, labour market integration and competitiveness between immigrant and native workers. They stress that the characteristics of immigrants differ considerably across European countries. They seem to differ in terms of education and skill structure, country of origin and ethnicity. Also, the density of immigrants differs across European countries.

So far, there is not much literature on the effects of immigration on labour market outcomes in Portugal. The immigrant share in Portugal is below the EU average (Frattini & Sartori (2021)). Looking at Figure 1, it becomes clear that the trend of the immigrant native ratio in Portugal was rather decreasing until the end of 2016. Since then, Portugal had experienced a continuing increase in the immigrant native ratio. This emphasizes the growing importance of an assessment of the effects of immigration inflows in Portugal.

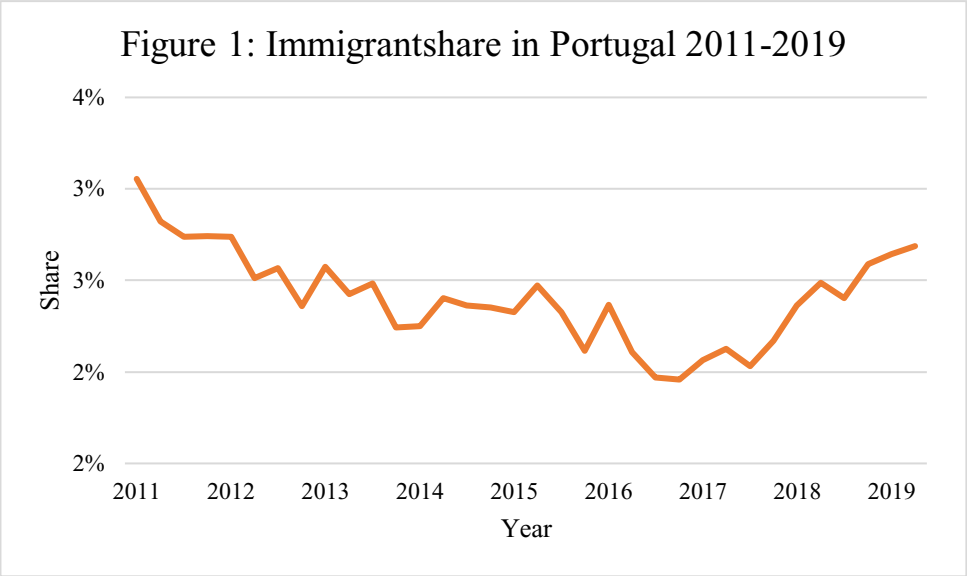

Figure 1: Immigrant share as immigrant native ratio in Portugal from 2011-2019 (Source: Portuguese Labour Force Survey 2011-2019)

Cabral & Duarte (2013) analysed wage differences between native and immigrant workers in Portugal for the 2002-2008 period. They find that immigrants' wages are on average below wages of natives. This gap does not seem to be a result of immigrants being less skilled than natives but rather be driven by lower returns to skills for immigrants. The difference in the returns to education seem to increase with a higher level of education. There seems to be some assimilation after being active in the Portuguese labour market. However, wages of immigrants and natives of the same skill level do not seem to fully converge. The analysis of Cabral & Duarte (2013) is based on employer-employee matched data from Quadros de Pessoal.

Martins et al. (2018) used the data from Quadros de Pessoal for the 2003-2007 period. They analysed the effect of immigration on natives' employment. Instead of using aggregate data they analyse the impact of immigration on the firm- and job level. They do not find evidence for immigrants crowding out employment of native workers.

This analysis will be based on the data of the Portuguese Labour Force Survey for the 1998-2010 and the 2011-2019 period. To better understand the effects of immigration on labour market outcomes on a macro level, this paper will start with an analysis of the effect of being an immigrant on labour market outcomes on an individual level. It will examine the effect of being an immigrant on the employment probability and monthly wages. Further, a spatial

approach introduced by Borjas (1999) will be applied to conduct an analysis of the effect of an increase of the immigrant / native ratio on unemployment rates and monthly wages on a regional level.

Using a different data set, time-period, and approach, the results of this analysis will contribute to the previous literature on the effects of immigration on the Portuguese labour market in several ways. First, it checks for the robustness of previous results, for example, the effect on natives' unemployment analysed by Martins et al. (2018). Secondly, it analyses the effect on overall wages as well as on natives' wages. To my best knowledge only gaps between immigrant and native wages in Portugal have been analysed so far (Cabral & Duarte (2013)).

This paper will start with a literature review on the relationship between immigration and the receiving countries' labour market outcomes in Section 2. Section 3 will introduce the data base of this analysis. It will give an overview of the demographic structures of the immigrant and native population in Portugal. As emphasized by Dustmann & Fabbri (2005), understanding these structures seems to be important to better grasp potential effects of an increase of the immigrants share. Section 4 will present an analysis of the effect of being an immigrant on the employment probability and wages. No significant effect was found on wages and a at most small positive effect on the employment probability. The results will be presented comparing the 1998-2010 and 2011-2019 period. Section 5 will continue with an analysis of the effect of an increase of the immigrant / native ratio on unemployment rates and wages. The analysis is conducted on a regional level using the 'spatial correlations' approach introduced by Borjas (1999). First, the empirical implementation and empirical issues will be discussed. Following, the results will be presented, finding no significant effect on overall unemployment or unemployment among natives. This seems to be in line with the findings of Martins et al. (2018). On overall and natives' wages no significant effect was found neither. However, the analysis faces some empirical issues and limitations that will be pointed out in Section 6. Section 7 will conclude with a discussion about some policy implications and ideas for future research.

2. Literature Review

The effects of immigration on labour market outcomes found in previous literature is not unambiguous. Card (1990) analyses the labour market effects of immigration of unskilled individuals based on a natural field experiment in Miami, the 'Mariel Boatlift'. He does neither find an effect of the immigration shock on natives' wages nor on natives' employment. Immigrants seem to have integrated into the Miami labour market quite fast without significantly impacting natives or earlier immigrants.

Peri et al. (2017) focus their analysis on the effect of immigration on firm's outcomes. Their analysis is based on micro-data on French manufacturing firms focusing on the 1995-2005 period. Their results suggest that an increase in foreign labour supply leads to increased total factor productivity. They find that the increase in productivity comes along with faster growth of capital, increased exports, and increased wages for natives.

Borjas (2003) uses data from the US and differentiates between different education groups. He finds that immigration lowers wages of workers with similar characteristics. In contrast, Dustmann et al. (2013) find an overall increasing effect of immigration on natives' wages. They used data from the UK and analysed the effect of immigration along the income distribution. For workers located at the parts of the income distribution with a higher share of immigrants they find a decreasing effect of immigration on native workers' wages. Workers located at the parts of the income distribution less affected by immigration experience an increase in their wages, leading to an overall positive effect. This indicates that immigration seems to particularly impact skill groups or industries where immigrants are located in.

Antonji & Card (2018) analyse the effect of immigration on the labour market outcomes of less-skilled natives. Their analysis is based on data from the Standard Metropolitan Statistical Area in the US for the 1970-1980 period. They distinguish between different industries and cities. They show that less-skilled immigrants will settle into occupations where less-skilled work is required. Thus, labour supply in those industries increases after an immigration inflow. When they study the distributions of less-skilled natives in cities that are more and in those that are less affected by immigration, they find evidence for some displacement of natives out of low-wage industries which show a high share of immigrants. On employment, they do not find strong effects.

Dustmann et al. (2005) analyse the effect of immigration on various labour market outcomes in Britain. They stress in their analysis the effects immigration has on different labour market outcomes seem to strongly depend on the characteristics of the immigrants as well as of the host country.

The baseline of this seems to be the question whether immigrant and native workers are substitutes or rather complements. If they are substitutes, this would presumably lead to increased competition between natives and immigrants potentially resulting in increased unemployment or decreased wages. If immigrants bring rather complementary skills, natives' labour market outcomes could be positively affected. Referring to Ottaviano & Peri (2012), the impact of immigration on natives' wages seems to depend on the degree of substitutability between immigrants and natives in the labour market. Considering data from the US for the 1960-2006 period, Ottaviano & Peri (2012) concluded that immigrants and natives seem to be imperfect substitutes. They state that even if the degree of imperfect substitutability is only small, this seems to have an influence on the estimated wage effects of immigration.

Hence, the degree of substitutability seems to be dependent on demographic structures of immigrant and native workers. For that reason, this analysis will also analyse the effect of an increased immigrant / native ratio on unemployment and wages among different demographic subgroups. Different education levels, age groups and gender will be considered. For the analysis of the wage effects, it will additionally differentiate between the effects on wages among workers employed in professions that require certain skills and among those that work in professions for unskilled workers.

3. Data and Descriptive

3.1. Data

The analysis will be based on the data of the Portuguese Labour Force Survey. The survey was conducted on a quarterly basis. The analyses in this paper will be conducted using the 1998-2010 period as well as the 2011-2019 period. The data sets contain detailed information on labour market variables as employment and wages as well as on personal information of the individuals such as age, nationality, and their educational level. Since the analysis focuses on labour market outcomes the data set is restricted to a working sample with individuals aged 25-

65. Furthermore, an individual living in Portugal and naming a nationality different from Portuguese is considered an immigrant for this analysis.

3.2. Demographics of Natives and Immigrants in Portugal

As emphasized by Dustmann et al. (2013) and Ottaviani & Peri (2012), the effect of immigration on the host country's labour market seems to be dependent on the characteristics of the immigrant and native population. This section will give an overview of the development of the main demographics of the native and immigrant population in Portugal for the 1998-2019 period. Gender, age, and education structures can be determining factors of employment and wages in an economy.

3.2.1. Gender

Figure 2 depicts the share of male and female individuals among the native and immigrant population in Portugal for the years 1998, 2011 and 2019. The Portuguese population seems to consist of a slightly higher share of females. In the period 1998-2019 the female share among immigrants increased, while it decreased for natives. Differences between natives and immigrants, however, are only small and they converged between 1998 and 2019.

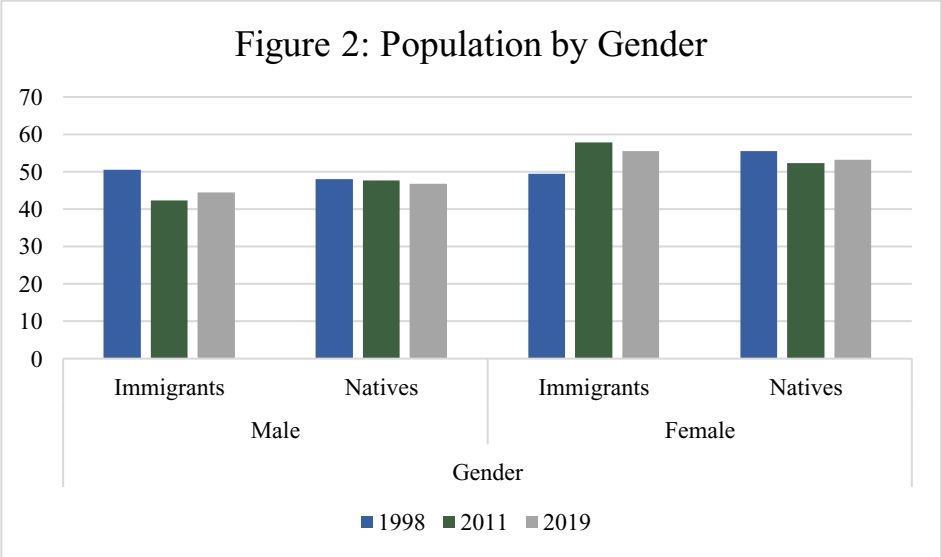

Figure 2: Immigrant and native population in Portugal 1998, 2011, 2019. (Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

3.2.2. Age

The mean age of immigrants and natives in the years 1998, 2011 and 2019 can be obtained from Figure 3. It is observable that the native population seems to have a higher age structure than the immigrant population in all three years. For both groups the average age increased from 1998-2019. While the mean age among immigrants was 39 in 1998, it is 43 in 2019. For natives it increased from 44 in 1998 to 47 in 2019.

For the analysis on a regional level (Section 5), individuals will be divided into four age groups to analyse the effect of immigration among different age groups. Figure 4 shows the age structure of natives and immigrants throughout the years 1998, 2011 and 2019.

It is observable that the overall population aged from 1998-2019. Furthermore, immigrants seem to be more prone to belong to the youngest age group than natives. It seems that immigrants coming to Portugal tend to be rather young. However, comparing the shares of 1998 to 2019, it is observable that also the immigrant population seems to be aging. While the shares of immigrants decreased from 1998-2019 in the two younger groups, they increased for the two older groups.

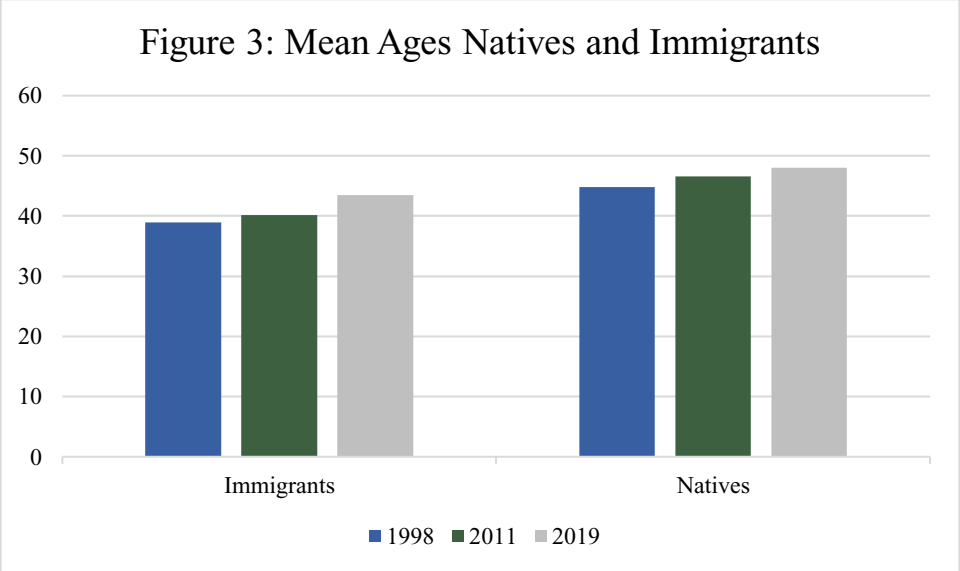

Figure 3: Mean Ages of immigrants and natives in Portugal 1998, 2011, 2019. (Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

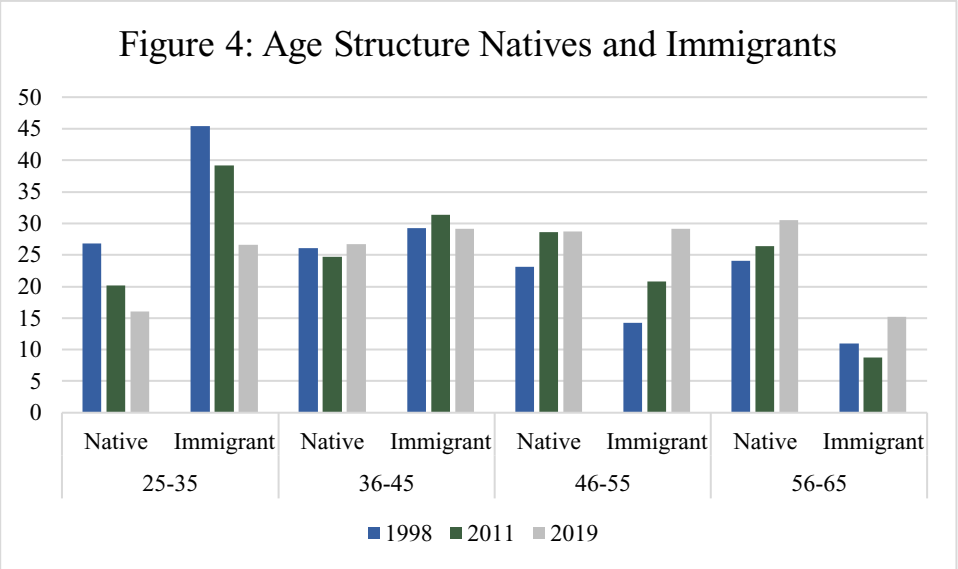

Figure 4: Shares of natives and immigrants in different age groups 1998, 2011, 2019. (Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

3.2.3. Education

The four education groups considered in this analysis are 'Higher Education' (HE) if the individual experienced higher education, 'High School' (HS) if the individual graduated from High School, 'Ninth Grade' (NG) if the individual completed ninth grade, and 'Lower Education' if the individual did not finish ninth grade.

Looking at Figure 5, it can be observed that the overall educational attainment increased between 1998 and 2019. This applies for both groups, natives as well as immigrants. While in 1998 the highest share of immigrants belonged to the Lower Education group, in 2019 the highest share belonged to the Higher Education group. This shows that the immigrant stock in Portugal of 2019 was much better educated than it was in 1998. Natives experienced an increase in their overall educational levels from 1998 to 2019 as well. However, the highest share of natives still belongs to the Lower Education group.

This indicates that immigrants in Portugal seem on average to be better educated than natives. This is especially interesting since this is not usually the case for immigration to Europe.

Looking at countries like Germany or France for example, immigrants seem to be on average less educated than the average native (Frattini & Sartori (2021)).

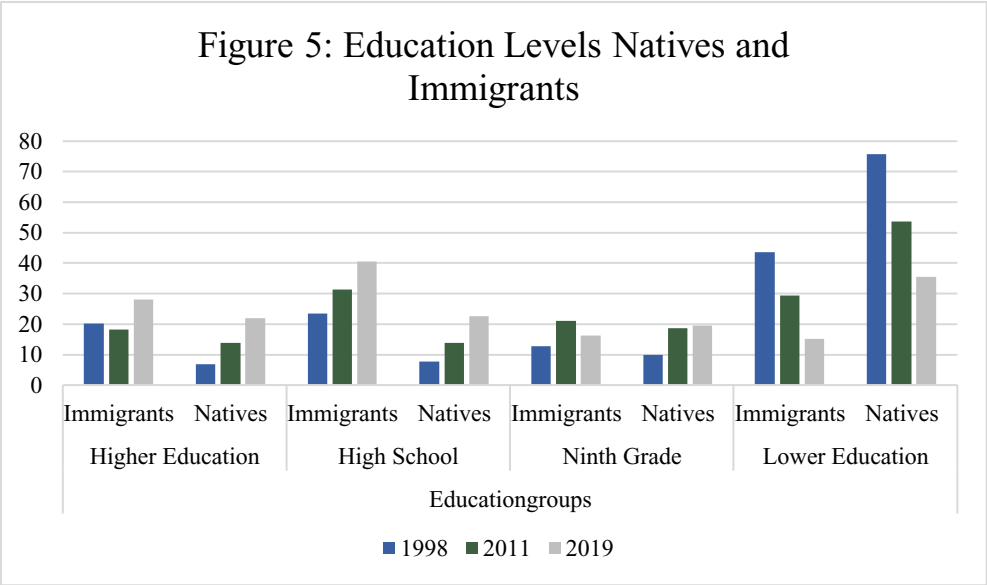

Figure 5: Shares of immigrants and natives on different education levels 1998, 2011, 2019. (Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

3.2.4. Employment by Profession

Figure 6 compares the share of immigrant and native workers employed in professions that require certain skills and those that do not require specific skills. It is observable that most natives and immigrants work in professions that require certain skills. A table of the respective professions belonging to the skilled and unskilled group can be found in the Appendix (Table A1).

While for natives the share of workers employed in skilled professions increased between 1998 and 2019, it decreased for immigrants. Furthermore, it seems to be important to note that though immigrants show higher educational levels, they seem to have a higher probability of being employed in unskilled professions. This indicates a mismatch of education levels and workplace for immigrants in Portugal.

Dustmann et al. (2016) refers to this as downgrading. Downgrading describes the circumstance where immigrants tend to work in occupations that are below their skill levels. This might be a

result of language barriers or a lack of transferability of the skills acquired in the home country to the labour market requirements of the receiving country. For example, Dustmann & Fabbri (2003) show in their analysis that the probability of being employed increases with higher language proficiencies.

Furthermore, Barret et al. (2013) find in their analysis that immigrants are less likely to receive training that is provided by their firm than natives. These disadvantages are partly driven by the fact that immigrants fail to find employers that are prone to provide training in the first place. But also, immigrants seem to be less likely to receive training within firms compared to natives.

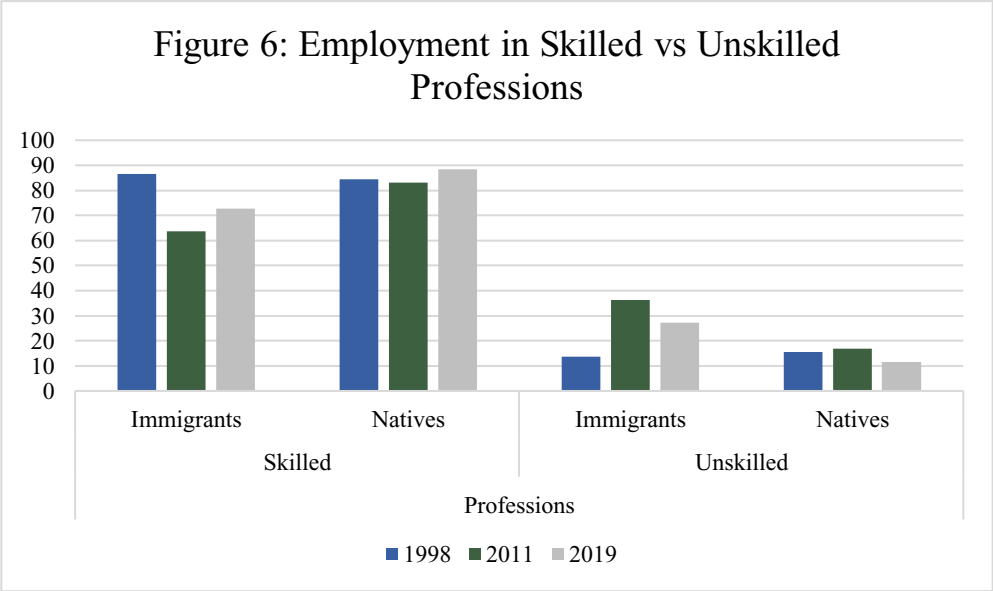

Figure 6: Shares of immigrants and natives in skilled and unskilled professions in Portugal 1998, 2011, 2019. (Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

3.2.5. Unemployment

Figure 7 differentiates between unemployment rates among natives and immigrants in 1998, 2011 and 2019. It is observable that for both groups unemployment increased from 1998 to 2011, which is presumably ascribable to the financial crisis. From 2011 until 2019 unemployment experienced a decreasing trend for both groups.

Furthermore, unemployment rates among immigrants seem to be higher compared to natives for all three years. This is an interesting finding that should be kept in mind when interpreting the effect of immigration on unemployment rates. It seems to be conceivable that immigration might have an increasing effect by only increasing unemployment among immigrants but not for natives.

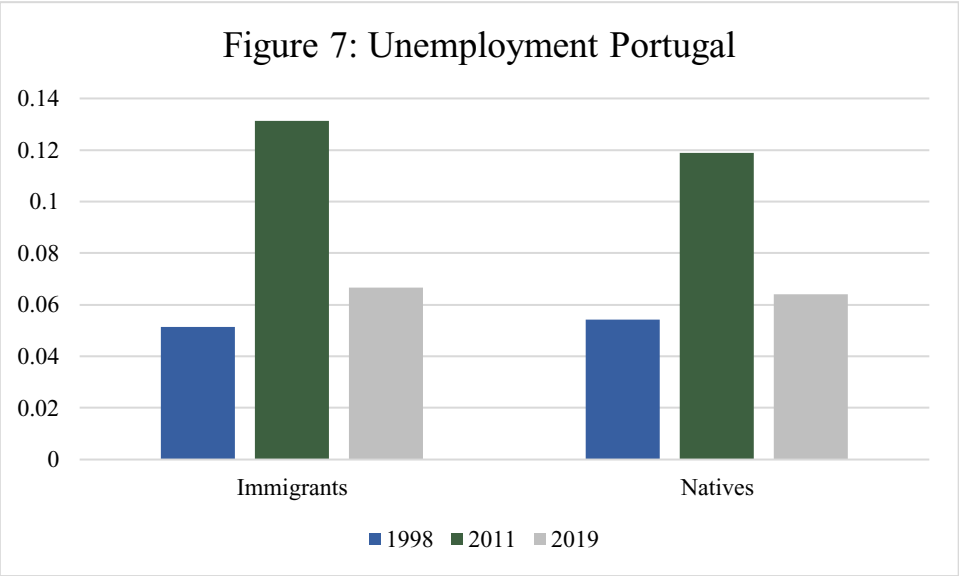

Figure 7: Unemployment among immigrants and natives in Portugal 1998, 2011, 2019. (Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

3.2.6. Country of Origin

Referring to Lewis (2011), the degree of substitutability of immigrants and natives also depends on the immigrant's language skills. Coming from a Portuguese speaking country may ease the integration process of immigrants in the labour market. Also, coming from an EU-country might help to better integrate into the labour market in Portugal, since skills acquired in the home country might be better transferable within EU countries. Hence, immigration inflows consisting mostly of immigrants belonging to one of those groups might affect the labour market differently compared to immigration from other countries.

Figure 8 shows that the highest share of immigrants from EU countries in Portugal in 2019 arrived in 2002. Looking at Figure 9 and 10, it can be obtained that a considerable high share of Portuguese speaking immigrants and immigrants from other countries arrived in 2018. It seems to be conceivable that immigration inflows varying in their composition could have differential impacts on the labour market of the receiving country.

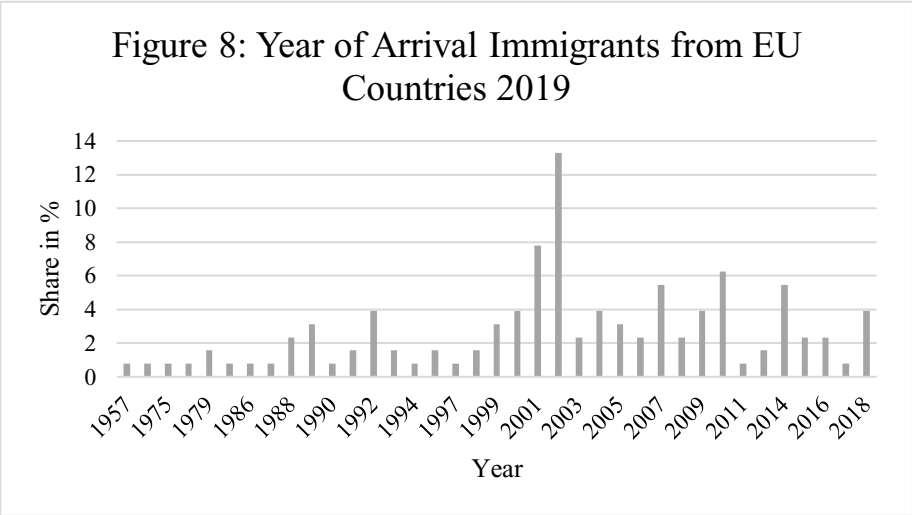

Figure 8: Years of arrival of the immigrant stock that comes from EU countries in Portugal 2019. (Source: Portuguese Labour Force Survey 2011-2019)

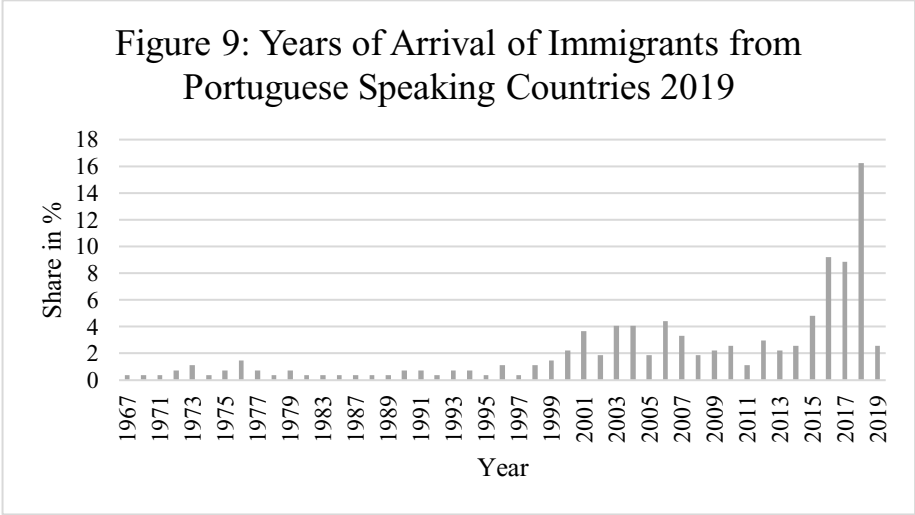

Figure 9: Years of arrival of the immigrant stock that comes from Portuguese speaking countries in Portugal 2019. (Source: Portuguese Labour Force Survey 2011-2019)

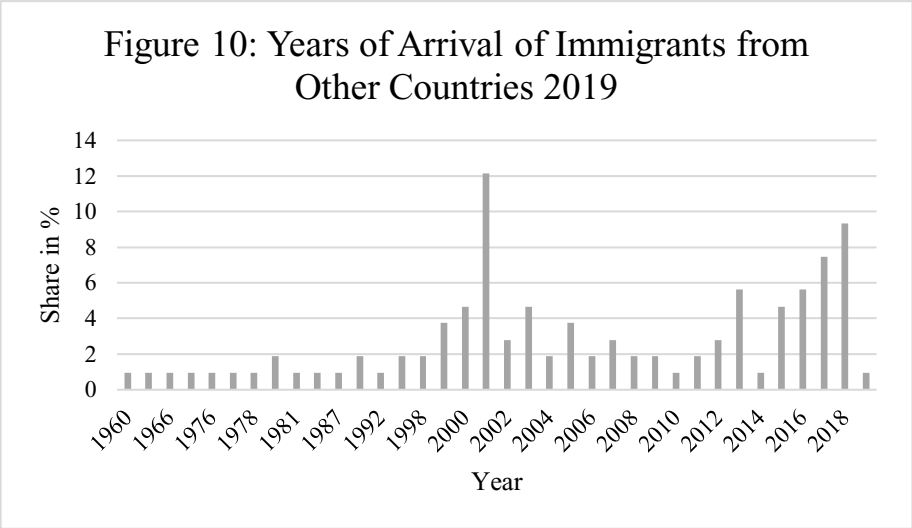

Figure 10: Years of arrival of the immigrant stock that comes from other countries in Portugal 2019. (Source: Portuguese Labour Force Survey 2011-2019)

3.2.7. Years since Arrival

It seems to be important to consider the time spent in the receiving country to derive a clear picture of the labour market dynamics induced by immigration. Chiswick (1978), for example, emphasizes in his analysis that it seems to be important to control for the time spent in the host country since immigrants seem to experience a positive assimilation of wages. This seems to be a result of increased language abilities and an adaption to the labour market requirements of the host country.

Table 1 shows the median years since arrival of the immigrant stock of Portugal in 1998, 2011 and 2019. It can be derived that the median years since arrival of the immigrant stock in Portugal increased from 1998 to 2019. Differentiating between immigrants from EU-countries, Portuguese speaking countries and other countries, immigrants from Portuguese speaking countries show the longest time, then EU. The lowest median years show the immigrant population coming from other countries.

Hence, it seems to be conceivable that immigration from Portuguese speaking countries might induce labour market dynamics different from those induced by immigration from other countries. Therefore, this analysis will additionally differentiate between the effects of immigration from different countries of origin.

Table 1: Years since Migration Median

Year	Total	EU	PT	Other
1998	19.5	14.5	16	15
2011	21.5	16	20	16
2019	27	20	23	17.5

Table 1: Median years since arrival of immigrants from different countries of origin in Portugal 2019. (Source: Portuguese Labour Force Survey 2011-2019)

4. The Effect of Being an Immigrant: Individual Level

4.1. The Effect of Being an Immigrant on the Employment Probability

To better understand the effects of immigration on labour market outcomes on a macro level, it seems to be interesting to analyse the effect of being an immigrant on labour market outcomes on an individual level. This section will provide an analysis of the effect of being an immigrant on the employment probability. A Dummy variable that constitutes 1 if an individual is an immigrant will be regressed on the employment probability. Furthermore, a set of variables that control for other factors that influence the employment probability is included in the regression. It is controlled for education level, age, gender, and if the individual is married. As for the education level, dummy variables for each level are included. The 'Lower Education' level serves as the reference group. Additionally, dummies for each quarter are included that control for seasonality.[1]

A simple OLS regression including a set of control variables and a Fixed Effects regression that additionally controls for time and individual fixed effects were run. The regression was conducted using robust standard errors to control for heteroskedasticity.

For the 1998-2010 period a negative effect of being an immigrant was found using the simple OLS specification. Being an immigrant seems to reduce the employment probability by 5

[1] The approach is based on the specification of Dustmann & Fabbri (2005)

percentage points. The results can be obtained from Table 2. Using the 2011-2019 data a similar result was found. Being an immigrant seems to decrease the probability of being employed by 9 percentage points. The effect is significant on a one percent significance level. The coefficients are shown in Table 3. However, it is well conceivable that there are individual fixed effects that influence the employment probability. Hence, the second specification includes individual fixed effects as well as quarter dummies.

Considering the OLS regression including fixed effects and time dummies, the effect loses significance for both periods. Furthermore, a higher level of education increases the employment probability. The size of the effect increases with a higher educational level. Employment probability seems to increase with a higher age. However, the effect decreases with increasing age. Referring to the specification including fixed effects, being male and being married seem to positively influence the employment probability using the 1998-2010 data. For the 2011-2019 period, no significant effect was found for gender and marriage.

Referring to Figure 5, there are differences between the education structure of the immigrant and the native population in Portugal. Hence, it seems to be interesting to analyse if there is a significant effect of the interaction between being an immigrant and belonging to a certain education group.

A further OLS and Fixed Effects regression that additionally includes interaction terms between being an immigrant and belonging to a certain education group were run. The results can be obtained from the right columns of Table 2 and Table 3. Focusing on the specification including fixed effects and quarter dummies, the coefficients for the interaction terms are not significantly different from zero for neither of the considered periods. For the 1998-2010 period the coefficient of the immigrant dummy is not significant. However, the coefficient of the immigrant dummy is positive and significant on a one percent significance level using the 2011-2019 data. It seems that being an immigrant in the Lower Education group increases the probability of being employed by 3 percentage points compared to natives.

Concluding from the presented results, it seems that being an immigrant has at most a small positive effect on the employment probability on an individual level.

Table 2: Effect on the Employment Probability 1998-2010

	Without Interaction with Education						Including Interaction with Education					
	OLS			FE			OLS			FE		
	Coeff.	t	p>t	Coefficient	t	p>t	Coeff.	t	p>t	Coeff.	t	p>t
Immigrant	-0.051*** [0.003]	-19.77	0.000	-0.015 [0.016]	-0.91	0.361	0.003 [0.004]	0.64	0.522	-0.016 [0.020]	-0.85	0.397
HE	0.170*** [0.001]	129.45	0.000	0.168*** [0.010]	17.01	0.000	0.173*** [0.001]	129.74	0.000	0.167*** [0.010]	16.82	0.000
HS	0.073*** [0.001]	57.44	0.000	0.018 [0.007]	2.48	0.013	0.075*** [0.001]	58.12	0.000	0.017** [0.007]	2.36	0.018
NG	0.066*** [0.001]	57.34	0.000	0.024*** [0.005]	4.46	0.000	0.067*** [0.001]	57.25	0.000	0.025*** [0.005]	4.72	0.000
Age	0.051*** [0.0003]	180.69	0.000	0.034*** [0.002]	20.19	0.000	0.051*** [0.0002]	180.66	0.000	0.034*** [0.002]	20.18	0.000
Age²/100	-0.068*** [0.0003]	-220.16	0.000	-0.049*** [0.002]	-26.59	0.000	-0.068*** [0.0003]	-220.06	0.000	-0.049*** [0.002]	-26.59	0.000
Male	0.170*** [0.001]	227.59	0.000	0.086*** [0.011]	8.09	0.000	0.170*** [0.001]	227.70	0.000	0.086*** [0.011]	8.06	0.000
Married	0.066*** [0.001]	71.23	0.000	0.014** [0.005]	2.56	0.011	0.067*** [0.001]	71.58	0.000	0.014*** [0.005]	2.56	0.010
Immigrant#HE	-	-	-	-	-	-	-0.118*** [0.008]	-15.40	0.000	0.033 [0.035]	0.92	0.358
Immigrant#HS	-	-	-	-	-	-	-0.083*** [0.007]	-12.56	0.000	0.011 [0.031]	0.36	0.718
Immigrant#NG	-	-	-	-	-	-	-0.057*** [0.007]	-7.91	0.000	-0.042 [0.026]	-1.64	0.102
Quarter 2	-	-	-	0.003*** [0.0004]	8.04	0.000	-	-	-	0.003*** [0.0003]	8.03	0.000
Quarter 3	-	-	-	0.003*** [0.0004]	7.55	0.000	-	-	-	0.003*** [0.0004]	7.54	0.000
Quarter 4	-	-	-	0.002*** [0.0004]	4.05	0.000	-	-	-	0.002*** [0.0004]	4.04	0.000
	Obs.		*1,245,911*	*Obs.*		*1,245,911*	*Obs.*		*1,245,911*	*Obs.*		*1,245,911*
	R²		*0.163*	*R²*		*0.915*	*R²*		*0.163*	*R²*		*0.915*
	F(8, 1245902)		*30374.48*	*F(11, 980259)*		*198.24*	*F(11, 1245899)*		*22122.14*	*F(14, 980256)*		*265.641*
	p>F		*0.0000*	*p>F*		*0.0000*	*p>F*		*0.0000*	*p>F*		*0.0000*

Table 2: Estimated coefficients for the regression of the employment probability using 1998-2010 data. The F-test is a test for joint significance of the regressors.
*** Significance on a one percent significance level
** Significance on a five percent significance level
* Significance on a ten percent significance level
(Source: Portuguese Labour Force Survey 1998-2010)

Table 3: Effect on the Employment Probability 2011-2019

	Without Interaction with Education						Including Interaction with Education					
	OLS			FE			OLS			FE		
	Coeff.	t	p>t	Coefficient	t	p>t	Coeff.	t	p>t	Coeff.	t	p>t
Immigrant	-0.088*** [0.003]	-26.56	0.000	0.022 [0.014]	1.54	0.123	-0.018** [0.007]	-2.46	0.014	0.034* [0.017]	1.94	0.053
HE	0.214*** [0.001]	146.90	0.000	0.043*** [0.006]	7.36	0.000	0.217*** [0.001]	147.17	0.000	0.045*** [0.006]	7.49	0.000
HS	0.149*** [0.001]	103.15	0.000	0.015*** [0.003]	4.64	0.000	0.150*** [0.001]	102.76	0.000	0.015*** [0.003]	4.62	0.000
NG	0.095*** [0.001]	68.50	0.000	0.007*** [0.003]	2.59	0.010	0.096*** [0.001]	68.24	0.000	0.007*** [0.003]	2.80	0.005
Age	0.067*** [0.0004]	172.05	0.000	0.049*** [0.003]	19.31	0.000	0.067*** [0.0004]	172.09	0.000	0.049*** [0.003]	19.31	0.000
Age²/100	-0.082*** [0.0004]	-196.48	0.000	-0.056*** [0.003]	-21.37	0.000	-0.082*** [0.0004]	-196.45	0.000	-0.056*** [0.003]	-21.37	0.000
Male	0.090*** [0.001]	89.83	0.000	0.079 [0.071]	1.12	0.263	0.090*** [0.001]	89.96	0.000	0.079 [0.071]	1.12	0.263
Married	0.067*** [0.001]	60.24	0.000	0.001 [0.004]	0.15	0.884	0.066*** [0.001]	60.54	0.000	0.001 [0.004]	0.15	0.882
Immigrant#HE	-	-	-	-	-	-	-0.134*** [0.010]	-13.35	0.000	-0.027 [0.021]	-1.30	0.195
Immigrant#HS	-	-	-	-	-	-	-0.079*** [0.009]	-8.71	0.000	-0.007 [0.018]	-0.41	0.680
Immigrant#NG	-	-	-	-	-	-	-0.048*** [0.010]	-4.63	0.000	-0.020 [0.016]	-1.27	0.205
Quarter 2	-	-	-	0.008*** [0.001]	12.25	0.000	-	-	-	0.008*** [0.001]	12.24	0.000
Quarter 3	-	-	-	0.009*** [0.001]	11.65	0.000	-	-	-	0.009*** [0.001]	11.64	0.000
Quarter 4	-	-	-	0.002*** [0.001]	3.44	0.001	-	-	-	0.002*** [0.001]	3.43	0.001
	Obs.		*737,377*	*Obs.*		*737,377*	*Obs.*		*737,377*	*Obs.*		*737,377*
	R²		*0.150*	*R²*		*0.846*	*R²*		*0.150*	*R²*		*0.846*
	F(8, 737368)		*16200.57*	*F(11, 564265)*		*72.27*	*F(11, 737365)*		*11802.44*	*F(14, 564262)*		*57.02*
	p>F		*0.0000*	*p>F*		*0.0000*	*p>F*		*0.0000*	*p>F*		*0.0000*

Table 3: Estimated coefficients for the regression of the employment probability using 2011-2019 data. The F-test is a test for joint significance of the regressors.
*** Significance on a one percent significance level
** Significance on a five percent significance level
* Significance on a ten percent significance level
(Source: Portuguese Labour Force Survey 2011-2019)

4.2. The Effect of Being an Immigrant on Wages

This section examines the effect of being an immigrant on wages. The regression equation is the same as for the employment probability except of the log wage being the dependent variable now. Wages are defined as the monthly net income from the main activity. The results can be obtained from Table 4. The wage variables in the two data sets seem to be not comparable due to different units. Therefore, this analysis will only focus on the 2011-2019 period.

Considering the equation including fixed effects, being an immigrant seems to not have a significant effect on wages. Furthermore, the interaction terms between being an immigrant and

the different education groups are also not significantly different from zero. The educational levels show positive and highly significant coefficients. (Table 4).

As in the analysis on the employment probability, wages also seem to increase with age. The magnitude of the increase shrinks with increasing age. The effect of being male seems not to be significantly different from zero. Neither is the effect of being married.

Table 4: Effect on Wages 2011-2019

	Without Interaction with Education						Including Interaction with Education					
	OLS			FE			OLS			FE		
	Coeff.	t	p>t	Coefficient	t	p>t	Coeff.	t	p>t	Coeff.	t	p>t
Immigrant	-0.164*** [0.005]	-36.13	0.000	0.009 [0.013]	0.64	0.524	0.049*** [0.010]	4.75	0.000	0.013 [0.018]	0.71	0.479
HE	0.896*** [0.002]	468.82	0.000	0.058*** [0.006]	9.11	0.000	0.903*** [0.002]	468.97	0.000	0.057*** [0.006]	9.05	0.000
HS	0.438*** [0.002]	227.22	0.000	0.019*** [0.003]	5.57	0.000	0.443*** [0.002]	227.28	0.000	0.019*** [0.003]	5.57	0.000
NG	0.266*** [0.002]	137.31	0.000	0.010*** [0.003]	3.67	0.001	0.268*** [0.002]	137.12	0.000	0.010*** [0.003]	3.74	0.000
Age	0.047*** [0.001]	80.34	0.000	0.030*** [0.003]	12.09	0.000	0.047*** [0.001]	80.40	0.000	0.030*** [0.003]	12.09	0.000
Age²/100	-0.041*** [0.001]	-62.70	0.000	-0.024*** [0.003]	-9.03	0.000	-0.041*** [0.001]	-62.63	0.000	-0.024*** [0.003]	-9.03	0.000
Male	0.282*** [0.001]	270.35	0.000	-0.040 [0.058]	-0.69	0.492	0.284*** [0.001]	208.06	0.000	-0.040 [0.058]	-0.69	0.491
Married	0.053*** [0.001]	36.24	0.000	-0.001 [0.005]	-0.24	0.809	0.055*** [0.001]	37.05	0.000	-0.001 [0.005]	-0.24	0.810
Immigrant#HE	-	-	-	-	-	-	-0.413*** [0.014]	-29.08	0.000	-0.001 [0.024]	-0.02	0.981
Immigrant#HS	-	-	-	-	-	-	-0.246*** [0.013]	-19.44	0.000	-0.007 [0.017]	-0.42	0.673
Immigrant#NG	-	-	-	-	-	-	-0.132*** [0.014]	-9.08	0.000	-0.010 [0.016]	-0.60	0.551
Quarter 2	-	-	-	0.004*** [0.001]	5.88	0.000	-	-	-	0.004*** [0.001]	5.88	0.000
Quarter 3	-	-	-	0.003*** [0.001]	5.06	0.000	-	-	-	0.003*** [0.001]	5.06	0.000
Quarter 4	-	-	-	-0.001 [0.001]	-1.05	0.294	-	-	-	-0.001 [0.001]	-1.05	0.294
	Obs.		*371,278*	*Obs.*		*371,278*	*Obs.*		*371,278*	*Obs.*		*371,278*
	R²		*0.409*	*R²*		*0.953*	*R²*		*0.411*	*R²*		*0.953*
	F(8, 371269)		*32164.16*	*F(11, 269733)*		*44.59*	*F(11, 371266)*		*23535.54*	*F(14, 269730)*		*35.12*
	p>F		*0.0000*	*p>F*		*0.0000*	*p>F*		*0.0000*	*p>F*		*0.0000*

Table 4: Estimated coefficients for the regression of wages using 2011-2019 data. The F-test is a test for joint significance of the regressors.
*** Significance on a one percent significance level
** Significance on a five percent significance level
* Significance on a ten percent significance level
(Source: Portuguese Labour Force Survey 2011-2019)

5. Regional Analysis of Immigration

The above presented results give an interesting insight on different determinants of the employment probability and wages and potential differences between natives and immigrants in the Portuguese labour market on an individual level. It showed that being an immigrant seem to have no effect on wages and a at most small positive effect on the employment probability. Additionally, it showed that the educational level and age are determining factors of employment and wages. As well, gender seemed to influence employment probability and wages in the 1998-2010 period.

Furthermore, it seems to be interesting to understand the dynamics between immigration and unemployment and wages on a macro level. The analysis will continue with an evaluation of the effect of increased immigrant shares on unemployment rates and wages on a regional level.

Since there are several channels through which immigration can affect unemployment, it seems to be reasonable to also analyse the effect on the unemployment of different demographic subgroups. More precise, an overall effect that is not significantly different from zero could be the result of some subgroups experiencing higher unemployment after an immigration inflow and others that experience decreased unemployment rates. The two effects would cancel each other out and would lead to an overall effect that is not different from zero.

Therefore, the analysis will differentiate between the effects on different demographic groups. The effect on education and age groups as well as gender will be examined since those seem to be determining factors of employment and wages. Additionally, the analysis will consider gender and different countries of origin of the immigrants.

5.1 Empirical Strategy

Calculating the immigrant shares in the population for the considered period allows to show how immigration patterns have evolved over the years. The immigrant share is defined as ratio of immigrants and natives. By regressing it on wages and the unemployment rate, it is aimed to extract the effect of immigration on the outcomes of the Portuguese labour market. However, it is important to note that there are several potential issues that could arise and might lead to biased estimates. Dustmann et al. (2003) mention some problems that are potentially present in the analysis of labour market effects of immigration.

5.1.1. Selection Bias

Immigrants might self-select themselves to areas with higher economic performance leading to upward biased effects of the immigrant share on wages and employment.

A potential solution for the selection-bias issue would be to introduce an instrumental variable approach. Historic settlement patterns could serve as instruments for immigrant inflows. The idea is that immigrants tend to settle in areas in which earlier immigrants already settled (Dustmann et al. (2003)). This seems to be conceivable because there they might already have some networks and hence lower language barriers. Assuming that economic shocks are not persistent, those settle patterns seem not to be correlated with current economic shocks but rather historical ones. Bartel (1989) analyzed location choices of immigrants in the US. The results support this hypothesis. Looking at Figure A1 in the Appendix, it can be observed that immigration patterns in the different regions seem to be quite constant between regions in Portugal. This supports the hypothesis that immigrants tend to settle in regions where earlier immigrants have already settled. It is conspicuous that immigrants mostly settle to the Lisbon and Algarve region. When interpreting the results, it should be kept in mind that they are presumably mainly driven by the effects of immigration to those two regions. In this analysis, two years lags of the immigrant share in a specific region will be used as instruments.

5.1.2. Measurement Error & Small Sample Size

Referring to Figure 2, the overall immigrant / native ratios are only small. Hence, immigrants make up only a small fraction of the total population. Thus, sample sizes are relatively small. This can lead to measurement errors resulting in biased estimates. Especially when analyzing the effect within subgroups, sample sizes are reduced further. Referring to Dustmann et al. (2013) this issue could be addressed by an instrumental variable approach. Still, the size of the coefficients should be interpreted with caution.

5.1.3. Labour Market Flows

If natives experience a change in their labour market outcomes, for example either in wages or employment, it is very well conceivable that they will respond to those changes. Natives might settle to other locations less affected by immigration if they experience higher unemployment or reduced wages (Lozano & Steinberger (2010)). The estimated effect would then be

downward biased. Evidence on the mobility of workers after an immigration inflow is mixed. Card (2001) finds that inflows of low-skilled immigrants to cities in the US from 1985-1990 did not lead to significant outflows of native workers. The share of less-skilled workers in the respective cities increased. Relating this to Ottaviano & Peri (2012), the response of natives after an immigration inflow presumably depends on the degree of substitutability between their work and immigrants' work. If they are perfect substitutes an immigration inflow might increase the mobility of native workers to avoid negative consequences on their wages or employment. If they are complements, however, natives might be positively affected by the inflow and there would be no need for them to settle to other regions. It is, however, conceivable that workers from other regions will move to regions experiencing economic growth.

Hence, to determine whether this is an issue or not country specific characteristics seem to play an important role. The Portuguese Labour Force Survey allows for longitudinal analyses and flows of workers between labour market states to be calculated. In this analysis ratios between High Educated and Low Educated (HE/LE) as well as the ratio of High School Graduates and Low Educated workers (HS/LE) and Ninth Grade Graduates and Low Educated workers (NG/LE) are used to control for labour flows.

5.2. Empirical Implementation

To quantify the effects of immigration on the Portuguese labour market, the immigrant share in Portugal will be regressed on unemployment rates and wages. The estimation strategy will be based on Dustman et al. (2003) estimation of the effect of immigration on the British labour market. They used data from the British Labour Force Survey for their analysis. They used the 'spatial correlation' approach recommended by Borjas et al. (1999) for the economic analysis of immigration.

In this paper, the spatial correlations approach introduced by Borjas (1999) will be used as well. The quarterly data of the Portuguese Labour Force Survey allows to calculate average unemployment rates, ages, education ratios and immigrant shares for 7 regions in 34 time periods for the 2011-2019 data set and for 7 regions and 52 periods for the 1998-2010 period. The unemployment rate is defined as the ratio between unemployed individuals and the active labour force for each region and time. The immigrant ratio is defined as the ratio between the immigrant and the native count of individuals in the population. Since the Portuguese Labour

Force Survey provides information on the educational attainment of every individual, it is possible to divide the individuals in education groups. As in the analysis on the individual level in Section 4, individuals are divided into four groups: Higher Education (HE), High School Graduate (HS), Ninth Grade Graduate (NG) and Lower Education (LE).

Prais-Winsten Regression Analysis in Differences:

(1) $$\Delta u_{it} = \alpha_{it} + \beta_1 \Delta Immshare_{it} + \beta_2 \Delta \ln\left(\frac{HE}{LE}\right)_{it} + \beta_3 \Delta \ln\left(\frac{HS}{LE}\right)_{it} + \beta_4 \Delta \ln\left(\frac{NG}{LE}\right)_{it} + \beta_5 \Delta meanageim_{it} + \beta_6 \Delta meanagenat_{it} + \boldsymbol{\delta \mu}_{it} + \boldsymbol{\gamma \nu}_{it} + \varepsilon_{it}$$

(2) $$\Delta lnw_{it} = \alpha_{it} + \beta_1 \Delta Immshare_{it} + \beta_2 \Delta \ln\left(\frac{HE}{LE}\right)_{it} + \beta_3 \Delta \ln\left(\frac{HS}{LE}\right)_{it} + \beta_4 \Delta \ln\left(\frac{NG}{LE}\right)_{it} + \beta_5 \Delta meanageim_{it} + \beta_6 \Delta meanagenat_{it} + \boldsymbol{\delta \mu}_{it} + \boldsymbol{\gamma \nu}_{it} + \varepsilon_{it}$$

Instrumental Variable Approach (First Stage):

(3) $$\Delta Immshare_{it} = \alpha_{it} + \beta_1 \Delta meanagenat_{it} + \beta_2 \Delta meanageim_{it} + \beta_3 lagImmshare_{it} + \beta_4 \Delta \ln\left(\frac{HE}{LE}\right)_{it} + \beta_5 \Delta \ln\left(\frac{HS}{LE}\right)_{it} + \beta_6 \Delta \ln\left(\frac{NG}{LE}\right)_{it} + \boldsymbol{\delta \mu}_{it} + \boldsymbol{\gamma \nu}_{it} + \varepsilon_{it}$$

Instrumental Variable Approach (Second Stage):

(4) $$\Delta u_{it} = \alpha_{it} + \beta_1 \Delta \widehat{Immshare}_{it} + \beta_2 \Delta \ln\left(\frac{HE}{LE}\right)_{it} + \beta_3 \Delta \ln\left(\frac{HS}{LE}\right)_{it} + \beta_4 \Delta \ln\left(\frac{NG}{LE}\right)_{it} + \beta_5 \Delta meanageim_{it} + \beta_6 meanagenat_{it} + \boldsymbol{\delta \mu}_{it} + \boldsymbol{\gamma \nu}_{it} + \varepsilon_{it}$$

(5) $$\Delta lnw_{it} = \alpha_{it} + \beta_1 \Delta \widehat{Immshare}_{it} + \beta_2 \Delta \ln\left(\frac{HE}{LE}\right)_{it} + \beta_3 \Delta \ln\left(\frac{HS}{LE}\right)_{it} + \beta_4 \Delta \ln\left(\frac{NG}{LE}\right)_{it} + \beta_5 \Delta meanageim_{it} + \beta_6 meanagenat_{it} + \boldsymbol{\delta \mu}_{it} + \boldsymbol{\gamma \nu}_{it} + \varepsilon_{it}$$

Equation (1) and (2) reflect the regression specification that were run to examine the effect of an increase in the immigrant / native ratio in a specific region on the unemployment rate and log wages, respectively. The analyses were run using Prais-Winsten regression with panel corrected standard errors.

First differences of the dependent as well as the independent variables, except of the time and region dummies, were used. Since there are only 7 regions and 34 periods for the 2011-2019 data set and 7 regions and 52 periods for the 1998-2010 data set, first differences were used to control for non-stationarity. The results of the unit root tests can be obtained in the Appendix (Table A2). The Im, Pesaran and Shin test was implemented (Hurlin & Mignon (2006)).

Wages are defined as the monthly net income of an individual from its main activity. u_{it} reflects the unemployment rate in a specific region at a certain point in time. lnw_{it} reflects the logged wage in a specific region at a certain point in time. α_{it} is a constant term. Furthermore, the regression includes the log of native education ratios, namely $\frac{HE}{LE}$, $\frac{HS}{LE}$ and $\frac{NG}{LE}$. Including the stock of native workers within each education group in each region controls for the labour flows of native workers. Education groups are used as ratios where one education group is omitted to ensure homogeneity. It is also controlled for average ages of natives ($meanagenat_{it}$) as well as of immigrants ($ageim_{it}$). $\boldsymbol{\mu}_{it}$ are quarterly dummies that control for seasonality. Seasonal patterns in the different regions in Portugal can be observed looking at Figure A1 in the Appendix. $\boldsymbol{\nu}_{it}$ is a vector of regional dummies that controls for regional fixed effects.

The analysis will additionally differentiate between different subgroups (education, age, gender, professions). Here, the mean ages within each subgroup are additionally included as controls in the respective regression equations. They are also included as first differences. When differentiating between different immigrant categories (country of origin and gender), the immigrant / native ratio was calculated considering only immigrants from the respective group.

As mentioned in Section 5.1, the analysis is potentially affected by several issues that need to be addressed. A possible solution to deal with selection bias and measurement errors is to introduce an instrumental variable approach. In this analysis two years lagged values of the immigrant shares are used to address potential endogeneity. Equation (3) shows the specifications of the first stage regression of the instrumental variable approach. Equation (4) and Equation (5) show the second stage regressions. The instrumental variable approach was also implemented using Prais-Winsten regressions.

For an instrument to be valid it must be correlated with the endogenous variable that it replaces. At the same time, it may not have a direct effect on the dependent variable. It may only affect the outcome variable through its correlation with the endogenous regressor (Angrist & Krüger (2001)). That the instrument does only affect the dependent variables through the correlation with the endogenous variables is a condition that is not quantitative testable. Here, it is assumed that using lags of two years is a sufficiently large period to presume that economic shocks back then will not directly impact labour market outcomes today. However, when interpreting the results and deriving conclusions it should be considered that the verification of the instruments relies on this assumption. The First Stage results of the analysis of the subgroups are shown in Tables A3-A7 in the Appendix. It is important to note that the instrument shows significance on a ten percent significance level for the analysis of unemployment using the 2011-2019 data base. However, the instruments seem to not be valid for the analysis of wages and the analysis using the 1998-2010 data. For that reason, interpretations for those will mainly focus on the results of the specifications using first differences without instruments. It is important to note, however, that this specification is also exposed to some issues as selection bias, small sample sizes or measurement errors as explained in Section 5.1.

5.3. Results

5.3.1. Unemployment

Table 5 and Table 6 present the results of the analysis of the effect of an increased immigrant share on unemployment rates. The left column shows the results using the 1998-2010 data set. Results based on the 2011-2019 period can be obtained from the right column. Coefficients are shown for the Prais-Winsten regression using first differences and the instrumental variable approach using first differences as well. All of them include quarter dummies that control for seasonal patterns and region dummies that control for regional fixed effects. The tables presented here only show the coefficients of the immigrants / native ratio since this is the variable of interest for this analysis. The coefficients of the control variables as well as their significance tests can be obtained from the Tables A8-A23 in the Appendix.

The results will be related to the composition of natives and immigrants in the different subgroups presented in Section 3.2.

The instrumental variable approach seems to be the most robust specification to the issues mentioned in section 5.1. Hence, interpretations for the analysis of the 2011-2019 data will be derived focusing on the results of the IV estimates. However, since significance of the instruments is only weak, the results of the specification in first differences without instrument will also be considered. For the 1998-2010 analysis and the analysis of wages, interpretations will be derived from the specification without the instrument.

5.3.1.1. Overall and Natives

Referring to Table 5 the effect of an increase in the growth of the immigrant share does not seem to have a significant impact on changes of overall unemployment rates. The estimated coefficients are not significant neither using the 1998-2010 data nor considering the 2011-2019 period. The same was found focusing on unemployment among natives only. The coefficients are not significant for both specifications.

Table 5: Effect on Overall and Natives' Unemployment

	1998-2010		2011-2019	
Unemployment	Prais-Winsten, First Differences	IV, First Differences	Prais-Winsten, First Differences	IV, First Differences
Overall	0.120	-0.661	-0.092	-0.818
	[0.139]	[0.817]	[0.239]	[1.403]
Natives	0.140	-0.860	-0.158	-0.441
	[0.131]	[0.782]	[0.240]	[1.411]

Table 5: Estimated Coefficients of the immigrant / native ratio of the regressions on overall unemployment and unemployment among natives. Tables with the coefficients of the control variables as well as statistics of the regressions can be found in the Appendix Table A8 and Table A9.
*** Significance on a one percent significance level
** Significance on a five percent significance level
* Significance on a ten percent significance level
(Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

Table 6: Effect on Unemployment by Different Demographic Groups

	1998-2010		2011-2019	
Unemployment	Prais-Winsten, First Differences	IV, First Differences	Prais-Winsten, First Differences	IV, First Differences
Educationgroups				
Higher Education	0.210	2.741*	0.446*	-0.181
	[0.204]	[1.52]	[0.230]	[1.509]
High School	-0.103	-1.427	-0.639*	-1.127
	[0.189]	[1.307]	[0.348]	[1.792]
9th Grade Graduate	0.178	-0.175	-0.471	-1.907
	[0.213]	[1.506]	[0.424]	[2.277]
Lower Education	0.072	0.930	-0.004	1.964
	[0.174]	[0.854]	[0.386]	[2.079]
Agegroups				
25-35	-0.016	-0.587	0.014	-5.622**
	[0.238]	[1.495]	[0.469]	[2.695]
36-45	0.067	-1.510*	-0.648**	2.389
	[0.187]	[0.837]	[0.285]	[1.854]
46-55	0.410	-0.309	0.360	-2.117
	[0.313]	[1.332]	[0.517]	[3.549]
56-65	0.276	-0.580	-0.010	0.617
	[0.202]	[1.442]	[0.348]	[2.057]
Gender				
Male	0.173	-0.353	-0.207	-1.272
	[0.139]	[0.905]	[0.266]	[1.463]
Female	0.083	-1.224	0.009	-1.187
	[0.189]	[1.094]	[0.281]	[1.612]

Table 6: Coefficients of the immigrant / native ratio of the regressions on unemployment among different demographic groups. Tables with the coefficients of the control variables as well as statistics of the regressions can be found in the Appendix Table A9 - Table A19.
*** Significance on a one percent significance level
** Significance on a five percent significance level
* Significance on a ten percent significance level
(Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

5.3.1.2. Education Groups

Using the data from 1998-2010 and considering the approach without instrument, no significant effect was found for neither of the different education groups.

According to the coefficient of the instrumental variable approach using the 2011-2019 data, no significant effect was found either. However, there was an increasing effect found using the approach without the instrument for the 'Higher Education' group and a decreasing for the

'High School Graduate' group. The respective coefficients can be obtained from Table 6. The significance of the instrument is only weak. Hence, it should be noted that the results of the two approaches differ for those two groups before drawing conclusions.

5.3.1.3. Age

Referring of the results without the instrument there was no significant effect found using the 1998-2010 data for neither of the age groups.

For the 2011-2019 period, it seems that only the youngest group was significantly affected by an increase in the growth of the immigrant / native ratio. According to the coefficient of the instrumental variable approach, an increase of the growth of the immigrant / native ratio of one percent seems to result in a decrease of the growth of the unemployment rate by 5.62 percentage points. Note however, that the size of the coefficient should be interpreted with caution.

Referring to Figure 4, approximately 45 percent of the immigrant stock in 2011 belonged to the youngest age group. This share decreased between 2011-2019. Still, approximately 29 percent belonged to the youngest group in 2019.

Hence, this would support the hypothesis that the effect of increased immigration depends on the characteristics of immigrants as well as natives. It seems that those with similar characteristics are more affected than others.

5.3.1.4. Gender

Differentiating between unemployment among male and female individuals, no significant effect was found. This applies to both empirical specifications and periods.

5.3.1.5. Characteristics of Immigrants

Table 7 presents the results of the analysis of immigrants with different characteristics on unemployment using the data from 1998-2010 and 2011-2019, respectively. It will be differentiated between immigrants from EU countries, Portuguese speaking countries (PT) and 'other' countries as well as between male and female immigrants. Note, that immigrants make up only a small fraction in the population. Hence, sample sizes are only small. The significance for the instruments of the different immigrant shares considered in this section is not given for

neither of the data sets. Hence, the interpretations of the results will be derived only from the specification without instruments. However, it should be noted that the specification without instruments has some caveats. Further explanations can be found in Section 5.1.

Table 7: Effect on Unemployment by Immigrants' Characteristics

1998-2010

Country of Origin	EU	PT	Other	EU	PT	Other
Overall	0.010	0.117	0.207	-2.095	-0.854	0.820
	[0.445]	[0.180]	[0.305]	[2.005]	[0.849]	[2.299]
Native	-0.03	0.156	0.250	-2.519	-1.152	-0.006
	[0.420]	[0.171]	[0.287]	[1.905]	[0.803]	[2.179]
Gender	Male	Female		Male	Female	
Overall	0.213*	-0.112		-2.721**	0.906	
	[0.130]	[0.144]		[1.325]	[0.697]	
Native	0.187	-0.061		-2.371*	0.693	
	[0.125]	[0.137]		[1.263]	[0.673]	

2011-2019

Unemployment	Prais-Winsten, First Differences			IV, First Differences		
Country of Origin	EU	PT	Other	EU	PT	Other
Overall	-0.184	-0.210	0.055	-0.643	-1.287	-6.487
	[0.583]	[0.323]	[0.423]	[2.859]	[1.570]	[4.003]
Native	-0.251	-0.378	0.133	0.159	-1.138	-6.210
	[0.581]	[0.329]	[0.420]	[2.889]	[1.588]	[3.941]
Gender	Male	Female		Male	Female	
Overall	-0.279	0.176		1.483	-1.364	
	[0.231]	[0.220]		[1.267]	[1.162]	
Native	-0.303	0.135		1.044	-0.796	
	[0.231]	[0.220]		[1.283]	[1.170]	

Table 7: Coefficients of the immigrant / native ratios considering immigrants with different characteristics. Tables with the coefficients of the control variables as well as statistics of the regressions can be found in the Appendix Table A20 - Table A23.
*** Significance on a one percent significance level
** Significance on a five percent significance level
* Significance on a ten percent significance level
(Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

Referring to the results presented in Table 7, there was no significant effect found for neither of the different countries of origin for both periods.

Considering the data for the 1998-2010 period, a positive effect of an increase in the growth of the male immigrant / native ratio was found on overall unemployment. The effect is significant on a ten percent significance level. According to the estimated coefficient, an increase of the growth of the male immigrant share of one percent results in an increase of the overall unemployment rate growth of 0.21 percentage points.

Considering the data for the 2011-2019 period, no significant effect was found. Neither an increase of the male immigrant share nor of the female immigrant share seems to affect overall unemployment rates or unemployment rates among natives.

Since there was no significant effect found on natives, it is conceivable that the increase on overall unemployment is mainly driven by increased unemployment among male immigrants themselves. Referring to Figure 7, unemployment among immigrants seems to be more prevalent than among natives.

5.3.2 Wages

This section will present the estimated effects of immigration on wages. The coefficients of the Prais-Winsten regressions using first differences with and without instruments can be obtained from Table 8 and Table 9. Tables including all regressors and tests for significance can be found in the Appendix (Tables A24-A32). Interpretations will be derived from the specification without the instrument due to a lack of significance of the instruments. The analysis of the effect on wages was only conducted using the data of the 2011-2019 period. The wage variables in the two data sets seem to be not comparable due to different units. Therefore, this analysis will focus on the more recent period.

5.3.2.1. Main Results

There was no significant effect of an increase in the growth of the immigrant / native ratio found. The coefficients are not significantly different from zero for overall unemployment effects as well as for effects on unemployment among natives only. This result holds for both specifications. The results can be obtained from Table 8.

When differentiating between education groups, age groups and gender, no significant effect was found.

Referring to Figure 5 and Figure 6 it is observable that though immigrants seem to show on average higher education levels than immigrants they seem to be more likely to be employed in professions that do not require certain skills. Hence, for the analysis of the relationship between the immigrant density and wages it was additionally differentiated between the effects on wages within these two groups. The effect was not significant for neither of the groups.

A table of a more detailed description of the professions defined as 'skilled' and 'unskilled' can be found in the Appendix (Table A1).

Table 8: Effect on Overall and Natives' Wages 2011-2019

Wages	Prais-Winsten, First Differences	IV, First Differences
Overall	-0.056	-1.370
	[0.199]	[1.206]
Natives	0.255	-1.049
	[0.202]	[1.250]

Table 8: Coefficients of the immigrant / native ratio of the regressions on overall wages and wages of natives. Tables with the coefficients of the control variables as well as statistics of the regressions can be found in the Appendix Table A24.
*** Significance on a one percent significance level
** Significance on a five percent significance level
* Significance on a ten percent significance level
(Source: Portuguese Labour Force Survey 2011-2019)

Table 9: Effect on Wages by Different Demographic Groups 2011-2019

Wages	Prais-Winsten, First Differences	IV, First Differences
Educationgroups		
Higher Education	-0.021 [0.340]	-0.756 [1.966]
High School	-0.054 [0.285]	-3.142* [1.757]
9th Grade Graduate	-0.278 [0.317]	1.995 [1.546]
Below	0.155 [0.252]	0.626 [1.726]
Agegroups		
25-35	-0.359 [0.341]	-1.170 [2.264]
36-45	0.253 [0.321]	-1.910 [1.774]
46-55	-0.323 [0.366]	-1.755 [2.245]
56-65	0.828 [0.648]	-0.884 [4.163]
Gender		
Male	-0.116 [0.272]	-0.385 [1.432]
Female	0.145 [0.235]	-0.481 [1.063]
Professions		
Skilled	0.093 [0.221]	-0.055 [1.033]
Unskilled	-0.898 [0.318]	-0.854 [1.973]

Table 9: Coefficients of the immigrant / native ratio of the regressions on wages among different demographic groups. Tables with the coefficients of the control variables as well as statistics of the regressions can be found in the Appendix Table A25-A30.
*** Significance on a one percent significance level
** Significance on a five percent significance level
* Significance on a ten percent significance level
(Source: Portuguese Labour Force Survey 2011-2019)

5.3.2.2. Characteristics of Immigrants

In this section, it will be differentiated between immigrants of different countries of origin and gender. Referring to the Prais-Winsten regression in differences, a positive effect of an increase of the growth of the immigrant / native ratio considering only Portuguese speaking immigrants was found. An increase in the growth rate of the immigrant / native ratio considering immigrants from the EU or other countries of origin do not seem to have a significant effect on the growth of the wage rate.

A conceivable reason for this could be that Immigrants from Portuguese speaking countries might bring skills that are complementary to natives' enhancing overall productivity and, in that way, increasing natives' wages. Furthermore, immigrants from Portuguese speaking countries have a lower language barrier. Hence, it might be easier for them to integrate into the Portuguese labour market (Dustmann & Fabbri (2003)). Furthermore, the median number of years since arrival is the highest for immigrants coming from Portuguese speaking countries (Table 1, Section 3.2.7). Being in the country for a longer period might lead to a better adaption of the labour market requirements for immigrants from Portuguese speaking countries (Chiswick (1978)).

Differentiating between male and female immigrants no significant difference was found. Both coefficients are not statistically different from zero. However, there are some empirical issues due to small sample sizes for example, that are not fully addressed with this approach. Hence, the results should be interpreted with caution.

Table 10: Effect on Wages by Immigrants' Characteristics 2011-2019

Wages	Prais-Winsten, First Differences			IV, First Differences		
Country of Origin	EU	PT	Other	EU	PT	Other
Overall	-0.502	-0.022	0.022	-1.347	-1.999	-6.469
	[0.347]	[0.165]	[0.228]	[3.037]	[1.813]	[6.172]
Native	-0.345	0.234***	0.234	-0.918	-2.055	-6.668
	[0.476]	[0.205]	[0.024]	[2.354]	[1.453]	[4.132]
Gender	Male	Female		Male	Female	
Overall	-0.038	-0.031		-0.751	-0.630	
	[0.161]	[0.173]		[1.237]	[0.716]	
Native	0.042	0.204		-0.863	-0.377	
	[0.159]	[0.170]		[1.276]	[0.736]	

Table 10: Coefficients of the immigrant / native ratios considering immigrants with different characteristics. Tables with the coefficients of the control variables as well as statistics of the regressions can be found in the Appendix Table A31 - Table A32.
*** Significance on a one percent significance level
** Significance on a five percent significance level
* Significance on a ten percent significance level
(Source: Portuguese Labour Force Survey 2011-2019)

6. Limitations

The results presented in the previous sections give an interesting overview about the dynamics induced by an increase in the immigrant / native ratio among different demographic groups. However, this analysis faces some limitations that should not be neglected.

The observations in the data are structured into only seven regions. This makes the N dimension for the analysis on a regional level relatively small. Since the data was collected on a quarterly basis the time dimension T is 34 for the 2011-2019 data set and 52 for the 1998-2010 data set. Hence, the N dimension is considerably smaller than the T dimension. To overcome the issue of non-stationarity of some variables the analysis was run using first differences. This, however, further reduces sample sizes which in turn can also lead to biased estimates. By using instruments this problem can be addressed. Tables A3-A7 in the Appendix show the p-values of the instruments used in this analysis. It is observable that the instruments used in the analysis using data from 1998-2010 and for the wage analysis of 2011-2019 fail the significance test of the first stage regression. For that reason, coefficients of specification using first differences

without instruments were used for interpretations. Referring to the empirical issues explained in Section 5.1, there are several factors that could lead to biased estimates which is why the size of the coefficients should be interpreted with caution. For most of the estimations the effect of the immigrant / native ratio was not significant using both specifications, giving rise to the assumption that the effect is indeed not significant for those groups. Furthermore, finding no effect on employment seems to be in line with the results of Martins et al. (2018). However, it should be considered that the specifications used in this analysis do not address all issues that can lead to biased estimates. Especially the coefficients for the subgroups where the two specifications indicate different results should be interpreted with caution. For future analyses of the relationship between immigration and labour market outcomes using the Portuguese Labour Force Survey it seems to be meaningful if the observations were structured into a higher number of regions.

Furthermore, looking at the immigrant shares in the different regions of Portugal it is noticeable that immigration is mainly prevalent in Lisbon region and Algarve. Hence, it should be considered when deriving policy implications that the results are presumably mostly driven by those two regions. A differentiation between regions might be reasonable when implementing immigration and labour market policies.

For the analysis on the individual level, it should be noted that every individual is only followed for a maximum of six quarters in the 2011-2019 period and 10 quarters in the 1998-2010 period. Hence, the period considered for every individual is only short. This should be considered when interpreting the coefficients of the regressions on the individual level presented in Section 4. Furthermore, the regression specifications for the analysis on the individual level do not include region dummies since they were omitted due to collinearity with the fixed effects using the data 2011-2019. However, it seems to be conceivable that regional characteristics influence employment probabilities and wages. For the analysis of the 1998-2010 data on the individual level, the presented specifications were run with and without region dummies. Excluding them did not significantly change the size or significance of coefficients of the other regressors. For that reason, the region dummies were excluded to have the same specification for both data sets.

7. Discussion

This paper gives an overview about the demographic structures among the native and immigrant population in Portugal and how those structures may determine the effect immigration has on unemployment and wages. On an individual level, it seems that being an immigrant does lead to an at most small positive effect on the employment probability and no effect on wages. On a regional level, there was no significant effect of increased immigration found on overall unemployment rates or unemployment among natives. However, the specifications show some empirical issues that should be considered before deriving conclusions.

It seems that though immigrants show a higher skill structure than natives they seem to be more prone to be employed in professions that do not require certain skills. Hence, there seems to be a mismatch of education and the place of employment among immigrants in Portugal. Referring to Chiswick (1978) or Dustmann et al. (2016), this might be because immigrants fail to translate the skills, they have acquired in their home country, to the labour market requirements of the host country. Providing language courses and training programs that are targeted to better translate immigrants' skill sets to the Portuguese labour market requirements seems to be of great importance to ensure that productivity is not harmed by a lack of efficiency in the use of the production inputs.

Governmental provision of language courses could contribute to a better integration of immigrants into society and the labour market. The High Commission of Migration in Portugal does already offer a set of trainings for immigrants, including language courses. A further analysis of the effect of those trainings would be interesting to verify their effectiveness. This seems to be important to derive channels for potential further improvement. This would presumably contribute to a better integration of immigrants in society and the labour market.

Since it is presumably also in firms' best interest to produce at maximum efficiency levels, they could play an important role for the implementation and finance of such programs. It seems to be important to educate firms about the positive impact hiring immigrant workers can have on their productivity. This might lead firms to realize that it is worth investing in immigrants and hence providing them with adequate training. This could solve the problem of disadvantages of immigrants within firms.

Additionally, it seems to be interesting to put further attention on the characteristics of immigrants for future research on the channels through which immigration alters labour market dynamics in Portugal. This analysis started by differentiating between different countries of origin and gender of immigrants. However, this analysis faces some empirical issues due to small sample sizes. Therefore, the respective coefficients should be interpreted with caution. Referring to Chiswick (1978), differentiating between earlier immigrants and those that entered the country just recently seems to be reasonable.

Furthermore, this analysis does not differentiate between short-term and long-term effects of immigration inflows. According to Edo (2019), this seems to be important since in the long run firms can respond to an increased supply of workers induced by immigration through adaptions in the capital accumulation process. It seems to be an important factor that deserves further attention to fully understand the effects of increased immigration.

Appendix

A1. Professions

Table A1: Description of Professions

Profession	Profession Description
Skilled	Professions in the armed forces Representatives of the legislative power and of executive bodies, leaders, directors and executive managers Specialists in intellectual and scientific activities Technicians and associate professionals Administrative personnel Personal service workers, security and safety workers, and salespeople Farmers and skilled agricultural, fishing and forestry workers Skilled industrial, construction and crafts workers Plant and machine operators and assemblers
Unskilled	Unskilled workers

Table A1: Description of professions according to definitions of Portuguese Labour Force Survey. (Source: Portuguese Labour Force Survey 2011-2019)

A2. Immigrant Shares per Region

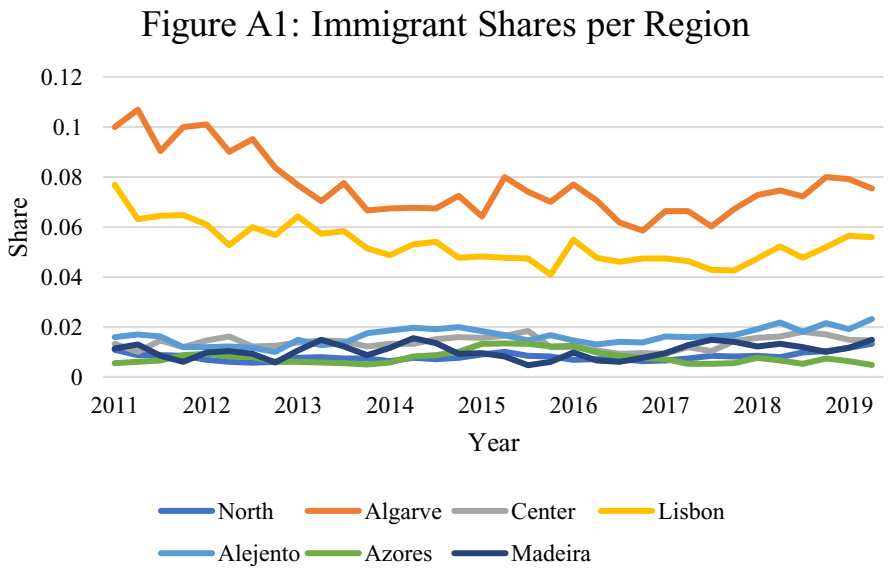

Figure A1: Immigrant Shares per Region in Portugal from 2011-2019
(Source: Portuguese Labour Force Survey 2011-2019)

A3. Tests for Stationarity (IPS)

Table A2: Tests for Stationarity

	1998-2010		2011-2019	
Variable	*Z-t-tilde-bar*	*p*	*Z-t-tilde-bar*	*p*
Unemployment	-3.812	0.0001	-3.1423	0.00008
Unemployment Native	-4.051	0.0000	-3.2009	0.0007
Unemployment HE	-6.7451	0.0000	-4.415	0.0000
Unemployment HS	-6.2230	0.0000	-4.3533	0.0000
Unemployment NG	-5.4776	0.0000	-4.5838	0.0000
Unemployment LE	-3.4062	0.0000	-4.5838	0.0000
Unemployment 25-35	-5.7761	0.0000	-3.8273	0.0001
Unemployment 36-45	-4.7544	0.0000	-3.5133	0.0002
Unemployment 46-55	-3.5786	0.0002	-3.7949	0.0001
Unemployment 56-65	-5.3728	0.0000	-4.7487	0.0000
Unemployment Male	-2.9289	0.0017	-3.2542	0.0006
Unemployment Female	-5.4745	0.0000	-3.7733	0.0001
ln Wage	-	-	-2.3450	0.0095
ln Wage Native	-	-	-2.3649	0.0090
ln Wage HE	-	-	-2.4506	0.0071
ln WageHS	-	-	-4.9617	0.0000
ln Wage NG	-	-	-4.6298	0.0000
ln Wage LE	-	-	-1.3923	0.0819
ln Wage 25-35	-	-	-3.1017	0.0010
ln Wage 36-45	-	-	-4.7852	0.0000
ln Wage 46-55	-	-	-2.5201	0.0059
ln Wage 56-65	-	-	-5.2252	0.0000
ln Wage Male	-	-	-3.3000	0.0005
ln Wage Female	-	-	-2.8598	0.0021
ln Wage Skilled	-	-	-2.6627	0.0039
ln Wage Unskilled	-	-	-3.8565	0.0001
Immigrant Share	-3.370	0.0004	-1.7837	0.0372
EU Immigrant Share	-1.5638	0.0589	-3.6356	-
PT Immigrant Share	-0.6198	0.2677	-4.0244	0.0000
Other Immigrant Share	-0.3173	0.3755	-3.1971	0.0007
Male Immigrant Share	-0.2535	0.3999	-3.3302	0.0004
Female Immigrant Share	0.6520	0.7428	-4.3430	0.0000
Mean Age Native	2.060	0.0004	4.7716	1.0000
Mean Age Immigrant	-2.832	0.0023	-3.4779	0.0003
Mean Age HE	-1.7777	0.0377	0.4259	0.6649
Mean Age HS	1.4906	0.9320	1.9735	0.9758
Mean Age NG	0.2658	0.6048	1.8733	0.9695
Mean Age LE	4.8745	1.0000	1.8733	0.9695
Mean Age 25-35	-2.5481	0.0054	-1.9420	0.0261
Mean Age 36-45	-1.5598	0.0594	1.1919	0.8834
Mean Age 46-55	-4.1419	0.0000	-3.3959	0.0003
Mean Age 56-65	-1.8884	0.0295	-2.8492	0.0022
Mean Age Male	1.4185	0.9220	1.3652	0.9139
Mean Age Female	1.5333	0.9374	4.1283	1.000
ln HE/LE	3.3223	0.9996	-0.2550	0.3993
ln HS/LE	2.927	0.998	-2.4151	0.0079
ln NG/LE	5.606	1.000	-3.4706	0.0003

Table A2: Tests for stationarity using the Im, Pesaran, Shin test (IPS) for all dependent and independent variables.
(Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

A4. First Stage Results of the Instrumental Variable Approach

Table A3: Significance of Instruments: Unemployment 2011-2019

Unemployment 2011-2019	Immigrant Share	
Unemployment	X^2	**p**
Unemployment Overall / Native	2.67	p=0.1021
Education Groups	X^2	**p**
Unemployment HE	2.64	p=0.1043
Unemployment HS	2.94	p=0.0865
Unemployment NG	2.72	p=0.0990
Unemployment LE	2.65	p=0.1034
Age Groups	X^2	**p**
Unemployment 25-35	2.74	p=0.0980
Unemployment 36-45	2.77	p=0.0959
Unemployment 46-55	2.64	p=0.1042
Unemployment 56-65	2.67	p=0.1023
Gender	X^2	**p**
Unemployment Male	2.85	p=0.0912
Unemployment Female	2.85	p=0.0912

Table A3: Results of the first stage regression of the instrumental variable approach. 2 year lagged values of the immigrant share were used in each regression.
Significance of the Instruments.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A4: Significance of Instruments: Unemployment 1998-2010

Unemployment 1998-2010	Immigrant Share	
Unemployment	X^2	**p**
Unemployment Overall / Native	0.04	p=0.850
Education Groups	X^2	**p**
Unemployment HE	0.04	p=0.849
Unemployment HS	0.03	p=0.859
Unemployment NG	0.02	P=0.877
Unemployment LE	0.07	p=0.790
Age Groups	X^2	**p**
Unemployment 25-35	0.04	p=0.840
Unemployment 36-45	0.06	p=0.799
Unemployment 46-55	0.02	p=0.886
Unemployment 56-65	0.02	p=0.882
Gender	X^2	**p**
Unemployment Male	0.04	p=0.840
Unemployment Female	0.04	p=0.840

Table A4: Results of the first stage regression of the instrumental variable approach. 2 year lagged values of the immigrant share were used in each regression.
Significance of the Instruments.
(Source: Portuguese Labour Force Survey 1998-2010)

Table A5. Significance of Instruments: Unemployment by Immigrants' Characteristics

2011-2019			1998-2010		
Country of Origin					
Unemployment	X^2	**p**	**Unemployment**	X^2	**p**
EU Immigrants Share	0.04	p=0.8467	EU Immigrants Share	0.09	p=0.769
Other Immigarnt Share	0.96	p=0.3277	Other Immigarnt Share	0.03	p=0.873
PT Immigrant Share	0.98	p=0.3224	PT Immigrant Share	0.51	p=0.475
Gender					
Unemployment	X^2	**p**	**Unemployment**	X^2	**p**
Male Immigrants Share	0.09	p=0.7638	Male Immigrant Share	0.23	p=0.623
Female Immigrants Share	0.34	p=0.5606	Female Immigrants Share	1.32?	p=0.251

Table A5: Results of the first stage regression of the instrumental variable approach. Two year lagged values of the respective immigrant shares were used.
Significance of the Instruments.
(Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

Table A6: Significance of Instruments: Wages 2011-2019

2011-2019	Immigrant Share	
Wages	**chi2(1)**	**p**
Wage Overall / Native	0.66	p=0.4160
Education Groups	**chi2(1)**	**p**
Wage HE	0.75	p=0.3871
Wage HS	0.66	p=0.4156
Wage NG	0.46	p=0.4969
Wage LE	0.67	p=0.4134
Age Groups	**chi2(1)**	**p**
Wage 25-35	0.67	p=0.4142
Wage 36-45	0.65	p=0.4206
Wage 46-55	0.65	p=0.4204
Wage 56-65	0.65	p=0.4199
Gender	**chi2(1)**	**p**
Wage Male	0.70	p=0.4034
Wage Female	0.60	p=0.4397
Professions	**chi2(1)**	**p**
Wage Skilled	0.82	p=0.3649
Wage Unskilled	0.58	p=0.4457

Table A6: Results of the first stage regression of the instrumental variable approach. Two year lagged values of the immigrant share were used in each regression.
Significance of the Instruments.

Table A7: Significance of Instruments:
Wages by Immigrants' Characteristics

2011-2019

Country of Origin		
Wages	**chi2(1)**	**p**
EU Immigrants Share	0.23	p=0.6302
Other Immigarnt Share	0.00	p=0.9913
PT Immigrant Share	0.03	p=0.8529
Gender		
Wages	**chi2(1)**	**p**
Male Immigrants Share	0.09	p=0.7638
Female Immigrants Share	0.34	p=0.5606

Table A7: Results of the first stage regression of the instrumental variable approach. Two year lagged values of the respective immigrant shares were used. Significance of the Instruments.
(Source: Portuguese Labour Force Survey 1998-2010 & 2011-2019)

A5. Results Unemployment

Table A8: Results Overall and Native Unemployment 1998-2010

	Overall						Native					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	0.120 [0.139]	0.87	0.385	-0.661 [0.817]	-0.81	0.419	0.140 [0.131]	1.07	0.285	-0.860 [0.782]	-1.10	0.272
ln HE/LE	-0.003 [0.006]	-0.49	0.624	-0.007 [0.006]	-1.13	0.259	-0.003 [0.005]	-0.61	0.543	-0.008 [0.006]	-1.32	0.187
ln HS/LE	-0.007 [0.007]	-0.95	0.341	-0.007 [0.009]	-0.78	0.436	-0.010 [0.007]	-1.31	0.189	-0.011 [0.008]	-1.30	0.194
ln NG/LE	-0.006 [0.007]	-0.71	0.479	-0.008 [0.011]	-0.79	0.432	-0.005 [0.008]	-0.69	0.490	-0.007 [0.010]	-0.67	0.500
Mean Age Immigrant	-0.0001 [0.0002]	-0.55	0.579	0.00001 [0.0002]	0.05	0.960	-0.0001 [0.0002]	-0.45	0.653	0.0004 [0.0002]	0.17	0.862
Mean Age Native	0.004 [0.002]	-1.98	0.048	-0.004 [0.002]	-2.01	0.044	-0.004 [0.002]	-2.18	0.030	-0.005 [0.002]	-2.36	0.019
Quarter 2	-0.006 [0.001]	-4.60	0.000	-0.007 [0.002]	-3.28	0.001	-0.005 [0.001]	-4.35	0.000	-0.007 [0.002]	-3.39	0.001
Quarter 3	-0.003 [0.001]	-2.12	0.034	-0.003 [0.001]	-2.52	0.012	-0.002 [0.001]	-1.84	0.065	-0.003 [0.001]	-2.40	0.016
Quarter 4	-0.001 [0.001]	-0.53	0.596	-0.002 [0.002]	-0.99	0.324	-0.001 [0.001]	-0.54	0.592	-0.002 [0.002]	-1.25	0.212
Center	-0.001 [0.001]	-1.14	0.254	-0.001 [0.001]	-1.07	0.286	-0.001 [0.001]	-1.26	0.206	-0.001 [0.001]	-1.17	0.241
Lisbon	-0.0004 [0.001]	-0.65	0.514	-0.0004 [0.001]	-0.60	0.546	-0.001 [0.001]	-0.87	0.383	-0.001 [0.001]	-0.80	0.422
Alentejo	-0.001 [0.001]	-1.38	0.167	-0.001 [0.001]	-0.81	0.417	-0.001 [0.001]	-1.37	0.172	-0.001 [0.001]	-0.80	0.426
Algarve	-0.002 [0.001]	-0.20	0.838	0.002 [0.001]	0.17	0.867	-0.0005 [0.001]	-0.39	0.700	0.001 [0.001]	0.08	0.940
Azores	-0.001 [0.001]	-1.42	0.154	-0.001 [0.001]	-1.46	0.145	-0.001 [0.001]	-1.47	0.142	-0.001 [0.001]	-1.48	0.139
Madeira	-0.001 [0.001]	-0.94	0.349	-0.001 [0.001]	-0.89	0.367	-0.001 [0.001]	-0.94	0.346	-0.001 [0.001]	-0.96	0.339
	Obs.		*357*	*Obs.*		*301*	*Obs.*		*357*	*Obs.*		*301*
	R^2		*0.132*	R^2		*0.123*	R^2		*0.127*	R^2		*0.121*
	Wald X^2 *(5)*		*36.62*	*Wald* X^2 *(15)*		*32.85*	*Wald* X^2 *(5)*		*35.74*	*Wald* X^2 *(5)*		*32.84*
	$p > X^2$		*0.0014*	$p > X^2$		*0.0049*	$p > X^2$		*0.0019*	$p > X^2$		*0.049*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*28.57*	$X^2(3)$		*23.87*	$X^2(3)$		*25.61*	$X^2(3)$		*22.03*
	p		*0.0000*	*p*		*0.0000*	*p*		*0.0000*	*p*		*0.0001*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*3.49*	$X^2(6)$		*2.89*	$X^2(6)$		*3.81*	$X^2(6)$		*3.14*
	p		*0.7459*	*p*		*0.8224*	*p*		*0.7019*	*p*		*0.7912*

Table A8: Results of the analysis of overall unemployment and unemployment among natives in Portugal 1998-2010. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 1998-2010)

Table A9: Results Overall and Native Unemployment 2011-2019

	Overall						Native					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	-0.092 [0.239]	-0.35	0.730	-0.818 [1.403]	-0.58	0.560	-0.158 [0.240]	-0.66	0.508	-0.441 [1.411]	0.31	0.755
ln HE/LE	-0.011 [0.018]	-0.64	0.519	-0.018 [0.021]	-0.86	0.391	-0.009 [0.019]	-0.46	0.644	-0.015 [0.021]	-0.73	0.467
ln HS/LE	0.033 [0.016]	2.09	0.036	0.034 [0.024]	1.37	0.170	0.028 [0.016]	1.79	0.073	0.033 [0.025]	1.34	0.182
ln NG/LE	0.009 [0.018]	0.57	0.565	0.030 [0.022]	1.35	0.178	0.010 [0.018]	0.55	0.580	0.028 [0.022]	1.28	0.200
Mean Age Immigrant	0.001 [0.0005]	1.44	0.149	0.001 [0.001]	0.94	0.346	0.001 [0.0005]	1.35	0.178	0.001 [0.001]	0.91	0.363
Mean Age Native	-0.001 [0.005]	-0.13	0.894	0.002 [0.005]	0.43	0.664	-0.001 [0.005]	-0.22	0.823	0.002 [0.005]	0.43	0.664
Quarter 1	-0.013 [0.002]	-	-	-0.016 [0.004]	-3.62	0.000	-0.012 [0.003]	-4.76	0.000	-0.014 [0.005]	-3.18	0.001
Quarter 2	-0.009 [0.003]	-5.30	0.000	-0.011 [0.004]	-2.48	0.013	-0.008 [0.003]	-3.07	0.002	-0.010 [0.005]	-2.11	0.035
Quarter 3	0.003 [0.003]	-3.27	0.001	0.001 [0.003]	0.50	0.615	0.003 [0.003]	1.16	0.247	0.002 [0.003]	0.77	0.440
Center	-0.001 [0.004]	-0.86	0.392	0.0002 [0.004]	0.05	0.964	-0.001 [0.004]	-0.25	0.799	0.0005 [0.004]	0.12	0.905
Lisbon	0.0003 [0.002]	-0.75	0.455	0.002 [0.001]	1.20	0.231	0.0002 [0.002]	0.15	0.833	0.002 [0.001]	1.22	0.223
Alentejo	-0.0004 [0.001]	-1.30	0.195	0.0001 [0.001]	0.10	0.919	-0.0001 [0.001]	-0.07	0.943	0.0004 [0.001]	0.33	0.742
Algarve	0.0001 [0.002]	-0.43	0.665	0.0003 [0.002]	0.21	0.831	0.0001 [0.002]	0.04	0.965	0.0003 [0.002]	0.22	0.825
Azores	0.002 [0.002]	-1.61	0.107	0.001 [0.002]	0.81	0.420	0.002 [0.002]	0.82	0.411	0.001 [0.002]	0.90	0.368
Madeira	0.0001 [0.002]	-1.24	0.217	-0.0001 [0.002]	-0.05	0.961	0.0001 [0.002]	0.03	0.979	-0.000 [0.002]	-0.00	0.998
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.2862*	R^2		*0.362*	R^2		*0.267*	R^2		*0.3461*
	Wald X^2 *(15)*		*62.09*	*Wald* X^2 *(15)*		*89.32*	*Wald* X^2 *(15)*		*53.19*	*Wald* X^2 *(15)*		*78.03*
	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*50.37*	$X^2(3)$		*32.91*	$X^2(3)$		*43.82*	$X^2(3)$		*29.37*
	p		*0.0000*	*p*		*0.0000*	*p*		*0.0000*	*p*		*0.0000*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*1.31*	$X^2(6)$		*2.41*	$X^2(6)$		*1.22*	$X^2(6)$		*2.42*
	p		*0.9711*	*p*		*0.8782*	*p*		*0.9756*	*p*		*0.8776*

Table A9: Results of the analysis of overall unemployment and unemployment among natives in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A10: Results Unemployment by Education Group 1998-2010

-Higher Education, High School Graduate-

Education Groups	Higher Education						High School Graduate					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	0.210 [0.204]	1.03	0.305	2.741 [1.52]	1.80	0.072	-0.103 [0.189]	-0.55	0.584	-1.427 [1.307]	-1.09	0.275
ln HE/LE	0.015 [0.011]	1.35	0.181	0.012 [0.013]	0.99	0.325	-0.007 [0.010]	-0.67	0.505	-0.006 [0.011]	-0.58	0.561
ln HS/LE	-0.004 [0.015]	-0.33	0.738	0.003 [0.017]	0.18	0.854	-0.025 [0.013]	-1.88	0.060	-0.026 [0.016]	-1.65	0.099
ln NG/LE	0.011 [0.015]	0.73	0.468	-0.018 [0.010]	-0.90	0.368	-0.012 [0.015]	-0.82	0.410	-0.006 [0.017]	-0.37	0.712
Mean Age Immigrant	0.0001 [0.0005]	0.26	0.799	0.001 [0.001]	1.04	0.299	0.001 [0.0005]	1.70	0.089	0.001 [0.0004]	1.85	0.065
Mean Age Native	0.002 [0.004]	0.58	0.563	0.001 [0.004]	0.33	0.740	-0.002 [0.004]	-0.54	0.589	-0.002 [0.004]	-0.37	0.713
Mean Age HE	-0.003 [0.001]	-2.36	0.018	-0.005 [0.002]	-2.84	0.005	-	-	-	-	-	-
Mean Age HS	-	-	-	-	-	-	0.002 [0.001]	1.13	0.260	0.001 [0.002]	0.77	0.438
Mean Age NG	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age LE	-	-	-	-	-	-	-	-	-	-	-	-
Quarter 2	0.0001 [0.002]	0.04	0.966	0.005 [0.004]	1.31	0.190	-0.004 [0.002]	-1.73	0.083	-0.004 [0.004]	-1.26	0.207
Quarter 3	0.010 [0.002]	6.02	0.000	0.011 [0.002]	5.03	0.000	-0.003 [0.002]	-1.62	0.105	-0.004 [0.002]	-1.79	0.073
Quarter 4	-0.0001 [0.002]	-0.06	0.948	0.005 [0.004]	1.33	0.183	-0.001 [0.002]	-0.33	0.744	-0.002 [0.004]	-0.44	0.659
Center	0.001 [0.002]	0.32	0.749	0.001 [0.002]	0.28	0.782	-0.001 [0.002]	-0.33	0.740	-0.001 [0.002]	-0.32	0.748
Lisbon	-0.001 [0.001]	-0.47	0.637	-0.001 [0.001]	-0.65	0.515	0.001 [0.002]	0.31	0.759	-0.0004 [0.002]	-0.22	0.824
Alentejo	-0.001 [0.002]	-0.28	0.777	0.0001 [0.002]	0.04	0.970	-0.0001 [0.002]	-0.03	0.972	-0.001 [0.002]	-0.33	0.741
Algarve	-0.0002 [0.002]	-0.09	0.932	0.001 [0.002]	0.26	0.799	0.001 [0.002]	0.42	0.673	-0.0004 [0.002]	-0.19	0.849
Azores	-0.001 [0.002]	-0.48	0.630	-0.002 [0.002]	-0.81	0.420	-0.001 [0.002]	-0.29	0.772	-0.002 [0.002]	-0.94	0.347
Madeira	0.001 [0.002]	0.36	0.718	0.001 [0.002]	0.32	0.750	-0.0003 [0.002]	-0.19	0.853	-0.001 [0.002]	-0.52	0.602
	Obs.		*333*	*Obs.*		*287*	*Obs.*		*352*	*Obs.*		*296*
	R^2		*0.140*	R^2		*0.139*	R^2		*0.056*	R^2		*0.048*
	Wald X^2 *(16)*		*59.23*	*Wald* X^2 *(16)*		*51.39*	*Wald* X^2 *(16)*		*17.57*	*Wald* X^2 *(16)*		*14.29*
	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.3496*	$p > X^2$		*0.5774*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*44.36*	$X^2(3)$		*30.19*	$X^2(3)$		*5.82*	$X^2(3)$		*5.77*
	p		*0.0000*	*p*		*0.0000*	*p*		*0.1207*	*p*		*0.1236*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*1.51*	$X^2(6)$		*3.16*	$X^2(6)$		*0.80*	$X^2(6)$		*0.97*
	p		*0.9588*	*p*		*0.7296*	*p*		*0.9921*	*p*		*0.9868*

Table A10: Results of the analysis of unemployment by education group in Portugal 1998-2010. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 1998-2010)

Table A11: Results Unemployment by Education Group 1998-2010

-Ninth Grade Graduate, Lower Education-

Education Groups	Ninth Grade Graduate						Lower Education					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	0.178 [0.213]	0.83	0.404	-0.175 [1.506]	-0.12	0.907	0.072 [0.174]	0.42	0.676	0.930 [0.854]	1.09	0.276
ln HE/LE	-0.006 [0.011]	-0.52	0.605	-0.007 [0.012]	-0.53	0.597	0.0002 [0.007]	0.03	0.973	-0.003 [0.008]	-0.43	0.665
ln HS/LE	-0.009 [0.014]	-0.62	0.534	-0.017 [0.017]	-0.96	0.335	0.004 [0.010]	0.41	0.679	0.011 [0.011]	1.04	0.297
ln NG/LE	-0.0002 [0.016]	-0.01	0.991	-0.006 [0.022]	-0.30	0.764	-0.006 [0.010]	-0.60	0.546	-0.024 [0.013]	-1.77	0.077
Mean Age Immigrant	-0.001 [0.0004]	-1.66	0.097	-0.001 [0.001]	-1.42	0.156	-0.0003 [0.0003]	-1.04	0.298	-0.0001 [0.0003]	-0.26	0.798
Mean Age Native	0.001 [0.004]	0.23	0.818	0.001 [0.005]	0.17	0.867	0.001 [0.005]	0.14	0.887	-0.0001 [0.005]	-0.02	0.980
Mean Age HE	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age HS	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age NG	-0.002 [0.002]	-1.03	0.301	-0.002 [0.002]	-1.09	0.277	-	-	-	-	-	-
Mean Age LE	-	-	-	-	-	-	-0.008 [0.004]	-1.98	0.047	-0.006 [0.004]	-1.48	0.139
Quarter 2	-0.010 [0.002]	-4.64	0.000	-0.009 [0.004]	-2.35	0.019	-0.006 [0.002]	-3.91	0.000	-0.004 [0.002]	-1.89	0.059
Quarter 3	-0.007 [0.002]	-3.56	0.000	-0.006 [0.002]	-2.57	0.010	-0.004 [0.002]	-2.48	0.013	-0.004 [0.002]	-2.26	0.024
Quarter 4	-0.001 [0.002]	-0.33	0.740	0.001 [0.004]	0.16	0.873	-0.001 [0.002]	-0.48	0.634	0.001 [0.002]	0.37	0.710
Center	-0.001 [0.002]	-0.55	0.585	-0.001 [0.002]	-0.68	0.498	-0.001 [0.001]	-1.19	0.236	-0.001 [0.001]	-1.04	0.299
Lisbon	-0.001 [0.001]	-0.34	0.732	-0.001 [0.002]	-0.33	0.741	0.00004 [0.001]	0.05	0.964	0.0002 [0.001]	0.16	0.872
Alentejo	-0.002 [0.002]	-1.01	0.314	-0.001 [0.002]	-0,63	0.526	-0.001 [0.001]	-1.01	0.312	-0.001 [0.001]	-0.43	0.667
Algarve	-0.001 [0.002]	-0.39	0.698	0.0005 [0.002]	0.26	0.793	-0.0001 [0.002]	-0.03	0.975	0.0004 [0.002]	0.27	0.785
Azores	-0.001 [0.002]	-0.64	0.522	-0.001 [0.002]	-0.70	0.486	-0.001 [0.001]	-1.24	0.214	-0.001 [0.001]	-1.19	0.235
Madeira	-0.002 [0.002]	-0.82	0.412	-0.002 [0.003]	-0.91	0.362	-0.001 [0.001]	-0.81	0.420	-0.001 [0.001]	-0.58	0.561
	Obs.		*351*	*Obs.*		*295*	*Obs.*		*357*	*Obs.*		*301*
	R^2		*0.123*	R^2		*0.120*	R^2		*0.136*	R^2		*0.144*
	Wald X^2 *(16)*		*43.39*	*Wald* X^2 *(16)*		*0.120*	*Wald* X^2 *(16)*		*39.25*	*Wald* X^2 *(16)*		*37.92*
	$p > X^2$		*0.0002*	$p > X^2$		*0.0025*	$p > X^2$		*0.0010*	$p > X^2$		*0.0016*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*39.08*	$X^2(3)$		*31.08*	$X^2(3)$		*22.04*	$X^2(3)$		*16.89*
	p		*0.0000*	*p*		*0.0000*	*p*		*0.0001*	*p*		*0.0007*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*1.40*	$X^2(6)$		*1.44*	$X^2(6)$		*3.77*	$X^2(6)$		*3.30*
	p		*0.9658*	*p*		*0.9636*	*p*		*0.7079*	*p*		*0.7705*

Table A11: Results of the analysis of unemployment by education group in Portugal 1998-2010. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 1998-2010)

Table A12: Results Unemployment by Education Group 2011-2019

-Higher Education, High School Graduate-

Education Groups	Higher Education						High School Graduate					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment Education	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	0.446 [0.230]	1.94	0.052	-0.181 [1.509]	-0.12	0.905	-0.639 [0.348]	-1.84	0.066	-1.127 [1.792]	-0.63	0.530
ln HE/LE	-0.029 [0.021]	-1.39	0.166	-0.034 [0.026]	-1.34	0.180	-0.001 [0.033]	-0.04	0.970	-0.022 [0.035]	-0.62	0.533
ln HS/LE	0.035 [0.019]	1.81	0.070	0.029 [0.029]	1.01	0.314	0.011 [0.031]	0.35	0.724	-0.012 [0.039]	-0.32	0.752
ln NG/LE	-0.006 [0.019]	-0.33	0.743	0.006 [0.023]	0.25	0.801	-0.001 [0.031]	-0.02	0.986	-0.010 [0.036]	-0.26	0.792
Mean Age Immigrant	0.001 [0.001]	0.86	0.387	0.0003 [0.001]	0.34	0.731	0.001 [0.001]	1.46	0.143	0.002 [0.001]	1.75	0.080
Mean Age Native	0.002 [0.006]	0.35	0.729	0.003 [0.006]	0.47	0.639	0.009 [0.009]	1.02	0.310	-0.003 [0.009]	-0.28	0.776
Mean Age HE	0.0004 [0.003]	0.15	0.879	-0.002 [0.003]	-0.55	0.581	-	-	-	-	-	-
Mean Age HS	-	-	-	-	-	-	-0.005 [0.004]	-1.31	0.190	-0.003 [0.004]	-0.67	0.502
Mean Age NG	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age LE	-	-	-	-	-	-	-	-	-	-	-	-
Quarter 1	-0.008 [0.003]	-2.64	0.008	-0.009 [0.005]	-1.65	0.098	-0.017 [0.005]	-3.57	0.000	-0.018 [0.007]	-2.73	0.006
Quarter 2	0.002 [0.003]	0.76	0.447	0.001 [0.005]	0.11	0.911	-0.012 [0.004]	-3.00	0.003	-0.013 [0.006]	-2.12	0.034
Quarter 3	0.003 [0.003]	0.86	0.392	0.001 [0.004]	0.27	0.789	-0.003 [0.005]	-0.67	0.504	-0.002 [0.005]	-0.41	0.685
Center	0.0004 [0.002]	0.19	0.849	0.002 [0.002]	0.96	0.335	-0.001 [0.003]	-0.44	0.659	-0.0004 [0.004]	-0.10	0.921
Lisbon	0.00003 [0.002]	0.02	0.988	0.001 [0.002]	0.33	0.739	0.0001 [0.002]	0.05	0.958	0.002 [0.002]	0.81	0.416
Alentejo	0.001 [0.002]	0.35	0.727	0.001 [0.002]	0.40	0.691	0.001 [0.002]	0.52	0.603	0.001 [0.002]	0.48	0.629
Algarve	-0.0001 [0.002]	-0.02	0.981	0.001 [0.002]	0.56	0.576	0.001 [0.003]	0.32	0.750	0.001 [0.003]	0.26	0.794
Azores	0.001 [0.002]	0.32	0.749	0.002 [0.003]	0.96	0.338	0.002 [0.003]	0.50	0.620	0.0002 [0.002]	0.08	0.940
Madeira	0.001 [0.002]	0.32	0.749	0.002 [0.003]	0.63	0.527	0.0002 [0.003]	0.07	0.942	-0.002 [0.003]	-0.06	0.546
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.139*	R^2		*0.123*	R^2		*0.156*	R^2		*0.190*
	Wald X^2 *(16)*		*31.11*	*Wald* X^2 *(16)*		*19.90*	*Wald* X^2 *(16)*		*31.43*	*Wald* X^2 *(16)*		*35.92*
	$p > X^2$		*0.0130*	$p > X^2$		*0.2246*	$p > X^2$		*0.012*	$p > X^2$		*0.0030*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*22.16*	$X^2(3)$		*13.69*	$X^2(3)$		*22.70*	$X^2(3)$		*13.05*
	p		*0.0001*	*p*		*0.0034*	*p*		*0.0000*	*p*		*0.0045*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*0.36*	$X^2(6)$		*1.40*	$X^2(6)$		*0.80*	$X^2(6)$		*1.30*
	p		*0.9991*	*p*		*0.9660*	*p*		*0.9920*	*p*		*0.9717*

Table A12: Results of the analysis of unemployment by education group in Portugal 2011-2019. The dependent variables are the respective unemployment rates among the subgroups. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A13: Results Unemployment by Education Group 2011-2019

-Ninth Grade Graduate, Lower Education-

Education Groups	Ninth Grade Graduate						Lower Education					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment Education	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	-0.471 [0.424]	-1.11	0.266	-1.907 [2.277]	-0.84	0.402	-0.004 [0.386]	-0.01	0.992	1.964 [2.079]	0.94	0.345
ln HE/LE	0.043 [0.033]	1.30	0.193	0.020 [0.037]	0.54	0.592	-0.012 [0.028]	-0.41	0.683	0.010 [0.031]	0.32	0.749
ln HS/LE	-0.011 [0.030]	-0.37	0.712	-0.002 [0.043]	-0.04	0.971	0.083 [0.026]	3.18	0.001	0.126 [0.037]	3.40	0.001
ln NG/LE	0.083 [0.032]	2.59	0.010	0.140 [0.039]	3.54	0.000	-0.008 [0.028]	-0.30	0.767	-0.020 [0.033]	-0.59	0.555
Mean Age Immigrant	0.001 [0.001]	1.16	0.246	0.001 [0.001]	0.71	0.481	-0.0001 [0.001]	-0.16	0.869	0.001 [0.001]	1.04	0.297
Mean Age Native	0.009 [0.009]	0.97	0.330	0.021 [0.010]	2.02	0.043	0.007 [0.009]	0.75	0.452	0.013 [0.010]	1.33	0.183
Mean Age HE	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age HS	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age NG	-0.011 [0.004]	-3.19	0.001	-0.014 [0.010]	-3.61	0.000	-	-	-	-	-	-
Mean Age LE	-	-	-	-	-	-	0.001 [0.006]	0.15	0.879	-0.001 [0.006]	-0.25	0.804
Quarter 1	-0.016 [0.005]	-3.19	0.001	-0.025 [0.007]	-3.36	0.001	-0.014 [0.004]	-3.78	0.000	-0.009 [0.007]	-1.24	0.214
Quarter 2	-0.008 [0.004]	-1.83	0.067	-0.016 [0.007]	-2.31	0.021	-0.014 [0.004]	-3.74	0.000	-0.00ß [0.007]	-1.28	0.201
Quarter 3	0.005 [0.005]	0.93	0.353	-0.001 [0.005]	-0.15	0.885	0.005 [0.004]	1.17	0.243	0.007 [0.005]	1.56	0.118
Center	-0.0004 [0.005]	-0.08	0.936	-0.001 [0.005]	-0.14	0.888	-0.001 [0.005]	-0.27	0.790	0.001 [0.005]	0.17	0.867
Lisbon	0.0003 [0.002]	0.17	0.864	0.001 [0.003]	0.39	0.700	0.0001 [0.003]	0.06	0.954	0.003 [0.002]	1.02	0.309
Alentejo	-0.001 [0.003]	-0.18	0.859	-0.001 [0.003]	-0.36	0.719	-0.001 [0.001]	-0.41	0.679	-0.001 [0.003]	-0.30	0.766
Algarve	-0.001 [0.003]	0.47	0.640	0.00002 [0.003]	0.01	0.995	-0.001 [0.003]	-0.26	0.794	0.0001 [0.003]	0.03	0.980
Azores	0.003 [0.003]	0.98	0.329	0.002 [0.004]	0.66	0.510	0.001 [0.002]	0.41	0.680	0.001 [0.001]	0.48	0.630
Madeira	0.001 [0.002]	0.60	0.550	0.0004 [0.002]	0.18	0.861	-0.001 [0.002]	-0.44	0.659	-0.001 [0.003]	-0.22	0.822
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.222*	R^2		*0.306*	R^2		*0.238*	R^2		*0.311*
	Wald X^2 *(16)*		*51.08*	*Wald* X^2 *(16)*		*81.76*	*Wald* X^2 *(16)*		*57.45*	*Wald* X^2 *(16)*		*73.64*
	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*28.85*	$X^2(3)$		*25.84*	$X^2(3)$		*42.87*	$X^2(3)$		*15.68*
	p		*0.0000*	*p*		*0.0000*	*p*		*0.0000*	*p*		*0.0013*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*1.71*	$X^2(6)$		*1.14*	$X^2(6)$		*0.85*	$X^2(6)$		*2.84*
	p		*0.9443*	*p*		*0.9797*	*p*		*0.9907*	*p*		*0.8280*

Table A13: Results of the analysis of unemployment by education group in Portugal 1998-2010. The dependent variables are the respective unemployment rates among the subgroups. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A14: Results Unemployment by Age Group 1998-2010

-25-35 & 36-45-

Agegroups	25-35						36-45					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	-0.016 [0.238]	-0.07	0.945	-0.587 [1.495]	-0.39	0.695	0.067 [0.187]	0.36	0.718	-1.510 [0.837]	-1.80	0.071
ln HE/LE	0.009 [0.011]	0.81	0.417	0.001 [0.011]	0.12	0.907	-0.005 [0.008]	-0.65	0.516	-0.008 [0.009]	-0.85	0.394
ln HS/LE	-0.027 [0.014]	-1.90	0.058	-0.021 [0.016]	-1.32	0.188	0.007 [0.011]	0.67	0.503	0.012 [0.012]	0.11	0.915
ln NG/LE	0.005 [0.015]	0.34	0.731	-0.010 [0.020]	-0.49	0.625	-0.013 [0.012]	-1.13	0.258	-0.010 [0.014]	-0.75	0.451
Mean Age Immigrant	-0.0005 [0.0004]	-1.15	0.250	-0.0002 [0.0005]	-0.51	0.610	0.0001 [0.0003]	0.44	0.662	0.0003 [0.0004]	0.85	0.398
Mean Age Native	-0.003 [0.004]	-0.65	0.517	-0.002 [0.004]	-0.51	0.610	0.002 [0.003]	0.53	0.594	0.001 [0.003]	0.29	0.774
Mean Age 25-35	0.0001 [0.007]	0.01	0.990	0.006 [0.007]	0.94	0.348	-	-	-	-	-	-
Mean Age 36-45	-	-	-	-	-	-	-0.012 [0.007]	-1.73	0.084	-0.016 [0.009]	-1.75	0.080
Mean Age 46-55	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age 56-65	-	-	-	-	-	-	-	-	-	-	-	-
Quarter 2	-0.011 [0.002]	-4.47	0.000	-0.011 [0.002]	-2.74	0.006	-0.003 [0.002]	-1.97	0.049	-0.006 [0.002]	-2.63	0.009
Quarter 3	-0.003 [0.002]	-1.18	0.240	-0.003 [0.002]	-1.38	0.166	-0.003 [0.001]	-1.85	0.064	-0.005 [0.002]	-3.00	0.003
Quarter 4	-0.002 [0.002]	-0.81	0.416	-0.003 [0.004]	-0.78	0.437	0.002 [0.002]	1.04	0.298	-0.002 [0.002]	-0.66	0.507
Center	-0.001 [0.001]	-0.51	0.608	-0.001 [0.002]	-0.45	0.650	-0.0004 [0.001]	-0.43	0.666	-0.0003 [0.001]	-0.30	0.764
Lisbon	-0.0005 [0.001]	-0.32	0.747	-0.001 [0.001]	-0.48	0.634	-0.0002 [0.001]	-0.14	0.889	-0.0003 [0.001]	0.23	0.815
Alentejo	-0.002 [0.002]	-1.13	0.260	-0.001 [0.002]	0.59	0.555	-0.0003 [0.001]	-0.21	0.831	0.000 [0.001]	0.00	0.999
Algarve	-0.0001 [0.002]	-0.06	0.955	0.001 [0.002]	0.26	0.791	-0.0001 [0.002]	-0.05	0.963	0.0004 [0.002]	0.22	0.824
Azores	-0.001 [0.001]	-1.07	0.284	-0.002 [0.002]	-1.20	0.229	-0.001 [0.001]	-0.64	0.523	-0.001 [0.001]	-0.41	0.681
Madeira	-0.001 [0.002]	-0.53	0.595	-0.001 [0.002]	-0.56	0.576	-0.0002 [0.001]	-0.14	0.889	-0.0003 [0.001]	-0.26	0.798
	Obs.		*357*	*Obs.*		*301*	*Obs.*		*357*	*Obs.*		*301*
	R^2		*0.1155*	R^2		*0.098*	R^2		*0.061*	R^2		*0.077*
	Wald X^2 *(16)*		*34.08*	*Wald* X^2 *(16)*		*26.26*	*Wald* X^2 *(16)*		*20.10*	*Wald* X^2 *(16)*		*26.25*
	$p > X^2$		*0.0053*	$p > X^2$		*0.0504*	$p > X^2$		*0.2159*	$p > X^2$		*0.0507*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(6)$		*26.04*	$X^2(6)$		*15.85*	$X^2(6)$		*15.26*	$X^2(3)$		*20.17*
	p		*0.0000*	*p*		*0.0012*	*p*		*0.0016*	*p*		*0.0002*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*2.24*	$X^2(6)$		*1.97*	$X^2(6)$		*0.50*	$X^2(6)$		*0.41*
	p		*0.8960*	*p*		*0.9221*	*p*		*0.9978*	*p*		*0.9988*

Table A14: Results of the analysis of unemployment by age group in Portugal 1998-2010. The dependent variable are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 1998-2010)

Table A15: Results Unemployment by Age Group 1998-2010

-46-55 & 56-65-

Agegroups	46-55						56-65					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	0.410 [0.313]	1.35	0.191	-0.309 [1.332]	-0.23	0.817	0.276 [0.202]	1.37	0.172	-0.580 [1.442]	-0.40	0.687
ln HE/LE	-0.021 [0.014]	-1.48	0.140	-0.029 [0.016]	-1.82	0.069	-0.003 [0.010]	-0.31	0.760	-0.004 [0.012]	-0.33	0.739
ln HS/LE	-0.013 [0.019]	-0.71	0.469	-0.007 [0.022]	-0.31	0.757	0.005 [0.013]	0.41	0.681	-0.0003 [0.015]	-0.02	0.983
ln NG/LE	-0.021 [0.020]	-1.08	0.279	-0.027 [0.025]	-1.08	0.280	-0.002 [0.014]	-0.11	0.911	0.010 [0.019]	0.52	0.600
Mean Age Immigrant	-0.0003 [0.001]	-0.46	0.648	-0.0003 [0.001]	-0.39	0.698	0.0003 [0.0004]	0.80	0.425	0.0002 [0.0005]	0.51	0.613
Mean Age Native	-0.019 [0.005]	-3.18	0.000	-0.021 [0.006]	-3.58	0.000	-0.006 [0.003]	-1.94	0.052	-0.008 [0.004]	-2.10	0.036
Mean Age 25-35	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age 36-45	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age 46-55	-0.003 [0.011]	-0.29	0.744	-0.001 [0.016]	-0.08	0.934	-	-	-	-	-	-
Mean Age 56-65	-	-	-	-	-	-	0.007 [0.007]	1.04	0.297	0.011 [0.009]	1.26	0.207
Quarter 2	-0.010 [0.003]	-3.87	0.000	-0.010 [0.004]	-2.58	0.010	-0.002 [0.002]	-1.09	0.275	-0.003 [0.004]	-0.95	0.341
Quarter 3	-0.004 [0.002]	-1.85	0.064	-0.005 [0.003]	-1.72	0.086	-0.002 [0.002]	-1.36	0.173	-0.002 [0.002]	-0.79	0.431
Quarter 4	-0.004 [0.003]	-1.56	0.118	-0.005 [0.004]	-1.24	0.215	-0.0002 [0.002]	-0.10	0.924	-0.001 [0.004]	-0.23	0.820
Center	-0.002 [0.002]	-1.29	0.198	-0.002 [0.002]	-1.11	0.266	-0.001 [0.001]	-0.70	0.486	-0.001 [0.001]	-0.72	0.470
Lisbon	-0.002 [0.002]	-0.74	0.458	-0.001 [0.002]	-0.35	0.729	-0.0004 [0.002]	-0.31	0.758	-0.0004 [0.002]	-0.21	0.835
Alentejo	-0.002 [0.003]	-0.89	0.372	-0.002 [0.003]	-0.59	0.552	-0.001 [0.002]	-0.76	0.446	-0.001 [0.002]	-0.63	0.527
Algarve	-0.002 [0.003]	-0.63	0.531	-0.001 [0.003]	-0.25	0.804	-0.0002 [0.002]	-0.10	0.919	-0.0001 [0.002]	-0.03	0.975
Azores	-0.002 [0.003]	-0.69	0.493	-0.002 [0.003]	-0.76	0.448	-0.001 [0.002]	-0.83	0.408	-0.002 [0.002]	-0.86	0.389
Madeira	-0.002 [0.002]	-1.09	0.276	-0.001 [0.002]	-0.66	0.509	-0.001 [0.002]	-0.37	0.713	-0.001 [0.002]	-0.63	0.527
	Obs.		*357*	*Obs.*		*301*	*Obs.*		*328*	*Obs.*		*278*
	R^2		*0.097*	R^2		*0.086*	R^2		*0.047*	R^2		*0.043*
	Wald X^2 *(16)*		*35.94*	*Wald* X^2 *(16)*		*27.18*	*Wald* X^2 *(16)*		*14.03*	*Wald* X^2 *(16)*		*11.15*
	$p > X^2$		*0.0029*	$p > X^2$		*0.0396*	$p > X^2$		*0.5962*	$p > X^2$		*0.8004*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*16.05*	$X^2(3)$		*8.90*	$X^2(3)$		*3.36*	$X^2(3)$		*3.30*
	p		*0.0011*	*p*		*0.0306*	*p*		*0.3389*	*p*		*0.3873*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*2.53*	$X^2(6)$		*1.34*	$X^2(6)$		*1.02*	$X^2(6)$		*1.11*
	p		*0.8646*	*p*		*0.9692*	*p*		*0.9847*	*p*		*0.9813*

Table A15: Results of the analysis of unemployment by age group in Portugal 1998-2010. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 1998-2010)

Table A16: Results Unemployment by Age Group 2011-2019

-25-35 & 36-45-

Agegroups	25-35						36-45					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	0.014 [0.469]	0.03	0.977	-5.622 [2.695]	-2.09	0.037	-0.648 [0.285]	-2.27	0.023	2.389 [1.854]	1.29	0.198
ln HE/LE	0.025 [0.039]	0.63	0.528	0.028 [0.042]	0.67	0.502	-0.023 [0.026]	-0.88	0.378	-0.030 [0.030]	-1.01	0.313
ln HS/LE	0.019 [0.034]	0.57	0.567	-0.0622 [0.046]	-1.36	0.174	0.026 [0.023]	1.11	0.266	0.083 [0.036]	2.30	0.021
ln NG/LE	0.010 [0.038]	0.27	0.788	-0.062 [0.046]	2.20	0.028	0.017 [0.023]	0.69	0.492	-0.010 [0.029]	-0.35	0.724
Mean Age Immigrant	0.002 [0.001]	2.01	0.044	0.103 [0.047]	0.26	0.792	-0.001 [0.001]	-1.86	0.062	-0.0001 [0.001]	-0.16	0.876
Mean Age Native	0.010 [0.010]	1.04	0.300	0.0003 [0.001]	1.08	0.281	0.007 [0.007]	1.10	0.271	0.008 [0.007]	1.22	0.224
Mean Age 25-35	-0.005 [0.013]	-0.40	0.686	-0.022 [0.013]	-1.75	0.081	-	-	-	-	-	-
Mean Age 36-45	-	-	-	-	-	-	-0.021 [0.012]	-1.78	0.075	-0.007 [0.013]	-0.50	0.617
Mean Age 46-55	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age 56-65	-	-	-	-	-	-	-	-	-	-	-	-
Quarter 1	-0.020 [0.006]	-3.55	0.000	-0.038 [0.009]	-4.32	0.000	-0.011 [0.003]	-3.12	0.002	-0.003 [0.006]	-0.54	0.591
Quarter 2	-0.012 [0.005]	-2.23	0.026	-0.030 [0.008]	-3.54	0.000	-0.006 [0.003]	-1.86	0.062	0.001 [0.006]	0.16	0.876
Quarter 3	0.008 [0.006]	1.27	0.203	-0.001 [0.006]	-0.12	0.904	0.001 [0.004]	0.37	0.714	0.005 [0.004]	1.36	0.174
Center	-0.001 [0.005]	-0.22	0.827	0.001 [0.005]	0.28	0.782	-0.001 [0.003]	-0.16	0.872	0.0004 [0.004]	0.11	0.910
Lisbon	0.0001 [0.002]	0.06	0.952	0.002 [0.003]	0.56	0.578	0.001 [0.002]	0.23	0.816	0.001 [0.002]	0.52	0.604
Alentejo	0.0004 [0.002]	0.19	0.846	0.002 [0.002]	0.72	0.470	0.0003 [0.002]	0.13	0.897	-0.001 [0.003]	-0.28	0.780
Algarve	0.001 [0.003]	0.30	0.762	0.001 [0.003]	0.26	0.792	0.001 [0.003]	0.25	0.803	-0.001 [0.003]	-0.26	0.796
Azores	0.003 [0.003]	0.80	0.421	0.002 [0.003]	0.63	0.527	0.001 [0.002]	0.47	0.637	-0.001 [0.003]	-0.23	0.816
Madeira	0.001 [0.004]	0.12	0.908	-0.0003 [0.004]	-0.08	0.939	-0.0001 [0.003]	-0.02	0.984	-0.002 [0.003]	-0.53	0.596
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.222*	R^2		*0.323*	R^2		*0.157*	R^2		*0.1463*
	Wald X^2 *(16)*		*43.20*	*Wald* X^2 *(16)*		*83.97*	*Wald* X^2 *(16)*		*32.10*	*Wald* X^2 *(16)*		*30.77*
	$p > X^2$		*0.0003*	$p > X^2$		*0.0000*	$p > X^2$		*0.0097*	$p > X^2$		*0.0144*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*35.31*	$X^2(3)$		*40.81*	$X^2(3)$		*18.64*	$X^2(3)$		*8.34*
	p		*0.0000*	*p*		*0.0000*	*p*		*0.0003*	*p*		*0.0396*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*0.94*	$X^2(6)$		*1.19*	$X^2(6)$		*0.33*	$X^2(6)$		*1.48*
	p		*0.9878*	*p*		*0.9776*	*p*		*0.9993*	*p*		*0.9607*

Table A16: Results of the analysis of unemployment by age group in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A17: Results Unemployment by Age Group 2011-2019

-46-55 & 56-65-

Agegroups	46-55						56-65					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	0.360 [0.517]	0.70	0.487	-2.117 [3.549]	-0.60	0.551	-0.010 [0.348]	-0.03	0.978	0.617 [2.057]	0.30	0.764
ln ln HE/LE	-0.104 [0.047]	-2.22	0.026	-0.061 [0.053]	-1.15	0.248	-0.011 [0.026]	-0.43	0.665	-0.033 [0.033]	-1.02	0.309
ln HS/LE	0.069 [0.044]	1.58	0.114	0.062 [0.068]	0.92	0.358	0.049 [0.024]	2.08	0.038	0.069 [0.034]	2.03	0.043
ln NG/LE	0.078 [0.044]	1.77	0.076	0.119 [0.057]	2.10	0.036	-0.010 [0.025]	-0.41	0.681	-0.018 [0.032]	-0.57	0.569
Mean Age Immigrant	0.003 [0.001]	2.47	0.014	0.003 [0.002]	1.60	0.110	0.0005 [0.007]	0.71	0.477	0.001 [0.001]	1.19	0.233
Mean Age Native	-0.012 [0.012]	-1.02	0.307	-0.001 [0.026]	-0.05	0.959	-0.008 [0.007]	-1.25	0.210	-0.010 [0.007]	-1.39	0.165
Mean Age 25-35	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age 36-45	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age 46-55	-0.019 [0.023]	-0.83	0.407	-0.036 [0.026]	-1.39	0.165	-	-	-	-	-	-
Mean Age 56-65	-	-	-	-	-	-	0.020 [0.014]	1.49	0.137	0.023 [0.014]	1.63	0.103
Quarter 1	-0.029 [0.006]	-5.15	0.000	-0.034 [0.011]	-3.05	0.002	.0.004 [0.004]	-0.92	0.360	-0.004 [0.007]	-0.49	0.626
Quarter 2	-0.017 [0.005]	-3.13	0.001	-0.023 [0.011]	-2.11	0.035	-0.006 [0.003]	-1.92	0.055	-0.004 [0.007]	-0.52	0.605
Quarter 3	-0.005 [0.006]	-0.83	0.405	-0.005 [0.007]	-0.72	0.469	0.009 [0.004]	2.11	0.035	0.008 [0.005]	1.52	0.129
Center	-0.001 [0.006]	-0.18	0.856	0.002 [0.006]	0.32	0.752	-0.001 [0.003]	-0.29	0.770	-0.0004 [0.003]	-0.11	0.916
Lisbon	0.002 [0.004]	0.45	0.650	0.006 [0.004]	1.39	0.164	0.0003 [0.002]	0.19	0.851	0.002 [0.002]	0.99	0.324
Alentejo	-0.0004 [0.004]	-0.11	0.914	0.0004 [0.005]	0.09	0.930	-0.002 [0.003]	-0.56	0.574	-0.0004 [0.003]	-0.12	0.906
Algarve	0.0004 [0.004]	0.09	0.929	0.003 [0.004]	0.69	0.492	-0.001 [0.002]	-0.33	0.742	0.001 [0.002]	0.34	0.732
Azores	0.003 [0.006]	0.43	0.667	0.007 [0.007]	1.06	0.290	0.001 [0.003]	0.38	0.700	0.003 [0.003]	0.97	0.333
Madeira	0.0003 [0.005]	0.07	0.943	0.002 [0.005]	0.45	0.655	0.0001 [0.002]	0.03	0.976	0.002 [0.002]	0.72	0.472
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.211*	*R^2*		*0.2316*	*R^2*		*0.158*	*R^2*		*0.195*
	Wald X^2 (16)		*59.99*	*Wald X^2 (16)*		*70.33*	*Wald X^2 (16)*		*38.62*	*Wald X^2 (16)*		*49.06*
	$p > X^2$		*0.0000*	*$p > X^2$*		*0.0000*	*$p > X^2$*		*0.0012*	*$p > X^2$*		*0.0000*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*38.49*	*$X^2(3)$*		*17.46*	*$X^2(3)$*		*22.62*	*$X^2(3)$*		*10.09*
	p		*0.0000*	*p*		*0.0006*	*p*		*0.0000*	*p*		*0.0178*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*0.58*	*$X^2(6)$*		*4.34*	*$X^2(6)$*		*1.64*	*$X^2(6)$*		*9.92*
	p		*0.9968*	*p*		*0.6304*	*p*		*0.9493*	*p*		*0.1283*

Table A17: Results of the analysis of unemployment by age group in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A18: Results Unemployment by Gender 1998-2010

	Female						Male					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	0.083 [0.189]	0.44	0.659	-1.224 [1.094]	-1.12	0.263	0.173 [0.139]	1.25	0.212	-0.353 [0.905]	-0.39	0.696
ln HE/LE	-0.005 [0.008]	-0.62	0.539	-0.009 [0.008]	-1.13	0.258	-0.002 [0.006]	-0.28	0.783	-0.006 [0.007]	-0.80	0.423
ln HS/LE	-0.023 [0.010]	-2.19	0.029	-0.026 [0.011]	-2.38	0.017	0.006 [0.008]	0.70	0.483	0.010 [0.010]	0.98	0.326
ln NG/LE	-0.018 [0.011]	-1.60	0.109	-0.019 [0.014]	-1.39	0.166	0.007 [0.008]	0.76	0.449	0.004 [0.013]	0.30	0.767
Mean Age Immigrant	-0.000 [0.0003]	-0.01	0.991	0.0002 [0.0003]	0.72	0.469	-0.0002 [0.0002]	-0.84	0.401	-0.0002 [0.0003]	-0.69	0.492
Mean Age Native	-0.005 [0.006]	-0.90	0.367	-0.002 [0.006]	-0.33	0.744	0.001 [0.004]	0.17	0.864	0.001 [0.005]	0.14	0.887
Mean Age Female	-0.004 [0.005]	-0.93	0.355	-0.007 [0.005]	-1.40	0.162	-	-	-	-	-	-
Mean Age Male	-	-	-	-	-	-	-0.001 [0.003]	-0.22	0.826	-0.002 [0.004]	-0.53	0.597
Quarter 2	-0.007 [0.002]	-3.88	0.000	-0.008 [0.003]	-2.96	0.003	-0.005 [0.001]	-4.17	0.000	-0.006 [0.002]	-2.68	0.007
Quarter 3	-0.001 [0.002]	-0.73	0.465	-0.002 [0.002]	-1.42	0.154	-0.004 [0.001]	-2.94	0.003	-0.004 [0.001]	-2.89	0.004
Quarter 4	0.0004 [0.002]	0.21	0.837	-0.002 [0.003]	-0.60	0.547	-0.002 [0.001]	-1.25	0.210	-0.003 [0.002]	-1.20	0.231
Center	-0.001 [0.001]	-0.86	0.392	-0.001 [0.001]	-0.77	0.442	-0.001 [0.001]	-0.95	0.344	-0.001 [0.001]	-1.01	0.313
Lisbon	-0.001 [0.001]	-0.75	0.455	-0.001 [0.001]	-0.76	0.445	-0.0001 [0.001]	-0.17	0.865	-0.0001 [0.001]	-0.11	0.913
Alentejo	-0.002 [0.002]	-1.30	0.195	-0.001 [0.001]	-0.80	0.423	-0.001 [0.001]	-0.83	0.407	-0.001 [0.001]	-0.59	0.556
Algarve	-0.001 [0.002]	-0.43	0.665	-0.0001 [0.002]	-0.05	0.962	0.0001 [0.001]	0.07	0.945	0.0004 [0.001]	0.31	0.759
Azores	-0.002 [0.001]	-1.61	0.107	-0.002 [0.001]	-1.32	0.187	-0.0004 [0.001]	-0.55	0.585	-0.001 [0.001]	-0.99	0.322
Madeira	-0.001 [0.001]	-1.24	0.217	-0.001 [0.001]	-1.23	0.219	-0.0002 [0.001]	-0.23	0.821	-0.0002 [0.001]	-0.20	0.838
	Obs.		*357*	*Obs.*		*301*	*Obs.*		*357*	*Obs.*		*301*
	R^2		*0.137*	R^2		*0.140*	R^2		*0.093*	R^2		*0.089*
	Wald X^2 *(16)*		*45.24*	*Wald* X^2 *(16)*		*45.97*	*Wald* X^2 *(16)*		*27.58*	*Wald* X^2 *(16)*		*23.04*
	$p > X^2$		*0.0001*	$p > X^2$		*0.0001*	$p > X^2$		*0.0355*	$p > X^2$		*0.1126*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*26.90*	$X^2(3)$		*26.86*	$X^2(3)$		*20.92*	$X^2(3)$		*14.87*
	p		*0.0000*	*p*		*0.0000*	*p*		*0.0001*	*p*		*0.0019*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*3.49*	$X^2(6)$		*2.52*	$X^2(6)$		*1.49*	$X^2(6)$		*2.26*
	p		*0.7459*	*p*		*0.8666*	*p*		*0.9602*	*p*		*0.8943*

Table A18: Results of the analysis of unemployment by gender in Portugal 1998-2010. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 1998-2010)

Table A19: Results Unemployment by Gender 2011-2019

	Female						Male					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	0.009 [0.281]	0.06	0.954	-1.187 [1.612]	-0.74	0.462	-0.207 [0.266]	-0.78	0.437	-1.272 [1.463]	-0.87	0.385
ln HE/LE	0.016 [0.023]	0.61	0.543	0.0005 [0.028]	0.02	0.986	-0.039 [0.021]	-1.82	0.069	-0.035 [0.023]	-1.50	0.134
ln HS/LE	0.053 [0.020]	2.65	0.008	0.042 [0.031]	1.36	0.173	0.010 [0.019]	0.53	0.593	0.011 [0.029]	0.37	0.708
ln NG/LE	0.015 [0.021]	0.77	0.441	0.042 [0.028]	1.49	0.137	0.007 [0.020]	0.33	0.744	0.023 [0.025]	0.92	0.358
Mean Age Immigrant	0.001 [0.001]	0.97	0.334	0.0002 [0.001]	0.21	0.831	0.0004 [0.001]	0.72	0.474	0.0004 [0.001]	0.54	0.588
Mean Age Native	0.010 [0.010]	1.00	0.317	0.015 [0.013]	1.16	0.248	-0.002 [0.009]	-0.18	0.858	0.0003 [0.009]	0.03	0.975
Mean Age Female	-0.005 [0.008]	-0.63	0.528	-0.008 [0.010]	-0.78	0.434	-0.003 [0.007]	-0.46	0.648	-	-	-
Mean Age Male	-	-	-	-	-	-	-	-	-	-0.001 [0.008]	-0.15	0.878
Quarter 1	-0.014 [0.003]	-	-	-0.018 [0.004]	-3.31	0.001	-0.013 [0.003]	-4.18	0.000	-0.017 [0.005]	-3.44	0.001
Quarter 2	-0.008 [0.003]	-4.72	0.000	-0.010 [0.005]	-1.94	0.053	-0.009 [0.003]	-3.02	0.002	-0.015 [0.005]	-2.96	0.003
Quarter 3	0.001 [0.003]	-2.77	0.006	0.001 [0.004]	0.18	0.861	0.004 [0.003]	1.27	0.206	0.001 [0.003]	0.41	0.679
Center	-0.001 [0.004]	-0.86	0.392	0.001 [0.004]	0.27	0.784	-0.001 [0.004]	-0.30	0.763	-0.001 [0.004]	-0.21	0.837
Lisbon	0.0002 [0.002]	-0.75	0.455	0.002 [0.002]	0.77	0.442	0.001 [0.002]	0.24	0.808	0.001 [0.002]	0.81	0.419
Alentejo	0.0002 [0.002]	-1.30	0.195	0.0004 [0.002]	0.26	0.794	-0.001 [0.002]	-0.41	0.679	-0.0002 [0.002]	-0.14	0.887
Algarve	-0.0001 [0.002]	-0.43	0.665	-0.00004 [0.002]	-0.02	0.983	0.003 [0.002]	0.11	0.911	0.001 [0.002]	0.27	0.784
Azores	0.003 [0.002]	-1.61	0.107	0.002 [0.003]	0.92	0.359	0.001 [0.002]	0.29	0.773	0.0002 [0.002]	0.14	0.888
Madeira	0.0001 [0.002]	-1.24	0.217	0.0004 [0.004]	0.17	0.862	0.0001 [0.002]	0.03	0.973	-0.001 [0.002]	-0.27	0.787
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.243*	R^2		*0.258*	R^2		*0.231*	R^2		*0.317*
	Wald X^2 *(16)*		*59.53*	*Wald* X^2 *(16)*		*59.85*	*Wald* X^2 *(16)*		*43.30*	*Wald* X^2 *(16)*		*71.91*
	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0003*	$p > X^2$		*0.0000*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*40.84*	$X^2(3)$		*25.43*	$X^2(3)$		*38.12*	$X^2(3)$		*27.73*
	p		*0.0000*	*p*		*0.0000*	*p*		*0.0000*	*p*		*0.0000*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*1.61*	$X^2(6)$		*1.29*	$X^2(6)$		*0.58*	$X^2(6)$		*1.98*
	p		*0.9516*	*p*		*0.9720*	*p*		*0.9968*	*p*		*0.9219*

Table A19: Results of the analysis of unemployment by gender in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A20: Results Unemployment by Country of Origin 1998-2010

	Overall						Natives					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
EU Share	0.010 [0.445]	0.02	0.983	-2.095 [2.005]	-1.05	0.296	-0.03 [0.420]	-0.08	0.937	-2.519 [1.905]	1.32	0.186
PT Share	0.117 [0.180]	0.65	0.517	-0.854 [0.849]	-1.01	0.315	0.156 [0.171]	0.91	0.363	-1.152 [0.803]	1.43	0.151
Other Immigrants	0.207 [0.305]	0.68	0.496	0.820 [2.299]	0.36	0.721	0.250 [0.287]	0.87	0.384	-0.006 [2.179]	-0.00	0.998
ln HE/LE	0.001 [0.007]	0.07	0.943	-0.001 [0.009]	-0.11	0.909	0.0001 [0.007]	0.02	0.984	-0.002 0.009	-0.21	0.833
ln HS/LE	-0.010 [0.009]	-1.19	0.234	-0.009 [0.011]	-0.86	0.389	-0.012 [0.008]	-1.51	0.132	-0.015 [0.010]	-1.45	0.146
ln NG/LE	-0.006 [0.009]	-0.61	0.540	-0.005 [0.013]	-0.40	0.687	-0.006 [0.009]	-0.63	0.528	-0.004 [0.011]	-0.36	0.717
Mean Age Immigrant	-0.0002 [0.0003]	-0.63	0.529	0.0002 [0.0003]	0.61	0.542	-0.0001 [0.0003]	-0.48	0.629	0.0002 [0.0003]	0.54	0.587
Mean Age Native	-0.004 [0.002]	-1.86	0.063	-0.003 [0.003]	-1.17	0.243	-0.005 [0.002]	-2.00	0.045	-0.004 [0.003]	-1.65	0.099
Quarter 2	-0.006 [0.001]	-4.41	0.000	-0.007 [0.003]	-2.79	0.005	-0.006 [0.001]	-4.13	0.000	-0.008 [0.002]	-3.10	0.002
Quarter 3	-0.003 [0.001]	-2.04	0.041	-0.002 [0.002]	-1.12	0.264	-0.002 [0.001]	-1.75	0.081	-0.002 [0.002]	-1.16	0.245
Quarter 4	-0.001 [0.001]	-0.48	0.633	-0.002 [0.003]	-0.91	0.361	-0.001 [0.001]	-0.47	0.636	-0.003 [0.002]	-1.35	0.177
Center	-0.001 [0.001]	-1.11	0.266	-0.001 [0.001]	-0.96	0.337	-0.001 [0.001]	-1.23	0.217	-0.001 [0.001]	-1.08	0.281
Lisbon	-0.0004 [0.001]	-0.62	0.533	-0.0003 [0.001]	-0.50	0.617	-0.001 [0.001]	-0.88	0.380	-0.001 [0.001]	-0.72	0.473
Alentejo	-0.001 [0.001]	-1.34	0.181	-0.001 [0.001]	-0.81	0.420	-0.001 [0.001]	-1.32	0.186	-0.001 [0.001]	-0.85	0.398
Algarve	-0.0003 [0.002]	-0.19	0.846	0.0002 [0.001]	0.16	0.870	0.0005 [0.001]	-0.36	0.716	0.0001 [0.001]	0.07	0.947
Azores	-0.001 [0.001]	-0.66	0.507	-0.001 [0.001]	-1.53	0.125	-0.001 [0.001]	-0.71	0.476	-0.001 [0.001]	-1.59	0.112
Madeira	-0.001 [0.001]	-0.58	0.564	-0.001 [0.001]	-0.62	0.538	-0.001 [0.001]	-0.61	0.543	-0.001 [0.001]	-0.67	0.502
	Obs.		*333*	*Obs.*		*277*	*Obs.*		*333*	*Obs.*		*277*
	R^2		*0.138*	R^2		*0.151*	R^2		*0.132*	R^2		*0.142*
	Wald X^2 *(16)*		*33.35*	*Wald* X^2 *(17)*		*42.05*	*Wald* X^2 *(16)*		*32.34*	*Wald* X^2 *(16)*		*42.35*
	$p > X^2$		*0.0102*	$p > X^2$		*0.0007*	$p > X^2$		*0.0136*	$p > X^2$		*0.0006*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*25.83*	$X^2(3)$		*18.44*	$X^2(3)$		*22.75*	$X^2(3)$		*18.49*
	p		*0.0000*	*p*		*0.0004*	*p*		*0.0000*	*p*		*0.0003*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*2.35*	$X^2(6)$		*3.51*	$X^2(6)$		*2.80*	$X^2(6)$		*3.82*
	p		*0.8848*	*p*		*0.7421*	*p*		*0.8334*	*p*		*0.7009*

Table A20: Results of the analysis of unemployment by immigrants' country of origin in Portugal 1998-2010. It is differentiated between immigrants from EU countries, Portuguese speaking countries (PT) and 'other' countries The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 1998-2010)

Table A21: Results Unemployment by Country of Origin 2011-2019

	Overall						Native					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
EU Share	-0.184 [0.583]	-0.32	0.752	-0.643 [2.859]	-0.22	0.822	-0.251 [0.581]	-0.43	0.666	0.159 [2.889]	0.06	0.956
PT Share	-0.210 [0.323]	-0.65	0.516	-1.287 [1.570]	-0.82	0.412	-0.378 [0.329]	-1.15	0.250	-1.138 [1.588]	-0.72	0.474
Other Immigrants	0.055 [0.423]	0.13	0.896	-6.487 [4.003]	-1.62	0.105	0.133 [0.420]	0.32	0.753	-6.210 [3.941]	-1.58	0.115
ln HE/LE	0.005 [0.019]	0.26	0.791	-0.012 [0.029]	-0.41	0.682	0.006 [0.020]	0.31	0.758	-0.012 [0.029]	-0.43	0.668
ln HS/LE	0.027 [0.015]	1.76	0.078	0.036 [0.026]	1.40	0.163	0.021 [0.015]	1.42	0.156	0.035 [0.026]	1.35	0.177
ln NG/LE	0.004 [0.018]	0.25	0.804	0.042 [0.029]	1.41	0.158	0.006 [0.018]	0.34	0.734	0.041 [0.029]	1.41	0.158
Mean Age Immigrant	0.0002 [0.0004]	0.59	0.554	0.001 [0.001]	1.21	0.226	0.0001 [0.0004]	0.31	0.757	0.001 [0.001]	1.09	0.275
Mean Age Native	-0.0003 [0.005]	-0.06	0.951	0.005 [0.005]	0.87	0.387	-0.001 [0.005]	-0.14	0.887	0.004 [0.005]	0.75	0.453
Quarter 2	-0.015 [0.002]	-6.57	0.000	-0.016 [0.005]	-3.00	0.003	-0.014 [0.002]	-5.93	0.000	-0.014 [0.005]	-2.52	0.012
Quarter 3	-0.010 [0.002]	-4.05	0.000	-0.017 [0.006]	-2.75	0.006	-0.009 [0.002]	-3.72	0.000	-0.014 [0.006]	-2.36	0.018
Quarter 4	0.001 [0.002]	0.56	0.575	0.0005 [0.003]	0.17	0.865	0.002 [0.002]	0.64	0.524	0.001 [0.003]	0.49	0.628
Center	-0.001 [0.004]	-0.25	0.806	0.001 [0.004]	0.15	0.884	-0.001 [0.004]	-0.21	0.836	0.001 [0.004]	0.22	0.825
Lisbon	0.0003 [0.001]	0.22	0.824	0.002 [0.002]	0.93	0.355	0.0003 [0.002]	0.18	0.857	0.002 [0.002]	1.00	0.318
Alentejo	-0.0005 [0.001]	-0.41	0.682	0.0002 [0.002]	0.10	0.918	-0.0002 [0.001]	-0.21	0.831	0.0004 [0.002]	0.29	0.771
Algarve	0.0003 [0.002]	0.19	0.852	0.0003 [0.002]	0.15	0.877	0.0003 [0.002]	0.17	0.868	0.0003 [0.002]	0.18	0.859
Azores	-0.001 [0.002]	-0.26	0.796	0.002 [0.002]	0.69	0.491	-0.0005 [0.002]	-0.22	0.826	0.002 [0.002]	0.71	0.479
Madeira	0.0004 [0.002]	0.22	0.827	0.0002 [0.002]	0.10	0.919	0.0004 [0.002]	0.24	0.808	0.0002 [0.002]	0.10	0.923
	Obs.		*213*	*Obs.*		*162*	*Obs.*		*213*	*Obs.*		*162*
	R^2		*0.316*	R^2		*0.382*	R^2		*0.300*	R^2		*0.362*
	Wald X^2 *(16)*		*83.40*	*Wald* X^2 *(16)*		*112.28*	*Wald* X^2 *(16)*		*68.61*	*Wald* X^2 *(16)*		*96.65*
	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*68.73*	$X^2(3)$		*18.07*	$X^2(3)$		*57.07*	$X^2(3)$		*15.03*
	p		*0.0000*	*p*		*0.0004*	*p*		*0.0000*	*p*		*0.0018*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*0.78*	$X^2(6)$		*2.32*	$X^2(6)$		*0.64*	$X^2(6)$		*2.24*
	p		*0.9925*	*p*		*0.8878*	*p*		*0.9957*	*p*		*0.8965*

Table A21: Results of the analysis of unemployment by immigrants' country of origin in Portugal 2011-2019. It is differentiated between immigrants from EU countries, Portuguese speaking countries (PT) and 'other' countries The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A22: Results Unemployment by Immigrants' Gender 1998-2010

	Overall						Native					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Male Immigrants	0.213 [0.130]	1.65	0.100	-2.721 [1.325]	-2.05	0.040	0.187 [0.125]	1.50	0.134	-2.371 [1.263]	-1.88	0.060
Female Immigrants	-0.112 [0.144]	-0.78	0.436	0.906 [0.697]	1.30	0.194	-0.061 [0.137]	-0.44	0.659	0.693 [0.673]	1.03	0.303
ln HE/LE	-0.004 [0.006]	-0.62	0.537	-0.0003 [0.007]	-0.04	0.969	-0.004 [0.006]	-0.71	0.479	-0.002 [0.007]	-0.31	0.755
ln HS/LE	-0.007 [0.007]	-0.99	0.322	-0.011 [0.009]	-1.22	0.223	-0.010 [0.007]	-1.34	0.179	-0.013 [0.008]	-1.60	0.110
ln NG/LE	-0.005 [0.008]	-0.63	0.527	-0.007 [0.011]	-0.65	0.517	-0.005 [0.008]	-0.63	0.528	-0.007 [0.010]	-0.67	0.503
Mean Age Immigrant	-0.0001 [0.0002]	-0.57	0.571	-0.0001 [0.0003]	-0.47	0.636	-0.0001 [0.0002]	-0.46	0.648	-0.0001 [0.0002]	-0.26	0.796
Mean Age Native	-0.004 [0.002]	-2.15	0.032	-0.001 [0.003]	-0.51	0.611	-0.005 [0.002]	-2.30	0.021	-0.002 [0.003]	-0.92	0.355
Quarter 2	-0.006 [0.001]	-4.64	0.000	-0.007 [0.002]	-3.51	0.000	-0.006 [0.001]	-4.38	0.000	-0.007 [0.002]	-3.43	0.001
Quarter 3	-0.003 [0.001]	-2.27	0.023	-0.001 [0.002]	-0.56	0.577	-0.002 [0.001]	-1.96	0.050	-0.001 [0.002]	-0.55	0.581
Quarter 4	-0.001 [0.001]	-0.62	0.534	-0.004 [0.002]	-1.74	0.082	-0.001 [0.001]	-0.61	0.544	-0.004 [0.002]	-1.72	0.086
Center	-0.001 [0.001]	-1.18	0.238	-0.001 [0.001]	-0.89	0.374	-0.001 [0.001]	-1.30	0.194	-0.001 [0.001]	-1.01	0.314
Lisbon	-0.0004 [0.001]	-0.56	0.574	-0.0004 [0.001]	-0.53	0.599	-0.001 [0.001]	-0.81	0.421	-0.001 [0.001]	-0.74	0.462
Alentejo	-0.001 [0.001]	-1.35	0.178	-0.001 [0.001]	-0.67	0.502	-0.001 [0.001]	-1.34	0.181	-0.001 [0.001]	-0.67	0.501
Algarve	-0.0002 [0.001]	-0.14	0.885	0.0002 [0.001]	0.13	0.895	-0.0004 [0.001]	-0.34	0.736	0.0004 [0.001]	0.04	0.970
Azores	-0.001 [0.001]	-1.42	0.154	-0.001 [0.001]	-1.34	0.179	-0.001 [0.001]	-1.47	0.141	-0.001 [0.001]	-1.40	0.162
Madeira	-0.001 [0.001]	-0.92	0.359	-0.001 [0.001]	-0.87	0.382	-0.001 [0.001]	-0.93	0.354	-0.001 [0.001]	-0.95	0.342
	Obs.		*357*	*Obs.*		*301*	*Obs.*		*357*	*Obs.*		*301*
	R^2		*0.140*	R^2		*0.135*	R^2		*0.132*	R^2		*0.128*
	Wald X^2 *(16)*		*38.33*	*Wald* X^2 *(16)*		*37.74*	*Wald* X^2 *(16)*		*36.85*	*Wald* X^2 *(16)*		*36.39*
	$p > X^2$		*0.0014*	$p > X^2$		*0.0016*	$p > X^2$		*0.0022*	$p > X^2$		*0.0026*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*28.66*	$X^2(3)$		*17.20*	$X^2(3)$		*25.66*	$X^2(3)$		*16.33*
	p		*0.0000*	*p*		*0.00006*	*p*		*0.0000*	*p*		*0.0010*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*3.39*	$X^2(6)$		*2.50*	$X^2(6)$		*3.70*	$X^2(6)$		*2.81*
	p		*0.7582*	*p*		*0.8684*	*p*		*0.7168*	*p*		*0.8329*

Table A22: Results of the analysis of unemployment by immigrants' gender in Portugal 1998-2010. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 1998-2010)

Table A23: Results Unemployment by Immigrants' Gender 2011-2019

	Overall						Native					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Unemployment	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Male Immigrants	-0.279 [0.231]	-1.21	0.228	1.483 [1.267]	1.17	0.242	-0.303 [0.231]	-1.31	0.189	1.044 [1.283]	0.81	0.419
Female Immigrants	0.176 [0.220]	0.80	0.425	-1.364 [1.162]	-1.17	0.241	0.135 [0.220]	0.61	0.539	-0.796 [1.170]	-0.68	0.496
ln HE/LE	-0.011 [0.018]	-0.58	0.563	-0.022 [0.021]	-1.05	0.291	-0.009 [0.018]	-0.45	0.650	-0.017 [0.021]	-0.83	0.405
ln HS/LE	0.033 [0.016]	2.04	0.041	-0.037 [0.023]	1.63	0.103	0.028 [0.016]	1.77	0.077	0.036 [0.023]	1.56	0.118
ln NG/LE	0.010 [0.018]	0.56	0.574	0.031 [0.021]	1.48	0.138	0.010 [0.017]	0.59	0.557	0.028 [0.021]	1.37	0.171
Mean Age Immigrant	0.001 [0.0004]	1.49	0.135	0.001 [0.001]	1.55	0.122	0.001 [0.0004]	1.33	0.185	0.001 [0.005]	1.31	0.192
Mean Age Native	-0.001 [0.005]	-0.21	0.834	0.005 [0.005]	0.92	0.357	-0.001 [0.005]	-0.27	0.786	0.004 [0.005]	0.74	0.459
Quarter 2	-0.013 [0.002]	-5.32	0.000	-0.011 [0.005]	-2.48	0.013	-0.012 [0.003]	-4.76	0.000	-0.011 [0.005]	-2.36	0.018
Quarter 3	-0.008 [0.003]	-3.26	0.001	-0.007 [0.004]	-1.56	0.118	-0.008 [0.003]	-3.04	0.002	-0.007 [0.004]	-1.49	0.136
Quarter 4	0.002 [0.003]	0.95	0.343	0.006 [0.004]	1.57	0.117	0.003 [0.003]	1.08	0.279	0.006 [0.004]	1.33	0.184
Center	-0.001 [0.004]	-0.29	0.771	0.0001 [0.004]	0.02	0.983	-0.001 [0.003]	-0.26	0.797	0.0004 [0.004]	0.10	0.917
Lisbon	0.0002 [0.002]	0.13	0.896	0.002 [0.001]	1.31	0.189	0.0002 [0.002]	0.10	0.922	0.002 [0.001]	1.30	0.194
Alentejo	-0.0004 [0.001]	-0.26	0.796	0.0002 [0.002]	0.13	0.899	-0.0001 [0.002]	-0.06	0.953	0.0004 [0.001]	0.34	0.734
Algarve	0.0001 [0.002]	0.07	0.940	0.0002 [0.002]	0.17	0.868	0.0001 [0.002]	0.04	0.965	0.0003 [0.001]	0.20	0.844
Azores	0.002 [0.002]	0.77	0.442	0.001 [0.002]	0.79	0.432	0.002 [0.002]	0.77	0.440	0.001 [0.002]	0.89	0.371
Madeira	0.0001 [0.002]	0.03	0.977	-0.0004 [0.002]	-0.19	0.852	0.0001 [0.002]	0.03	0.976	-0.0002 [0.002]	-0.10	0.924
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.293*	R^2		*0.369*	R^2		*0.274*	R^2		*0.350*
	Wald X^2 *(16)*		*63.57*	*Wald* X^2 *(16)*		*96.00*	*Wald* X^2 *(16)*		*54.25*	*Wald* X^2 *(16)*		*80.95*
	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*49.47*	$X^2(3)$		*34.11*	$X^2(3)$		*42.80*	$X^2(3)$		*28.75*
	p		*0.0000*	*p*		*0.0000*	*p*		*0.0000*	*p*		*0.0000*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*1.20*	$X^2(6)$		*2.95*	$X^2(6)$		*1.10*	$X^2(6)$		*2.76*
	p		*0.9769*	*p*		*0.8147*	*p*		*0.9817*	*p*		*0.8380*

Table A23: Results of the analysis of unemployment by immigrants' gender in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

A6. Results Wages

Table A24: Results Overall and Native Wages 2011-2019

	Overall						Natives					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Wage	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	-0.056 [0.199]	-0.28	0.777	-1.370 [1.206]	-1.14	0.256	0.255 [0.202]	1.26	0.206	-1.049 [1.250]	-0.84	0.401
ln HE/LE	0.109 [0.015]	7.31	0.000	0.084 [0.019]	-4.49	0.000	0.113 [0.015]	7.38	0.000	0.085 [0.019]	4.45	0.000
ln HS/LE	-0.008 [0.015]	-0.58	0.563	0.007 [0.018]	0.42	0.677	-0.005 [0.015]	-0.34	0.737	0.010 [0.018]	0.56	0.577
ln NG/LE	-0.002 [0.016]	-0.13	0.896	-0.030 [0.018]	-1.65	0.098	-0.005 [0.016]	-0.31	0.755	-0.028 [0.019]	-1.51	0.130
Mean Age Immigrant	0.0001 [0.0003]	0.36	0.719	0.0001 [0.0003]	0.33	0.743	-0.0002 [0.0003]	-0.07	0.947	-0.000 [0.0004]	-0.00	0.999
Mean Age Native	0.013 [0.004]	3.33	0.001	0.013 [0.004]	2.88	0.004	0.014 [0.004]	3.68	0.000	0.014 [0.005]	3.16	0.002
Quarter 1	0.002 [0.004]	0.61	0.543	-0.001 [0.003]	-0.38	0.703	0.002 [0.004]	0.52	0.605	-0.002 [0.003]	-0.54	0.592
Quarter 2	0.004 [0.004]	1.02	0.307	0.001 [0.004]	0.19	0.848	0.004 [0.003]	1.14	0.255	0.001 [0.004]	0.29	0.774
Quarter 3	0.002 [0.004]	0.46	0.644	-0.006 [0.004]	-1.54	0.123	0.002 [0.004]	0.40	0.690	-0.006 [0.004]	-1.46	0.144
Center	-0.002 [0.003]	-0.57	0.569	-0.001 [0.003]	-0.47	0.640	-0.001 [0.003]	-0.51	0.610	-0.001 [0.003]	-0.44	0.657
Lisbon	-0.0002 [0.002]	-0.09	0.925	0.0002 [0.003]	0.06	0.950	-0.00003 [0.002]	-0.02	0.986	0.0003 [0.002]	0.14	0.891
Alentejo	-0.001 [0.003]	-0.58	0.561	-0.001 [0.003]	-0.22	0.823	-0.002 [0.002]	-0.70	0.483	-0.001 [0.002]	-0.25	0.804
Algarve	-0.001 [0.002]	-0.56	0.574	-0.001 [0.003]	-0.29	0.770	-0.001 [0.002]	-0.49	0.624	-0.001 [0.003]	-0.26	0.798
Azores	-0.002 [0.002]	-1.19	0.234	-0.003 [0.002]	-1.43	0.153	-0.002 [0.002]	-1.09	0.276	-0.003 [0.002]	-1.37	0.169
Madeira	-0.002 [0.003]	-0.85	0.397	-0.004 [0.003]	-1.28	0.200	-0.002 [0.003]	-0.77	0.439	-0.004 [0.003]	-1.32	0.187
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.251*	R^2		*0.245*	R^2		*0.258*	R^2		*0.242*
	Wald X^2 *(15)*		*81.58*	*Wald* X^2 *(15)*		*55.43*	*Wald* X^2 *(16)*		*85.40*	*Wald* X^2 *(15)*		*53.37*
	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*1.07*	$X^2(3)$		*5.21*	$X^2(3)$		*1.31*	$X^2(3)$		*4.78*
	p		*0.7847*	*p*		*0.1567*	*p*		*0.7258*	*p*		*0.1883*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*1.78*	$X^2(6)$		*3.65*	$X^2(6)$		*1.73*	$X^2(6)$		*3.84*
	p		*0.9392*	*p*		*0.7235*	*p*		*0.9424*	*p*		*0.6984*

Table A24: Results of the analysis of overall wages and wages of natives in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A25: Results Wages by Education Group 2011-2019

-Higher Education, High School Graduate-

	Higher Education						High School Graduate					
Education Groups	**Prais-Winsten, First Differences**			**IV, First Differences**			**Prais-Winsten, First Differences**			**IV, First Differences**		
Wage	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	-0.021 [0.340]	-0.06	0.951	-0.756 [1.966]	-0.38	0.701	-0.054 [0.285]	0.19	0.850	-3.142 [1.757]	-1.79	0.074
ln HE/LE	-0.019 [0.029]	-0.65	0.518	-0.029 [0.033]	-0.90	0.370	0.047 [0.029]	1.58	0.113	0.003 [0.032]	0.09	0.930
ln HS/LE	-0.050 [0.029]	-1.74	0.083	0.007 [0.033]	0.22	0.828	-0.011 [0.027]	-0.40	0.688	-0.011 [0.031]	-0.35	0.725
ln NG/LE	0.0382 [0.030]	1.28	0.201	-0.012 [0.033]	-0.35	0.727	-0.026 [0.028]	-0.93	0.351	-0.031 [0.030]	-1.04	0.299
Mean Age Immigrant	-0.007 [0.001]	-1.08	0.280	0.00004 [0.001]	0.06	0.954	0.001 [0.001]	1.44	0.151	0.001 [0.001]	1.27	0.203
Mean Age Native	-0.001 [0.009]	-0.08	0.932	0.0014 [0.009]	0.15	0.881	-0.015 [0.007]	-2.07	0.039	-0.019 [0.008]	-2.38	0.017
Mean Age HE	0.021 [0.004]	5.19	0.000	0.018 [0.005]	3.87	0.000	-	-	-	-	-	-
Mean Age HS	-	-	-	-	-	-	0.023 [0.004]	5.33	0.000	0.017 [0.005]	3.73	0.000
Mean Age NG	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age LE	-	-	-	-	-	-	-	-	-	-	-	-
Quarter 1	0.001 [0.006]	0.18	0.855	-0.004 [0.007]	-0.59	0.556	-0.006 [0.005]	-1.13	0.256	-0.010 [0.004]	-2.46	0.014
Quarter 2	0.005 [0.006]	0.91	0.365	0.005 [0.008]	0.58	0.562	-0.002 [0.004]	-0.51	0.609	-0.015 [0.006]	-2.57	0.010
Quarter 3	0.003 [0.007]	0.52	0.603	-0.004 [0.008]	-0.51	0.613	-0.002 [0.005]	-0.45	0.653	-0.012 [0.005]	-2.51	0.012
Center	0.0005 [0.004]	0.11	0.912	0.003 [0.004]	0.71	0.475	0.00002 [0.004]	0.00	0.996	-0.005 [0.004]	-1.18	0.237
Lisbon	0.0001 [0.004]	0.03	0.974	0.002 [0.004]	0.49	0.622	-0.0003 [0.004]	-0.08	0.933	-0.002 [0.004]	-0.62	0.535
Alentejo	0.001 [0.004]	0.31	0.757	0.004 [0.004]	0.98	0.326	-0.002 [0.003]	-0.48	0.631	-0.003 [0.004]	-0.85	0.394
Algarve	-0.002 [0.004]	-0.49	0.622	0.001 [0.005]	0.17	0.863	-0.0002 [0.005]	-0.04	0.967	-0.004 [0.004]	-0.92	0.359
Azores	-0.004 [0.004]	-0.81	0.412	-0.002 [0.004]	-0.43	0.666	-0.002 [0.005]	-0.51	0.613	-0.008 [0.005]	-1.62	0.105
Madeira	-0.004 [0.005]	-0.91	0.364	-0.002 [0.005]	-0.42	0.678	-0.001 [0.005]	-0.25	0.805	-0.006 [0.005]	-1.39	0.164
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.178*	*R^2*		*0.173*	*R^2*		*0.177*	*R^2*		*0.199*
	Wald X^2 (16)		*45.61*	*Wald X^2 (16)*		*32.75*	*Wald X^2 (16)*		*43.79*	*Wald X^2 (16)*		*43.24*
	p > X^2		*0.0001*	*p > X^2*		*0.0080*	*p > X^2*		*0.0002*	*p > X^2*		*0.0003*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	X^2(3)		*1.00*	*X^2(3)*		*1.56*	*X^2(3)*		*1.39*	*X^2(3)*		*8.98*
	p		*0.8013*	*p*		*0.6684*	*p*		*0.7071*	*p*		*0.0295*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	X^2(6)		*2.17*	*X^2(6)*		*2.98*	*X^2(6)*		*0.53*	*X^2(6)*		*3.98*
	p		*0.9036*	*p*		*0.8118*	*p*		*0.9974*	*p*		*0.6799*

Table A25: Results of the analysis of wages by education group in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A26: Results Wages by Education Group 2011-2019

-Ninth Grade Graduate, Lower Education-

	Ninth Grade Graduate						Lower Education					
Education Groups	**Prais-Winsten, First Differences**			**IV, First Differences**			**Prais-Winsten, First Differences**			**IV, First Differences**		
Wage	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	-0.278 [0.317]	-0.87	0.383	1.995 [1.546]	1.29	0.197	0.155 [0.252]	0.l61	0.539	0.626 [1.726]	0.36	0.717
ln HE/LE	-0.071 [0.029]	-2.40	0.016	-0.093 [0.034]	-2.17	0.007	0.004 [0.021]	0.21	0.835	0.020 [0.028]	0.70	0.483
ln HS/LE	0.032 [0.026]	1.21	0.228	0.054 [0.031]	1.71	0.088	-0.019 [0.020]	-0.93	0.353	0.001 [0.028]	0.05	0.958
ln NG/LE	0.054 [0.029]	1.83	0.067	0.063 [0.033]	1.89	0.059	0.049 [0.021]	2.27	0.023	0.028 [0.026]	1.09	0.275
Mean Age Immigrant	-0.0004 [0.001]	-0.70	0.485	-0.001 [0.001]	-1.32	0.186	-0.001 [0.0004]	-1.41	0.159	-0.001 [0.001]	-0.94	0.348
Mean Age Native	-0.005 [0.008]	-0.68	0.499	-0.010 [0.009]	-1.05	0.294	0.008 [0.007]	1.19	0.235	0.010 [0.008]	1.26	0.206
Mean Age HE	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age HS	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age NG	0.014 [0.004]	3.78	0.000	0.016 [0.005]	3.28	0.001	-	-	-	-	-	-
Mean Age LE	-	-	-	-	-	-	-0.004 [0.004]	-1.18	0.239	-0.006 [0.005]	-1.33	0.184
Quarter 1	0.008 [0.007]	1.07	0.287	0.010 [0.006]	1.75	0.081	0.004 [0.004]	0.97	0.331	0.002 [0.004]	0.66	0.508
Quarter 2	0.006 [0.006]	1.10	0.273	0.017 [0.006]	2.64	0.008	0.002 [0.003]	0.53	0.598	0.002 [0.006]	0.38	0.701
Quarter 3	0.004 [0.007]	0.53	0.597	0.003 [0.007]	0.39	0.697	-0.001 [0.004]	-0.17	0.867	-0.002 [0.005]	-0.44	0.658
Center	-0.001 [0.004]	-0.20	0.843	-0.001 [0.005]	-0.16	0.874	-0.002 [0.003]	-0.80	0.425	-0.002 [0.003]	-0.54	0.587
Lisbon	0.0001 [0.004]	0.02	0.982	0.002 [0.005]	0.38	0.701	-0.0002 [0.003]	-0.07	0.942	-0.001 [0.003]	-0.35	0.723
Alentejo	-0.002 [0.004]	-0.44	0.658	0.002 [0.004]	0.42	0.675	-0.002 [0.003]	-0.73	0.467	-0.003 [0.004]	-0.84	0.401
Algarve	-0.001 [0.005]	-0.28	0.779	0.002 [0.006]	0.31	0.754	-0.001 [0.003]	-0.41	0.685	-0.003 [0.003]	-0.73	0.468
Azores	-0.003 [0.004]	-0.90	0.369	-0.002 [0.005]	-0.45	0.656	-0.002 [0.003]	-0.72	0.473	-0.003 [0.003]	-1.02	0.307
Madeira	-0.002 [0.004]	-0.48	0.635	-0.002 [0.006]	-0.40	0.690	-0.003 [0.004]	-0.79	0.428	-0.007 [0.004]	-1.54	0.123
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.129*	*R^2*		*0.210*	*R^2*		*0.059*	*R^2*		*0.060*
	Wald X^2 (16)		*32.35*	*Wald X^2 (16)*		*45.28*	*Wald X^2 (16)*		*14.15*	*Wald X^2 (16)*		*11.25*
	$p > X^2$		*0.0090*	*$p > X^2$*		*0.0001*	*$p > X^2$*		*0.5878*	*$p > X^2$*		*0.7939*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*1.86*	*$X^2(3)$*		*11.71*	*$X^2(3)$*		*2.07*	*$X^2(3)$*		*2.51*
	p		*0.6019*	*p*		*0.0084*	*p*		*0.5584*	*p*		*0.4726*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*1.52*	*$X^2(6)$*		*1.87*	*$X^2(6)$*		*1.18*	*$X^2(6)$*		*2.57*
	p		*0.9584*	*p*		*0.9313*	*p*		*0.9780*	*p*		*0.8610*

Table A26: Results of the analysis of wages by education group in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A27: Results Wages by Age Group 2011-2019

-25-35 & 36-45-

Age Groups	25-35						36-45					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Wage	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	-0.359 [0.341]	-1.05	0.293	-1.170 [2.264]	-0.52	0.605	0.253 [0.321]	0.79	0.430	-1.910 [1.774]	-1.08	0.282
ln HE/LE	0.103 [0.030]	3.41	0.001	0.108 [0.040]	2.17	0.007	0.103 [0.030]	3.46	0.001	0.050 [0.033]	1.51	0.130
ln HS/LE	-0.052 [0.027]	-1.94	0.053	-0.064 [0.033]	-1.96	0.050	0.027 [0.027]	0.98	0.325	0.077 [0.031]	2.51	0.012
ln NG/LE	0.012 [0.030]	0.39	0.698	-0.010 [0.034]	-0.30	0.764	-0.029 [0.028]	-1.05	0.295	-0.070 [0.030]	-2.33	0.020
Mean Age Immigrant	0.001 [0.001]	0.96	0.337	0.0005 [0.001]	0.65	0.517	-0.00003 [0.001]	-0.05	0.960	-0.0002 [0.001]	-0.37	0.709
Mean Age Native	0.007 [0.007]	1.02	0.306	0.004 [0.008]	0.57	0.568	0.003 [0.007]	0.51	0.613	0.003 [0.008]	0.43	0.664
Mean Age 25-35	-0.012 [0.009]	-1.33	0.183	-0.013 [0.010]	-1.30	0.193	-	-	-	-	-	-
Mean Age 36-45	-	-	-	-	-	-	0.002 [0.014]	0.13	0.897	0.022 [0.016]	1.41	0.160
Mean Age 46-55	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age 56-65	-	-	-	-	-	-	-	-	-	-	-	-
Quarter 1	0.005 [0.006]	0.78	0.436	-0.01 [0.005]	-0.25	0.805	0.001 [0.005]	0.11	0.916	-0.003 [0.004]	-0.62	0.532
Quarter 2	0.008 [0.005]	1.53	0.125	0.006 [0.007]	0.79	0.431	0.002 [0.005]	0.41	0.680	-0.003 [0.006]	-0.58	0.565
Quarter 3	-0.006 [0.006]	-0.96	0.336	-0.009 [0.006]	-1.40	0.160	0.007 [0.005]	1.21	0.225	-0.004 [0.005]	-0.71	0.479
Center	-0.001 [0.004]	-0.16	0.872	0.001 [0.004]	0.35	0.726	-0.003 [0.004]	-0.83	0.408	-0.006 [0.005]	-1.28	0.202
Lisbon	0.002 [0.003]	0.58	0.563	0.002 [0.003]	0.70	0.482	-0.003 [0.004]	-0.83	0.407	-0.003 [0.003]	-1.01	0.310
Alentejo	-0.001 [0.005]	-0.27	0.788	-0.0002 [0.005]	-0.03	0.974	-0.003 [0.004]	-0.93	0.353	-0.004 [0.004]	-0.90	0.366
Algarve	0.0005 [0.004]	0.11	0.910	0.002 [0.005]	0.46	0.645	-0.003 [0.004]	-0.86	0.390	-0.003 [0.004]	-0.84	0.401
Azores	-0.003 [0.004]	-0.88	0.379	-0.002 [0.003]	-0.57	0.570	-0.003 [0.004]	-0.84	0.399	-0.008 [0.004]	-2.14	0.032
Madeira	-0.004 [0.005]	-0.78	0.433	-0.003 [0.006]	-0.42	0.673	-0.003 [0.004]	-0.87	0.383	-0.011 [0.004]	-2.42	0.016
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.102*	R^2		*0.121*	R^2		*0.118*	R^2		*0.149*
	Wald X^2 *(16)*		*29.44*	*Wald* X^2 *(16)*		*31.10*	*Wald* X^2 *(16)*		*30.58*	*Wald* X^2 *(16)*		*33.31*
	$p > X^2$		*0.0211*	$p > X^2$		*0.0131*	$p > X^2$		*0.0152*	$p > X^2$		*0.0067*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*7.25*	$X^2(3)$		*8.26*	$X^2(3)$		*2.18*	$X^2(3)$		*0.57*
	p		*0.0645*	*p*		*0.0410*	*p*		*0.5365*	*p*		*0.9027*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*4.20*	$X^2(6)$		*2.35*	$X^2(6)$		*1.91*	$X^2(6)$		*8.30*
	p		*0.6500*	*p*		*0.8845*	*p*		*0.9280*	*p*		*0.2171*

Table A27: Results of the analysis of wages by age group in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A28: Results Wages by Age Group 2011-2019

-46-55 & 56-65-

Age Groups	46-55						56-65					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Wage	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	-0.323 [0.366]	-0.88	0.377	-1.755 [2.245]	-0.78	0.434	0.828 [0.648]	1.28	0.201	-0.884 [4.163]	-0.21	0.832
ln HE/LE	0.092 [0.032]	2.85	0.004	0.102 [0.036]	2.85	0.004	0.148 [0.060]	2.46	0.014	0.082 [0.065]	1.26	0.206
ln HS/LE	0.003 [0.032]	0.11	0.913	0.004 [0.036]	0.11	0.915	-0.009 [0.058]	-0.16	0.876	-0.040 [0.067]	-0.61	0.544
ln NG/LE	0.006 [0.032]	0.20	0.842	-0.052 [0.035]	-1.48	0.139	0.030 [0.057]	0.52	0.600	0.093 [0.068]	1.38	0.169
Mean Age Immigrant	0.001 [0.001]	0.95	0.343	0.001 [0.001]	1.39	0.163	-0.002 [0.001]	-1.59	0.112	-0.001 [0.002]	-0.43	0.664
Mean Age Native	0.016 [0.008]	2.05	0.041	0.015 [0.008]	1.83	0.067	0.019 [0.013]	1.48	0.139	0.006 [0.014]	0.45	0.654
Mean Age 25-35	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age 36-45	-	-	-	-	-	-	-	-	-	-	-	-
Mean Age 46-55	0.002 [0.016]	0.15	0.883	0.013 [0.018]	0.73	0.468	-	-	-	-	-	-
Mean Age 56-65	-	-	-	-	-	-	0.017 [0.019]	0.90	0.370	0.002 [0.021]	0.08	0.932
Quarter 1	0.001 [0.006]	0.13	0.894	-0.001 [0.006]	-0.16	0.870	0.007 [0.010]	0.65	0.514	0.006 [0.013]	0.48	0.634
Quarter 2	-0.001 [0.006]	-0.11	0.915	-0.003 [0.008]	-0.38	0.701	0.012 [0.008]	1.44	0.150	0.008 [0.015]	0.53	0.598
Quarter 3	0.001 [0.006]	0.10	0.918	-0.012 [0.007]	-1.71	0.088	0.009 [0.011]	0.87	0.382	0.005 [0.015]	0.34	0.735
Center	-0.002 [0.005]	-0.34	0.733	0.001 [0.006]	0.16	0.870	0.004 [0.009]	0.43	0.668	0.001 [0.009]	0.07	0.946
Lisbon	-0.001 [0.005]	-0.19	0.850	0.003 [0.007]	0.40	0.691	0.006 [0.007]	0.80	0.425	0.001 [0.008]	0.08	0.938
Alentejo	-0.001 [0.005]	-0.26	0.792	0.0001 [0.005]	0.02	0.980	0.002 [0.005]	0.33	0.738	0.002 [0.005]	0.41	0.682
Algarve	-0.003 [0.004]	-0.77	0.444	-0.001 [0.005]	-0.19	0.852	0.006 [0.008]	0.83	0.404	0.001 [0.008]	0.12	0.902
Azores	-0.003 [0.006]	-0.49	0.624	-0.001 [0.007]	-0.10	0.921	0.0004 [0.009]	0.04	0.966	-0.002 [0.009]	-0.20	0.840
Madeira	-0.002 [0.005]	-0.43	0.665	-0.002 [0.005]	-0.34	0.733	0.008 [0.008]	1.01	0.315	0.007 [0.009]	0.73	0.466
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.086*	R^2		*0.119*	R^2		*0.085*	R^2		*0.060*
	Wald X^2 *(16)*		*20.44*	*Wald* X^2 *(16)*		*23.33*	*Wald* X^2 *(16)*		*22.15*	*Wald* X^2 *(16)*		*12.05*
	$p > X^2$		*0.2013*	$p > X^2$		*0.1051*	$p > X^2$		*0.1385*	$p > X^2$		*0.740*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*0.06*	$X^2(3)$		*4.49*	$X^2(3)$		*2.20*	$X^2(3)$		*0.39*
	p		*0.9960*	*p*		*0.2129*	*p*		*0.5310*	*p*		*0.9431*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*0.74*	$X^2(6)$		*0.87*	$X^2(6)$		*1.65*	$X^2(6)$		*1.17*
	p		*0.9936*	*p*		*0.9901*	*p*		*0.9490*	*p*		*0.9784*

Table A28: Results of the analysis of wages by age group in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A29: Results Wages by Gender 2011-2019

Gender	Female						Male					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Wage	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	0.145 [0.235]	0.62	0.536	-0.481 [1.063]	-0.45	0.651	-0.116 [0.272]	-0.42	0.671	-0.385 [1.432]	-0.27	0.788
ln HE/LE	0.139 [0.020]	7.04	0.000	0.111 [0.022]	5.00	0.000	0.073 [0.021]	3.50	0.000	0.069 [0.025]	2.70	0.007
ln HS/LE	-0.0001 [0.019]	-0.01	0.995	0.011 [0.022]	0.50	0.619	-0.015 [0.021]	-0.75	0.455	0.005 [0.025]	0.20	0.838
ln NG/LE	-0.035 [0.020]	-1.71	0.088	-0.065 [0.022]	-2.91	0.004	0.030 [0.022]	1.37	0.172	0.017 [0.025]	0.67	0.502
Mean Age Immigrant	0.0004 [0.0005]	0.89	0.374	0.001 [0.001]	1.47	0.141	-0.0004 [0.0005]	-0.93	0.351	-0.001 [0.001]	-1.45	0.146
Mean Age Native	0.008 [0.008]	1.02	0.309	0.006 [0.010]	0.56	0.576	0.009 [0.008]	1.07	0.283	0.013 [0.009]	1.49	0.136
Mean Age Female	0.003 [0.006]	0.55	0.583	0.003 [0.009]	0.35	0.725	-	-	-	-	-	-
Mean Age Male	-	-	-	-	-	-	0.008 [0.006]	1.43	0.152	0.004 [0.007]	0.60	0.547
Quarter 1	0.002 [0.004]	0.47	0.641	-0.001 [0.005]	-0.22	0.830	0.002 [0.005]	0.38	0.704	-0.001 [0.004]	-0.16	0.872
Quarter 2	0.003 [0.004]	0.97	0.334	0.002 [0.005]	0.37	0.713	0.003 [0.004]	0.61	0.541	0.003 [0.005]	0.70	0.486
Quarter 3	-0.002 [0.004]	-0.49	0.625	-0.005 [0.005]	-1.07	0.283	0.005 [0.005]	0.96	0.337	-0.003 [0.005]	-0.62	0.534
Center	-0.001 [0.003]	-0.32	0.752	-0.001 [0.003]	-0.41	0.678	-0.002 [0.003]	-0.65	0.513	0'-0.002 [0.004]	-0.48	0.634
Lisbon	0.001 [0.002]	0.38	0.706	0.0004 [0.002]	0.18	0.854	-0.001 [0.003]	-0.46	0.646	-0.0005 [0.003]	-0.15	0.880
Alentejo	-0.002 [0.003]	-0.86	0.391	-0.002 [0.003]	-0.65	0.518	-0.001 [0.003]	-0.28	0.782	0.0002 [0.003]	0.06	0.949
Algarve	-0.00001 [0.003]	-0.00	0.996	-0.002 [0.003]	-0.57	0.567	-0.002 [0.003]	-0.85	0.396	-0.0003 [0.003]	-0.08	0.936
Azores	-0.004 [0.003]	-1.35	0.178	-0.004 [0.003]	-1.49	0.137	-0.002 [0.003]	-0.60	0.550	-0.003 [0.003]	-0.78	0.435
Madeira	-0.002 [0.004]	-0.55	0.582	-0.003 [0.003]	-0.96	0.339	-0.003 [0.003]	-1.06	0.290	-0.005 [0.003]	-1.49	0.136
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.238*	R^2		*0.205*	R^2		*0.145*	R^2		*0.157*
	Wald X^2 *(15)*		*72.30*	*Wald* X^2 *(15)*		*49.13*	*Wald* X^2 *(15)*		*39.39*	*Wald* X^2 *(15)*		*30.42*
	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0010*	$p > X^2$		*0.0159*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*2.45*	$X^2(3)$		*2.94*	$X^2(3)$		*1.11*	$X^2(3)$		*2.32*
	p		*0.4852*	*p*		*0.4010*	*p*		*0.7748*	*p*		*0.5078*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*4.30*	$X^2(6)$		*4.59*	$X^2(6)$		*1.47*	$X^2(6)$		*3.56*
	p		*0.6355*	*p*		*0.5972*	*p*		*0.9616*	*p*		*0.7355*

Table A29: Results of the analysis of wages by gender in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A30: Results Wages by Profession 2011-2019

	Skilled						Unskilled					
Professions	**Prais-Winsten, First Differences**			**IV, First Differences**			**Prais-Winsten, First Differences**			**IV, First Differences**		
Wage	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Immigrant Share	0.093 [0.221]	0.42	0.676	-0.055 [1.033]	-0.05	0.957	-0.898 [0.318]	-2.82	0.005	-0.854 [1.973]	-0.43	0.665
ln HE/LE	0.098 [0.016]	6.07	0.000	0.080 [0.020]	3.97	0.000	-0.008 [0.032]	-0.25	0.802	-0.010 [0.040]	-0.26	0.792
ln HS/LE	-0.022 [0.016]	-1.35	0.178	0.005 [0.020]	0.24	0.808	-0.027 [0.031]	-0.85	0.396	-0.023 [0.038]	-0.59	0.555
ln NG/LE	-0.008 [0.017]	-0.44	0.657	-0.030 [0.019]	-1.59	0.112	0.074 [0.032]	2.31	0.021	0.075 [0.040]	1.87	0.061
Mean Age Immigrant	-0.0004 [0.0003]	-1.21	0.225	-0.0003 [0.0004]	-0.85	0.396	-0.0001 [0.001]	-0.12	0.905	-0.001 [0.001]	-0.57	0.571
Mean Age Native	-0.015 [0.009]	-1.62	0.105	-0.008 [0.013]	-0.62	0.537	0.002 [0.008]	0.21	0.835	-0.008 [0.009]	-0.82	0.410
Mean Age Skilled	0.031 [0.008]	3.67	0.000	0.023 [0.013]	1.85	0.064	-	-	-	-	-	-
Mean Age Unskilled	-	-	-	-	-	-	-0.008 [0.003]	-2.91	0.004	-0.006 [0.004]	-1.38	0.168
Quarter 1	0.006 [0.004]	0.16	0.874	-0.002 [0.003]	-0.72	0.471	0.013 [0.005]	2.46	0.014	0.012 [0.005]	2.30	0.022
Quarter 2	0.002 [0.003]	0.63	0.530	0.002 [0.004]	0.53	0.597	-0.001 [0.004]	-0.12	0.906	-0.002 [0.007]	-0.28	0.776
Quarter 3	0.001 [0.004]	0.34	0.737	-0.005 [0.003]	-1.37	0.172	0.005 [0.005]	1.01	0.312	0.005 [0.006]	0.83	0.407
Center	-0.001 [0.003]	-0.58	0.561	-0.001 [0.003]	-0.30	0.763	-0.003 [0.004]	-0.82	0.413	-0.004 [0.004]	-0.92	0.357
Lisbon	-0.001 [0.002]	-0.36	0.716	0.0003 [0.002]	0.14	0.891	0.0004 [0.004]	0.09	0.926	-0.001 [0.005]	-0.24	0.812
Alentejo	-0.002 [0.003]	-0.93	0.354	-0.001 [0.003]	-0.47	0.642	-0.003 [0.004]	-0.71	0.477	-0.003 [0.005]	-0.58	0.561
Algarve	-0.002 [0.002]	-0.88	0.378	-0.001 [0.003]	-0.28	0.779	-0.0004 [0.005]	-0.08	0.940	-0.002 [0.006]	-0.44	0.662
Azores	-0.004 [0.002]	-1.69	0.091	-0.004 [0.002]	-1.71	0.087	-0.002 [0.005]	-0.43	0.665	-0.003 [0.006]	-0.55	0.584
Madeira	-0.003 [0.003]	-1.12	0.262	-0.004 [0.003]	-1.30	0.194	-0.001 [0.007]	-0.21	0.830	-0.004 [0.007]	-0.60	0.547
	Obs.		*231*	*Obs.*		*175*	*Obs.*		*231*	*Obs.*		*175*
	R^2		*0.249*	R^2		*0.203*	R^2		*0.106*	R^2		*0.092*
	Wald X^2 *(15)*		*75.80*	*Wald* X^2 *(15)*		*41.65*	*Wald* X^2 *(15)*		*34.04*	*Wald* X^2 *(15)*		*21.46*
	$p > X^2$		*0.0000*	$p > X^2$		*0.0004*	$p > X^2$		*0.0054*	$p > X^2$		*0.1616*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*0.44*	$X^2(3)$		*4.65*	$X^2(3)$		*7.80*	$X^2(3)$		*6.89*
	p		*0.9317*	*p*		*0.1990*	*p*		*0.0504*	*p*		*0.0754*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*3.24*	$X^2(6)$		*4.37*	$X^2(6)$		*2.56*	$X^2(6)$		*1.23*
	p		*0.7778*	*p*		*0.6262*	*p*		*0.8618*	*p*		*0.9752*

Table A30: Results of the analysis of wages by 'skilled' versus 'unskilled' professions in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained. For the definition of 'skilled' and 'unskilled' professions see Table A1.
(Source: Portuguese Labour Force Survey 2011-2019)

Table A31: Results Wages by Country of Origin 2011-2019

	Overall						Native					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Wage	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
EU Share	-0.502 [0.347]	-1.45	0.147	-1.347 [3.037]	-0.44	0.657	-0.345 [0.476]	-1.10	0.271	-0.918 [2.354]	-0.39	0.697
PT Share	-0.022 [0.165]	-0.13	0.894	-1.999 [1.813]	-1.10	0.270	0.234 [0.205]	2.80	0.005	-2.055 [1.453]	-1.41	0.157
Other Immigrants	0.022 [0.228]	0.10	0.922	-6.469 [6.172]	-1.05	0.295	0.234 [0.024]	1.14	0.253	-6.668 [4.132]	-1.61	0.107
ln HE/LE	0.118 [0.014]	8.32	0.000	0.093 [0.030]	3.15	0.002	0.126 [0.013]	9.66	0.000	0.092 [0.027]	3.33	0.001
ln HS/LE	-0.034 [0.016]	-2.09	0.036	-0.010 [0.027]	-0.36	0.717	-0.031 [0.016]	-1.92	0.055	-0.009 [0.023]	-0.39	0.694
ln NG/LE	0.002 [0.019]	0.13	0.894	-0.027 [0.036]	-0.77	0.444	0.0004 [0.018]	0.02	0.983	-0.025 [0.032]	-0.79	0.427
Mean Age Immigrant	0.0001 [0.0004]	0.12	0.901	0.001 [0.001]	0.93	0.354	-0.0002 [0.0004]	-0.56	0.573	0.001 [0.001]	0.92	0.357
Mean Age Native	0.014 [0.003]	4.89	0.000	0.011 [0.005]	2.15	0.031	0.016 [0.003]	6.12	0.000	0.013 [0.004]	3.20	0.001
Quarter 2	0.001 [0.003]	0.48	0.629	0.007 [0.009]	0.75	0.453	0.001 [0.003]	0.37	0.714	0.006 [0.008]	0.80	0.423
Quarter 3	0.003 [0.002]	1.05	0.295	-0.005 [0.009]	-0.58	0.561	0.003 [0.002]	1-17	0.241	-0.005 [0.007]	-0.74	0.458
Quarter 4	0.001 [0.003]	0.27	0.790	-0.006 [0.004]	-1.46	0.146	0.0004 [0.002]	0.17	0.862	-0.006 [0.006]	-1.11	0.266
Center	-0.002 [0.003]	-0.54	0.588	-0.002 [0.007]	-0.22	0.827	-0.001 [0.002]	-0.66	0.509	-0.002 [0.004]	-0.34	0.733
Lisbon	-0.0002 [0.003]	-0.06	0.949	-0.0001 [0.004]	-0.02	0.986	-0.0001 [0.003]	-0.02	0.981	0.0001 [0.004]	0.01	0.989
Alentejo	-0.001 [0.002]	-0.66	0.508	-0.001 [0.003]	-0.25	0.802	-0.001 [0.001]	-1.07	0.286	-0.001 [0.002]	-0.42	0.678
Algarve	-0.001 [0.001]	-1.72	0.086	-0.001 [0.001]	-0.79	0.429	-0.001 [0.001]	-1.94	0.053	-0.001 [0.001]	-0.68	0.498
Azores	0.015 [0.005]	2.93	0.003	-0.002 [0.004]	-0.40	0.686	0.017 [0.004]	3.72	0.000	-0.002 [0.004]	-0.58	0.563
Madeira	-0.004 [0.004]	-0.89	0.374	-0.006 [0.004]	-1.42	0.155	-0.003 [0.004]	-0.73	0.464	-0.006 [0.004]	-1.65	0.099
	Obs.		*188*	*Obs.*		*142*	*Obs.*		*188*	*Obs.*		*142*
	R^2		*0.251*	R^2		*0.269*	R^2		*0.272*	R^2		*0.275*
	Wald X^2 *(14)*		*301.64*	*Wald* X^2 *(14)*		*988.98*	*Wald* X^2 *(14)*		*348.18*	*Wald* X^2 *(14)*		*989.69*
	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*1.19*	$X^2(3)$		*8.98*	$X^2(3)$		*1.55*	$X^2(3)$		*4.53*
	p		*0.7549*	*p*		*0.0295*	*p*		*0.6708*	*p*		*0.2099*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*151.93*	$X^2(6)$		*124.77*	$X^2(6)$		*133.74*	$X^2(6)$		*102.22*
	p		*0.0000*	*p*		*0.0000*	*p*		*0.0000*	*p*		*0.0000*

Table A31: Results of the analysis of wages by immigrants' country of origin in Portugal 2011-2019. It is differentiated between immigrants from EU countries, Portuguese speaking countries (PT) and 'other' countries. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained
(Source: Portuguese Labour Force Survey 2011-2019)

Table A32: Results Wages by Immigrants' Gender 2011-2019

	Overall						Native					
	Prais-Winsten, First Differences			IV, First Differences			Prais-Winsten, First Differences			IV, First Differences		
Wage	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z	Coeff.	z	p>z
Male Immigrants	-0.038 [0.161]	-0.24	0.812	-0.751 [1.237]	-0.61	0.544	0.042 [0.159]	0.27	0.790	-0.863 [1.276]	-0.68	0.499
Female Immigrants	-0.031 [0.173]	-0.18	0.856	-0.630 [0.716]	-0.88	0.379	0.204 [0.170]	1.20	0.230	-0.377 [0.736]	-0.51	0.609
ln HE/LE	0.107 [0.016]	6.91	0.000	0.084 [0.020]	4.21	0.000	0.112 [0.016]	7.17	0.000	0.087 [0.020]	4.25	0.000
ln HS/LE	-0.008 [0.015]	-0.50	0.614	0.008 [0.019]	0.40	0.691	-0.005 [0.015]	-0.30	0.767	0.009 [0.019]	0.44	0.660
ln NG/LE	-0.002 [0.017]	-0.12	0.905	-0.029 [0.019]	-1.56	0.118	-0.005 [0.017]	-0.32	0.751	-0.029 [0.019]	-1.48	0.139
Mean Age Immigrant	0.0001 [0.0004]	0.31	0.759	0.000 [0.0004]	0.02	0.998	-0.0001 [0.0004]	-0.14	0.886	-0.0001 [0.0003]	-0.35	0.724
Mean Age Native	0.012 [0.004]	2.96	0.003	0.012 [0.006]	2.01	0.044	0.014 [0.004]	3.38	0.001	0.013 [0.006]	2.17	0.030
Quarter 2	0.002 [0.004]	0.54	0.586	-0.001 [0.003]	-0.29	0.775	0.002 [0.003]	0.45	0.651	-0.002 [0.004]	-0.57	0.567
Quarter 3	0.003 [0.004]	0.86	0.388	0.001 [0.004]	0.24	0.810	0.004 [0.004]	0.98	0.328	0.001 [0.005]	0.24	0.808
Quarter 4	0.002 [0.004]	0.46	0.647	-0.006 [0.004]	-1.41	0.158	0.002 [0.004]	0.41	0.681	-0.006 [0.004]	-1.43	0.153
Center	-0.002 [0.003]	-0.55	0.583	-0.001 [0.003]	-0.49	0.624	-0.001 [0.003]	-0.53	0.595	-0.001 [0.003]	-0.50	0.618
Lisbon	-0.0002 [0.002]	-0.09	0.928	0.0001 [0.003]	0.06	0.953	-0.0001 [0.002]	-0.03	0.976	0.0003 [0.002]	0.12	0.904
Alentejo	-0.002 [0.003]	-0.54	0.588	-0.001 [0.003]	-0.22	0.822	-0.002 [0.002]	-0.65	0.517	-0.001 [0.002]	-0.26	0.797
Algarve	-0.001 [0.002]	-0.56	0.577	-0.001 [0.003]	-0.29	0.774	-0.001 [0.002]	-0.49	0.625	-0.001 [0.003]	-0.23	0.819
Azores	-0.002 [0.002]	-0.92	0.355	-0.003 [0.002]	-1.50	0.134	-0.002 [0.002]	-0.86	0.387	-0.003 [0.002]	1.43	0.152
Madeira	-0.002 [0.003]	-0.76	0.446	-0.005 [0.003]	-1.46	0.145	-0.002 [0.003]	-0.70	0.484	-0.005 [0.003]	-1.50	0.135
	Obs.		*225*	*Obs.*		*171*	*Obs.*		*225*	*Obs.*		*171*
	R^2		*0.242*	R^2		*0.247*	R^2		*0.250*	R^2		*0.246*
	Wald X^2 *(16)*		*73.90*	*Wald* X^2 *(16)*		*55.68*	*Wald* X^2 *(16)*		*80.38*	*Wald* X^2 *(16)*		*53.61*
	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*	$p > X^2$		*0.0000*
	Time Dummies			*Time Dummies*			*Time Dummies*			*Time Dummies*		
	$X^2(3)$		*0.77*	$X^2(3)$		*5.00*	$X^2(3)$		*0.96*	$X^2(3)$		*4.65*
	p		*0.8574*	*p*		*0.1718*	*p*		*0.8110*	*p*		*0.1989*
	Region Dummies			*Region Dummies*			*Region Dummies*			*Region Dummies*		
	$X^2(6)$		*1.16*	$X^2(6)$		*3.86*	$X^2(6)$		*1.32*	$X^2(6)$		*3.98*
	p		*0.9786*	*p*		*0.6950*	*p*		*0.9752*	*p*		*0.6796*

Table A32: Results of the analysis of wages by immigrants' gender in Portugal 2011-2019. The dependent variables are the respective unemployment rates. Joint significance tests of the regressors as well as for the time and region dummies can be obtained.
(Source: Portuguese Labour Force Survey 2011-2019)

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