UNIVERSITY OF SOUTHAMPTON

FACULTY OF SOCIAL AND HUMAN SCIENCES

Department of Economics

Labour market outcomes and welfare use of international migrants in the UK
An empirical investigation

by

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ABSTRACT

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DEPARTMENT OF ECONOMICS

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In this PhD thesis we are investigating topics on international migration and we focus in the case of the UK as a host country. We analyse the implications of restricted and unrestricted migration on the the labour market outcomes and the welfare use of the migrants.

In the first chapter we estimate the joint decision over the labour market behavior of an individual and her subsequent welfare use, and attempt to explain how this decision is differentiated between natives and immigrants. We incorporate differences in the purchasing power parities of the home countries and the host country to explain how these differences create different incentives between natives and immigrants.

In the second chapter we investigate the effects of the economic crisis on the labour market performance of natives and immigrants in the UK. We assess the unemployment durations of EU and non-EU immigrants, and UK natives for the years before and during the economic crisis of 2008. We find that the unemployment duration of the EU immigrants converged to that of the UK natives, while the non-EU immigrants were the ones affected the most. We also find that the high degree of clustering into specific socioeconomic statuses, drove at a significant degree the unemployment duration outcomes for the EU immigrants.

In the third chapter we investigate the job separation rates of immigrants and natives for the periods before and during the economic crisis of 2008. We find that the non-EU immigrants had higher separation rates than the natives and that this gap widened even further for the years during the crisis. The A8 immigrants had higher separation rates than the natives mainly due to early attrition from the survey. Exits towards unemploy-

ment or underemployment happened at a lower rate for this immigrant group compared to the natives. The two results combined indicate the importance of out-migration when the labour market outcomes of EU migrants are compared to those of the UK natives.

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Declaration of Authorship

I, Dafni Papoutsaki, declare that the thesis entitled *"Labour market outcomes and welfare use of international migrants in the UK. An empirical investigation."* and the work presented in the thesis are both my own, and have been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
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the exception of such quotations, this thesis is entirely my own work;

5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission.

Signed: .....

Date: .....

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1

Introduction

1.1 Background

International migration is a complex and highly controversial topic for those developed countries who are the main recipients of migrants. With 3% of the world's population living in a different country than their initial country of birth, migration and its implications has found itself more and more in the spotlight of policy debates. Migration, and specifically labour migration, can have several impacts on the host country's economy, for example on the wages of the natives, the productivity and the skill composition of the host country, on welfare state provisions, on internal migration and on demand in the goods market (Bodvarsson and Van den Berg, 2009).

Migration literature has focused on the identification of the incentives behind migration, which are described as the push and pull factors. It has also attempted to build the profiles of the potential immigrants, and given their characteristics, find their effects on various aspects of the host economy (Borjas, 2014). However, restrictive immigration policies set by the host countries determine the types and the level of skills that can be accepted. Even though there is a vast literature examining the outcomes of migration without restrictions (Borjas, 2014), as one would expect there are not many practical examples of free migration from less developed countries to developed ones. However the accessions of the A8[1] and the A2[2] countries to the European Union in 2004 and 2007 respectively could be considered relatively good examples of such situations, given the large wage gap between these countries and others in the union.

The flows from these countries to the old EU member states were not particularly high initially (Zaiceva and Zimmermann, 2008), but they increased in the subsequent years, especially for some old EU member-states like the UK. The reason that free migration in the EU area might be of interest is because the income distributions of the new member states are considerably lower than those of the old member states. Thus, the relative

[1] Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia.

[2] Bulgaria and Romania

differences in the purchasing parities between those two groups of countries create dynamics that, under traditional migration theory, should boost migration flows; and that is exactly what they do. For these reasons, the current EU situation could be used for the empirical study of free migration in comparison to restricted migration between countries with large differences in their income distributions.

In this thesis we focus on the UK case, which is a perfect example of a developed country that has a long history as a host country, and for that reason a significant immigrant population. It gives us the opportunity to examine unrestricted and restricted migration as the UK has been a recipient country under both regimes, and it also allows us to investigate the position of the children of the migrants, the Second Generation migrants. The UK has a large immigrant population, with the countries India, Poland, Pakistan, Ireland, Germany, United States, South Africa, Bangladesh, Nigeria, and Kenya to be the main senders countries (Rienzo and Vargas-Silva, 2013). We utilise the information provided by these large stocks of immigrants that entered under different migration regimes in order to make inferences about the the differences in their position in the host economy. More specifically, we focus on their labour market outcomes, their use of the welfare state and their vulnerability towards economic shocks. The analysis of those three matters helps us understand how immigrant workers fare in the host economys labour market and how the different regimes under which they entered the country might affect those results.

Before introducing the details of this thesis, it is of great importance to understand what the two different migrant regimes might mean for the host country. In the case of restricted migration, the receiving country chooses which are the skills that are needed during the period that it accepts migrant flows, the level of the skills of the individuals and the number of people. Thus, there is -at an important level- control over the type and the number of immigrants that are being accepted. Even though there might be some unobservable characteristics of the individuals that choose to migrate which could affect the behaviors and profiles of immigrants entering under restricted migration regimes, analysis gets more complicated when the host country has no screening power over the immigrants that are crossing its borders. Under a free migration regime, the educational background of the immigrants and the level of their skills are not a criterion for entering

the host country anymore. The host country can have information about the characteristics of the immigrants only after they have entered the country. Economic models give some intuition about the potential immigrant skill levels that a country might attract, (Borjas, 1987); however, practise raises more questions than theory can answer. For this reason an empirical approach might help us understand better the mechanisms at work in the cases of restricted and unrestricted migrations.

Restricted migration is more organised than the unrestricted case and it is based on the needs of the host country. Unrestricted migration on the other hand is mainly based on/determined by the needs of the migrants and is not organised by the host country. Under free migration, immigrants are expected to be driven by the potential earnings they might have in the host country as predicted by Harris and Todaro (1970). Potential earnings would imply the differences in the wages and the unemployment rates between the home and host countries. However, what happens after the immigrants enter the host country under free migration is the main point of interest. If their skills are not transferrable, not needed, or if the migrants are not really familiar with the language of the host country[3] this might lead to higher unemployment levels for this group of immigrants. However, evidence suggests that this is not the case in the UK, as immigrants from the A8 countries have the highest participation and employment rates amongst all immigrant groups (Dustmann et al., 2009). This thesis aims to explain the fundamental differences in the incentives and the behaviour of the different immigrant groups and how those lead to the observed outcomes in the labour market.

We suggest that the reasons that lie behind the observed outcomes are the differences in the reservation wages of the immigrants, and the absense of restrictions of the job choices of EU immigrants in the labour market. We adopt a broader definition of the reservation wage (as in Mortensen (1987) in order to explain the labour market outcomes of different types of immigrants. The reservation wage does not imply just a monetary minimum, but also the sacrifice that a person is willing to make in order to be employed, for instance by taking a job that she/he does not really enjoy, or a job where she/he does not use hers/his obtained skills. In this case, we expect that this

[3] Those are some of the basic criteria when applying for a working visa in the UK.

sacrifice would imply higher educated individuals being employed in lower skilled jobs in order to avoid unemployment. This is probably a choice that immigrants who enter the country under restricted migration regimes might not be allowed to make under the specific types of their working visas. Going back to the new EU members, the reason behind their willingness to sacrifice their human capital by undertaking elementary and manual jobs is the great difference in the income distributions between the host and the home country, in conjunction with the possibility of return or the possibility of sending remittances back home; the purchasing power of their UK wages will play an important role in determining their final labour market choices.

Finally, another part of migrant behaviour that is also considered is assimilation in the labour market and how this might differ between different immigrant groups given their differences in the choices in the labour market. Furthermore, since the EU migrants enter the host under no restrictions this might mean that their english language skills[4] might be weak, or that their educational skills might not be transferable. Those factors are expected to delay assimilation when compared to migrants who have been selected as reaching specific standards that make them a good match for the UK labour market.

1.2 Immigrants and Occupational Downgrading/Upgrading

The idea that economic gains would result from open borders between nations has been analysed theoretically in the past by Hamilton and Whalley (1984). The findings suggested that the efficiency gains on a global scale from free migration would be high. Borjas (2014) has also examined possible benefits following economic migration in the case of highly skilled migrants. He found that there exist strong, positive productivity spillovers from high-skilled workers, and that if the externalities of these workers are strong enough, they can overcome the negative effects of diminishing returns to scale of the larger labour force.

The recent accession of new EU countries in 2004 could provide an example of free

[4]Unfortunately this information could not be used in the analysis due to lack of observations

migration movement of highly skilled individuals. The income distribution differences between the old and the new EU members were high enough to create a strong pull factor for new immigrants. In the case of the UK, the accession led to high inflows of immigrant workers from the new EU countries to the UK (Vargas-Silva, 2014). However, this great inflow of workers from the newly accessed countries came with great frictions in the form of the transferability of their skills. Even though the migrants seem to acquire high levels of education, they have ended up working mainly in elementary and manual jobs (Clark and Drinkwater, 2008b).

The two reasons that could possibly drive these results are discrimination against immigrants and non transferability of their skills. Another reason could be that the migration patterns of A8 immigrants are temporary rather than permanent, which could undermine labour market assimilation.

The rest of this introductory chapter is given over to a brief empirical analysis of the level of human capital loss due to mismatch in the labour market of the new immigrants which might be due to non-transferability of their skills. We use the Quarterly Labour Force Survey for this analysis, from which we can obtain information about the educational level of the individuals, the level of their acquired skills, the specific type of skills they have, and whether they obtained their highest training in their home country or in the UK.

By utilising the above information, we will be able to assess the effect of non transferability of skills by comparing immigrants of same skill levels, who have obtained their degrees either in their home country or in the UK. We will also include the experience in the UK job market as another way of capturing assimilation and its implications. This analysis provides a useful introduction to the issues discussed in the remainder of this thesis, as not only gives some background in the differences in labour market behaviour between immigrants and natives in the UK highlighted, but also the central concept of downgrading is also utilised in later analyses.

A challenge for this research question will be the fact that immigrants of higher education who decided to migrate (and to downgrade in the host country) might be of lower unobserved ability (Borjas, 1989). In the case that migrants decide to study in the host country and then stay to work, it could be that they have higher unobserved ability. Re-

gardless of this limitation, our results can still give some insight on the powers at work. The findings of this work may be policy relevant, as they suggest directions that integration policies in the UK should take, in order to make the most out of the skills of the immigrants who migrate under a free migration regime in the UK. Using a measure of the downgrading and upgrading of immigrants in the labour market, we quantify the difference in this measure between natives and immigrants. Another contribution of this work is an attempt to explain the reasons behind the differences between the downgrading and upgrading rates of natives and immigrants, under the hypothesis of slow or bad assimilation. However, some downgrading and upgrading difference between natives and migrants cannot be explained, which might be due to the fact that the controls we use (experience in the UK labour market and educational attainment in the UK) do not lead to perfect assimilation of immigrants to the level of natives, or possibly due to other reasons, such as discrimination. Some other authors have recently attempted similar analyses to examine skills mismatch. Visintin et al. (2015), for example, examined skills mismatch for a large number of migration flows, and found characteristics of sending and receiving countries were significant for downgrading.
The rest of the introduction is structured as follows: The next section (Section 1.3) introduces the data used for the empirical analysis as well as a thorough description of all the relevant variables; Section 1.4 explains the econometric approach we use in our analysis; the results and findings follow in Section 1.5 and finally, section 1.6 concludes.

1.3 Data Description

In this thesis we use the Quarterly Labour Force Survey. This survey is chosen among others as it includes information needed for the questions studied in this thesis, it has a good sample size overall, but most importantly it has a good sample of migrant groups from the old EU members states and the new EU member states. Alternative data sources that could potentially be considered are the British Household Panel Survey (BHPS) and the International Passenger Survey (IPS). The BHPS is a dataset that in-

cludes all the relevant variables for the analysis undertaken, however it does not have enough observations of immigrants from the new EU member states. The IPS does not have all the relevant information for the analysis of this thesis and also does not include information on the UK natives. Finally, another source of data that could be used in migration research is the National Insurance Number (NINo) data. This data is publicly available but in an aggregate form, which unfortunately makes it inappropriate for the current study. Individual level NINo data could be accessed and used for tackling the questions of this thesis, if successfully linked with other administrative data so that all the relevant information needed are included in the final dataset. However, the QLFS is good starting point for the undertaken analysis, and it is widely used by many scholars who investigate labour market outcomes and benefit use of natives and immigrants in the UK, for example Dustmann et al. (2009), Drinkwater and Robinson (2013), or Clark and Drinkwater (2008b).

For this part of the introduction, the years between the second quarter of 2004 and the second quarter of 2010 have been used. In this analysis we will ignore the panel element of the survey and treat the data as a pooled cross-section. We will cluster the error terms on the individual level.

The first variable we use is the level of education which is determined as in Dustmann et al. (2009) and it has three levels; high, intermediate and low[5]. The second variable that we utilise in order to create the downgrading/upgrading outcomes is the socioeconomic status. Those are seven categories, namely (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations. The first three will be considered as upgrading and the last four will be considered as downgrading. Even though an actual upgrading would be a match of a person with low education working in a higher managerial job and actual downgrading would be a person of high education working

[5]People who dropped out of school at any age before the age of 16 are considered the low education group; people who stopped education before the age of 20 (inclusive), are considered intermediately educated and finally, people who stopped education at any point after the age of 21 are considered highly educated.

in a routine occupation, for more comprehensive presentation given the vast number of different combinations we will use the separation above.

We also control for a number of exogenous demographic characteristics that might affect the observed outcomes; age, age squared, number of dependent children under the age of 19 in the household, dummy for dependent children in the household, disability status, marital status, year-quarter dummies and region of residence. However, the interest of this analysis is on how the downgrading or upgrading probability is affected by the country of origin of the immigrant, so we control for the different immigrant groups (A8 immigrants, EU14 immigrants, non-EU immigrants and Second Generation immigrants), and also how downgrading/upgrading is affected by subsequent integration in the UK. In order to capture the integration levels for the different groups and its effects we use dummies that indicate different cohorts, defined according to year of entry to the UK[6], a variable for the years the individuals have been in the UK and most importantly, a variable capturing the potential experience in the UK labour market that these individuals could have.

The potential experience in the UK labour market is estimated by the difference between the years in the UK and the age that the individual left full-time education. The assumption is that the individual started working as soon as she finished studying, which is a strong assumption to make, especially if there are differences in the periods of jobsearch between the natives and the immigrants. However, the further back in time a person has finished studying, the less this assumption matters. The reason we control for this proxy for experience is because we expect that by working in the host country, a person learns the language, the work ethics, and the general culture, a procedure that potentially boosts assimilation. We also control for the event that a person has studied in the host country and remained to seek employment. A person who has already studied their highest degree in the host is expected to be more familiar with the language and have skills that are specific to the country where she obtained her degree, in this case, the host country. We include a dummy that gets the value 1 if a person obtained her last degree in the UK and 0 otherwise.

[6]The cohorts we use are: entered before 1973 which is the year of accession of the UK in the EU, and yearly after that.

Finally, we control for the way a person got their job, namely; reply to advertisement, job centre, careers office, job club, private employment agency,business, hearing from someone who worked there, direct application, and some other way.

1.3.1 Descriptive Statistics

We start our descriptive analysis by presenting the levels of observed socioeconomic statuses for the employed individuals in the sample, which can be seen in Table 1.1[7]. Each row of the table displays a different level of socioeconomic status, with percentage indicating the proportion of the relevant country group who identify themselves in that socioeconomic group.

Table 1.1: Levels of Socioeconomic status per Country of Origin

	UK	EU14	SecGen	A8	nonEU
higher managerial	11.12	15.96	12.1	3.03	13.91
lower managerial	23.78	25.02	24.34	5.51	20.32
intermediate occupations	10.75	8.86	11.53	3.97	7.65
small employers	8.37	7.71	7.56	5.74	8.91
lower supervisory	9.4	7.22	8.11	9.21	6.26
semi-routine occupations	13.62	11.85	13.81	26.53	13.35
routine occupations	9.79	9.49	7.81	39.78	8.65
never worked, unemployed	13.16	13.88	14.74	6.22	20.96
Number of Obs.	1,486,684	36,802	75,100	11,145	141,873

Source: *QLFS*, 2004 *Second Quarter*- 2010 *Second Quarter*.

In the Appendix A, in Table A.4 we can see the descriptive characteristics of our sub-sample. We must note here that this sub-sample consists of people in employment only. The younger age and the later accession of the A8 immigrants in the UK drives the great differences we observe in many of the descriptives, for instance in age, years

[7] In Appendix A we can see the same breakdown per educational level.

in the UK, disability status, number of dependent children and potential UK experience. Regarding the educational levels, we see that non-EU immigrants are the most highly educated, followed by the EU14 immigrants and then A8 immigrants. The A8 immigrants are the ones with the highest proportions of intermediate education, while on average, the immigrants from the A8 countries have the higher proportions of intermediate and higher education together, followed by the non-EU immigrants and then by the EU14 immigrants. All these immigrant groups are more highly educated than the UK natives and the Second Generation immigrants.

1.4 Econometric Model

In order to assess the probabilities of downgrading for the immigrant groups in comparison to the UK natives, we use a probit model where we model the response probability assuming a normal distribution. Following Greene (2003), we consider that the underlying continuous regression

$$y^* = x'\beta + \epsilon$$

is only observed as a discrete outcome. More specifically, a person either downgrades or not.

$$y = 1 \text{ if } y^* > 0$$
$$y = 0 \text{ if } y^* \leq 0$$

and since we assume a normal distribution, it should be the case that:

$$Prob(Y = 1|x) = \Phi(x'\beta)$$

where Φ is the normal distribution.
The outcome y is the event of downgrading or not, and as we explained earlier, we use four different measures for downgrading. The controls x we consider are some strictly

exogenous demographic characteristics; immigrant status based on country of origin clustered in larger categories (A8 immigrants, EU14 immigrants, Second Generation immigrants and non-EU immigrants), age, age squared, gender, disability status, marital status, dummy for having children in the household, and the number of children in the household. Other exogenous characteristics we control for are year-quarter effects as well as region of residence effects. We also control for some characteristics relevant to the migration event; years in the UK, years in the UK squared and migrant cohort. We finally control for the variables of interest which are potential working experience in the UK, potential working experience in the UK squared, and a dummy indicating whether the individual studied in the UK or not.

Since we use the dataset as a pooled-cross section we cluster the errors on the individual level. The subsequent probit estimation is then straight-forward. The likelihood function to be maximised will be:

$$L = \prod_{i=1}^{N} P_i^{y_i}(1-P_i)^{1-y_i} \Longrightarrow$$

$$L = \prod_{i=1}^{N} \Phi(x_i'\beta)^{y_i}(1-\Phi(x_i'\beta))^{1-y_i} \Longrightarrow$$

$$lnL = \sum_{i=1}^{N}[y_i ln\Phi(x_i'\beta) + (1-y_i)ln(1-\Phi(x_i'\beta))]$$

for each one of the four possible downgrading outcomes and after controlling for the aforementioned parameters.

We must note here that we separate all results of socioeconomic outcomes per educational level.

1.5 Results

In this section we present the main results[8] for the seven different measures of downgrading/upgrading following the discussion above. We have separated the sample based on the level of education (low, intermediate, high) and matched an outcome for each level of socioeconomic status (higher managerial and professional, lower managerial and professional, intermediate occupations, small employers and own account workers, lower supervisory and technical, semi-routine occupations, routine occupations). We consider as upgrading the highest three outcomes (socioeconomic statuses one to three) and as downgrading the four last socioeconomic statuses (four to seven). In each table of outcomes, we include the first simple model, model 1 where we only control for the demographic characteristics of the individuals. In model 2 we control for the cohort quality and how this might affect the downgrading outcomes. In model 3 we control for potential years of experience in the UK labour market, the square of this variable, years in the UK, and having studied in the UK or not. Finally, in model 4 we control for search methods for finding current job.

1.5.1 Results-High Education

In table 1.2 we can see how different immigrant groups when compared to the UK natives differ in their socioeconomic status, given that they have higher education. The first outcome could be considered as the highest socioeconomic status (higher managerial and professional), and as we move to the right, the seventh outcome (routine occupations) could be considered the lowest socioeconomic status. A match with the lowest categories could be considered downgrading, whereas a match with the higher categories could be considered upgrading.

In model (1), socioeconomic status (7) we see that all immigrant groups are more likely to downgrade than the natives; the EU14 are about 2% more likely, the second generation are 3% more likely, the A8 are 31% more likely, and the non-EU are 4% more

[8] Full breakdown of the results can be found in Appendix A.

likely. The A8 are the group that seems to downgrade the most. Looking at the upgrading matching, and specifically socioeconomic status one (higher managerial and professional) we see that that the EU14 are 4% more likely than the natives to upgrade, the second generation are 1% less likely, the A8 are 26% less likely, and the difference between non-EU and natives is extremely small and insignificant. An overview of the results shows that for the last three socioeconomic statuses, which capture downgrading, all migrant groups are more likely to downgrade than the natives with the A8 reaching the highest probability of downgrading when compared to natives. Outcomes one to four don't give results towards a standard direction for all groups. The EU14, with the exception of outcome two, are more likely to upgrade than the natives. The second generation immigrants are less likely to upgrade than the natives for all first four categories. The A8 are less likely to upgrade for the first two categories, whereas no significant difference is detected for categories three and four. Finally, the non-EU are less likely (by 16%) to upgrade than the natives to category two, however they are less likely to upgrade/downgrade for the following categories (three to seven).

In model (2), we see that controlling for demographic characteristics increases the probability of upgrading for EU14 migrants, while it leaves the probability of downgrading approximately the same. More specifically, a match with category one shows a 5% higher probability for EU14 migrants, while a match with category (7) shows again a 2% higher probability for EU14 migrants. For the second generation migrants all differences become mitigated or insignificant once we control for demographic characteristics. For example, a match with category three shows a lower probability of upgrading of 1% for the second generation immigrants, whereas in model (1) this was 3%. For the A8 immigrants differences in upgrading remain the same, while differences in downgrading get smaller after we control for demographic characteristics. For example a match with socioeconomic status five (lower supervisory and technical) becomes 6% more likely for A8 migrants when compared to natives, as opposed to an 8% increase of the probability in model (1). Finally, interestingly, the non-EU see an increase in absolutes of their probabilities to upgrade and downgrade when compared to the natives after we control for demographic characteristics. For upgrading the probability becomes significant and smaller (for example -2% for socioeconomic status one) and

for downgrading the probability becomes larger (for example, 8% for socioeconomic status eight).

In model (3) after we control for a series of assimilation proxies, we see that the differences in the probability of downgrading (socioeconomic statuses five to seven) but even on the outcome of socioeconomic status four, the probability in differences becomes insignificant between natives and this group of migrants. However, at the same time the EU14 migrants are 18% more likely to upgrade (socioeconomic status one) than the natives. For the second generation migrants, no change is detected. For the A8 migrants we see that the differences in absolutes become greater, however for the downgrading outcomes (socioeconomic statuses four to seven), the differences are either insignificant or significant at most at a 1% significance level. Finally, for the non-EU migrants, apart from outcome socioeconomic status two, where the non-EU are found to be 23% more likely than the natives to upgrade, all other differences are insignificant.

In model (4) we control for the method that the individuals used to obtain their job. However, the number of observations is much lower after this variables is included. Almost all outcomes for the migrant groups compared to natives show that there is no significant differences, apart from the case of the A8 immigrants; for this group we see a persistent lower probability of upgrading (20% less likely to have socioeconomic status one than the natives) and a persistent higher probability to downgrade than the natives (78% more likely than the natives). However, for socioeconomic statuses five and six, even for this group the difference is not significant.

Table 1.2: Probit Results for Downgrading/Upgrading from High Education

		High Education						
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
EU14	Model 1	0.0381***	-0.0965***	0.0141**	-0.000879	0.00740**	0.0233***	0.0158***
		(0.0103)	(0.00999)	(0.00592)	(0.00465)	(0.00354)	(0.00500)	(0.00314)
	Model 2	0.0454***	-0.103***	0.0104*	0.00713	0.00789**	0.0232***	0.0176***
		(0.00995)	(0.00984)	(0.00569)	(0.00504)	(0.00358)	(0.00494)	(0.00338)
	Model 3	0.178**	-0.185***	-0.0243	0.00859	-0.00930	0.0119	0.0318
		(0.0803)	(0.0716)	(0.0358)	(0.0350)	(0.0172)	(0.0358)	(0.0354)
	Model 4	0.0408	-0.126	-0.256***		0.137	-0.0133	0.459
		(0.217)	(0.222)	(0.0380)		(0.230)	(0.129)	(0.321)
2nd Gen.	Model 1	-0.0140*	-0.0434***	0.0327***	-0.00848***	0.00476**	0.0265***	0.00328*
		(0.00729)	(0.00749)	(0.00458)	(0.00318)	(0.00241)	(0.00356)	(0.00187)
	Model 2	0.00403	-0.0348***	0.0133***	0.00228	0.00111	0.0162***	0.000169
		(0.00724)	(0.00748)	(0.00400)	(0.00364)	(0.00220)	(0.00315)	(0.00159)
	Model 3	-0.00134	-0.0321***	0.0144***	0.00323	0.00129	0.0159***	4.57e-05
		(0.00706)	(0.00751)	(0.00421)	(0.00365)	(0.00237)	(0.00335)	(0.00153)
	Model 4	1.94e-05	-0.0186	0.0274**		-0.00457	0.0116	-0.0122***
		(0.0142)	(0.0157)	(0.0121)		(0.00411)	(0.0101)	(0.00375)
A8	Model 1	-0.264***	-0.350***	-0.00330	-0.00319	0.0787***	0.226***	0.313***
		(0.00778)	(0.00840)	(0.00706)	(0.00587)	(0.00784)	(0.0117)	(0.0124)
	Model 2	-0.246***	-0.341***	-0.0294***	0.0261***	0.0609***	0.183***	0.262***
		(0.00897)	(0.00886)	(0.00510)	(0.00812)	(0.00692)	(0.0108)	(0.0119)
	Model 3	-0.179***	-0.391***	-0.0502**	0.0949	0.0333	0.142*	0.325**
		(0.0533)	(0.0335)	(0.0252)	(0.0659)	(0.0415)	(0.0860)	(0.134)
	Model 4	-0.206**	-0.346***	-0.261***		0.229	0.112	0.780***
		(0.103)	(0.110)	(0.0372)		(0.295)	(0.225)	(0.145)
non-EU	Model 1	-0.000386	-0.160***	0.00716*	0.0250***	0.0271***	0.0730***	0.0365***
		(0.00717)	(0.00677)	(0.00396)	(0.00400)	(0.00315)	(0.00457)	(0.00306)
	Model 2	-0.0237***	-0.147***	0.0166***	0.0245***	0.0291***	0.0834***	0.0413***
		(0.00676)	(0.00681)	(0.00419)	(0.00389)	(0.00326)	(0.00485)	(0.00327)
	Model 3	0.107	-0.229***	-0.0194	0.0271	0.00258	0.0654	0.0642
		(0.0795)	(0.0654)	(0.0376)	(0.0415)	(0.0243)	(0.0593)	(0.0535)
	Model 4	-0.0201	-0.194	-0.246***		0.170	0.0503	0.499
		(0.198)	(0.197)	(0.0401)		(0.258)	(0.182)	(0.314)

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

[1] This table includes only individuals who have been classified as highly educated.

[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Each model has the following controls: model (1) only regional and year-quarter controls, model (2) demographic characteristics, model (3) years, education, and experience in the UK and cohort of arrival, model (4) how they obtained their current job.

[4] Reported marginal effects.

[5] Number of observations per model: model (1) 264,006, model (2) 260,348, model (3) 260,348, model (4) 31,799.

[6] Outcome 4, model 4 not enough observations.

1.5.2 Results-Intermediate Education

As we can see in table 1.3, for this educational level, the significant differences between the EU14 or the second generation migrants and the UK natives are detected at the marginal socioeconomic statuses one, two six and seven for most model categories. On the other hand, the A8 and the non-EU migrants still differ significantly from the UK natives form most socioeconomic statuses, for most models. The same patterns as above are detected with migrants being less likely to upgrade and more likely to downgrade than the natives.

In model (1) we see that the EU14 migrants are 2% less likely than natives to be in socioeconomic status one, and 4% less likely to be in socioeconomic status four. On the other hand they are 3% more likely to be in socioeconomic status six and 4% more likely to be in socioeconomic status seven compared to natives. The second generation migrants are 3% less likely than natives to be in socioeconomic statuses seven and six, and 4% more likely to be in socioeconomic status six. The A8 are 1% less likely to be in socioeconomic status one and 3% less likely to be in socioeconomic status two, indicating a lower probability of upgrading. Indicating a higher probability of downgrading we see that the A8 are 4% more likely to be in socioeconomic status seven than the natives. The non-EU are 5% less likely than the natives to be in socioeconomic status one and 7% more likely to be in socioeconomic status seven than the natives.

In model (2) the changes in the probabilities between the A8 or the non-EU migrants and the natives after controlling for demographic characteristics are marginal. However, than changes for EU14 and second generation compared to the UK natives seem to change after we control for demographic characteristics, however the direction remains the same, apart from socioeconomic status seven where the second generation migrants are 1% less likely to downgrade than natives.

In model (3) after we control for assimilation proxies, all differences become insignificant between the UK natives and the EU14 migrants. For the second generation migrants the change when compared to the second model model is marginal. For the A8 immigrants, we see a decrease in magnitude for the downgrading probabilities. Now, the socioeconomic status seven is 2% more likely for the A8 than the UK natives at a

5% significance level. For the non-EU, we see an increase in magnitude for the higher socioeconomic statuses one to three, whereas the differences in probabilities of downgrading compared to the natives become insignificant.
In model (4) due to the small number of observations many outcomes become insignificant, however, the direction of the differences between the migrant groups and the natives remains the same.

Table 1.3: Probit Results for Downgrading/Upgrading from Intermediate Education

		Intermediate Education						
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
EU14	Model 1	-0.0216***	-0.0380***	-0.0129	-0.00635	0.00634	0.0319***	0.0438***
		(0.00706)	(0.0102)	(0.00828)	(0.00585)	(0.00602)	(0.00819)	(0.00639)
	Model 2	-0.0110	-0.0361***	-0.0201**	-0.000253	0.00525	0.0294***	0.0439***
		(0.00723)	(0.0101)	(0.00784)	(0.00606)	(0.00592)	(0.00790)	(0.00634)
	Model 3	-0.0635	-0.0520	-0.0663	0.0357	0.109	0.0719	-0.0128
		(0.0386)	(0.0710)	(0.0481)	(0.0497)	(0.0721)	(0.0654)	(0.0345)
	Model 4	0.0119	-0.259***	-0.217***		0.0372	0.462**	0.406
		(0.130)	(0.0476)	(0.0707)		(0.128)	(0.185)	(0.286)
2nd Gen.	Model 1	-0.0272***	-0.0296***	0.0116**	-0.000368	0.00590	0.0400***	0.00230
		(0.00433)	(0.00632)	(0.00527)	(0.00388)	(0.00385)	(0.00513)	(0.00331)
	Model 2	-0.0124***	-0.0102	0.00731	0.00376	-0.000996	0.0231***	-0.00621**
		(0.00452)	(0.00635)	(0.00508)	(0.00393)	(0.00361)	(0.00473)	(0.00299)
	Model 3	-0.0135***	-0.0115*	0.00661	0.00417	-0.000824	0.0230***	-0.00637**
		(0.00459)	(0.00635)	(0.00511)	(0.00386)	(0.00348)	(0.00470)	(0.00317)
	Model 4	-0.00540	-0.0118	0.000463		0.00849	0.0277**	-0.0222***
		(0.00808)	(0.0126)	(0.0130)		(0.00855)	(0.0119)	(0.00848)
A8	Model 1	-0.129***	-0.297***	-0.142***	-0.0134**	0.0200***	0.163***	0.392***
		(0.00208)	(0.00479)	(0.00360)	(0.00560)	(0.00674)	(0.00985)	(0.0109)
	Model 2	-0.124***	-0.280***	-0.144***	0.00727	-0.00282	0.133***	0.323***
		(0.00291)	(0.00605)	(0.00336)	(0.00677)	(0.00563)	(0.00946)	(0.0106)
	Model 3	-0.138***	-0.282***	-0.148***	0.125*	0.123	0.143*	0.153*
		(0.00708)	(0.0275)	(0.0187)	(0.0753)	(0.0780)	(0.0789)	(0.0901)
	Model 4	-0.0780***	-0.288***	-0.250***		0.0216	0.524***	0.640***
		(0.0292)	(0.0260)	(0.0368)		(0.118)	(0.164)	(0.210)
non-EU	Model 1	-0.0542***	-0.122***	-0.0480***	0.0590***	0.0200***	0.0860***	0.0727***
		(0.00446)	(0.00670)	(0.00542)	(0.00578)	(0.00485)	(0.00672)	(0.00552)
	Model 2	-0.0597***	-0.122***	-0.0368***	0.0430***	0.0222***	0.103***	0.0845***
		(0.00410)	(0.00657)	(0.00563)	(0.00520)	(0.00491)	(0.00690)	(0.00582)
	Model 3	-0.0954***	-0.135**	-0.0767*	0.0865	0.130*	0.151*	0.00704
		(0.0267)	(0.0590)	(0.0446)	(0.0628)	(0.0767)	(0.0776)	(0.0428)
	Model 4	-0.0107	-0.268***	-0.210***		0.0222	0.492***	0.458
		(0.111)	(0.0397)	(0.0767)		(0.117)	(0.174)	(0.279)

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

[1] This table includes only individuals who have been classified as highly educated.

[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Each model has the following controls: model (1) only regional and year-quarter controls, model (2) demographic characteristics, model (3) years, education, and experience in the UK and cohort of arrival, model (4) how they obtained their current job.

[4] Reported marginal effects.

[5] Number of observations per model: model (1) 381,291, model (2) 376,189, model (3) 376,189, model (4) 44,569.

[6] Outcome 4, model 4 not enough observations.

1.5.3 Results-Low Education

As we can see in table 1.4, the similar results like in the previous two education classifications are observed; immigrants are less likely to upgrade and more likely to downgrade when compared to natives. For model (1) for socioeconomic status one compared to natives the EU14 are 2% less likely to upgrade, the second generation are 1% less likely to upgrade, the A8 are 6% less likely to upgrade, and the non-EU are 3% less likely to upgrade. In the same model for socioeconomic status seven the EU14 are 6% more likely to downgrade, the second generation do not differ significantly from the natives, the A8 are 43% more likely to downgrade, and the non-EU are 5% more likely to downgrade.

In model (2), after controlling for demographic characteristics, there is a marginal change in the differences of upgrading and downgrading probabilities for the EU14 compared to natives when compared to the model (1) results. The same holds for all migrant groups.

In model (3) after we control for assimilation proxies the EU14 do not differ significantly from the UK natives for most results, the second generation migrants see no difference in their outcomes compared to model (2), the A8 see a decrease in the probabilities of downgrading compared to models (1) and (2) (for example now the probability of socioeconomic status seven for the A8 migrants compared to natives is 2% higher as opposed to 4% that it was in the previous two models), and the non-EU do not differ significantly from the natives when comparing most of the lower socioeconomic statuses. In model (4), after we control for way the current job was obtained, the EU14, the second generation and the non-EU migrants do not differ significantly from the UK natives for most results, the A8 outcomes suffer from lack of observations however show no significant difference from the UK natives being in socioeconomic statuses five to seven. The A8 results should be taken with caution.

Table 1.4: Probit Results for Downgrading/Upgrading from Low Education

		Low Education						
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
EU14	Model 1	-0.0206***	-0.0393***	-0.0215***	-0.00916	0.00415	0.0315***	0.0603***
		(0.00456)	(0.00883)	(0.00721)	(0.00778)	(0.00862)	(0.0104)	(0.0103)
	Model 2	-0.0183***	-0.0362***	-0.0203***	-0.00459	0.00284	0.0256**	0.0602***
		(0.00474)	(0.00893)	(0.00713)	(0.00791)	(0.00844)	(0.00999)	(0.0103)
	Model 3	-0.0300	-0.0817*	-0.0916***	0.0595	-0.000845	0.120*	0.0840
		(0.0213)	(0.0432)	(0.0158)	(0.0573)	(0.0491)	(0.0678)	(0.0677)
	Model 4	-0.0241	-0.109	-0.135***		0.137	0.165	0.0843
		(0.0461)	(0.0798)	(0.0276)		(0.193)	(0.223)	(0.216)
2nd Gen.	Model 1	-0.00933***	-0.00531	-0.00429	0.00795**	-0.00233	0.0199***	-0.00643
		(0.00257)	(0.00451)	(0.00361)	(0.00401)	(0.00408)	(0.00488)	(0.00432)
	Model 2	-0.00580**	0.00154	-0.00136	0.00960**	-0.00566	0.0154***	-0.0128***
		(0.00267)	(0.00458)	(0.00356)	(0.00396)	(0.00397)	(0.00475)	(0.00420)
	Model 3	-0.00544**	0.00175	-0.00131	0.00938**	-0.00589	0.0154***	-0.0128***
		(0.00267)	(0.00457)	(0.00360)	(0.00392)	(0.00397)	(0.00472)	(0.00418)
	Model 4	-0.00378	0.0186	0.0151		-0.0137	0.0152	-0.0309**
		(0.00547)	(0.0117)	(0.0113)		(0.00924)	(0.0139)	(0.0128)
A8	Model 1	-0.0576***	-0.184***	-0.110***	-0.0742***	-0.0811***	0.0652***	0.429***
		(0.00171)	(0.00450)	(0.00323)	(0.0101)	(0.0126)	(0.0228)	(0.0258)
	Model 2	-0.0566***	-0.182***	-0.110***	-0.0639***	-0.0902***	0.0677***	0.401***
		(0.00230)	(0.00526)	(0.00365)	(0.0117)	(0.0113)	(0.0227)	(0.0261)
	Model 3	-0.0587***	-0.176***	-0.116***	0.0230	-0.0744**	0.0622	0.243***
		(0.00265)	(0.0153)	(0.00458)	(0.0596)	(0.0353)	(0.0697)	(0.0924)
	Model 4		-0.140***	-0.147***		0.0591	0.118	0.224
			(0.0392)	(0.0107)		(0.166)	(0.223)	(0.242)
non-EU	Model 1	-0.0275***	-0.0815***	-0.0513***	0.0791***	-0.0225***	0.0634***	0.0514***
		(0.00303)	(0.00538)	(0.00414)	(0.00718)	(0.00563)	(0.00761)	(0.00718)
	Model 2	-0.0304***	-0.0811***	-0.0418***	0.0553***	-0.0261***	0.0799***	0.0573***
		(0.00278)	(0.00539)	(0.00450)	(0.00644)	(0.00551)	(0.00780)	(0.00734)
	Model 3	-0.0312	-0.0980***	-0.0931***	0.128*	-0.0396	0.155**	0.0498
		(0.0198)	(0.0373)	(0.0149)	(0.0678)	(0.0388)	(0.0689)	(0.0612)
	Model 4	-0.0251	-0.112	-0.139***		0.140	0.239	0.0350
		(0.0415)	(0.0754)	(0.0233)		(0.196)	(0.222)	(0.204)

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

[1] This table includes only individuals who have been classified as highly educated.

[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Each model has the following controls: model (1) only regional and year-quarter controls, model (2) demographic characteristics, model (3) years, education, and experience in the UK and cohort of arrival, model (4) how they obtained their current job.

[4] Reported marginal effects.

[5] Number of observations per model: model (1) 726,601, model (2) 716,582, model (3) 716,582, model (4) 62,254.

[6] Outcome 4, model 4 not enough observations.

1.6 Discussion of Empirical Results

In this introductory analysis, we assessed the probabilities of four immigrant groups to downgrade/upgrade to a greater/smaller extent than the natives in the labour market. By downgrading we imply a mismatch of higher obtained skills and a lower-skill occupation, by upgrading we imply a mismatch of lower obtained skills and a higher-skill occupation.
In order to capture this event we have separated the sample based on the level of education (low, intermediate, high) and we have matched each with a different socioeconomic status level. We used a number of exogenous characteristics as controls and, furthermore, we assessed the effects of different cohorts, potential job market experience in the UK and education in the UK on the observed outcomes.
Our findings suggest that the A8 immigrants are more likely to downgrade than the natives but less likely to upgrade, with the rest of immigrant groups to follow showing similar results but not as robust. We also saw that having obtained some education in the UK has a negative effect on downgrading, however the result of the effect of years in the UK on upgrading and downgrading is ambiguous.
All the above motivate further investigation into the labour market behaviour of immigrants; the extent of downgrading suggests that human capital is being wasted through downgrading, and that targeted assimilation policies might help mitigate this.

1.7 Thesis Structure

In the first chapter of this thesis we assess the joint decision of the immigrants over the labour market and over the use of the welfare provisions of the host country. We take into account the possible effect the differences in the purchasing parities between the home countries and the UK might have in labour market outcomes. Our findings suggest that male employment is slightly affected by the aforementioned differences in purchasing parities, and that the decisions regarding the labour market and welfare use are highly correlated. Furthermore, our results suggest that the differences in the

purchasing power parities have an indirect effect on the benefit claims of the immigrants. In the second chapter we build upon the previous findings by assessing the level of vulnerability of immigrants to economic shocks with respect to the level of vulnerability of natives. The main interest is in whether immigrants who entered the country under free or a restricted migration regime show higher levels of vulnerability than the natives during difficult economic periods. The periods we utilise for this part of our analysis are the years before the 2008 economic crisis and the years during the crisis. Our findings suggest that the A8 immigrants did almost as well as the UK natives during the crisis, but that their outcomes were affected adversely to some degree by the fact that they were mainly employed in elementary jobs, which held higher unemployment rates during the crisis. The opposite result held for immigrants from the old EU member states, where they were affected positively by the fact that they were mainly employed in higher skilled and managerial occupations. Just as with the A8 immigrants, they did as well as the UK natives during the crisis. Finally, we find that the non-EU immigrants as well as the Second Generation immigrants were affected most by the crisis. In the third chapter, we focus on job separation rates and how these differ between immigrants and natives, finding that separations where higher for all immigrant groups, an effect which lessened somewhat during the economic crisis. In the sections that follow, we present the three chapters that constitute the main body of the thesis and then the overall conclusion. The Appendixes of each chapter follow and finally the bibliography is presented.

2

Welfare use under unrestricted migration in the UK

2.1 Introduction

Free migration laws between countries are not the norm when it comes to migration flows of economic immigrants[1]. However, several European Union member states have been gradually allowing free movement of workers from other EU member states over the years. Such political decisions have economic and social implications and thus, have been subject to much debate. Even more so, as some of the new member states had at the time of their accession significantly lower average income distributions than the average of the old member states. More specifically, the accession of new countries in the European Union back in 2004 and later on, in 2007 was heavily debated. However, one specific strand of debate that attracted a lot of attention was about the possible ”abuse” of the welfare state provisions of the old member countries of the EU by the migrants

[1] Meaning migrants that immigrate to find work.

(Giulietti and Wahba, 2012).

Recent literature has not verified these fears, but quite the opposite, it has shown that even when migrants are eligible for benefits, they do not claim as much as the natives, (Dustmann et al., 2009). This paper aspires to explain the reasons behind these observed outcomes, by analysing the welfare dependence of the individuals jointly with their labour market outcomes.

One of the main connections between labour market outcomes and welfare support is through the reservation wage. Income support or unemployment benefits could have a mitigating effect on the hours a person chooses to work by increasing her reservation wage, or by making her more selective over prospective jobs, in this way expanding the duration of her unemployment period, (Cahuc and Zylberberg, 2004). At the same time, when two countries have great differences in their income distributions, any specific amount of disposable income earned in the host country will have higher purchasing power in the home country of the immigrant. This paper aims to investigate whether this incentive is actually also affecting the labour market outcomes of immigrants by shaping lower reservation wages for them and, thus, increases their employment levels, leading eventually to a lower degree of dependence on welfare.

We will focus on the case of the UK as a recipient country for immigrants from the 14 old member states, from now on called EU14, and for immigrants from the A8[2] new EU member states. The reason we choose the UK is because of all the 15 old member states, only the UK, Sweden and Ireland allowed free access to their labor markets to A8 immigrants, whereas the rest of the old member states applied a seven year transitional period before completely opening their borders, (Barrett and McCarthy, 2008). Furthermore, by 2009 Germany and the UK had received 62% of the total population of migrants from the A8 countries. For the above reasons, the UK is a perfect candidate for investigating the aforementioned research question.

We should note two key assumptions that are essential for this paper. The first is that

[2]The EU expanded in 2004 to include ten new member states. The ten countries that entered the EU were Malta, Cyprus, Poland, Lithuania, Estonia, Czech Republic, Hungary, Latvia, Slovakia, and Slovenia. Apart from Malta and Cyprus, which were already close to the EU economic standards at the time of the accession, the other eight countries, collectively termed the A8, had income distributions quite far from those of the old member states.

the British pound has different purchase power parities in the EU member states. As we show later on in the data descriptives section, this seems to hold. The second is that migrants intend to spend some of the income that they gain in the host country back in their home countries, either in the form of remittances today or in the form of savings that will be used in the home country in the future, when the migrant returns. This assumption cannot be tested using our data as such a question is not included. However, Vargas-Silva (2013), using evidence from World Bank data, claimed that the volume of remittances from the UK to Poland is quite high, with Poland being amongst the largest recipient countries for remittances from the UK. This point is quite reassuring as Poland is the source of the greatest migrant inflows to the UK among the A8 countries[3]. One more important point worth making is that by "welfare state", we mean the benefit provisions in the host country, leaving aside the use of the health care system, for which we do not have micro-data linked to our data-set.

Benefits can be decomposed initially in the following sub-groups: unemployment benefit, income support (not for the unemployed), sickness or disability benefit, state pension, family benefit, child benefit and house/council tax benefit (Spicker, 2011). Those benefits have a part which can depend on the person's labour market outcome and another part exogenous to any employment choices of the person, for example the disability benefit. In order to be able to estimate the probability of an individual claiming benefits, we have to control for the characteristics linked to the eligibility criteria for the different types of benefits. Even though benefits like the disability benefit are straightforward, things become more complicated when we consider benefits that are dependent on the employment status of the individual.

Our contribution is that we assess the welfare use under a free migration regime, by taking into account the labour market outcomes of the individuals. Furthermore, we include a proxy that aims to capture the possible incentive immigrants might have in the labour market due to differences in the purchasing power of the host and home currencies, which might eventually determine at some level their labour market outcomes.

Even though we provide a sketch of a model that shows the direction of the outcomes we

[3] Own calculations of the author, using data from the Quarterly Labour Force Survey.

observe, our approach is mainly empirical. We use the Quarterly Labour Force Survey of the UK in order to estimate the probability of claiming benefits given that a person is either an A8 immigrant, an EU14 immigrant, or a UK native. In the analysis we control for some demographic characteristics that might affect benefit claims (for example having dependent children or having a disability) and the aforementioned proxy related to immigrant incentive for lower reservation wage in the labour market.
The rest of the paper is structured as follows: section 2 reviews the literature on migrants' employment and benefits' decisions. In section 3 we present a theoretical framework that explains some of the mechanisms at work and motivates the empirical approach. section 4 introduces the data used for the empirical analysis, and section 5 provides details of the econometric approach. The results and implications follow in section 6 and finally, section 7 concludes.

2.2 Literature Review

The research regarding the use of the welfare state by immigrants in the UK began mainly within the confines of research over the fiscal effects of immigrants. The main interest was about their total net position within the welfare state and the use of benefits was only one part of it. Reports that addressed this issue were by Gott and Johnston (2002) and later on by Sriskandarajah et al. (2005). Barrett and McCarthy (2008) turned their interest solely on the use of benefits by immigrants using the BHPS dataset for the year 2007 and found that immigrants were more likely to claim benefits than the UK natives. However, their results should be taken with caution as the greatest percentage of their immigrant sample was from Ireland and for this reason the findings should not be generalised for the whole immigrant population. This view can be supported when one compares the former to the findings of Dustmann et al. (2009); using the Labor Force Survey for the years $2004 - 2009$, they found that the $\mathrm{A}8$ immigrants were less likely to claim benefits than the UK natives even when controlling for various different demographic characteristics. On the other hand, after assessing the welfare use by different immigrant groups, Drinkwater and Robinson (2013) found that some immigrants

were more likely to claim benefits than the UK natives (mainly immigrants from Asia) while others were less likely (Australasian immigrants and EUA8 immigrants). Finally, Dustmann and Frattini (2013) using the LFS for a time span from 1995 to 2012 found that EEA immigrants were less likely to claim benefits or tax credits than the UK natives while the non-EEA were claiming benefits at a similar rate as the natives.

The second area that we focus on are the labor market outcomes of the immigrants in comparison to the labor market outcomes of the native population. We can see already, in the paper by Dustmann et al. (2009) that the A8 immigrants have higher employment and participation rates than the UK natives. Nevertheless, their wages are lower than those of the natives, but with increasing growth rates. The literature on labor market results of immigrants in the UK has so far found different employment rates for the recent immigrants, heavily dependent on their country of origin, and lower earnings than the natives (Clark and Drinkwater, 2008b). In this paper, instead of investigating the possible reasons that might adversely affect the labor market outcomes of immigrants[4], as they are reported by Clark and Drinkwater (2008b), we focus on possible monetary incentives that might increase the probability of employment of migrants.

Dustmann et al. (2011) identify as a possible reason for return migration the higher purchasing power of the earnings of immigrants back in their home countries. Return migration combined with higher purchasing power of earnings in the home country, could also lead to lower reservation wages (Dustmann, 2001). Interestingly, Nekoei (2013) finds that migrant workers in the USA adapt their hours of work based on the depreciation of their host currency against the US dollar. Finally, Clark and Drinkwater (2008b) claim that the difference between the purchasing powers between the host and the home country might have an effect on the types of jobs the immigrants are willing to do if their migration decision includes sending remittances back home or saving money to be spent in the home country. All the above statements and findings motivate our approach into investigating further incentives of migrants in the labour market based on differences in the purchasing power parities of the host and the home countries.

Our econometric model will be estimated using a bivariate probability model. This

[4] 1. Non-transferable skills, ineffective human capital, 2. Permanent or temporary migration, 3. Discrimination.

model is appropriate when there is an endogenous influence on two binary outcomes, leading to their error terms to be correlated (Greene, 2003). In our case the two outcomes are the receipt of benefits and the employment status and two different specifications of this model will be used. In the first case where the benefit outcome is the unemployment benefit, a recursive bivariate model is used, while in the second case where the benefit outcome is any other income related benefit - but not those linked to unemployment status - a seemingly unrelated bivariate probability model is used.
The purpose and the main contribution of this paper is to identify one of the main reasons behind the difference between natives' and immigrants' claims of benefits by addressing this question on a broader setting, where the choices of the immigrants in the labor market, and not only their demographic characteristics, drive the observed results.

2.3 Data Description

We are using the Quarterly Labour Force Survey for the UK for the period between the second quarter (April-June) of 2005 until the forth quarter (October-December) of 2013. As we are interested in people who migrated under free migration laws, we keep in our sample the UK natives and immigrants that migrated from any EU old member state countries[5] and anyone who migrated from an A8 country, after the accession of these countries in 2004 in the UK. The A8 countries entered the EU in May 2004, however we cannot distinguish between the immigrants that entered during April under a restricted migration policy or May under free movement. We include all immigrants who have been in the UK for at least a year which is the minimum time for A8 immigrants to be granted equal rights of use of benefit provisions as the natives.
The QLFS is a rotating panel, where each household enters the survey and is observed for five subsequent quarters. We treat it as a pooled cross-section and cluster the stan-

[5]This implies the 14 remaining countries from the EU15 member states: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden.

dard errors at the individual level. Each year is split to four quarters[6]. Our unit of observation is the person-year quarter.

The QLFS for the UK offers information about the socioeconomic characteristics of the individual, as well as the country of origin and the year of migration- vital information for our research question. As previous research has indicated (Dustmann et al., 2009), it does not include any weights for the country of origin of the immigrant and it does not include people who have been living in their current address for less than six months, so it is quite likely that the number of immigrants is underestimated, especially if they are seasonal workers. However, of all the available microeconomic surveys it is the most informative one.

We include three major groups of countries in our analysis. The first group is the reference group, which consists of the UK natives. The immigrant groups are separated based on differences of their income distributions and years since accession, so the second group includes the A8 immigrants and the third includes immigrants from EU14 countries.

The A8 immigrants did not have the right to claim benefits or tax credits during the first year of their residence in the UK, unless they registered to the Worker Registration Scheme (Migration Advisory Committee (2009)). Furthermore, they had to fulfil one year of continuous employment before they could apply for income related benefits in the same way as the EU15 member states' nationals. After that first year they could claim both contributory[7] and non-contributory benefits. In order to have a sample of immigrants who are equally eligible for the same benefits, the A8 immigrants who will be included in our sample should have been in the country for at least one year. For the EU14 immigrants, if they have a "right to reside"[8], they can claim public funds as the UK nationals do. The same does not hold for the rest of the immigrants; they might be

[6]Quarter 1: January-March, Quarter 2: April-June, Quarter 3: July-September, Quarter 4: October-December.

[7]Regarding the contributory benefits, in general one can claim these sort of benefits after two years of contributions, however, this is not strictly so (Spicker, 2011).

[8]If they are an EEA national they are automatically given a three-month right to reside when they enter the UK, but this is not accepted as a right to reside for the habitual residence test. However, under European law, if they take up work in the UK, they also gain a right to reside and may be able to claim certain benefits(Citizens Advice Bureau).

under "immigration control" which means that they are not allowed to claim any public funds[9]. This, along with the fact that we are interested in immigrants that entered the country under free migration laws, is one of the main reasons we do not include immigrants from other countries, as restrictions to their eligibility for benefits is likely to lead to under-estimation of their claims. Finally, we do not include people who are still in full-time education as they are not eligible for benefits and -usually- do not work.

Our dependent variables are benefit claims and labour market outcomes. The welfare benefits are divided into two categories; unemployment benefits and income related but not unemployment benefits. The labour market outcome is a dummy on whether a person is currently employed or not. We control for a series of demographic characteristics; age, age squared, gender (reference category female), having dependent children in the household under the age of 19, the number of dependent children in the household and disability status. We control also for the level of education following the classification of Dustmann et al. (2009), where a person is considered to have obtained low education if they dropped education at the age of 16, intermediate education if they dropped out at the age of 20 and higher education if they dropped out any time after the age of 21.

Furthermore, we created a proxy in order to capture the personal cost one individual is willing to undertake in order to be employed[10]. In order to capture the "downgrading" in the labour market we created a dummy that indicates downgrading if a person of high education has classified her occupation as an elementary (not-skilled) one. This proxy is used as an indicator that motivates our research question.

In order to capture the purchase power of each country in a comparable way, we use the Eurostat indicator called Comparative Price Levels[11]. As Eurostat explains "*CPLs are the ratio between the Purchasing Power Parities (PPPs) and market exchange rate for each country. PPPs are currency conversion rates that convert economic indica-*

[9] Attendance allowance, Carers allowance, Child benefit, Child tax credit, Council tax benefit, Council tax reduction, Disability living allowance, Housing and homelessness assistance, Housing benefit, Income-based jobseekers allowance, Income related employment & support allowance, Income support, Personal independence payment, Severe disablement allowance, Social fund payment, State pension credit, Universal credit, Working tax credit.

[10] More on the theoretical motivation behind the use of this variable in Appendix B.

[11] Comparative price levels of final consumption by private households including indirect taxes (EU28 = 100).

tors expressed in national currencies to a common currency, called Purchasing Power Standard (PPS), which equalises the purchasing power of different national currencies and thus allows meaningful comparison. The ratio is shown in relation to the EU average (EU$28 = 100$*). If the index of the comparative price levels shown for a country is higher/ lower than* 100*, the country concerned is relatively expensive/cheap as compared with the EU average*" (Eurostat, 2015). As we are interested in the differences of the Purchasing Power of the home country with respect to the Purchasing Power of the host countries we created a ratio of the CPL of the home country to the CPL of the UK per year. In that way the CPL is now indicating how much more expensive or cheap the home country is compared to the UK. The CPL ratio for the UK will then be normalized to one for any point in time. Finally, we include year-quarter and residential dummies.

2.3.1 Descriptive Statistics

In this section we will present the characteristics of the data with respect to the variables included in the regressions. In table 2.1 we can see the demographic characteristics of the natives and the different groups of immigrants. All the immigrants that entered the country after 2004 are on average more than ten years younger than the natives. There also seem to be more female EU14 immigrants than males.

Table 2.1: Demographic Characteristics

	UK	**EU14**	**A8**
Age	43.7	42.8	30.9
	(0.020)	(0.119)	(0.091)
Gender (male %)	49.9	46.4	50.8
	(0.001)	(0.004)	(0.006)
Disability	23.8	19.7	5.5
	(0.001)	(0.003)	(0.002)
Has Children in HH	37.4	37.4	47.7
	(0.001)	(0.004)	(0.006)
Number of Children	0.7	0.7	0.7
	(0.001)	(0.009)	(0.011)
Education			
Low	55.0	33.8	9.7
	(0.001)	(0.004)	(0.003)
Intermediate	27.2	31.6	53.9
	(0.001)	(0.004)	(0.006)
High	17.8	34.6	36.4
	(0.001)	(0.004)	(0.006)
Downgrading	1.9	3.7	42.5
	(0.000)	(0.002)	(0.008)
Number of Observations	2,165,276	52,153	24,645

[1] Weights were used for the estimation of age and gender.

[2] *Source*: QLFS,2005 Quarter 2- 2013 Quarter four.

Immigrants from the A8 countries hold a higher percentage amongst all groups of having at least one dependent child in the household, however the average number of dependent children in the household seems to be similar among all groups. Regarding the disability status, we see high levels for the EU14 immigrants and for the UK natives. As those two groups contain people who are older on average than the other two groups, this statistic is not surprising. Finally, we observe substantial differences in the distributions of the educational levels of the three groups. Half the UK natives fall into the low

education category. The EU14 immigrants have similar proportions of people at each educational level. What is most remarkable, though, is the educational distributions of the A8 immigrants. The great majority of the A8 immigrants are mainly categorised as intermediate or higher educated.

Comparing the labour market outcomes between the three groups, we can see how much better the A8 immigrants are performing with respect to the rest of the groups. We present the labor market outcomes in Table 2.2. The A8 immigrants hold the highest employment and participation rates, and slightly higher unemployment rates than the other groups. The EU14 immigrants and the UK natives have similar performances in terms of employment and participation rates.

Table 2.2: Employment Status

	UK	**EU14**	**A8**
In employment	69.8	70.2	84.2
ILO unemployed	4.2	4.1	4.9
Inactive	26.0	25.6	11.0
Number of Observations	2,165,276	52,153	24,645

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.

In table 2.3 we can see the descriptives for the welfare claims. The group that depends the least on welfare provisions are the A8 migrants. Their claims are mainly for child benefits and housing/council tax benefits. Given their high claims of housing benefits, looking at table B.2 one can easily recognise as a possible reason the extremely disproportionately high levels of renting compared to other tenancy types, and also compared to the tenancy figures of the EU14 migrants and the UK natives.

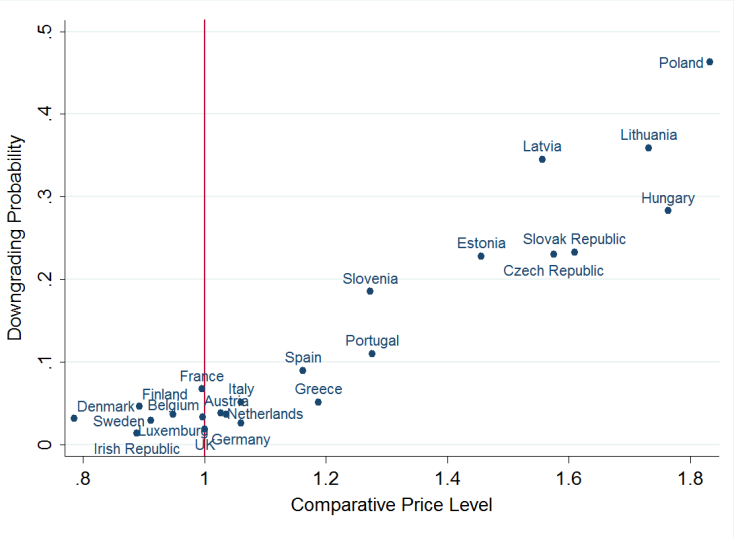
Table 2.3: Benefit Claims per Population Group

	UK	EU14	A8
Claim Benefits	44.2	40.8	31.1
	(0.001)	(0.004)	(0.005)
Income Based Benefits	40.6	38.3	27.0
	(0.001)	(0.004)	(0.005)
JSA	2.2	1.8	1.2
	(0.000)	(0.001)	(0.001)
Number of Observations	2,160,706	52,056	24,571

Source: *QLFS,* 2005 *Second Quarter-* 2013 *Fourth Quarter.*

The one-year ago job classification distributions of the groups are quite diverse as well as can be seen in table B.4. The UK natives are distributed between the different groups in a relatively uniform way, although slightly more clustered towards higher specialization occupations. The EU14 immigrants are mainly employed in higher managerial, administrative and professional occupations, but also have a high percentage in elementary occupations. The A8 immigrants on the other hand, are mainly employed in elementary and manual occupations, which contradicts the fact that their educational background is relatively quite high. This result might be due to difficulties in the language, non transferrable skills or even, as we explain later on, due to the fact that they have incentives to minimise their periods of unemployment.

Table B.1 includes the Comparative Price Levels of the EU countries in comparison to the reference group, which is the UK. In the table and the estimations that follow, the CPL is greater the richer a country is relative to the UK. The inverse classification (the richer a country is relative to the UK, the lower the CPL) was used for the graph 2.1, where the probabilities of downgrading (probability of being currently employed at an elementary profession while being highly educated) are plotted against the average CPL levels of the countries. This motivates using CPL as a proxy that captures the willingness for ”sacrifices” in the labour market.



(a) Downgrading and Comparative Price Levels

Figure 2.1: Downgrading and Comparative Price Levels

2.4 Econometric Model

2.4.1 Main Specification

The main focus of this paper is to explain why different employment outcomes between natives and immigrants might explain the fact that immigrants rely less on benefits than natives at any given point in time, even though they are equally eligible. More precisely, we deal with the employment outcomes and the welfare claims outcomes as two results jointly determined within a specific decision framework of the individual. We use a pooled cross-section to study that question, and we control for characteristics of the individuals that drive the eligibility for benefits. The basic econometric specification is:

$$y = a + X'\beta + I'\gamma + \tau_t + \varepsilon$$

where X = age, age squared, gender, children in the household dummy, number of

children in the household, education level, disability, I = A8 immigrant, EU14, UK native , t = year-quarter dummies. The benefit claiming outcome is in the form of a binary variable[12] and the employment outcome is a binary variable as well[13].
However, the two outcomes are correlated and if this correlation is not taken into account, then our estimation might be inefficient. Thus, we need to control for this correlation of the error terms, given the independent parameters.
The model is nonlinear with correlated error terms. It would be even more precise to say that both the benefits' claiming variable and the employment outcome variable are determined within a system by a series of exogenous variables (Wooldridge, 2010a) and thus, the most appropriate way of estimating this system would be by a bivariate probit model using maximum likelihood (Greene, 2003).

Our main econometric specification is then written as:

$$y_1^* = a_1 + \beta_1' X_1 + \xi' X_2 + \gamma_1' I_1 + \tau_{1t} + \varepsilon_1$$
$$y_2^* = a_2 + \delta' y_1 + \beta_2' X_1 + \gamma_2' I_2 + \tau_{2t} + \varepsilon_2$$

or

$$y_1^* = \beta_1' X_1 + \nu_1' Z_1 + \varepsilon_1 \tag{2.4.1}$$
$$y_2^* = \beta_2' X_2 + \nu_2' Z_2 + \varepsilon_2 \tag{2.4.2}$$

where $\nu_1' Z_1 = a_1 + \gamma_1' I_1 + \tau_{1t}$ and $\nu_2' Z_2 = a_2 + \gamma_2' I_2 + \tau_{2t}$, and y_1^* and y_2^* are unobservable. What we observe is the binary outcome for both cases following the rule:

$$y_1 = \begin{cases} 1 \text{ if } y_1^* > 0 \\ 0 \text{ if } y_1^* \leq 0 \end{cases}$$

$$y_2 = \begin{cases} 1 \text{ if } y_2^* > 0 \\ 0 \text{ if } y_2^* \leq 0 \end{cases}$$

[12] Benefit = 1 if the individual is claiming a state benefit and zero otherwise.
[13] Employed = 1 if the person is employed and zero if the person is unemployed or inactive.

But the problem here is that the error terms are correlated and thus $Cov[\varepsilon_1, \varepsilon_2 \neq 0]$ in a way such that:

$$\varepsilon_1 = \eta + u_1$$
$$\varepsilon_2 = \eta + u_2$$

We assume that η, u_1, u_2 are normally distributed, thus $\varepsilon_1, \varepsilon_2$ are normally distributed but also dependent. (This specification can be modified in order to take heteroscedasticity into account (Greene, 2003).)

$$\left(\begin{array}{c|c} \varepsilon_1 & \\ \varepsilon_2 & X, Z \end{array} \right) \sim N \left[\left(\begin{array}{c} 0 \\ 0 \end{array} \right), \left(\begin{array}{cc} 1 & \rho \\ \rho & 1 \end{array} \right) \right]$$

where $X = X_1, X_2$ and $Z = Z_1, Z_2$. Which leads to the fact that we are interested in the joint probability of y_1 and y_2:

$$\begin{aligned} P(y_1 = 1) &= P(\varepsilon_1 > -(a_1 + \beta_1' X_1 + \xi' X_2 + \gamma_1' I_1 + \tau_{1t})) \\ &= P(\eta + u_1 > -(a_1 + \beta_1' X_1 + \xi' X_2 + \gamma_1' I_1 + \tau_{1t})) \\ &= P(\eta + u_1 > -(\nu_1' Z_1 + \xi' X_2)) \end{aligned}$$

and

$$\begin{aligned} P(y_2 = 1) &= P(\varepsilon_1 > -(a_2 + \beta_2' X_1 + \gamma_2' I_2 + \tau_{2t})) \\ &= P(\eta + u_2 > -(a_2 + \beta_2' X_1 + \gamma_2' I_2 + \tau_{2t})) \\ &= P(\eta + u_2 > -(\nu_2' Z_1)) \end{aligned}$$

The joint probability of the two outcomes enters the log-likelihood in the form: $P(y_1 = 1, y_2 = 1) = \Phi(w_1, w_2, \varrho)$ and the likelihood to be maximized is

$$ln(L) = \sum_{i=1}^{n} ln\Phi(w_{i1}, w_{i2}, \varrho_i)$$

In the case where the benefit outcome is the unemployment benefit, due to the specific nature of the jobs seekers allowance (JSA) a slightly different specification is adopted. The JSA is mainly given to individuals who are unemployed and are actively looking for a job. It can be given to employed individuals as well, as a form of income support but that is not the norm. In this case, the one outcome is a significant prerequisite of the other outcome. For this reason we use a recursive simultaneous equations model and as instruments, we use the type of job classification of the individuals a year ago. The joint probability of the two outcomes will now be:

$$P(y_1 = 1, y_2 = 1) = \Phi(x_1'\beta_1 + \gamma y_2, x_2'\beta_2, \varrho)$$

2.4.2 Estimation

In order for the above model to be identified when $Cov(\varepsilon_1, \varepsilon_2) \neq 0$, - which we have good reason to believe holds - no further assumptions need to be made nor exclusion restrictions are needed, apart from the fact that the error terms are jointly normally distributed.

Our main interest in this paper is the difference of the labour market outcomes between the natives and the immigrants, and how this affects their claiming of benefits. As we explained earlier at the demonstration of the basic mechanisms, we expect that the differences in purchasing parities between the host and the home country affect the labour market outcomes of the immigrants, thus one type of variable that should be included in equation (2) is the CPL ratio between the home and the host country. Furthermore, it has been found that women's labour supply is continuous whereas men's labour supply is discrete in the UK (Blundell et al., 2007). What this means is that women are found to enter the labour market and provide various different hours of work, whereas men either

enter or do not enter the labour market and when they enter they mainly work full time (ibid). For this reason we present the employment outcomes separately for each gender type. However, we do not do so in the bivariate regressions, as it could be the case that within a household the fact that females claim for a specific benefit more than males, or vice versa, does not necessarily imply that the other members are not benefiting from it. When claims are made the income of the spouse or the partner are taken into account, so separating the benefit regressions by gender might be misleading if it is the case that more females or more males are more likely to claim a specific benefit on behalf of the household.

The costs people are willing to take in the labour market are partly affected by the differences in the CPL ratios between the countries but also by the personal preferences of the individual. Since the CPL ratio does not affect the benefits outcome directly, but only through the costs people are willing to undertake in the labour market, the CPL ratio is included only in the labour market outcome regression.

Since the correlation of the error terms of the two equations is not only created due to the immigration status, it would also exist had there not been any immigrants. For this reason we will include previous employment type as an instrumental variable for the recursive model. Finally, all estimations include year-quarter and region of residence dummies.

2.5 Results

We start our analysis by presenting in table 2.4 the results of simple univariate models, where the outcome of interest is the probability a person being employed (full results can bee seen in table B.5). In the first column we only control for the immigrant status dummies. The control group is the UK natives. Being an A8 immigrant (compared to being a UK native) increases the probability of employment by 0.145, while being an EU14 shows no significant increase in the probability of employment compared to natives. After controlling for demographic characteristics we see that differences in observable characteristics are partly responsible for the better outcomes immigrants seem

to have compared to natives. Now, being an A8 immigrant decreases the probability of being employed by 0.0287. However, it is worth mentioning that when comparing female employment outcomes, being an A8 immigrant decreases the probability of employment by 0.0931, while when comparing males being an A8 immigrant increases the probability of employment by 0.0462. After controlling for CPL and previous occupation a year ago, it seems that the clustering of the immigrants in specific categories that probably suffer higher unemployment rates is partly the reason for their relative disadvantage in the labour market; being an A8 immigrant increases the probability of employment approximately by 0.04 and being an EU14 immigrant increases the probability of employment approximately by 0.03. The CPL seem to have an infinitesimal effect on the employment probabilities which is also hardly significant. This does not cancel out the initial hypothesis, but perhaps a better proxy would be needed. It is also worth noting here, how the probability outcome for males only (table B.6) is much more robust than the results for females (table B.7).

Table 2.4: Probability of Employment

		(1)	(2)	(3)	(4)
All	A8	0.145***	-0.0287***	0.0263	0.0458***
		(0.00391)	(0.00593)	(0.0863)	(0.00440)
	EU14	-0.00238	-0.0357***	0.0103	0.0343**
		(0.00387)	(0.00432)	(0.0689)	(0.0155)
Males	A8	0.175***	0.0462***	0.138***	0.0429***
		(0.00378)	(0.00666)	(0.0514)	(0.00183)
	EU14	0.0145***	-0.00973*	0.0975	0.0354**
		(0.00530)	(0.00553)	(0.0600)	(0.0142)
Females	A8	0.115***	-0.0931***	-0.0660	0.0416**
		(0.00640)	(0.00859)	(0.136)	(0.0207)
	EU14	-0.00672	-0.0559***	-0.0954	0.0197
		(0.00542)	(0.00624)	(0.108)	(0.0418)
	Observations	2,310,769	2,286,103	2,228,399	337,702

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.

[1] The p-values to indicate significance are denoted by * p$<$ 0.05, ** p$<$ 0.01, *** p$<$ 0.001.

[2] Reported marginal effects, model (1) no controls, model (2) controls for age, age squared, gender (when "All"), number of children in household, dummy for children in household, disability, marital status, education level, model (3) also controls for CPL, model (4) also controls for job specification one year ago.

[3] We also include year-quarter and regional dummies.

In table 2.5 we see that being an A8 immigrant decreases the probability to claim unemployment benefits compared to being a native by 0.00706, however the difference is small (details for the rest of the covariates in table B.8). Being an EU14 immigrant decreases the probability of claiming unemployment benefits by 0.00452, however this difference becomes insignificant once we control for demographic characteristics. Regarding claims of other income related benefits, being an A8 immigrant seems to increase the probability of claiming benefits compared to being a native by 0.0363 once we control for demographic characteristics. However, once we control for type of ten-

ancy being an A8 immigrant decreases the probability of those claims by 0.102, indicating that it is mainly the housing benefit that drives those results. Being an EU14 immigrant decreases the probability of such claims compared to natives for all model specifications. In table B.9 we present the results for all the covariates.

Table 2.5: Probability of claiming benefits

	Unemployment Benefits		Income Related Benefits		
	(1)	(2)	(1)	(2)	(3)
A8	-0.0110***	-0.00706***	-0.130***	0.0363***	-0.102***
	(0.000924)	(0.000544)	(0.00499)	(0.00725)	(0.00608)
EU14	-0.00452***	-0.000145	-0.00690*	-0.00958**	-0.0351***
	(0.000924)	(0.000735)	(0.00413)	(0.00460)	(0.00445)
Observations	2,305,854	2,281,864	2,305,854	2,281,864	2,280,978

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.
[1] The p-values to indicate significance are denoted by * p$<$ 0.05, ** p$<$ 0.01, *** p$<$ 0.001.
[2] Reported marginal effects.
[3] We also include year-quarter and regional dummies.
[4] For unemployment benefits: model(1) no controls, model (2) controls for age, age squared, gender , number of children in household, dummy for children in household, disability, marital status, education level.
[5] For income related benefits: model(1) no controls, model (2) controls for age, age squared, gender , number of children in household, dummy for children in household, disability, marital status, education level, model (3) also controls for tenancy type.

In table 2.6 we see the results from the seemingly unrelated bivariate model displaying the probability of claiming income related benefits for the case that the individuals are employed and for the case that the individuals are unemployed. Being an A8 or an EU14 immigrant does not change the probability of claiming income related benefits in case of employment, while being an A8 immigrant decreases the probability of claiming such benefits by 0.0793 in the case of no employment. We also found that the correlation between the two outcomes is negative and very strong (-0.646) as well as significant at a 1% significance level. This indicates that the best approach would require the unobserved correlation of the error terms to be taken into account. Finally,

in the same table we see the results for the recursive model for claims of unemployment benefits. Being an A8 immigrant significantly decreases the probability of claiming unemployment benefits than the natives by 0.256. Also, not surprisingly, being employed has a strong negative effect on the probability of claiming the Job Seeker Allowance. Again the unobserved correlation was found to be negative (-0.236) and significant at a 1% significance level. Results for the rest of the covariates can be seen in tables B.10 and B.11.

Table 2.6: Seemingly Unrelated Bivariate Probit & Recursive Bivariate Probit

	P(11)	P(10)	Recursive
A8	0.00978	-0.0793***	-0.256***
	(0.0297)	(0.0293)	(0.089)
EU14	-0.0318	0.00451	0.037
	(0.0294)	(0.0293)	(0.063)
Observations	2,223,388	2,223,388	334,913

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.

[1] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.

[2] Reported marginal effects, the first two columns are for the SUR bivariate probit for the probability of claiming income related benefits, and the third column is the recursive bivariate probit for the probability of claiming unemployment benefits.

[3] For the SUR bivariate probit, outcome P(11) is probability of claiming benefits and being employed and outcome P(10) is probability of claiming benefits and being unemployed.

[3] The SUR bivariate probit controls for demographic characteristics, CPL and tenancy type. The recursive bivariate probit controls for demographic characteristics.

[4] We also include year-quarter and regional dummies.

2.5.1 Limitations

An important limitation of the dataset is that it has no information on non labour income. Since the study is on benefit claims and how they are determined together with labour market outcomes, differences of non labour income, and possibly systematic differences of non labour income between natives and migrants, might be able to explain a great deal of the observed outcomes of the different population groups. Non labour income is expected to affect both labour market outcomes and welfare claims; for example high non labour income normally means higher reservation wage, and at the same time -if high enough- ineligibility for benefits. If we want to be able to identify the reasons behind the differences between migrants and natives in those outcomes, it is essential that we have information on important factors like non labour income.
Another limitation is not having a view of individuals as parts of a household; employment and welfare decisions are possibly taken taking into account the finances and the needs of the household as a whole, something we cannot observe in the data. Perhaps some of the welfare/employment combinations observed are the result of a household decision rather than one person.
Finally, since migrants have the choice or returning back home during times of hardship, this could mean that the observed labour market outcomes of those who remain would seem better than what they would be had no return migration taken place. As a consequence welfare claims are also likely to be lower than what they would be had there been no return migration of the less successful migrants. Thus, this could create a biases for both outcomes.

2.6 Conclusion

In this paper we estimated the joint decision over the labour market behavior of an individual and the benefits they are claiming, restricting the sample to eligible claimant migrants. We found that the two outcomes are highly negatively correlated after controlling for the observable characteristics of the individuals, and that the correlation is

significant. Thus, we concluded that these two outcomes are better estimated jointly.
Furthermore, we elaborated the hypothesis of how specific incentives for the immigrants might affect their labour market choices an thus their labour market outcomes. Even though the proxy we chose to use did not seem to have significant effects on the differences between labour market outcomes of immigrants and natives, it might be the case that this specific proxy is not ideal. We saw that, on average, being an A8 immigrant decreases the probability of benefit claims and increases the probability of employment. At the same time, being an EU14 immigrant doesn't seem to significantly change the probabilities of employment and benefit claims. The positive outcomes of the A8 immigrants when compared to the natives might be due to the fact that immigrants return back home or out-migrate when unemployed. If that is the case then the better labour market outcomes and low benefit claims are not a result of a "success story", but at least partly of a biased outcome due to missing information. It could also be the case that A8 immigrants only enter the UK when they have already found a job, so the risk of unemployment is very low for them.
Some other limitations we faced were the insufficient information about the population weights of immigrants, or whether some other member of their family was claiming benefits. Furthermore, it would have been very beneficial if we had more information about the individuals' non-labour income, which would have made the estimation of the labour market outcomes more precise. Ideally, such a study would use information on household level income and benefit claims so that safer inferences could be made.
Despite the above limitations, we obtained some interesting results that could motivate further research on the differences of the incentives of immigrants and natives and how these affect the immigrants' choices regarding welfare use and their labour market outcomes.

3

The effects of the Economic Crisis on Natives and Immigrants in the UK

3.1 Introduction

In this paper we assess the labour market performance of immigrants compared to the natives at different phases of the business cycle in the UK. The focus of the paper is on the levels and the duration of unemployment during the recent economic crisis in the UK and how it differed for different demographic groups, with the categorization being made based on the country of origin. Immigrant unemployment and the rate at which immigrants find jobs is politically sensitive in European countries because of public perceptions about both immigrant benefit dependence and the effect of migration on employment prospects for natives (Frijters et al., 2005; Carrasco and García-Pérez, 2015). High levels of immigration in many European countries in recent decades and

the worsening of employment conditions that followed the economic crisis of 2007-8 only serve to make these concerns more salient. Economic theory and a number of empirical studies give reasons to suggest that immigrants may be more affected by the business cycle than comparable natives (e.g. Dustmann et al., 2010; Prean and Mayr, 2012). However, using a proportional hazards model to examine the duration of unemployment, we find little evidence that the crisis affected EU immigrants' ability to exit unemployment to a greater extent than natives.

The effects of the world-wide economic depression begun to be felt in the UK during the second quarter of 2008. There was an increase of the unemployment rate that persisted in subsequent years, as well as an increase in the redundancy rates. The extent of the effect was clustered across regions, sectors of employment, and demographic groups. The West Midlands and the Northwest regions were worst affected, while job offers declined more in England and Wales than in the constituent nations of the UK. With respect to industrial sectors, manufacturing and wholesale and retail trade faced the greatest losses. As would be expected, individual earnings also suffered; there was a decrease in income levels during the years 2008-2009 followed by a small increase (smaller than the rate of inflation) during 2009-2010. Significantly, levels of migration were affected as well, with internal migration rates falling during the crisis, while the outflows of international immigrants (especially A8 immigrants and EU14 immigrants) increased. Furthermore, inflows of international immigrants also declined (Cecilia Campos and Reid, 2011) .

The negative effects of the recession were unequally shared across the population. The UK male population was affected more adversely than the female population. At the same time, youth (16-25 years old) unemployment rose, while the unemployment of older individuals declined. The decline in permanent full-time employment seemed to spur a rise in other forms of employment, such as self-employment, temporary contracts and part-time employment. During the crisis, people moved from inactivity to unemployment leading to a larger increase of the unemployment rates than the decrease in the employment rates. However, inactivity rates increased as well, perhaps due to disillusionment on the part of some job-seekers. Finally, unemployment for younger people was lower the better the class of the degree they obtained, and lower skilled occupations contributed most to the unemployment rate, (Bell and Blanchflower, 2010).

The dataset used in the following analysis is the Quarterly Labour Force Survey (QLFS) for the UK. The time period covered spans the second quarter of 2004 and the first quarter of 2010. The effects of the economic crisis became evident in the UK after the second quarter of 2008 (Cecilia Campos and Reid, 2011). Thus, our analysis covers two main periods; the years before the crisis (2005, second quarter - 2008, first quarter) and those after its onset (2008, second quarter - 2011, first quarter).

Several theories suggest reasons why unemployment rates and durations for immigrants and natives might differ. However, the expectations they might create can be contradictory. For example, it could be the case that the immigrants have lower reservation wages which could raise the probability of employment. On the other hand, it could be that the job separation rates are higher for the immigrants leading to a higher proportion of job offers being directed towards the natives, especially during recession periods (Dustmann et al., 2010).

Search theory offers models that incorporate the elements that determine unemployment events and unemployment durations. Due to lack of information on the distribution of wages, search intensity, job offers or job separation rates, we are not be able to estimate a structural model derived directly from theory (Cahuc and Zylberberg, 2004). Instead, we estimate reduced form models and assess the probability of unemployment and mainly our focus is on the estimation of the duration of unemployment for the periods before and during the crisis for the natives and for different immigrant groups.

The contribution of this paper is two-fold; Firstly, this paper assesses the labour market outcomes of immigrants with respect to those of the natives during one of the most severe economic crises of the last decade. Secondly, we utilise the panel element of the UK QLFS which allows us to focus on the duration of unemployment instead of its probability and also to control for the effects of skills (the actual transferable skills in the case of the immigrants, instead of the level of education) on the hazard of exiting unemployment.

This approach gives us the opportunity to assess the labour market outcomes of the immigrants with respect to the natives during the crisis, an investigation that helps understand better how vulnerable different groups are to economic shocks in the UK. Furthermore, we are able to disentangle the characteristics of the immigrants that lead to

the observed outcomes, a finding that can be used for better and more effective policy recommendations regarding better labour market integration of economic migrants.
The rest of this paper is structured as follows: In section 2, a literature review is offered, covering similar investigations on the effects of the crisis on the labour market outcomes of immigrants; in section 3 we present a theoretical discussion to motivate our econometric approach; section 4 contains a description of the data used; the econometric models used is presented in section 5; in section 6 we discuss the results; and, finally, in section 7 some conclusions are offered

3.2 Literature Review

It is well established that migrants' labour market behaviour and their outcomes in terms of wages and employment are different in important respects to those of the native born. Chiswick (1978), for example, found in an early paper on the subject that migrants on average earn less upon entry to the USA, but that these average earnings increase with years spent in the US, and eventually overtake those of American-born workers. A number of reasons for this differential performance between natives and immigrants have been suggested. Firstly, immigrants differ in characteristics and area of employment from those already present in the labour market. For instance, immigrants may be selected on observed or unobserved quality, and may cluster in more manual occupations where the labour market is more volatile, with implications for their employment and wage prospects (Borjas, 1987, 1994). Secondly, human capital acquired by immigrants in their country of origin may not be transferable to the destination environment, leading to worse outcomes relative to comparable natives (McGuinness and Byrne, 2015). This non-transferability applies to work experience, educational qualification, and also to language skills (ibid). Finally, immigrant's information about the job market and, relatively, their ability to search for and find jobs may differ from that of natives. Chassamboulli and Palivos (2014), for instance, included differential search costs as well as heterogeneity in skill in their model of skill-biased migration to the USA.
As well as differences in earnings and employment relative to natives at a given point

in time, immigrants may also display a different dynamic response to changes in the business cycle, a point of central interest to the current investigation. Chiswick et al. (1997) suggested that migrants might be expected to display a more exaggerated sensitivity to the business cycle than those born in the host country, as they are likely to have fewer years on the job, and as the result of reduced information on both sides of the job search process, are more likely to be poorly matched to the position they hold. As a result, he suggested they may be more likely to lose their job in the event that lay-offs are required, although he found only weak evidence of this effect in US data. Similarly, Dustmann et al. (2010) gave three reasons for a greater sensitivity of migrant employment to the business cycle observed in UK and German data: firstly, migrants are likely to have higher separation rates than natives, if only because of a propensity to return to the country of origin, and this incites firms to prioritise the short-term over long-term returns from creating a vacancy, thus exaggerating cyclical patterns in hirings; secondly, again because of higher separation rates, migrants are more likely to be employed in the 'secondary' sector of a dual labour market, in which labour demand is more responsive to the business cycle; and finally, if migrants' skills are less complementary to capital than are natives', they are more likely to be victims of firm's adjustments to recession, and more likely to be hired again in an up-turn.

Further empirical evidence for the effects of the business cycle on immigrant labour can be sought in an emerging literature on how the recent global economic downturn affected immigration and immigrant labour market performance in host countries. At the macro level, the evidence suggests that the level of immigration responds to business cycle, as poor prospects in host countries tend to discourage immigrants. Boubtane et al. (2013) took a vector autoregressive approach to the analysis of times series data from 22 OECD countries, and find that the level of immigration responds positively to GDP and negatively to unemployment changes, while Clark et al. (2014) found that in the UK the recent recession decreased the inflows of immigrants from EU countries. They also indicate the low occupational attainment of the new EU-states immigrants, from the accessions of 2004 and 2007, one of the main explanatory parameters we consider in this paper for the differences in the labour market outcomes between UK natives and migrants (mainly EU migrants).

Studies from a variety of developed countries have highlighted the greater vulnerability of migrants to the business cycle since the downturn began. With regard to employment rates, Bratsberg et al. (2014) found that migrants from recent EU members states in Norway showed higher and more persistent unemployment rates than the natives, while Orrenius and Zavodny (2011) found that in the US the less skilled immigrants were the most harmed by the downturn, while the higher skilled migrants did worse than equally high-skilled natives. Other studies have focussed on job separation rates, capturing the extent to which immigrants find themselves more likely to lose a job after the onset of regression. Arai and Vilhelmsson (2004) examined the effects of an earlier recession in Sweden in the early 1990s on the probability of beginning a spell of unemployment, and found that migrants were considerably more at risk than natives with similar characteristics, and furthermore, that employers appeared to be favouring natives with lower levels of seniority despite legal constraints determining the order in which employees could be laid off. In contrast, Paggiaro (2013) found that, in the recent downturn, the differences in separation rates between migrants and the native-born males in Italy disappeared once characteristics were controlled for, suggesting that the migrants were no more likely to lose their job than comparable natives.

In general, then, evidence suggests that migrants to developed countries have suffered more from the recent downturn than those born in the host country, and often this difference remains after characteristics are controlled for. In common with the analysis in this paper, some studies have examined durations of unemployment of immigrants during the recent downturn. Carrasco and García-Pérez (2015) examined both employment and unemployment hazards in Spain between 2000-2011, and again found that migrants were more vulnerable to economic conditions than natives by both these measures, but that this vulnerability decreases with duration at a faster rate for immigrants. Furthermore, unemployment benefits are found to act as a disincentive to employment for immigrants to Spain when economic conditions are good. Prean and Mayr (2012) took a similar approach, analysing both inflows and outflows as well as overall levels of unemployment for immigrants in Austria, and found that those from non-EEA (European Economic Area) countries especially were more vulnerable than natives to the labour market shocks that occurred during the period 1995-2008. Interestingly, they

find that this difference cannot be explained by sectoral clustering of immigrants. Furthermore, non-EEA immigrants were also observed to gain jobs faster in upturns, as well as losing them faster in downturns.

Turning to evidence from the UK specifically, Frijters et al. (2005) examined the success of job search on the part of immigrants in a period of economic expansion (1997-2001). He found that migrants are less likely to acquire a job than natives, and that this lack of success could not be explained by the search methods these individuals used. UK evidence from past business cycle downturns has shown that the immigrants were also more sensitive to business cycle fluctuations. Dustmann et al. (2010) found that between the period 1981-2005 low-skilled (lower education) immigrants were affected more by economic shocks when compared to immigrants of higher skill, but also that immigrants of any skill level were affected more adversely than natives of the same skill level. The contribution of this paper is to extend on this assessment for the years of the economic crisis, considering different immigrant groups, and estimating the duration of unemployment rather than the level of unemployment, which also allows us to capture the skill level of individuals based on past labour market type rather than education.

3.3 Theoretical Framework

In this section we will discuss a theoretical framework that explains unemployment based on search theory (Mortensen, 1987) in the simplified form introduced by Kiefer (1988), where this framework is linked to duration analysis. However, a strict theoretical approach is not presented here, as we have no data that would allow us to estimate a structural model and therefore a reduced form model is used instead. It is relevant, though, to introduce intuition about the powers at work so that the econometric approach is better understood.

We will consider the simple choice of an individual between unemployment and dependent employment, and more specifically, transitions from unemployment to dependent employment. The unemployed individuals have knowledge of the cumulative distribu-

tion of wages $F(w)$, from which job offers are considered as independent draws. The workers receive job offers from this distribution at a rate $\eta(t)$. The probability of them accepting the offer is dependent on the cumulative distribution of wages, each individual's reservation wage, and the level of $\eta(t)$.
Knowing that a person will only accept job offers with wages higher than their reservation wage w_r, the probability of exiting unemployment depends on the product of the cumulative distribution $(1 - F(w_r))$ and the rate $\eta(t)$, which is dependent on the personal characteristics of the individuals in question and the availability of jobs per region (Lancaster, 1979). Thus, the hazard h of exiting unemployment into dependent employment will be given by $h = \eta(t)[1 - F(w_r)]$.
We do not have any information about the cumulative distribution of wage offers. We do not observe $\eta(t)$ or the actual reservation wages of the individuals, either. We can at best therefore observe only the accepted wage offers in our sample. However, we can observe a series of characteristics that might affect the number of wage offers an individual receives and the offers she might accept (for example age, level of education, labour market experience, children in the household or disability status). For this reason, we proceed in our analysis with the estimation of a reduced model (Cahuc and Zylberberg, 2004).

3.4 Data Description

In order to investigate the labor market outcomes of different demographic groups during the crisis, we use the Quarterly Labour Force Survey (QLFS) for the years from 2004 (second quarter) to 2011 (first quarter). This survey collects information every (calendar) quarter on an individual level, and all individuals within any particular household are interviewed. Every household is followed for five quarters, and every quarter, one fifth of the dataset is replaced by new households. The information collected include personal characteristics of the individuals in the households and characteristics of their labour market conditions (UK Data Archive).
The analysis of this paper is conducted in two parts. The first part includes all sampled

individuals (unemployed, employed or inactive) over 18 years old, while the second part includes individuals over 18 years old who are unemployed but have been employed before[1]. In general, we do not include individuals who are still in full time education, or people who have not been classified as either employed, unemployed or inactive[2].

The personal characteristics that are used throughout the analysis are age, gender, educational level, disability status, marital status and family status (i.e. whether they have dependent children under the age of 19 in the household, and the number of such children). Further information used is regions of residence and year-quarter dummies. For the duration analysis we include information on previous job experience using data on the occupation type and the socioeconomic status at time of last employment. Ideally, we would like to be able to control for years of experience as this is a known important factor for earnings (as explained by the Mincer equation). More years of experience are expected increase the productivity of the individual, and thus most likely affect their duration of unemployment. However, this variable is not observed in our data. Given the specific nature of the outcome being based on survey retrospective data, we did not create an approximation of years of experience to minimise the probability of biases caused by measurement errors. However, we tried to control for many previous job information, namely previous occupation type, reason for losing last job and type of last job (self-employment or dependent employment).

A person is classified as an immigrant based on their country of birth; if a person was born outside the UK and has migrated in the UK she/he is considered to be an immigrant from that specific country of origin. The data also include information on the years that a person has been in the UK[3]. We group the immigrants and the natives in the following five categories: UK natives, Second Generation immigrants, EU14 immigrants, A8 immigrants and non-EU immigrants. We are separating the UK natives into UK natives and second generation immigrants due to the remarkably different performance these two groups have in the labour market. Immigrants groups are separated into EU and

[1] We do not include people who cannot be classified based on their socioeconomic status.

[2] International Labour Organization definition.

[3] However, the question the person is answering is "*when they first entered the UK*", thus it would not capture the history of subsequent migrations of the person into the country from this initial date.

non-EU migrants due to the different migration laws that dictate their entry to the UK. The non-EU migrants have to fulfil specific requirements in order to enter the country, for example they might have to hold specific qualifications, perhaps have job market experience, or they might have to verify that they are proficient in English, whereas the EU migrants can migrate freely into the UK regardless of their skills. Furthermore, we separate the EU migrants into EU14[4] migrants and A8[5] migrants due to the different choices that the two groups seem to make in the labour market.

In the duration analysis part of this paper we make use of the panel component of the QLFS. Our initial focus is on transitions from unemployment to dependent employment. The duration of unemployment is constructed by including retrospective information on the unemployment duration of the people in the sample who are initially unemployed (stock sample), as well as people who become unemployed at some point during the five quarters that we are observing them (flow sample). For the flow sample, we can observe whether a person has become unemployed sometime during the first, second, third, fourth or fifth quarter the individual is followed in the QLFS. For the stock sample element, the retrospective information is on a three months basis. The smallest period of observed unemployment is less than three months but in our analysis, for reasons that will be explained at the econometric methodology section, we only consider spells of at least three months. For the second part of our duration analysis we will consider exits from unemployment to dependent employment, self-employment and inactivity.

3.4.1 Descriptive Statistics

In this section we present a descriptive analysis of the sample to set the context for further analysis. There are two parts; in the first part we introduce the statistics related to the parameters of interest for the whole sample for the period spanning from the second

[4]Migrants from the old 15 EU member states, minus the UK: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, and Sweden.

[5]The A8 migrants are migrants coming from eight of the ten countries that entered the EU in 2004. They are separated from the rest of the EU member states due to the lower GDP per capita they have with respect to the EU average. These countries are the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia.

quarter of 2005 until the first quarter of 2011. In the second part, we present the duration analysis sub-sample as well as an initial non-parametric analysis. The descriptive analysis has to be done in two parts as the two samples differ in construction. In the first case, by including the whole sample, we mean that individuals who find themselves in any possible labour market condition (employed as employees or self-employed[6], inactive or unemployed) are all included. The unit of observation here is the (three month) person-quarter. This gives a picture of the labour market at the moment we observe it. In the second case, individuals who are unemployed and transit at some point towards employment or inactivity, or who do not transit at all, are included. This second sample is constructed with unemployment spells as the focus; the unit of observation is again the person-quarter, but only people who experience unemployment spells are included. Before proceeding any further, we need to clarify the way we have selected our sub-sample from the initial QLFS sample for the second part of the analysis. We have restricted the sample to include individuals over the age of 18 who can be assumed to have developed a more stable relation with the labour market (Bover et al., 2002). We only include individuals with some experience in the labour market and who have been classified based on their socioeconomic status or by their current or previous industry of employment.

The above sub-sample systematically leaves out people who have never worked and as a result of that, most of the long-term unemployed. However, this excluded group of people is highly unlikely to be employed and has an ambiguous connection with the labour market. This paper focuses mainly on the dynamics of the labour market and how they changed before and during the crisis. The relatively stable status of those disconnected from the labour market therefore does not contribute to the direction of the analysis, and so these groups can be excluded.

[6] In the case of the employed individuals, we exclude those who are participating in a government scheme and those who work at home without payment.

Descriptive Statistics for the overall sample

The demographic characteristics that systematically differentiate the sub-groups we are interested in seem to be the average age of the individuals, the levels of education and, for the comparison between immigrant groups, the number of years in the UK, as can be seen in Table 3.1. The A8 immigrants are much younger on average than the rest of the groups, a fact that is related to the recent accession of their countries of origin in the EU. Another result of the recent accession is that the immigrants in this group have been in the UK on average for a substantially shorter period of time than the rest of the immigrants. Regarding the educational levels of the immigrant groups, the A8 immigrants have the smallest proportion of ”low” educated people, with the majority being ”intermediately” educated. The non-EU immigrants have the highest percentages of high educated individuals, a result that might also be related to the immigration criteria they had to fulfil in order to enter the UK.

Table 3.1: Descriptive Statistics for the Whole Sample

	UK	EU14	2nd Gen.	A8	nonEU
Employment Status					
Unemployed	2.9	3.0	6.0	4.8	5.0
	(0.000)	(0.001)	(0.001)	(0.003)	(0.001)
Employee	51.1	49.1	54.3	79.1	49.9
	(0.001)	(0.005)	(0.003)	(0.006)	(0.002)
Self Employed	8.1	7.8	8.1	6.0	9.8
	(0.000)	(0.002)	(0.002)	(0.003)	(0.001)
Inactive	37.8	40.1	31.6	10.0	35.3
	(0.001)	(0.005)	(0.003)	(0.004)	(0.002)
Age	50.8	51.1	44.0	30.5	45.4
	(0.027)	(0.170)	(0.119)	(0.121)	(0.077)
Gender (%male)	47.5	42.2	48.0	50.7	46.3
	(0.001)	(0.005)	(0.003)	(0.007)	(0.002)
Children in the H/H (dummy)	30.9	29.6	38.8	40.8	48.7
	(0.001)	(0.004)	(0.003)	(0.007)	(0.002)
Number of Children in H/H	54.3	53.6	73.0	62.4	96.0
	(0.001)	(0.009)	(0.008)	(0.013)	(0.006)
Disability Status	28.2	25.8	26.0	4.1	23.4
	(0.001)	(0.004)	(0.003)	(0.003)	(0.002)
Marital Status	57.8	53.6	49.1	43.1	65.4
	(0.001)	(0.005)	(0.003)	(0.007)	(0.002)
Education					
Low Education	56.8	35.8	45.7	10.1	26.8
	(0.001)	(0.005)	(0.004)	(0.004)	(0.002)
Intermediate Education	26.3	31.6	30.3	53.9	35.0
	(0.001)	(0.005)	(0.003)	(0.007)	(0.002)
High Education	16.9	32.6	24.0	36.0	38.2
	(0.001)	(0.005)	(0.003)	(0.007)	(0.003)
Years in the UK	.	32.1	.	2.7	22.5
		(0.190)		(0.023)	(0.089)

[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] Standard errors are included in the parenthesis.

Table 3.2: Before and During the Crisis: Comparison of Differences

	UK natives	Non-EU immigrants	EU14 immigrants	A8 immigrants	Sec.Generation
Unemployed	0.00858***	0.00498***	0.00618**	0.000829	0.0111***
Inactive	-0.00452***	-0.00722***	- 0.0104**	0.0188***	0.000237
Employed	-0.00406***	0.00224	0.0042	-0.0196***	-0.0113***
Self-Employed	0.00262***	0.00174	0.0108**	0.0218***	0.00234
Dependent Employment	-0.00624***	0.000558	0.000558	-0.00609	-0.0426***
Socioeconomic Status					
Higher managerial, administrativ	0.0145***	-0.00503	0.0180**	0.0258***	0.0115**
Intermediate Occupations	-0.00177*	0.00165	0.0052	0.0224***	-0.0101**
Routine and manual occupations	-0.0128***	0.00338	-0.0232***	-0.0482***	-0.00138
Location of Residence					
Tyne & Wear	-0.000162	0.00295***	-0.00132	-0.00108	0.0013
Rest of Northern region	-0.000336	0.0000862	0.00257	0.00387	0.00176*
South Yorkshire	-0.000157	0.00112	-0.000209	-0.0135***	-0.00101
West Yorkshire	0.00123**	-0.00344**	0.000627	-0.0277***	0.000461
Rest of Yorks & Humberside	0.000482	0.000722	-0.00378*	0.0120***	-0.00108
East Midlands	0.00391***	0.00341*	0.0046	-0.0231***	0.0180***
East Anglia	0.000683	-0.000432	0.00244	-0.00648	0.00694***
Inner London	0.000577*	-0.00997***	0.0122**	-0.00767	-0.00379
Outer London	-0.00405***	-0.0150***	-0.0182***	-0.00994	-0.0101***
Rest of South East	-0.00555***	-0.000726	-0.00839	-0.00518	-0.00911*
South West	0.000105	-0.00330*	-0.00611	-0.00166	-0.00857***
West Midlands (met county)	-0.00240***	0.00488**	-0.00147	0.000147	0.00437
Rest of West Midlands	0.00146**	0.00622***	0.00459*	0.00322	0.00258*
Greater Manchester	0.00364***	0.0114***	0.00517*	0.0237***	0.0000888
Merseyside	0.000666*	-0.00236***	0.00165	0.00135	-0.00311***
Rest of North West	0.00284***	-0.00281**	0.00721***	0.0273***	-0.00577***
Wales	-0.00265***	-0.00272**	0.00182	0.00462	0.0023
Strathclyde	0.000887*	0.00208**	-0.000679	0.00945**	-0.0163***
Rest of Scotland	-0.00103*	0.00526***	0.0014	0.0147***	0.0216***
Northern Ireland	-0.000146	0.00262***	-0.00412	-0.00409	-0.000558*

[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] The employment rates are estimated as the percentage of the working age population that is considered employed based on the ILO classification. The working age population is between the ages 16-65 for men and between the ages 16-60 for women under the Pensions Act 1995. However, in our sample we have kept individuals who are at least 18 years old.

[3] The p-values to indicate significance are denoted by * $p< 0.05$, ** $p< 0.01$, *** $p< 0.001$.

In Table 3.2, we can see how the composition of the five groups has changed after the onset of the crisis. There has been a significant decrease in the employment rates for the UK natives, A8 immigrants and Second Generation immigrants. However, for UK natives this is accompanied by a significant decrease in inactivity, and a significant increase in unemployment. In the case of the A8 immigrants we observe a significant increase in inactivity of almost 2% , while a significant increase in unemployment can be observed for Second Generation immigrants. There is also a significant increase in

self-employment for immigrants from the EU, and specifically for the A8 immigrants. Regarding the socio-economic statuses of the five subgroups, apart from the non-EU immigrants (where we do not observe any significant differences), we can see an overall average increase of socioeconomic status which might be an aging effect.
Finally, there is a reallocation, quite large in magnitude, of the A8 immigrants away from the North East regions which were highly affected by the crisis. However, we have to keep in mind that the changes that we observe on the averages of migrant populations might largely depend on out-migrations or in-migrations. As stated in the discussion in Cecilia Campos and Reid (2011) on the impact of the crisis using International Passenger Survey data, during 2008 the inflow of international immigrants was quite low, especially for A8 immigrants, the decline in which reached 81%. The same report claims that the outflow of A8 immigrants seemed to increase during the crisis.

Descriptive Statistics for the Duration Analysis

The duration analysis consists of two parts. In the first part we investigate exits from unemployment to dependent employment, and in the second part we examine exits from unemployment to dependent employment or inactivity. Table 3.3 contains the main demographic characteristics of individuals in unemployment. The demographic characteristics are quite similar to those for the whole sample, as one would expect. Some notable points are the fact that people are on average younger than in the whole sample, and that for the UK natives and the second generation migrants especially, the sample is more male-dominated. For all groups, the main pool of the unemployed did some sort of elementary or manual profession before losing their job.

Table 3.3: Descriptive Statistics for the Duration Analysis

	UK	EU14	2nd Gen.	A8	nonEU
Age	35.8	37.2	30.3	29.8	37.1
	(0.1)	(0.6)	(0.3)	(0.5)	(0.2)
Number of Observations	41,004	1,132	3,917	672	6,137
Gender (% male)	59.3	53.6	59.5	44.6	54.2
	(0.004)	(0.023)	(0.012)	(0.028)	(0.01)
Number of Observations	41,004	1,132	3,917	672	6,137
Married (%)	29.9	34.6	20.5	40.1	54.4
	(0.004)	(0.022)	(0.01)	(0.027)	(0.01)
Number of Observations	40,583	1,120	3,876	671	6,062
Has Children (%)	39.3	39.6	48.7	41.2	49.3
	(0.004)	(0.023)	(0.013)	(0.028)	(0.01)
Number of Observations	40,995	1,132	3,915	672	6,136
Number of Children	0.67	0.72	0.91	0.65	0.97
	(0.008)	(0.049)	(0.03)	(0.054)	(0.026)
Number of Observations	40,995	1,132	3,915	672	6,136
Disability Status (%)	20.5	16.2	15.5	5.2	15.7
	(0.003)	(0.017)	(0.009)	(0.013)	(0.007)
Number of Observations	41,004	1,132	3,917	672	6,137
Education (%)					
Low	59.9	39.8	44.1	10.7	25.6
	(0.004)	(0.024)	(0.013)	(0.017)	(0.009)
Intermediate	28.1	34.5	35.3	54.7	39
	(0.003)	(0.022)	(0.012)	(0.028)	(0.01)
High	12	25.6	20.6	34.7	35.4
	(0.002)	(0.02)	(0.01)	(0.027)	(0.01)
Number of Observations	40,594	1,100	3,870	666	5,907
Last Job Classification (%)					
Managers, Directors and Senior Official	10.6	10.5	7.8	1.5	10.9
Professional Occupations	5.5	10.4	5.2	3.7	11.2
Associate Professional and Technical Oc	8.7	14.5	11.5	2.7	11.5
Administrative and Secretarial Occupati	10.0	6.3	14.4	6.2	9.6
Skilled Trades Occupations	13.7	11.5	9.6	13.5	8.7
Caring, Leisure and Other Service Occup	6.7	6.9	5.6	3.9	5.5
Sales and Customer Service Occupations	10.9	9.4	15.8	6.4	9.6
Process, Plant and Machine Operatives	11.3	9.3	9.3	22.7	11.1
Elementary Occupations	22.6	21.3	20.9	39.5	22.1
Number of Observations	33,804	947	2,856	519	4,517
Type of Last Employment					
Employee	92.18	90.4	92.52	93.7	90.35
Self-employed	7.82	9.6	7.48	6.3	9.65
Number of Observations	33,217	927	2,808	508	4,435

[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] This sub-sample includes unemployed individuals and individuals who exited in dependent employment.

Finally in tables 3.4 and C.1 we present the more technical characteristics of the duration sub-samples, including the number of individuals, the number of observations, and the number of censored observations. For the single exits to dependent employment, a quarter of the individuals exit unemployment towards dependent employment, while from the multiple exits[7] model descriptives in table C.1, we see that one-tenth of the individuals exit to inactivity. However, this is not the case for the A8, for whom one in twenty unemployed individuals exit to inactivity. The level of censored observations is quite high in both sub-samples, reaching about 70% in most cases. For the A8, the percentage of censoring is even higher. We must note here that by censoring we mean individuals who remain unemployed until the last time we observe them. For the single exit model, censoring also includes exits to inactivity and self-employment, while for the multiple exits model exits to self-employment are considered censored.

Table 3.4: Exits to Unemployment for the Duration Analysis

	UK	**EU14**	**2nd Gen.**	**A8**	**nonEU**
Number of Observations	41,004	1,132	3,917	672	6,137
Number of Individuals	20,639	574	1,961	386	3,172
Percentage of each group in the sample	77.6	2.1	7.4	1.3	11.6
Length in Panel	3.7	3.6	3.8	2.8	3.8
Number of Exits	4,915	145	387	72	586
Number of Exits (%)	23.8	25.3	19.7	18.7	18.5
Number of Censored Observations	14,512	406	1,405	313	2,304
Number of Censored Observations (%)	70.3	70.7	71.6	81.1	72.6
Number of Observations by year					
2005	4,249	128	429	28	681
2006	6,377	163	662	73	1,077
2007	5,755	200	613	150	939
2008	6,016	167	564	117	907
2009	8,719	204	807	124	1,213
2010	7,873	212	716	149	1,037
2011	2,015	58	126	31	283
Mean Survival Time*	5.6	5.5	5.9	5.5	5.9
	(0.0)	(0.1)	(0.1)	(0.2)	(0.0)

[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] This sub-sample includes unemployed individuals and individuals who exited to dependent employment.

[3] (*) Largest observed analysis time is censored, mean is underestimated

[7]This model has exits towards dependent employment and inactivity. It will be presented in the following section and it is called "competing risks model".

3.5 Econometric Specification

In this section we explain the econometric specifications we use for our analysis. The first part includes a simple estimation of the probability of unemployment against the alternatives (dependent employment, self-employment, inactivity) for the whole sample. The second part includes, in the first case, a duration analysis for the estimation of the hazard rates of exiting the initial state of unemployment into dependent employment and, in the second case, exits into inactivity and dependent employment.

3.5.1 Probability of Unemployment

We will start our analysis with a simple estimation on the probability of unemployment for the different groups of immigrants with respect to that for natives, against the probability of being in dependent employment for the periods before and during the crisis. We will also present the probability of unemployment against the probability of being in dependent employment, in self-employment or inactivity, again for the periods before and during the crisis. The econometric specification for this approach will be:

$$y_{il} = a + X'_{il}\beta + I'_{ml}\gamma + \tau_{tl} + \gamma_{jl} + \varepsilon_{il}$$

where $i = 1, 2, ..., N$ are the individuals in the sample; $l = \{$unemployed, in dependent employment, self-employed, inactive$\}$ the possible outcomes; $X =$ age, age squared, gender, children in the household dummy, number of children in the household, educational level, disability status; $m =$ A8 immigrant,non-EU immigrant, EU14 immigrant and Second Generation immigrant, $\tau_t =$ year-quarter dummies where $t = \{$2004-2^{nd}quarter, ... 2010-1^{st} quarter$\}$; and γ_j regional dummies where $j = \{$Tyne and Wear, rest of Northern region,...$\}$. The specification with two possible states, unemployment or dependent employment, is the same as above, but without the l indicator of alternative exits.

In order to make these results informative and comparable with the duration analysis,

we present a model where we estimate the probability of being unemployed against the probability of being in dependent employment, inactive or self-employed. The individual outcomes y_{il} are in the form of binary variables, for example, unemployed$= 1$ if the individual is unemployed and zero otherwise. The form of the remaining three possible outcomes is constructed in the same manner. However, the outcome variable that we use in our model is a categorical variable of four different categories.
We assume the errors to be normally distributed $\varepsilon \sim N(0, \Sigma)$, where $\varepsilon = (\varepsilon_{il_1}, \varepsilon_{il_2}, \varepsilon_{il_3}, \varepsilon_{il_4})$ for the case of four possible states (Cameron and Trivedi, 2010). Furthermore, for the model with the four possible states, we assume the errors ε_{il_n}, where $n = 1, 2, 3, 4$ to have a multivariate normal distribution with arbitrary correlations between ε_{il_1} and ε_{il_2} for any $l_1 \neq l_2$, where l_1 and l_2 denote different outcomes, and thus, we use a multinomial probit model. Since we use our sample as a pooled cross-section where the same person can appear in the dataset up to five times, we cluster the standard errors over the individual level in order to correct probable serial correlation of observations of the same individual over time. One more reason we choose to use a multinomial probit model for this estimation is that we cannot rule out the possibility that the assumption of *Independence from Irrelevant Alternatives*[8] does not hold. However, with the chosen specification we relax the "IIA" assumption and proceed with the estimation of the model, which provides consistent estimators (Wooldridge, 2010b).

3.5.2 Duration Analysis

In this section we present the econometric models for the duration analysis element of the paper. The models we use are a proportionate hazard piecewise-constant model to estimate exits from unemployment to dependent employment, since exits to dependent employment are the main outflow from the initial state and a good approach when comparing the labour market outcomes of natives and immigrants. We also estimate a competing risks model for exits from unemployment to dependent employment and

[8]The "IIA" assumption implies that "*adding another alternative or changing the characteristics of a third alternative does not affect the relative odds between alternatives j and h*" (Wooldridge, 2010b).

inactivity, covering the main possible destinations for people of working age.

Exits from Unemployment to Dependent Employment

The underlying time to event distribution in our model is continuous. However, we observe our data in a grouped form (three month/quarterly intervals). This means that a person might have entered and exited the initial state (unemployment) at any point within a three month interval. For this reason we use a discrete time model, under the assumption that the underlying distribution is continuous. We model our data utilizing the panel characteristic of the QLFS, following Frijters et al. (2005)[9].
We assume a proportional hazard specification of the form:

$$\theta(t, X_t) = [\theta_0(t)exp(\beta_0)] \ [exp(\beta_1 X_t + \beta_1 X_t + ...\beta_2 X_t + \beta_k X_t)]$$

where $[\theta_0(t) \ exp(\beta_0)]$ is the baseline hazard including the constant term which is assumed to be equal for all the individuals and $exp(\beta_1 X_t + \beta_1 X_t + ...\beta_2 X_t + \beta_k X_t)$ are the characteristics of the individuals that proportionately increase or decrease the baseline hazard. We do not assume a specific shape for the hazard function; we adopt a piecewise-constant exponential model specification. Thus, the hazard function[10] is:

$$h(j, X_t) = 1 - exp[-exp(\beta' X_t + \gamma_j)]$$

where by h we denote the hazard rate; j the time intervals $j = 1, 2, ...$; X_t the controls of the regression; β the parameters to be estimated; and γ_j the difference of the integrated baseline hazard $\theta_0(t)$ between the beginning and the end of the interval j (Jenkins, 2005a).
The characteristics that are included in X_t are, as before: the demographic charac-

[9] Due to the utilisation of the stock sample instead of the flow sample, in our paper, just as in the paper of Frijters et al. (2005), we cannot include unobserved heterogeneity.

[10] We have a continuous underlying time to event distribution, however, we observe the data in a grouped form. In this case the most appropriate model to use is the complementary log-log (Jenkins, 2005a).

teristics gender, age, age squared, marital status, disability status, level of education, dummy about having children or not, number of children, and years in the UK for the immigrants, as well as dummies that indicate whether a person belongs in a specific immigrant groups (A8 immigrants, non-EU immigrants, EU14 immigrants or Second Generation immigrants). Furthermore, in the duration analysis we include proxies for job experience. These proxies are the socioeconomic status at the beginning of the period that we observe the individuals (in the case of an exit into employment they might change their socioeconomic status) and the industry at last job.

Previous literature has also estimated the effect of unemployment benefit claims on the duration of unemployment (Bover et al. (2002)). In the UK case, including such a benefit would be of interest due to differences on the eligibility for the Job Seekers Allowance (JSA)[11] between natives and immigrants. However, due to the specific nature of the JSA, which makes it endogenous, it is not possible to include it. More specifically, one of the eligibility criteria for the JSA is that the person who claims it has to prove that she is actively searching for a job. If the search intensity of the person is not meeting the standards set by the Job Center that is providing the benefit, then the person loses eligibility for it. However, search intensity affects the probability to exit unemployment directly, and for this reason the unemployment benefit becomes endogenous.

Our dataset has the characteristic that during the first period that individuals enter unemployment (first 3 months/first quarter), exits from this state cannot be observed. Thus, we observe survival rates given that everyone has survived for at least one quarter. Bover et al. (2002) dropped this first quarter altogether since it has no variation in the outcome, however, since we are combining the stock and the flow sample, we will consider it in the theoretical specification, where it cancels out and give us a sample where we have variation in the outcome variable at every quarter.

Following Jenkins (1995), the likelihood function for an individual i who is unemployed for k time intervals is:

[11] The JSA has replaced the unemployment benefit for the UK since 1996. It has a contributory part based on the National insurance contributions of the individual and a non-contributory independent to the level of contributions. However, in order to claim either, the individual has to prove that she is actively searching for a job.

$$\left.\begin{aligned} L = \frac{[\frac{h_i}{(1-h_{ij})}]^{c_i} \prod_{k=1}^{j}(1-h_{ik})}{S_i(u_i))} \\ S_i(u_i) = \prod_{k=1}^{u_i}(1-h_{ik}) \end{aligned}\right\} \Rightarrow L = \left(\frac{h_{ij}}{1-h_{ij}}\right)^{c_i} \frac{\prod_{k=1}^{j}(1-h_{ik})}{\prod_{k=1}^{u_i}(1-h_{ik})}$$

$$\Rightarrow L = \left(\frac{h_{ij}}{1-h_{ij}}\right)^{c_i} \prod_{k=u_i+1}^{j}(1-h_{ik})$$

where $S_i(u_i)$ is survival of individual i until interval u_i, which in the case of the stock sample will be the first interval that we observe that individual (during which we observe no exits), while in the flow sample it will be the first interval that the individual is unemployed (during which we also do not observe any exits). The time intervals are denoted by k and a person is in the initial state until the last time we observe them, thus we observe them in total for $k = 1, 2, ..., j$ intervals. The hazard of an individual i exiting at time j is denoted by h_{ij}, and the dummy c_i is equal to 1 if the individual exits the initial state during the observation period and it is equal to 0 if the individual is still in the initial state at the last time we observe the individual at interval j (in which case the interval is right-censored).

We take the logs of the above equation, and substitute c_i with y_{ik}, an indicator dummy. This takes the value zero for all the periods the individual is still in the initial state and the value one if they exit the initial state in the last interval when we observe the individual, or the value zero if the individual does not exit the initial state during the last period we observe them (right-censored). After a few simple manipulations our log-likelihood takes the form:

$$logL = \sum_{i}^{N} \sum_{k=u_i+1}^{j} [(y_{ik})log(h_{ik}) + (1-y_{ik})log(1-h_{ik})]$$

which can be estimated assuming a logistic or complementary log-log specification of the hazard rate. The latter is adopted in this paper.

The above consideration of the data would imply the following outcomes within this framework: For the flow sample we shall estimate the probability of exit of each in-

dividual, given that they have survived for a quarter in the initial state. Thus, this implies that for them, the duration indexing variable k in the log-likelihood will start from $k = 1 + 1 \Rightarrow k = 2$. For the stock sample, it will be the usual specification for a stock sample $k = u_i + 1$, where $u_i = \{2, 3, ...\}$. Effectively, then, both the flow part and the stock part of the sample are results of stock sampling.

Competing Risks Model

In this section we introduce the econometric framework for the estimation of exits from the initial state (unemployment) to two destination states (dependent employment and inactivity). This approach requires conditional independence in competing risks. This implies that the hazard rates of each different possible exit are independent given the observed characteristics, which would lead to the following additive form of the hazard: $\theta(t) = \theta_{dependent\ empl.} + \theta_{inactivity}$.
If this assumption holds then the log-likelihood for the sample can be written as:

$$\sum_{i}^{N} ln\mathscr{L} = \sum_{i}^{N} \{(\delta_{de}\ ln\theta_{de}(T) + lnS_{de}(T)) + (\delta_{in}\ ln\theta_{in}(T) + lnS_{in}(T))\}$$

where δ_m is an indicator for the different possible exits dependent employment (de) or inactivity (in), with $m = \{de, in\}$. The indicator δ_m takes the value 1 if the individual exits to situation m and the value 0 if it is right-censored or if it exits to one of the alternative situations $-m$ (Jenkins, 2005a).

3.6 Results

In this section we present the results from our analysis on the whole sample, as well as the duration analysis of transitions from unemployment. The duration analysis comprises of a non-parametric approach and a more extensive parametric approach.

3.6.1 Estimated Probabilities of Labour Market Outcomes before and during the Crisis

We start our analysis with an estimation of the probabilities of the four possible events; the probabilities of unemployment, dependent employment, self-employment and inactivity. The results are presented in table 3.5. For the rest of the covariates, please refer to tables C.2 and C.3 in Appendix C. This first approach builds upon the descriptive statistics we presented, since after controlling for a series of demographic characteristics that might explain some part of the observed outcomes, we are able to see more clearly which path the immigrant groups are likely to follow, in comparison to the natives.

The results suggest that before the crisis all immigrants were more likely to be unemployed than the natives, after the effect of demographic characteristics is accounted for, a difference that is mitigated for at least two of the immigrant groups (A8 and EU14 immigrants) during the crisis. More specifically, before the crisis the EU14 and the A8 immigrants were 1% more likely to be unemployed than the natives, the second generation immigrants were 2% more likely to be unemployed than the natives, and the non-EU were 3% more likely to be unemployed than the natives. During the crisis, being an EU14 migrant hardly increased the probability of being unemployed compared to being a UK native by 0.6% and at 10% level of significance. The A8 had no significant difference from the UK natives at being unemployed during the crisis. The second generation immigrants had a 2% higher probability of being unemployed than the natives, like before the crisis, and the non-EU were 3% more likely to be unemployed than the natives during the crisis, a similar difference to before the crisis.

The A8 immigrants are the only group that had an insignificant difference in the probability of dependent employment relative to the natives before and during the crisis. The rest of the immigrant groups were less likely to be in dependent employment than the natives before and during the crisis. More specifically, the EU14 immigrants were 2% less likely, while during the crisis they were 3% less likely to be in dependent employment than the natives. The second generation immigrants were 4% less likely to be in

dependent employment than the natives before the crisis, while during the crisis they were 5% less likely. The non-EU migrants were 1% less likely to be in dependent employment than the natives before and during the crisis.
Regarding the other form of employment, namely self-employment, almost all migrant groups had no significant differences than the natives before and during the crisis, apart from the A8 during both periods, and the EU14 before the crisis. More specifically, the A8 were 3% less likely to be self-employed than the natives before the crisis, a difference that decreased to a 2% during the crisis. The EU14 migrants were 1% less likely than the natives to be self-employed before the crisis, a difference that was found to be insignificant during the crisis.

Table 3.5: Multinomial Probit

	Before the Crisis				During the Crisis			
	Employee	Unemployed	Self Employed	Inactive	Employee	Unemployed	Self Employed	Inactive
EU14	-0.0223***	0.00713***	-0.0123***	0.0274***	-0.0287***	0.00574*	-0.00249	0.0255***
	(0.00651)	(0.00232)	(0.00415)	(0.00544)	(0.00682)	(0.00294)	(0.00445)	(0.00552)
2nd Gen.	-0.0369***	0.0192***	0.00346	0.0143***	-0.0446***	0.0199***	0.00252	0.0222***
	(0.00448)	(0.00170)	(0.00321)	(0.00345)	(0.00471)	(0.00205)	(0.00332)	(0.00365)
A8	0.00428	0.0117***	-0.0321***	0.0161*	-0.0116	-0.00405	-0.0168***	0.0325***
	(0.00996)	(0.00369)	(0.00625)	(0.00878)	(0.00846)	(0.00308)	(0.00539)	(0.00744)
non-EU	-0.129***	0.0314***	-0.00130	0.0988***	-0.119***	0.0293***	-0.000960	0.0910***
	(0.00370)	(0.00163)	(0.00237)	(0.00322)	(0.00371)	(0.00184)	(0.00237)	(0.00321)

[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.

[3] The reference categories are UK native, female, without children, without disability, not married, with high education.

[4] We also include interactions of population groups with crisis so the reference group is UK before crisis.

[5] The estimated marginal effects are provided and their standard errors in parenthesis.

[6] The number of observations is 753,188 before the crisis and 716,396 during the crisis.

Finally, all immigrants are found to have a higher probability of inactivity before the crisis, a difference that on average remained the same during the crisis. More specifically, the EU14 were 3% more likely to be inactive than the natives before and during the crisis. The non-EU were 1% more likely to be inactive than the natives, also, before and during the crisis. The A8 didn't differ significantly when compared to the natives before the crisis, however this difference increased to 3% during the crisis. Finally, the second generation migrants we re 1% more likely to than the natives to be inactive be-

fore the crisis, a difference that increased to 2% during the crisis.

3.6.2 Duration Analysis

This section incorporates a non-parametric analysis of transitions from unemployment to dependent employment and an equivalent parametric analysis. This latter part examines the same type of transition from unemployment to dependent employment and, also, includes a competing risks model on transitions from unemployment to dependent employment and inactivity.

Non-Parametric Analysis

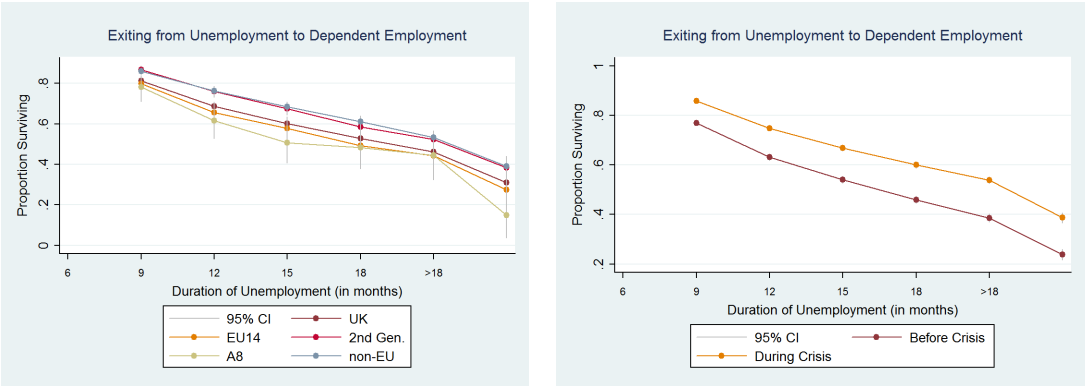
We present a non-parametric approach to the survival rates before and during the crisis for the UK natives and the immigrants (A8 immigrants, non-EU immigrants, EU14 immigrants and Second Generation immigrants). For this part of the analysis a standard non-parametric Kaplan-Meier estimator has been used. In figure 3.1a the survival rates in unemployment for the different population groups (categorized based on country of birth) are displayed. The non EU and the second generation immigrants have the highest survival rates in unemployment. In figure 3.1b it is obvious how the crisis significantly decreased the hazards of exiting unemployment towards dependent employment, for all unemployment durations.

A clearer picture of how the different migrant groups were affected by the crisis is provided by figures C.1a-C.1e. These figures show that the UK natives and second generation immigrants were significantly adversely affected by the crisis. At the same time, non EU migrants were mainly affected for the shorter durations of unemployment, while the A8 and the EU14 did not show a significant difference in their unemployment survival rates. This might be an indication of faster reactions by these two groups, stemming perhaps from their flexibility in moving between EU countries. It could also be due to labour market or demographic characteristics that explain the differences in the

groups. In the parametric analysis we are able to control for some main characteristics and investigate whether the differences between the groups for the periods before and during the crisis remain.

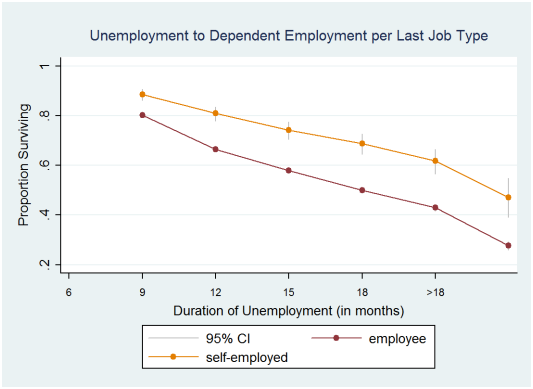
Finally, figures 3.2a and 3.2b show the importance of employment history on the probability of exiting unemployment. Individuals who were self-employed in their last job have higher survival rates in unemployment than former employees, and individuals who resigned and became unemployed exit unemployment into dependent employment the fastest, compared to the slower exits of individuals who were dismissed/made redundant and others whose their temporary job came to an end.

In order to understand which observed characteristics are driving the differences in the outcomes between the natives and the EU immigrants before and during the crisis, a parametric approach is necessary.

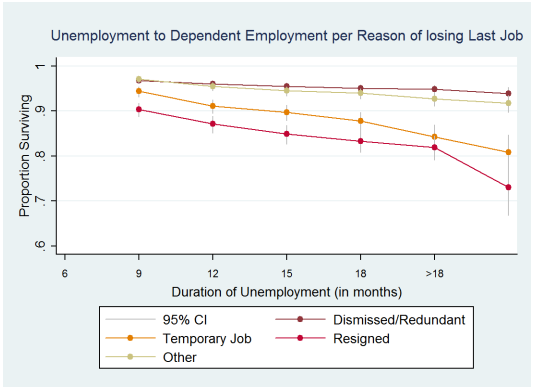


(a) Population Group (b) Crisis

Figure 3.1: Exits to Dep. employment by Population Group and Crisis Period



(a) Last Employment



(b) Reason out of Employment

Figure 3.2: Exits to Dep. employment by Last Employment and Reason out of Employment

Parametric Analysis: Exits from Unemployment to Dependent Employment

In this section, we control for a series of demographic and previous employment characteristics of the individuals in order to investigate whether there are any unobservable features of the immigrants (other than age, level of education, etc) that make them perform better or worse with regard to their re-employment rates when compared to the natives. Furthermore, the duration analysis gives us the opportunity to separate these possible unobservable effects from the baseline hazard (we have assumed a proportional hazard specification) that captures the duration dependence of the unemployment on duration of unemployment.

We estimate four different models[12]. The first model we estimate includes, apart from the immigrant status dummies, only regional and year-quarter dummies on top of the baseline hazard dummies. The second model also includes a series of controls for demographic characteristics; age, age squared, disability, marital status, children dummy, number of children, and level of education. The third model also includes controls for the type of occupation of individuals' previous employment (managers, directors and senior officials; professional occupations; associate professional and technical oc-

[12]Results are reported as hazard rates as presented by (Jenkins, 2005b) (mathematically; exp(coef.)-1).

cupations; administrative and secretarial occupations; skilled trades occupations; caring/leisure and other services occupations; process, plant and machine operatives; and finally, elementary occupations). In the fourth model we also include controls on the type of the last employment status (employees or self-employed) and controls on the reason the individual lost their last job (dismissed or made redundant; resigned; temporary job came to an end; or other reasons (health, family, etc). In order to see the differences between the immigrants and the natives before and during the crisis, interactions with a dummy that indicates the period before the crisis and a dummy that indicates the period during the crisis were used interchangeably. The results for the immigrants compared to the natives are included in table 3.6. We also present the results for the controls in other tables[13].

[13]The coefficients of the other controls from the two estimations (the interactions of immigrant statuses firstly with a dummy that gets the value one for the period during the crisis, and the second time with a dummy that gets the value one for the period before the crisis) are the same, so we report only the results from the first estimation, where the interaction is with the dummy getting the value one for the period during the crisis.

Table 3.6: Single Exits to Dependent Employment

Models	(1)	(2)	(3)	(4)	Models	(1)	(2)	(3)	(4)
A8 before	-0.360**	-0.698***	-0.614***	0.074	A8 during	0.179	-0.154	-0.123	-0.568
	(0.181)	(0.182)	(0.224)	(0.399)		(0.152)	(0.159)	(0.174)	(0.610)
EU14 before	0.140	0.003	0.033	0.128	EU14 during	0.053	-0.054	-0.061	-1.127
	(0.119)	(0.122)	(0.131)	(0.330)		(0.123)	(0.126)	(0.133)	(0.718)
non EU before	-0.123**	-0.457***	-0.424***	-0.640***	non EU during	-0.181***	-0.442***	-0.359***	-0.563**
	(0.062)	(0.066)	(0.073)	(0.235)		(0.065)	(0.068)	(0.073)	(0.252)
2nd Gen. before	-0.209***	-0.286***	-0.279***	-0.299	2nd Gen. during	-0.141*	-0.201***	-0.200**	-0.572*
	(0.073)	(0.076)	(0.085)	(0.228)		(0.074)	(0.076)	(0.083)	(0.310)
					UK during Crisis	-0.180*	-0.186*	-0.144	0.082
						(0.097)	(0.096)	(0.103)	(0.291)
Observations	26,130	25,559	20,858	15,711	Observations	26,130	25,559	20,858	15,711

[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] The p-values to indicate significance are denoted by * p< 0.05, ** p< 0.01, *** p< 0.001.

[3] The reference categories are UK native, female, without children, without disability, not married, with high education, dismissed/made redundant, elementary profession, self-employed.

[4] We also include interactions of population groups with crisis so the reference group is UK before crisis on the first group of models and the reference group is UK during the crisis on the second group of models.

[5] The regressions in the left column include a dummy(= 1) indicating the period during the crisis and its interactions with the immigrant status indicators. The reference group here is UK before the crisis, thus the estimates of the immigrant indicators (not their interactions with the crisis-dummy) give the difference between immigrants and natives before the crisis. The same exercise was conducted for the second column, in this case the crisis dummy being equal to one for the period before the crisis, thus the reference group here would be the UK during the crisis. The "UK during crisis" entry in the second column, is included in the second column, however, it was estimated from the first group of regressions, included in the left column.

[6] In model 1 we control for time and regional dummies, in model 2 we control for demographic characteristics as well (age, age squared, disability, marital status, children dummy, number of children and educational level), in model 3 we also control for occupation type at previous occupation and finally in model 4 we also control for reason for losing last job and type of last job (self-employment or dependent employment).

The first model for the period before the crisis shows that all the immigrant groups, apart from the EU14 immigrants, have significantly lower hazard rates of exiting unemployment than the natives. Being an A8 immigrant compared to being a UK native lowers the hazard of exiting unemployment to dependent employment by 30%, while being a non-EU migrant compared to being a native decreases the hazard of this transition by 12%, and being a second generation migrant compared to being a native decreases the hazard of this transition by 19%. The EU14 immigrants seem to have similar hazard rates to the natives before and during the crisis. For the period during the crisis there seems to be a convergence of the outcomes of the A8 immigrants and the natives, as be-

ing an A8 immigrant does not seem to affect the hazard of this transition significantly. Being a non-EU migrant during the crisis decreases the hazard of exiting unemployment by 17% when compared to being a UK native. The second generation migrants, on the contrary, seem to converge to the natives during the crisis; being a second generation migrant compared to being a UK native means a 13% lower hazard of exiting unemployment towards dependent employment during the crisis.

As we control for demographic and previous job characteristics in models 2 and 3 the above observations still hold, even though they seem to be greater than before we included the controls, meaning that given the observable characteristics, they perform worse compared to the natives; it seems that there are unobservable characteristics that increase immigrant's unemployment durations. More specifically, in models 2 and 3 we see that being an A8 immigrant compared to a UK native decreases the hazard of exiting unemployment towards dependent employment before the crisis by 50% and 46% respectively. During the crisis, the difference is insignificant. For the same models, being an non-EU migrant decreases the hazard by 34% and 35% respectively, while during the crisis, it decreases the hazard by 36% and 30%. Being a second generation migrant means a decrease of the hazard by 25% and 24% for models 2 and 3 before the crisis, and a decrease of 18% for both models during the crisis. For the same models, being an EU14 migrant compared to being a UK native does not significantly change the hazard of the transitions. Finally in model 4, after controlling for reasons for losing last job and for type of last job (dependent or self-employment) we see that EU14 and A8 immigrants show no significant differences in their unemployment hazards when compared to the natives for either period, before or during the crisis. This also holds for the second generation migrants, but only for the period before the crisis. However this is not the case for the non-EU migrants, who have a 47% lower hazard for exiting unemployment compared to the natives before the crisis and an 43% lower hazard during the crisis.

Table C.4 includes effects several demographic characteristics have on the probability of exiting unemployment. As would be expected, lower education compared to higher education decreases the hazard of exiting unemployment, and so does the disability status. From model 2 we can see that having obtained a low education as opposed to a high education means that the hazard of the transition from unemployment to depen-

dent employment is decreased by 44%. Having some disability compared to not having a disability decreases the hazard of this transition by 31%. As we control for labour market controls, family characteristics (having at least one child in the household, number of children in the household) become insignificant. Interestingly, given the other controls, age does not seem to have any statistically significant effect on the hazard of exiting unemployment. Table C.5 shows how previous job classifications, like jobs with managerial responsibilities, or professional occupations are affecting the hazard of exiting unemployment compared to elementary professions. For example, in model 3 we see that a person that was working in a managerial position at their last job has a higher hazard (22%) of exiting unemployment compared to individuals who worked in elementary professions at their last job. Finally, table C.6 shows how the hazard of exiting unemployment changes over duration of unemployment. Longer durations of unemployment lead to even lower hazards of exiting unemployment.

Parametric Analysis: Competing Risks Model, exits to Dependent Employment and Inactivity

The estimation of the competing risks model for the periods before and during the crisis gives estimates in the same direction as the model with exits from unemployment to dependent employment, but of different magnitude since different model specifications are used[14]. We do not find significant effects of the unobservable characteristics of the A8 and EU14 immigrant groups that would make their exits towards inactivity and dependent employment more likely than what it is for the natives for both periods. Being a non-EU immigrant compared to being a native decreases the relative risk ratio for exiting towards dependent employment by a factor of 0.5 approximately, and the relative risk ratio for exiting towards inactivity by a factor of 0.7 approximately for the period before the crisis. During the crisis, being a non-EU migrant decreases the relative risk ratio towards dependent employment by a factor of 0.6 while no statistical significance is found for exit towards inactivity during that period. Finally, being a

[14]Results are reported as relative risk ratios as presented by (Jenkins, 2005b) (mathematically; exp(coef.)).

second generation immigrant compared to being a naive decreases the relative risk ratio for exits towards dependent employment by a factor of 0.5.

Table 3.7: Competing Risks Model: Exits to Dependent Employment and Inactivity

	Before Crisis		During Crisis	
	Dependent Employment	Inactivity	Dependent Employment	Inactivity
A8	0.114	-0.453	-0.536	0.094
	(0.432)	(0.478)	(0.631)	(0.297)
EU14	0.153	-0.345	-1.126	-0.208
	(0.36)	(0.294)	(0.733)	(0.237)
non EU	-0.701***	-0.317**	-0.545**	-0.172
	(0.244)	(0.134)	(0.262)	(0.123)
2nd Gen	-0.325	-0.202	-0.621**	0.051
	(0.243)	(0.158)	(0.317)	(0.141)
UK			0.114	-0.19
			(0.307)	(0.178)
Observations	17,806		17,806	

[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.

[3] The reference categories are UK native, female, without children, without disability, not married, with high education, dismissed/made redundant, elementary profession, self-employed.

[4] We also include interactions of population groups with crisis so the reference group is UK before crisis on the first group of models and the reference group is UK during the crisis on the second group of models.

[5] This model is the equivalent of model 4 in the single exit case.

3.6.3 Limitations

There are some limitations in our analysis due to the lack of some information in the data, and also due to the coverage and length of the longitudinal Quarterly Labour Force Survey. Those issues will be discussed in this section.

The first limitation has to do with the lack of information on reservation wages in the data. The theory predicts that for any two identical individuals, given that everything else is equal, the one with the lower reservation wage should experience a shorter unemployment duration. However what we observe is the duration of unemployment but not the reservation wage of each individual. This could mean that migrants exit unemploy-

ment faster than natives due to the fact that they indeed might have lower reservation wages; they might be happy to work for less, work for more hours, or, work in a job that does not match their skill set. However, at the same time it is also possible that they do not accept job offers from the same distribution as the natives. Perhaps the jobs that are available for natives are not easily offered to migrants as their degrees might not be trusted, their knowledge of the English language and culture might be poor, or because their network cannot support them as much. Even though we try to control for factors that may affect the reservation wage or the job offers probability, since there is a remaining significant difference captured by the migrant dummy, it is not possible to identify which part of the mechanism is causing it, without having further information.
The second limitation is attrition from the dataset. Given that the QLFS follows households rather than individuals, it is impossible to know the labour market outcome of individuals who face early attrition. This attrition means that the individual we are following does not live in the house any more. In the case of migrants this means that perhaps the individual was unemployed for too long and returned home, in which case we are underestimating the unemployment duration of that group. However, it might also be the case that the individual found a job somewhere else in the UK so we are underestimating the hazard of exiting unemployment. This is an option available to both migrants and natives, however a native might not be as mobile as a migrant, since the migration costs for a native should normally be much higher. So it is more likely that this kind of attrition would cause an underestimation of the hazard for the migrants.
Finally, the third limitation is the possibility of measurement errors. The QLFS is a survey and as such is subject to mistakes. Even more when the information used in the analysis is retrospective in order to create unemployment histories. To mitigate the measurement error, as far as the retrospective dimension is concerned, we used the information on the length of unemployment from the first interview the individual was detected as unemployed and built the subsequent time event histories accordingly.
Better data sources (ideally administrative data), with more information on job histories and follow-up of the individuals would help with some of the limitations stated above, and could help give us a clearer picture of the labour market outcomes of migrants compared to natives.

3.7 Conclusion

In this paper we investigated the effects of the economic crisis on the labour market performance of natives and immigrants in the UK. We approached this question by conducting an initial evaluation of the probabilities of unemployment, dependent employment, self-employment and inactivity before and during the crisis, for five different demographic groups (UK natives, EU14 immigrants, non-EU immigrants, A8 immigrants and Second Generation immigrants). Then we focused on the outflows from unemployment towards dependent employment during the two periods, for the above demographic groups. This approach aspired to shed light on how the economic crisis affected the dynamics of the labour market for immigrant workers, and more specifically, the outflows from unemployment to dependent employment.

The unemployment stock per period is informative on its own, but it does not provide information on the duration dependence of unemployment (meaning the decrease in the hazard of a transition from unemployment to employment the longer an unemployment spell lasts), an important and determining characteristic of unemployment hazards. Furthermore, an unemployment duration approach provides the opportunity to follow the same individuals over time, making use of additional information that could not be used otherwise; for example information on previous employment, or reason for losing the last job could not be included in a simple cross-section model without raising endogeneity issues.

The estimation for the first part of the paper was conducted using a multinomial probability model to assess the relative probability of the different types of immigrants relative to the natives of existing in one of the four possible labour market positions; dependent employment, self-employment, unemployment and inactivity, for the periods before and during the crisis. The estimation of the second part of this paper was conducted using a complementary log-log proportional hazard model, using a flexible semi-parametric form of the baseline hazard, namely a piecewise constant hazard. The competing risks model with competing risks, dependent employment, unemployment and inactivity was conducted using a multinomial logit.

Based on the analysis presented above, we do not find evidence that EU migrants were disproportionately affected by the crisis, even though this does seem to be the case for the non-EU and the second generation migrants. The non-EU and the second generation migrants were less likely than UK natives to exit unemployment at any possible (relatively short-term) duration, a gap that seem to widen during the crisis. For the EU14 no significant difference was reported. The lower hazard that the A8 immigrants seemed to have compared to the natives for the period before the crisis became insignificant once we controlled for type of previous employment and reason for losing last job, among other demographic and job related characteristics. During the crisis, even the simplest model did not indicate a significant difference in the hazards of exiting unemployment between the natives and the A8 immigrants.

The above findings imply that the economic crisis hit hard some groups of immigrants, while others were not equally affected. There are many differences one can identify between the immigrant groups included in the sample, however, we would like to stress the fact that one main characteristic differentiating the position of EU and non-EU immigrants is the right of free movement between EU countries for individuals from EU member states. This could mean that the inflows and outflows of EU immigrants during times of hardship might be more flexible and, thus, these immigrants respond faster than the non-EU migrants regarding movements between countries. Such moves bear a cost, which in the case of the non-EU migrants could also mean difficulty of getting the right to re-migrate in the UK in the future. It could be the case that the crisis did hit harder immigrants than it hit natives, but that this could not be observed for EU immigrants due to their freedom of movement, which might have incited some of this group to return to their home countries, or migrate onwards to other countries.

The above realisation is one of the main limitations of this paper and any other paper that attempts to assess the labour market outcomes of natives and immigrants. The approach used in this paper mitigates the problem somewhat since it considers and follows the same individuals over time. However, returnees or individuals who re-migrated are considered right-censored and give no information on whether the risk of exiting the country is higher than the risk of entering dependent employment.

Regardless of the limitations, our results suggest that the non-EU and the Second Gen-

eration immigrants are affected by the crisis the most, whereas before the crisis the A8 immigrants were mainly affected due to non-transferability of their skills into the UK labour market, but during the crisis, the differences with respect to exits from unemployment between this group and the natives recede. Better integration of all the immigrant groups could be the best policy proposition, as it could lead to higher use of the workforce of the country and especially of the new additions of highly educated, young individuals from other countries.

4

Job separations in the UK during the Great Recession

4.1 Introduction

The financial crisis of 2008 is recognised to have had serious effects on the labour markets in developed economies. More difficult trading conditions led to lower hiring rates and the laying off of workers in many sectors. The effect of these changes in the labour market might be expected to differentially affect migrant and native labour. On one hand, immigrants face disadvantages relative to those born in a destination country due to language barriers, non-transferable human capital and potentially discriminatory hiring practises. On the other hand, positive selection of migrants may outweigh these factors, leading to better outcomes for immigrants.

This paper aims to investigate the differential effect of the crisis on native and migrant job separation rates. Separation rates give some indication of the relative value of labour, as we assume that employers will tend to keep hold of more productive workers, all else

being equal. A duration model with exits to unemployment is estimated (controlling for various characteristics) in order to address this question. The main assumption behind this approach being that the longer a employee has been working for a specific employer, the more likely they are to have accumulated job-specific human capital, and as a result, the greater the loss for the company in the event that that worker is of laid off (Cahuc and Zylberberg, 2004). The more skilled the job, the more relevant this connection between duration of employment and human capital accumulation may be. As well as the loss of job specific human capital, statutory redundancy costs are also often increasing in duration of employment. The implication is that there is duration dependence in the hazard of job separation, meaning that for different lengths of employment, one could expect different hazards of exit from employment.

Recent research on the drivers of unemployment in the UK has indicated that increased job separation rates might be equally if not more responsible for increased unemployment rates during the recession than reductions in hirings. Sutton (2013) found that during the economic crisis, job separations played an important role for increased unemployment in the UK, while Gomes (2012) found that for the UK job separations rates differed among individuals with different educational backgrounds and different employment histories (whether they were employed, unemployed or inactive before they transitioned from employment to unemployment).

This paper focusses particularly on the effects of the crisis on immigrants. The relatively high of levels of migration into the UK following the accession of eight Eastern European countries into the EU in 2004 has been politically controversial. As migration within the EU is unrestricted, this immigration flow is not subject to selection through UK visa laws, and so the extent to which such migrants are successful in the labour market is cannot be affected by UK laws of selection of more skilled immigrants. Immigrants might have a natural disadvantage in the labour market due to possible discrimination, language problems, lack of networks and non-transferability of skills. Immigrants from the newly accessed European countries are already found to downgrade in the labour market in the UK, which means to accept elementary jobs, while they are highly educated, Sirkeci et al. (2014). Human capital and experience that has been acquired abroad does not always provide equal returns in the UK labour market, as Clark

and Drinkwater (2008a) have found, both with respect to employment rates and wages. Those facts lead to the next question: where immigrants hit by the crisis to a greater extent than the natives.

In this paper we will analyse three types of models; a duration model with exits (separations) from dependent employment, two duration models with exits from dependent employment to specific destinations (unemployment in the first and underemployment in the second), and a competing risks model with exits from dependent employment to unemployment, inactivity, self-employment and underemployment. This approach requires that individuals of similar employment spans are compared. Our main interest is to examine the effects of the crisis on the migrants from the newly accessed EU member states. The timing of accession and the duration of the crisis are of imperative importance in our analysis, defining the final sample to be used.

The A8 countries joined the EU during the second quarter of 2004, so the majority of immigrants from these countries arrived after this date. The effect of the Great Recession on output dates from around the second quarter of 2008, and GDP declined for approximately four subsequent quarters. However, the effect on the labour market was much longer lasting, with unemployment remaining higher than before the recession until 2014 at least (Office of National Statistics, 2015). For comparisons between the UK natives and the A8 immigrants to be informative, we must consider that most A8 immigrants started work at earliest in 2004, and so we must restrict durations for each period to those commensurate with such a start date. The analysis covers the period between the second quarter of 2005 and the first quarter of 2011, allowing for a total highest of 72 months of employment. Identification is maintained under standard assumptions.

The data used in this paper are from the Quarterly Labour Force Survey. The sample created includes inflows to employment and follows the individuals until an exit from this initial state occurs or until the end of the observation window, using the start date in employment and relevant characteristics of each individual. This handling of the data allows for unobserved heterogeneity to be included in the model. A piecewise constant non-parametric model is used for the estimations.

Several potential drawbacks with this approach can be suggested. The return migration

of immigrant who do not perform well, or who perform very well, may bias estimates of immigrant survival. At the same time, the potential for attrition to be related to the ending of employment spells might introduce similar biases for the sample. In the end we cannot tell with certainty whether the differences we see for A8 migrants are due to the fact that they are significantly positively self-selected, or whether they are drawn to return to their country of origin due to discrimination or labour market failures, and nor can we tell how much this effects their final outcomes. However, the approach we follow is helping shed some light towards this direction. A better understanding on return migration and the flexibility of immigrants with respect to moving between countries is of imperative importance; as Barret and Kelly (2010) points out in the case of Ireland, the return migration of migrants in the case of unemployment is a positive for the host nation, as it provides a flexible source of labour.
One important implication of the better performance of the immigrants compared to the natives, is that it may lead to crowding out of native workers by immigrant workers.

4.2 Literature Review

This paper examines the differential effect of the economic crisis of the late 2000s on the immigrants in the United Kingdom. The historically high levels of immigration to the UK since the accession of the so-called A8 countries to the European Union has led to considerable public concern about the effect of such inflows on both the labour market and on public service providers. The onset of recession following the financial crash of 2007-8 only deepened these concerns in the UK (Lucchino et al., 2012), as increased unemployment and reductions in public spending made the perceived effect of immigration more salient. Much literature focuses on either the effect of the crisis on the labour market more generally (e.g. Bell and Blanchflower (2011)), or on the effect of immigration on native labour market outcomes and on aggregate fiscal balances (e.g. Dustmann et al. (2009)). In contrast, the focus here is on the labour market outcomes of immigrants themselves, and how these were effected by the more difficult conditions af-

ter 2008. This section proceeds by examining existing literature on the recession in the UK, before describing the state of current knowledge about the labour market behaviour of immigrants. Existing studies focusing on A8 immigration to the UK are mentioned, and the importance of duration perspective on labour market outcomes is also acknowledged.

Following the global financial crash of 2007-8, in common with many other developed economies, the United Kingdom fell into a recession, with GDP declining for 5 consecutive quarters (Office of National Statistics, 2015). The effects on the labour market would last considerably longer, however, as the unemployment rate remained high throughout the period 2008-2014, and only began to reach pre-crisis levels in 2015 (ibid). However, rates of unemployment were not as high as were experienced in other recent recessions in the UK, despite a more sustained effect on productivity and output (ibid). Gregg and Wadsworth (2010) consider this to be the result of successful labor market policies going back to 1996, as well as the right responses on behalf of both the workers, who accepted declines in their real wages, and firms, who did not lay off employees to preserve short-term profits. Transitions from employment to unemployment were thus, even though increased, mitigated. Of course, the effect of the change of job separation rates on the unemployment rate during the latest recession would be relevant only if, on average, inflows to unemployment from employment are not acyclical, and are significant compared to outflows from unemployment.

Job separations were found to account for almost half the unemployment dynamics in the UK before the onset of the crisis (Petrongolo and Pissarides, 2008). More interestingly, separation rates are found to be even more important than job finding rates in determining unemployment rates for the UK at times of rapidly increasing unemployment (Smith, 2011). This is in contrast to the experience in the US, where a reduction in the rate of hirings was most important in accounting for a much sharper rise in unemployment (Elsby and Smith, 2010). However, not all individuals suffer the same job loss rates; some population groups are more vulnerable than others. For example, individuals with the lowest educational background have two times higher separation rates than individuals with the highest educational background (Gomes, 2012).

The phenomenon of underemployment, where individuals work less than they would

like, came to cover for the hidden unemployment in the UK in the period after 2008. Underemployment was significant during the recession, and was one of the main reasons behind the fact that unemployment did not rise as significantly as might be expected during the crisis (Bell and Blanchflower, 2011). It mainly affected the young, least educated and ethnic minorities, as well as A8 and A2 immigrants, the self-employed, temporary workers, part-time workers and low-wage workers (Bell and Blanchflower (2014)).

There are a number of reasons why we might expect immigrants to experience different labour market outcomes to those born in a host country, both during a recession and during better times. Immigrants have different skills, motivations and experiences to native workers. However, the diversity of immigrant populations in the UK and the existence of factors that could effect immigrant's employment prospects in both directions makes it difficult to decide *a priori* how we expect migrants to perform relative to indigenous populations in a downturn. Chiswick (1978) examined the performance of American immigrants and found that despite initial disadvantage, migrants to America eventually caught up with and outperformed their peers after several years in the country. He also found that the labour market conditions upon entry to the country effect immigrants' long term performance. One explanation for such good performance on the part of immigrants is that immigrants are often subject to selection. This can take the form of external selection through border controls and visa regimes, whereby states attempt to allow only productive or wealthy migrants into their territories. For example, Bauer et al. (2002) examined Portuguese guest-workers in Germany, and found that while these migrants were less skilled than the average Portuguese worker, they were positively selected with respect to income relative to similarly skilled German workers, and had a high rate of vocational qualification, suggesting that the German immigration regime had succeeded in attracting migrants who met skills demand in the economy.

Migrants are also self-selected, in that those who tend to move have different characteristics than the general population. In many cases, the very fact that migrants have moved to work in another country leads us to expect them to have high unobserved qualities, such as motivation and determination, which may translate to job market success. Chiswick (1999) suggests based on theoretical considerations that migrants will be positively self selected, and that this self selection will be greater where there are higher

migration costs, between countries with small skill differentials despite high wage differentials, and where ability lowers migration costs. Migrants also have disadvantages relative to those who were educated in the destination country, however. Human capital acquired in the country of origin may translate imperfectly to the host country. The most obvious example of this is language skills; studies by Chiswick and Miller (2002) and Dustmann and Fabbri (2003) show for the US and UK respectively that lack of language skills leads to considerable disadvantages in the labour market. Educational or vocational qualifications gained in the host country may also not be transferable to the destination. McGuinness and Byrne (2015) examines the labour market performance of natives and immigrants in 11 EU countries, and finds significant evidence of overskilling amongst migrants, without a related gain in income. Visintin et al. (2015) finds similar evidence of such downgrading in a larger sample of more than 80 countries, finding additionally that the relationship between characteristics of the sending and receiving country is also significant in determining the degree of downgrading. DellAringa et al. (2015) examines downgrading among immigrants to Italy, and similarly finds that immigrant human capital is imperfectly transferable to the host nation.

Duration in employment may also be a significant explanatory factor for differences between migrants and native workers in aggregate, as it is expected that increased duration in work will lead to higher separation cost for employers (Cahuc and Zylberberg, 2004). Kogan (2004) explicitly examines the inflows and outflows to employment amongst migrant groups and natives in Germany. She finds that that recent non-EU migrants and guest workers are more likely to exit to unemployment because of the sectoral location of their employment, as well as because of their different human capital characteristics. As previously noted, much of the literature on A8 immigration to the UK has focused on the effect on the labour market outcomes of the natives, using spatial auto-correlation methods to determine whether areas with high immigrant inflows also experience high unemployment (Lucchino et al., 2012), although it has been suggested that the geographical mobility of natives may mitigate any such effect, as those who can't find a job due to immigration may simply move elsewhere (Hatton and Tani, 2005). Other research focusses on the benefit claims and fiscal impact of immigration. For instance, Dustmann and Frattini (2013) find that immigrants have a positive fiscal effect in the

UK. Drinkwater et al. (2006) suggest A8 immigrants have low skills and take low-paying jobs despite good education; their rate of return to human capital is low even after controlling for their characteristics.

Less research has focussed explicitly on the dynamics of labour market outcomes of A8 immigrants themselves and their entry and exits to employment. Barret and Kelly (2010) conducted such a study for Ireland using cross-sectional methods, and found that migrants to Ireland not only earned less than comparable natives, but also were more likely to lose their job after the recession. They also concluded that many immigrants returned to their country of origin or moved on to other destinations during the downturn, and that Ireland gained from this behaviour, as it was able to take advantage of labour during the boom, and shed it at little cost when the recession hit.

4.3 Data Description

The Quarterly Labour Force Survey (QLFS) for the UK is used for this analysis, and the observations are selected from a period between the second quarter (April-June) of 2005 until the first quarter (October-December) of 2011. This creates a time-span of 72 months. The beginning of the time-window is set one year after the accession of the A8 countries. This choice was made on the grounds of letting the A8 immigrant population in the UK grow large enough so that the sample would provide enough variation for all years.

The QLFS is a rotating panel, where each household enters the dataset and is observed for five subsequent quarters. Each year is divided in four quarters the first of which starts on 1st January[1]. The unit of observation is the person-month. The data are manipulated in such a way so that duration analysis on a flow sample is made possible. More specifically, the employment histories of each individual have been recovered and their other characteristics have been retrieved.

The main focus of this paper is on job separations, meaning, terminations of job con-

[1] Quarter 1: January-March, Quarter 2: April-June, Quarter 3: July-September, Quarter 4: October-December.

tracts of workers in dependent employment. The sample consists of inflows into employment with follow-up until separation or until the end of the observation window, whichever of the two occurs first. The reason we focus on job separations from dependent employment is because most of the employed workers in the sample are in dependent employment rather than self-employment (less than 10% of the sample is self-employed).

Apart from job separations, we also study two types of exits; exits from dependent employment to unemployment and exits from dependent employment to underemployment[2]. The analysis of each exit requires a different sub-sample; the second sample is also used for the comparative risks model where exits to unemployment, underemployment, inactivity and self-employment are studied. The two samples differ on the criteria of the initial state from which they are considered to exit. In the first case all people in dependent employment are considered to be in the initial state. In the second case only people who are in dependent employment and do not wish to work for longer hours than they currently do (for the same wage) are considered to be in the initial state.

4.3.1 Data Formation

The analysis consists of three parts: in the first part, job separations from dependent employment are explored; in the second part, exits from dependent employment to unemployment are explored and exits from dependent employment (which is defined as non-underemployment) to underemployment are explored; and in the third part, exits from dependent non-underemployment to unemployment, inactivity, self-employment and underemployment are explored. For this analysis all individuals find themselves in the initial state (inflows to employment) and an unbalanced panel is constructed, with spell length determined by the months of continuous employment of each individual, a formulation compatible with duration analysis. The initial state is employment, and exits at several durations are observed. The data gives information on the exact month

[2]We consider underemployed individuals in dependent employment who answered positively the question "Whether would like to work longer hours at current basic rate of pay, given the opportunity".

and year that a person started working for their current employer making it possible to estimate the exact months of employment of each individual. The durations of employment that individuals are allowed to experience is restricted; the sample contains only individuals with durations of a maximum that corresponds to what A8 immigrants could have experienced, given they are likely to have only arrived in the UK after 2004. For example, someone who has been continuously employed for the same employer in 2005 for 5 years is not included in the sample, while someone who has been continuously employed for the an employer for 5 years in 2011 is included. This leads to a sample size of 2,439,302 observations for the first part of the analysis, a sample size of 2,280,352 observations for the second part, and a sample size of 2,300,678 for the third part of the analysis.

Regarding the characteristics that are controlled for, some are constant over time, like industry of employment, socio-economic status or level of education, while others vary over time, like age and year controls. The variable characteristics had to be constructed working backwards for period before individuals joined the panel. It is worth noting here that only individuals who have been employed continuously for the same employer are considered, excluding transitions between jobs. Furthermore, transitions between jobs are not considered to be an exit in any of the models as they cannot be clearly identified. Finally, multiple transitions between different states are in general not studied in this paper.

4.3.2 Data Characteristics

The data cover the period between the second quarter of 2005 and the first quarter of 2011. The effects of the economic downturn were evident on the GDP levels for a shorter period, but the unemployment rate remained higher for longer. The period covered is divided in two parts; the time before the crisis (Q2 2005 - Q1 2008) and the time during the crisis (Q2 2008 - Q1 2011), which means that each period consists of 36 months.

In table 4.1 we present the characteristics of the duration dataset for exits from dependent employment. Histories of 94,970 individuals have been recovered. The individuals considered are older than 16 years old, have been continuously employed for the same employer and are not in full-time education. The sample has been divided in five population groups: UK natives, second generation immigrants, A8 immigrants, EU14 immigrants and non-EU immigrants. The EU14 immigrants account for the smallest proportion of the sample (less than 3%), while the UK natives comprise almost 80% of the sample. The second biggest group are the non-EU immigrants, followed by the Second Generation immigrants and the A8 immigrants. These numbers may be different than the actual population proportions of these groups, as they only include individuals in dependent employment, a specification that leaves a lot of individuals with different labour market characteristics out. Sampling weights are not used either for the data analysis or for the regression analysis, due to the fact that the correct weights for the recovered histories are not available. However, it is usual practice in the literature not to weight the data when the question of interest revolves around the comparison between immigrants and natives and specific weights have not been produced by the data provider for the immigrant population.

The group with the higher percentage of exits is the A8 immigrants. Comparing this characteristic with the number of exits towards other destinations indicates that attrition[3] is the main reason behind the relatively higher exit rates of the this group.

[3]This is the specification where attrition (disappearance of the individuals before the end of the observation window) is considered to be one more exit.

Table 4.1: Job Separations, Data characteristics

	UK	**EU14**	**2nd Gen.**	**A8**	**non EU**
Number of Observations	1,638,942	50,661	95,447	69,377	219,722
Number of Individuals	74,260	2,512	4,646	3,343	10,206
% of Group in Sample	79.0	2.4	4.6	3.3	10.6
Average length in Panel	35.3	32.7	32.8	32.5	34.1
Number of Exits	20,440	782	1,622	1,373	3,521
% of Individuals	27.5	31.1	34.9	41.1	34.5
Number of Censored Obs.	53,820	1,730	3,024	1,970	6,685
% of Individuals	72.5	68.9	65.1	58.9	65.5
Number of Observations by year					
2005	82,378	2,573	4,997	2,824	11,217
2006	249,023	7,860	15,403	9,981	33,541
2007	344,396	10,913	20,997	15,815	45,954
2008	373,013	11,667	22,749	16,967	51,471
2009	328,482	10,036	19,022	13,468	44,363
2010	232,768	6,831	11,203	9,235	29,841
2011	28,882	781	1,076	1,087	3,335
Mean Survival time*	46.6	42.4	40.0	37.1	41.6
	(0.13)	(0.73)	(0.49)	(0.55)	(0.33)

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

In table D.3, we present the characteristics of the duration dataset for exits from dependent employment to unemployment. The group with the shortest average duration in the panel is the A8 immigrants, which could be an indication of higher censorship, attrition, or faster exit from the initial state. A closer look at the percentage of censored observations in comparison to the percentage of exits indicates that exits towards other destinations or attrition might be the leading reason for the shorter lengths of this group in the panel. Observations that are considered censored include individuals who continue being in the initial state the last time we observe them, and individuals that exit towards inactivity and self-employment. Finally, it is quite likely that due to the fact

that the A8 population was intensely increasing during the first years of the accession, it might also be that the sample of A8 immigrants is weighted towards shorter durations. In table D.4, exits from employment to unemployment by duration are presented. The smallest probability of exit is observed during the first three months of employment, while the highest probability of exit is seen during the second quarter of employment. This fact might be related to specific types of contracts and/or seasonal jobs. In the analysis that follows, specific types of contracts will be controlled for. In table D.5 the levels of exit from the initial state are presented for each year. At later dates a higher proportion of exits is observed, however, this is a statistic that may be partly driven by the specific form of the data; longer durations are only observed during later years. In the regression analysis, identification of each effect is reached under some standard assumptions, and, thus, the effect of each period is estimated.

We also present the characteristics of the sub-samples for the other two types of analysis; exits to underemployment and multiple destinations. What is different here is that the initial state comprises of individuals that are employed in dependent employment and do not wish to increase their hours of work (for the same salary). The number of individuals in the two samples where exits emerge from the state of dependent employment (excluding those underemployed) are the same, however, since in the first case we have exits to underemployment only, all the rest of the destinations are considered censored which means that the number of observations for the multiple destinations sample will be greater as four possible different exits are considered.

Tables D.6 and D.9 in Appendix A show that the highest proportion of exits happens towards underemployment for all groups. Especially for the non-EU immigrants it holds that almost 10% exit to underemployment. The least likely exit for all groups is towards self-employment. In table D.6 the mean survival time before exit towards underemployment is lower by a few months than the mean survival time for exits towards unemployment. In table D.9, where multiple destinations are considered, the mean survival time is lower on an average of 10 months, than in the case of exits towards unemployment, an indication that might imply that the other exits happen faster than unemployment. Tables D.7 (exits towards underemployment) and D.10 (exits towards multiple destinations) show the same pattern on the proportion of exits per duration interval, as in the

case of exits towards unemployment. There is an increase in exits during the second quarter and the third quarter of employment, as well as for the longer durations. Finally, tables D.8 and D.11 also show increased exits towards underemployment and multiple destinations respectively, for the years during the crisis. However, this simple descriptive presentation conceals the fact that longer durations are only observed at later times, which might also be leading those percentages.

4.3.3 Descriptive Statistics

In this section we review the independent variables of the analysis. We present them first for the subgroup of individuals who exit from dependent employment. However, Appendix A includes the same statistics for the other types of exits and the statistics are very similar, as one would expect. The main difference is that in the case where individuals are originally employed but not underemployed, they are also more educated and of higher socioeconomic status than in the case when the initial state includes all individuals in dependent employment. In table 4.2 a presentation of the independent controls per population group is provided.

For the transitions from employment to any exit we control for age, age squared, gender, educational level, socioeconomic status, industry and also divide by contract type (permanent or temporary in some way). For the transitions from employment we control for age, age squared, gender, educational level, socioeconomic status, industry, contract type, and language difficulties that led to job loss. For this specific sub-sample we can see how the A8 immigrants and the second generation immigrants are relatively younger than the UK natives and the other two immigrant groups. It is also interesting that for A8 immigrants who find themselves in dependent employment, 55% are male. The A8 immigrants have on average higher levels of education than the UK natives. This is also true for the EU14 immigrants, even though to a lesser extent, and finally for the non-EU migrants. However, this is not something unexpected of the non-EU migrants, as they are subjected to migration controls in order to enter the country as economic migrants,

which might lead to higher levels of education for this group. The second generation migrants unsurprisingly have an educational distribution closer to that of the natives.

Table 4.2: Job Separations, Descriptive Statistics

	UK	EU14	2nd Gen.	A8	non EU
Age	37.8	36.3	33.4	31.2	37.1
	(0.01)	(0.05)	(0.03)	(0.03)	(0.02)
Gender (% male)	48.4	48.2	49.4	54.6	52.2
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Education					
Low	46.8	21.7	30.4	8.3	16.29
Intermediate	31.6	32.4	32.7	54.6	35.52
High	21.6	45.9	37.0	37.1	48.19
Number of Obs.	1,634,134	50,405	95,138	68,349	215,714
Socioeconomic Status					
Higher	41.1	54.6	49.5	9.7	45.6
Intermediate	16.3	12.0	16.6	4.7	12.0
Lower	42.5	33.3	33.7	85.2	42.2
Never Worked/Not Classified	0.1	0.1	0.2	0.4	0.2
Number of Obs.	1,638,942	50,661	95,447	69,377	219,722
Industry					
Agriculture & fishing	0.51	0.52	0.2	2.61	0.33
Energy & water	1.69	1.41	1.36	0.91	0.94
Manufacturing	10.14	9.52	7.08	31.45	8.3
Construction	6.71	3.73	4.47	4.28	3.39
Distribution, hotels & restaurants	20.03	20.94	19.84	28.52	21.59
Transport & communication	7.33	8.32	8.41	10.87	8.2
Banking, finance & insurance etc	17.11	23.14	23.45	8.83	21.01
Public admin, educ & health	30.73	27.42	29.98	8.43	31.79
Other services	5.75	5	5.21	4.11	4.44
Number of Obs.	1,634,923	50,591	95,181	68,830	218,793
Contract Type					
Permanent	93.08	91.03	91.77	90.96	89.99
Not permanent in some way	6.92	8.97	8.23	9.04	10.01
Number of Obs.	1,638,755	50,658	95,409	69,236	219,615

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Looking at socioeconomic status, EU14 migrants are generally employed in higher status jobs than natives, while the A8 are mainly clustered in manual and elementary jobs. This is also pictured in the industry distributions where the proportion of A8 immigrants who are employed in banking, financial or administrative jobs is much lower than the proportion of natives or other immigrants, while they find themselves disproportionately gathered in manufacturing. All groups show high percentages of employment in distribution services, hotels and restaurants. The UK natives are likely to have a permanent contract, while at the opposite side of the spectrum lie the A8 and non-EU migrants. Finally, A8 followed by EU14 migrants are the most likely to have lost a job due to language difficulties[4]. On the other hand, non-EU migrants have the lowest probability among immigrant groups (excluding second generation migrants) to have experienced such a job loss. This might be due to initial tests before visa approval, which may have led to filtering of non-EU migrants who have relatively good knowledge of the language. Finally, it is worth noting here that for the other two types of analysis, where exits emerge from dependent employment defined as non-underemployment, the sample includes individuals that are proportionally clustered in higher education, higher socio-economic status, higher probability of having a permanent contract and lower probability to have lost a job due to language difficulties. This can be seen in tables D.13 and D.14 in appendix A. This is most likely an indication that higher skilled employees are less likely to be underemployed.
In order to understand how these variables might be relevant to the duration in the initial state of employment it is imperative that we connect them with survival in that state.

4.3.4 Non-parametric Analysis

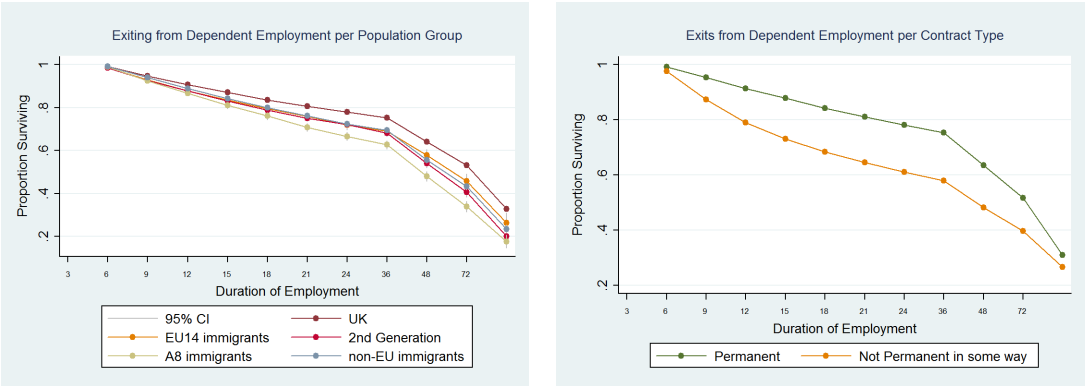
In this section we present the survival rates in the initial state of the individuals. That means that we present the survival rate of a group of individuals in the initial state (dependent employment) for different durations before they exit towards unemployment. The durations we consider are monthly quarters at the beginning, but as time in the ini-

[4]For the UK natives, this variable gets the value zero in the analysis.

tial state prolongs, we consider longer time spans so that we will be able to observe exits at each time interval. The specification we use allows for individuals to be censored. This is is done with the use of lifetables which are ideal for the case when survival times are grouped.

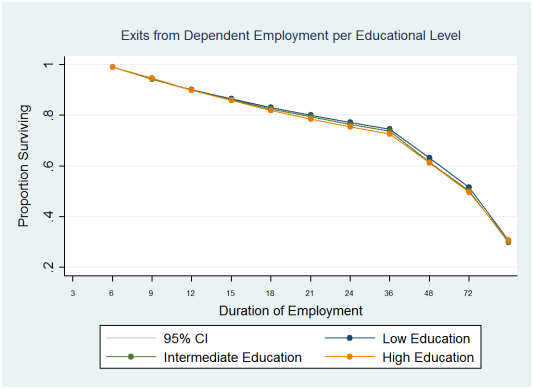
The grouped time intervals T_j are defined as $j = 1, ..., J : T_j : [t_t, t_{j+1})$ and we also consider three measures: $d_j =$ the number of failures observed in T_j; $m_j =$ the number of censored spell ending observed in T_j; and finally, $N_j =$ the number of individuals at risk at the beginning of each grouped interval. The assumption that exits happen uniformly within each time interval is made and thus an averaged estimate at the middle of each interval is considered, so that at each interval the adjusted number of people at risk of unemployment are equal to $n_j = N_j - \frac{d_j}{2}$ and the survival rate will be equal to $\widehat{S}(j) = \prod_{k=1}^{j}(1 - \frac{d_k}{n_k})$ (which is a typical Kaplan-Meier specification).

In figures 4.2a and 4.2b we see that job separations are happening faster the lower the socio-economic level, however, differences in educational levels do not seem to matter. Individuals with temporary contracts lose their jobs much faster than individuals with permanent contracts (4.1b). The A8 immigrants have the lowest survival rate in the sample, followed by the other immigrants. The UK natives have the highest survival rates (4.1a).

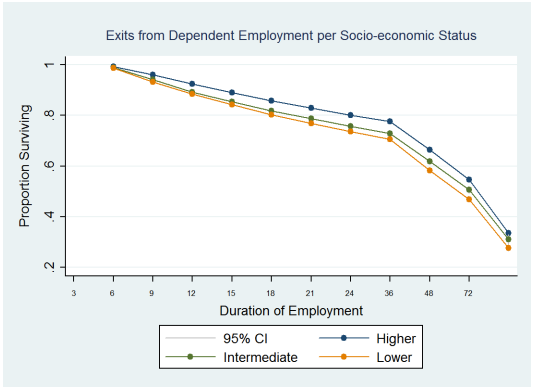


(a) Population Group (b) Contract Type

Figure 4.1: Exits to Unemployment by Population Group and Contract Type



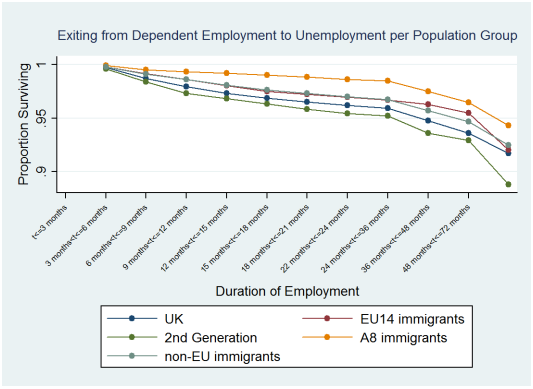
(a) Education Level



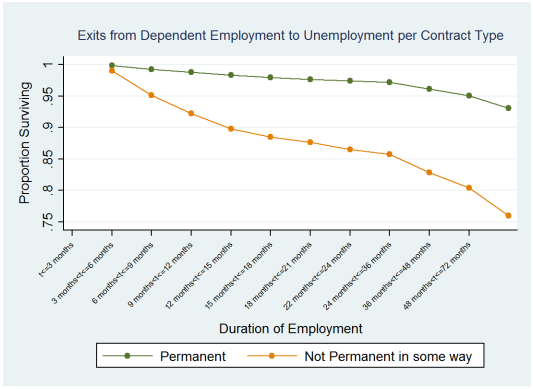
(b) Socio-economic Status

Figure 4.2: Exits to Unemployment by Education and Socio-Economic Status

In figures 4.4a and 4.4b we see that the transition to unemployment is happening faster the lower the educational level, and similarly the lower the socio-economic level. As one would expect, individuals with temporary contracts lose their jobs much faster than individuals with permanent contracts (4.3b). Interestingly, even though the A8 immigrants find themselves mainly in the subgroups that show the highest rates of exit from employment, they appear to have the highest survival rate in the sample, followed by the EU14 and the non-EU migrants, the UK natives and finally the Second Generation migrants (4.3a).

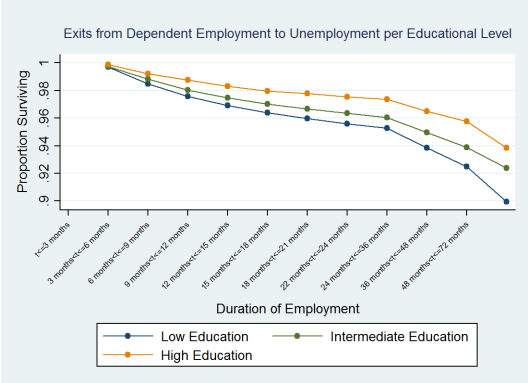


(a) Population Group

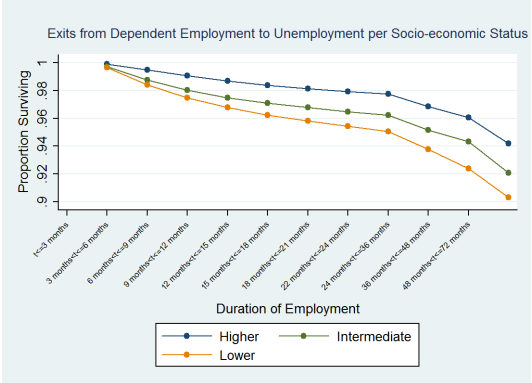


(b) Contract Type

Figure 4.3: Exits to Unemployment by Population Group and Contract Type



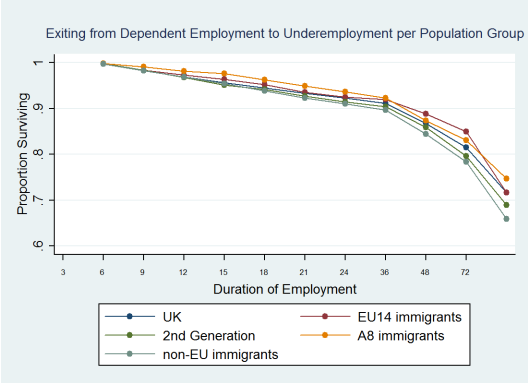
(a) Education Level



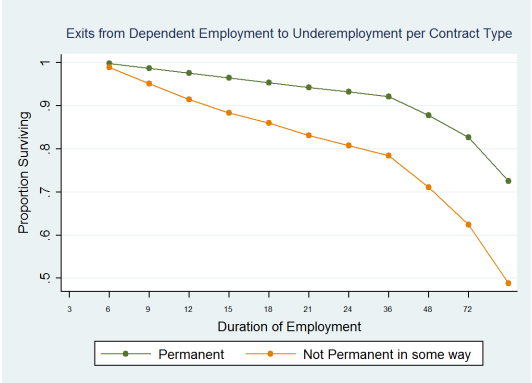
(b) Socio-economic Status

Figure 4.4: Exits to Unemployment by Education and Socio-Economic Status

In figures 4.5 and 4.6 we also include the equivalent non-parametric graphs for exits to under-employment. Two noticeable differences are, firstly, in figure 4.5a, the survival rates per population group and, secondly, in figure 4.6a, the survival rates per educational category. In the first case, it is not very clear which population group remains in the initial state for longer, especially for long durations. In the second case, unlike in the sample with exits to unemployment, we do not observe any differences in the survival rates for the intermediately educated and the lower educated.

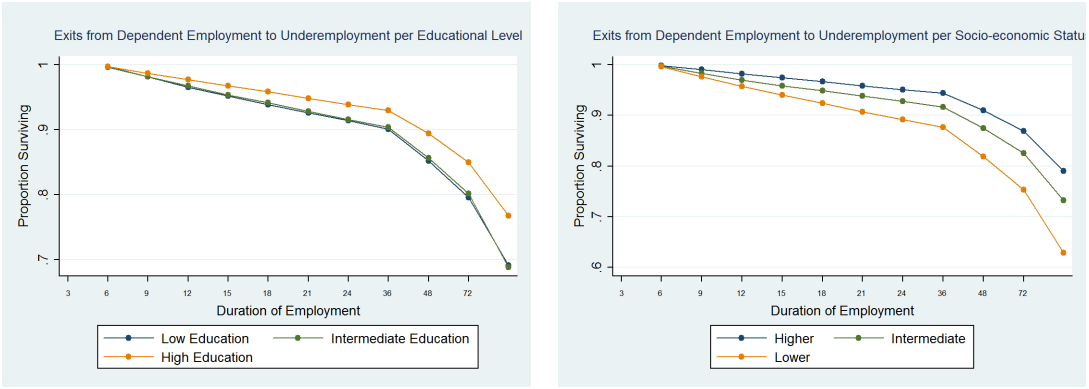


(a) Population Group



(b) Contract Type

Figure 4.5: Exits to Underemployment



(a) Education Level (b) Socio-economic Status

Figure 4.6: Exits to Underemployment

4.4 Econometric Model

4.4.1 Main Specification

In this section we present the econometric approach of this paper. There are two main approaches, the analysis of exits towards a single destination and the analysis of exits towards multiple destinations (competing risks model). In the estimation specification the specific form of the data (interval censored) is taken into account.

Single Destinations

We consider a proportional hazard model, observed in discrete time intervals. The sample has been recovered in its flow form. Given the continuous nature of the underlying procedure and the interval grouped form of the survey data, an ideal model to use is a complementary log-log model (Jenkins (2005b)). We consider intervals $(a_{t-1}, a_t]$ and

the survival function is then calculated at the end of each interval[5]:

$$S(a_t, X) = exp\left[-\int_0^{a_t} \theta(u, X)du\right]$$

where S is the survival function, θ is the hazard rate, and X are the individual observed characteristics.

We assume that the proportional hazard assumption is satisfied, so that the time hazard is constant among individuals and within a time interval, but can vary in duration (between time intervals) and, ultimately, its level is shifted proportionately by the individuals' observed characteristics:

$$\theta(t, X) = \theta_0(t)e^{\beta' X} = \theta_0(t)\lambda$$

where $\beta' X \equiv \beta_0 + \beta_1 X_1 + ... + \beta_\kappa X_\kappa$.

It follows:

$$\begin{aligned} S(a_t, X) &= exp\left[-\int_0^{a_t} \theta_0(u)\lambda du\right] \\ &= exp\left[-\lambda\int_0^{a_t} \theta_0(u)du\right] \\ &= \exp\left[-H(a_t)\lambda\right] \end{aligned}$$

where $H(a_t) = \int_0^{a_t} \theta_0(u, X)$ is the integral of the baseline hazard over the interval. Finally, the interval censored hazard function $h(a_t, X) \equiv h_t(X)$ will be:

$$\begin{aligned} h_t(X) &= \frac{S(a_{t-1}, X) - S(a_t, X)}{S(a_{t-1}, X)} \\ &= 1 - \frac{S(a_t, X)}{S(a_{t-1}, X)} \\ &= 1 - exp[\lambda(H_{t-1} - H_t)] \end{aligned}$$

[5]The mathematical exposition in this section follows closely that in Jenkins (2005b).

If we take the double logarithm of the above expression we obtain the convenient complementary log-log formulation: $log(-log[1-h_j(X)]) = \beta' X + log(H_j - H_{j-1})$. Isolating the baseline hazard for any random interval $(a_{j-1}, a_j]$ by setting $\beta' X = 0$ we have:

$$\begin{aligned} 1 - h_{0j} &= \exp(H_{j-1} - H_j) \\ log[-log(1-h_{0j})] &= log(H_j - H_{j-1}) \\ &= log\left[\int_{a_{j-1}}^{a_j} \theta_0(u)du\right] \\ &= \gamma_j \end{aligned}$$

Substituting the above expression in the previous hazard function we get:

$$\begin{aligned} log(-log[1-h_j(X)]) &= \beta' X + \gamma_j \\ h(a_j, X) &= 1 - \exp[-\exp(\beta' X + \gamma_j)] \end{aligned}$$

We allow γ_j to vary between intervals without restriction, adopting in this way a semi-parametric type of hazard. However, it is considered to be constant within a time interval.

In order to include heterogeneity in the model above, we consider a random variable v, positive, with mean equal to one, finite variance and distributed independently of duration and the observed characteristics X. This allows us to identify dynamic sorting from duration dependence. The survivor function with heterogeneity will be equal to:

$$S(t, X|v) = [S(t, X)]^v$$

This implies that the survivor function is scaled by heterogeneity. We assume a

proportional hazard form for the hazard rate

$$\theta(t, X) = \theta_0(t)e^{\beta' X}$$

which, after being scaled by heterogeneity will be:

$$\begin{aligned} \theta(t, X|v) &= v\theta_0(t)e^{\beta' X} \\ log[\theta(t, X|v)] &= log\theta_0(t) + \beta' X + u \end{aligned}$$

where $u = log(v)$ and $\epsilon(u) = \phi$. We assume a normal distribution for the random effect v and we integrate it out:

$$S_v(t, X) = \int_0^\infty [S(t, X)]^v g(v)dv$$

The discrete interval hazard function is equal to

$$h_t(X) = \frac{S(a_{t-1}, X|v) - S(a_t, X|v)}{S(a_{t-1}, X|v)}$$

Which becomes after some trivial manipulations:

$$log(-log(1 - h_t(X))) = \beta' X + log(H_t - H_{t-1}) + log(v)$$

We assume that u has a Normal distribution with mean zero, and the likelihood is computed numerically as there is no closed form expression for such a survivor function.

Competing Risks Model

We assume that the underlying data generating process and the transitions towards the possible different exits are happening in a continuous manner, however, we only observe them in grouped time intervals (monthly). The different possible exits are "competing" within any interval and we only observe the one that occurs first. The mathematical description of the model below follows Jenkins (2005b)

Even though the competing risks model considered in this paper has four possible destinations, the econometric specification presented below of the model will be for the simplified case of two possible destinations. The case with four possible exits is a straightforward generalization of the simplified case with two exits. Thus, we assume two possible competing risks A and B. For any interval j the discrete hazard will be:

$$\begin{aligned} h(j) &= 1 - \frac{S(a_j)}{S(a_{j-1})} \\ h(j) &= 1 - \frac{exp[-\int_0^{a_j}[\theta_A(t) + \theta_B(t)]dt]}{exp[-\int_0^{a_{j-1}}[\theta_A(t) + \theta_B(t)]dt]} \\ h(j) &= 1 - exp\left[-\int_{a_{j-1}}^{a_j}[\theta_A(t) + \theta_B(t)]dt\right] \end{aligned}$$

which holds under the assumption that the different destinations are independent, so that the property $\theta(t) = \theta_A(t) + \theta_B(t)$ holds.

For small hazards it will be $h(j) = h_A(j) + h_B(j)$ and thus we can re-write it as $h(j) = 1 - [1 - h_A(j)][1 - h_B(j)]$ which leads to the following survivor function: $S(j) = (1 - h_{A1})(1 - h_{A2})...(1 - h_{Aj}) \times (1 - h_{B1})(1 - h_{B2})...(1 - h_{Bj}) = S_A(j) \times S_B(j)$, which is also equal to the likelihood when an individual has a censored spell of j intervals. For the full formulation we need the likelihood for the event that an exit to destination A or B also occurs.

We assume that an exit towards outcome A occurs. The idea that needs to be expressed in the likelihood is that there is a joint probability of a spell length to lie between the boundaries of an interval, and that the exit towards the alternative destination has a

latent exit time after the exit time to the current destination. This joint probability will be equal to:

$$\begin{aligned} L_A &= Pr(a_j - 1 < T_A \leq a_j, T_B > T_A) \\ L_A &= \int_{a_j-1}^{a_j} \int_{u}^{\infty} f_A(u) f_B(v) du dv \\ L_A &= \int_{a_{j-1}}^{a_j} \left[\int_{u}^{a_j} f_A(u) f_B(v) dv + \int_{a_j}^{\infty} f_A(u) f_B(v) dv \right] du \end{aligned}$$

As one can observe, the independence of the risks is a strong but important assumption for the estimation of this model. One more important assumption will be that the destination specific hazard rates will be constant within intervals, but will be allowed to vary between intervals. This means that for any $t \in (a_{j-1}, a_j]$ it will be $\theta_M(t) = \overline{\theta}_{Mj}$ for possible exits $M = \{A, B\}$, where $\overline{\theta}_{Mj} = exp[\beta_M X]$. It will also hold that $\theta(j) = \overline{\theta}_{Aj} + \overline{\theta}_{Bj}$, which implies a constant piecewise exponential form.
The interval hazards for each destination can now be written as:

$$\begin{aligned} h_A(j) &= 1 - exp[-\overline{\theta}_{Aj}] \\ h_B(j) &= 1 - exp[-\overline{\theta}_{Bj}] \\ h(j) &= 1 - exp[-\overline{\theta}_{j}] \end{aligned}$$

and the likelihood will be (for $\delta_M = 1$ with $M = \{A, B\}$ when exit to destination M occurs, and $\delta_M = 0$ if exit to destination $M - 1$ occurs):

$$L = S(j) \left(\frac{h(j)}{1 - h(j)} \right)^{\delta_A + \delta_B} \left(\frac{\overline{\theta}_{Aj}}{\overline{\theta}_{Aj} + \overline{\theta}_{Bj}} \right)^{\delta^A} \left(\frac{\overline{\theta}_{Bj}}{\overline{\theta}_{Aj} + \overline{\theta}_{Bj}} \right)^{\delta^B}$$

For short intervals it can be approximated $h_M(j) \approx \overline{\theta}_{Mj}$ where $M = \{A, B\}$ destina-

tions and then the likelihood can be re-written as :

$$L = S(j)\left(\frac{h(j)}{1-h(j)}\right)^{\delta_A+\delta_B}\left(\frac{h_A(j)}{h(j)}^{\delta_A}\right)\left(\frac{h_B(j)}{h(j)}^{\delta_B}\right)$$

which is a model that can be estimated as a multinomial logit. The model can be rewritten in the exact same fashion for more than two destinations.

4.4.2 Estimation

For the single transitions to be estimated, an identification issue has to be resolved. Due to the specific choice of the sample, longer durations of employment are only observed during later dates. That could potentially bias the outcome if no restrictions are assumed that will allow to identify the effect of later dates and longer durations. The fact that later dates are also during the crisis could exacerbate this problem. Even though we observe longer durations only at later dates, we also shorter durations at all dates. Under the standard assumption of the proportional hazard specification that the hazard is independent of specific dates and only depends on duration in the initial state, we can identify the effect of the different years as an extra effect that shifts the duration dummies according to the business cycle.

For the competing risks model to be estimated, we assumed that the continuous underlying hazard is constant within the intervals in which the data are grouped (Allison, 1982). This assumption is more relevant the smaller the hazard is. We also account for destination specific heterogeneity by allowing the coefficients of the independent variables to vary between different outcomes. Finally, we assume that the risks are not correlated, an assumption that we test using the methodology from discrete choice modelling for testing the assumption of "Independence or Irrelevant Alternatives". Furthermore, identification in this model requires that the coefficients of one possible destination are equal to zero. We normalize the coefficients of the censored outcome to be equal to zero.

4.5 Results

In this section we present the main findings of this paper. The first part presents job separations, the second part presents the single transitions to unemployment and to under-employment and the third part presents the results from the competing risks model to unemployment, inactivity, self-employment and under-employment.

4.5.1 Job Separations

In this part we present the results from the mixed proportional hazard model. In table 4.3 we see three different model specifications and the comparative exits of immigrant groups with respect to natives for the periods before and during the crisis. All models include controls for region and year-quarters. Model two also includes demographic controls (age, gender, educational level) and model three includes demographic and job characteristics controls (socioeconomic status and industry type).
Being an A8 immigrant as opposed to being an UK native increased the hazard of job separation by 75% for the period before the crisis, and that is mitigated as we control for more characteristics, showing that the increase of the hazard in model 3 is 52%. Being a second generation migrant increased the job type separation hazard by 18% for the period before the crisis, however, after controlling for demographic and job characteristics we see that the hazard is increased by only 12%. However, this is not the case for the EU14 and the non EU migrants; in model one we see that being an EU14 migrant or a non-EU migrant increased the hazard of a job separation by 13% and 18% respectively for the period before the crisis. However, after controlling for demographic and job type characteristics we see that the hazard is increased by 15% and 27% when being an EU14 or a non-EU migrant respectively.
For the period during the crisis being an A8 immigrant rather than a UK native increased the hazard of job separation by 43% which is a lower increase than before the crisis. After controlling for observable characteristics, in model three we can see that the hazard increase by being an A8 immigrant was 25%. Being an EU14 or a second generation

migrant had a similar increase on the hazard of job separation like before the crisis, only slightly higher by approximately 2%. Being a non-EU migrant as opposed to being a UK native had the same increase during the crisis as before the crisis. Finally, being a UK native during the crisis compared to being a UK native before the crisis increased the hazard of job separation by more than 100%.

Table 4.3: Job Separations, Mixed Proportional Hazards model, per population group results

Models	1	2	3
A8 before	0.557***	0.472***	0.416***
	(0.042)	(0.048)	(0.049)
EU14 before	0.123**	0.148**	0.138**
	(0.059)	(0.064)	(0.064)
non-EU before	0.172***	0.255***	0.236***
	(0.03)	(0.034)	(0.034)
2nd Gen. before	0.169***	0.114**	0.111**
	(0.043)	(0.046)	(0.046)
During Crisis (UK)	3.374***	3.339***	3.334***
	(0.027)	(0.033)	(0.033)
A8 during	0.359***	0.280***	0.220***
	(0.035)	(0.035)	(0.037)
EU14 during	0.128***	0.170***	0.160***
	(0.045)	(0.045)	(0.045)
non-EU during	0.179***	0.258***	0.239***
	(0.023)	(0.023)	(0.024)
2nd Gen. during	0.189***	0.128***	0.127***
	(0.032)	(0.032)	(0.032)
Observations	2,074,149	2,063,740	2,057,956
Number of Individuals	94,967	94,492	94,108

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table 4.4: Job Separations, Mixed Proportional Hazards model, per personal characteristics results

Models	2	3
Age	-0.069***	-0.063***
	(0.003)	(0.003)
Age squared	0.001***	0.000***
	(0.000)	(0.000)
Gender (male%)	0.017	0.002
	(0.012)	(0.013)
Low Education	0.145***	0.071***
	(0.016)	(0.018)
Intermediate Education	-0.021	-0.067***
	(0.016)	(0.017)
Intermediate Socioeconomic Status		0.089***
		(0.019)
Lower Socioeconomic Status		0.127***
		(0.016)
Agriculture & fishing		0.087
		(0.079)
Energy & water		0.113**
		(0.057)
Manufacturing		0.023
		(0.032)
Construction		0.041
		(0.035)
Distribution, hotels & restaurants		0.072***
		(0.028)
Transport & communication		0.011
		(0.034)
Banking, finance & insurance		0.067**
		(0.029)
Public admin, educ & health		-0.025
		(0.028)
Observations	2,063,740	2,057,956
Number of Individuals	94,492	94,108

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

In table 4.4 we see age has a mitigating effect on job separations as one year decreased the hazard of job separation by 6%, and being a low educated individual increased the hazard of job separation by 7%. This contrasts then non-parametric analysis that did not show any differences in the survival rates of the individuals based on their educational level. Lower socioeconomic statuses are also at higher risk of job separation than professions of higher socioeconomic status; having an intermediate socioeconomic status compared to a high one increased the job separation hazard by 9%, while having a low socioeconomic status increased it by 14%.

Table 4.5: Job Separations, Mixed Proportional Hazards model, per duration in employment results

Models	1	2	3
3 months	-7.170***	-5.671***	-5.849***
	(0.064)	(0.09)	(0.094)
6 months	-5.530***	-4.013***	-4.183***
	(0.056)	(0.084)	(0.089)
9 months	-5.452***	-3.922***	-4.088***
	(0.056)	(0.085)	(0.089)
12 months	-5.486***	-3.947***	-4.113***
	(0.056)	(0.085)	(0.089)
15 months	-5.414***	-3.869***	-4.033***
	(0.057)	(0.085)	(0.09)
18 months	-5.446***	-3.885***	-4.048***
	(0.058)	(0.086)	(0.091)
21 months	-5.503***	-3.939***	-4.103***
	(0.059)	(0.087)	(0.091)
24 months	-5.518***	-3.946***	-4.111***
	(0.06)	(0.088)	(0.092)
36 months	-5.406***	-3.808***	-3.970***
	(0.056)	(0.085)	(0.09)
48 months	-5.269***	-3.639***	-3.801***
	(0.058)	(0.087)	(0.091)
72 months	-4.497***	-2.845***	-3.007***
	(0.059)	(0.088)	(0.092)
Observations	2,074,149	2,063,740	2,057,956
Number of Individuals	94,967	94,492	94,108

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table 4.6: Exits from Dependent Employment per Type of contract

	(1)	(2)
VARIABLES	Permanent Contract	Temporary Contract
A8 before	0.402***	0.298***
	(0.048)	(0.106)
EU14 before	0.115*	0.230
	(0.065)	(0.156)
non-EU before	0.198***	0.310***
	(0.034)	(0.074)
2nd Gen. before	0.125***	-0.033
	(0.046)	(0.126)
UK during crisis	3.352***	2.819***
	(0.029)	(0.082)
A8 during	0.203***	0.262***
	(0.034)	(0.095)
EU14 during	0.160***	0.131
	(0.044)	(0.129)
non-EU during	0.221***	0.219***
	(0.023)	(0.061)
2nd Gen. during	0.128***	0.045
	(0.030)	(0.088)
Observations	1,904,804	152,702

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] For the upper half of the table the reference group is UK natives before the crisis, and for the lower half of the table the reference group is UK natives during the crisis.

[3] Controls for demographic and job market characteristics are included.

Finally, table 4.5 shows the duration dependence of length in employment and separation risk. Longer employment durations significantly decrease the risk of exiting employment.

We also reassessed the employment termination hazards separately for individuals with permanent and temporary contracts. The results can be seen in table 4.6. Having a temporary contract as opposed to a permanent one did not increase the hazard of job separations for the EU14 and the second generation migrants compared to the natives for either period. On the other hand, being an A8 immigrant with a temporary contract increased the hazard by 35% before the crisis but did not seem to change it significantly during the crisis. Being a non-EU immigrant with a temporary contract increased the hazard by 36% before the crisis and by a lower 24% during the crisis. Being an A8 immigrant with a permanent contract before the crisis increased the hazard by 49% and during the crisis by 23%. Being a non-EU immigrant with a permanent contract increased the hazard by 22% before the crisis and by 25% during the crisis. Finally, the UK natives saw an increase in the risk of exiting employment during the crisis for workers under both types of contracts. It seems that on average, permanent contracts were the ones that faced higher risk of ending compared to temporary ones during the crisis.

4.5.2 Single Transitions to Unemployment or Under-employment

In this section we present the results from the different transitions, namely for transitions from employment to unemployment, from employment to underemployment, and from employment to multiple destinations (unemployment, inactivity, underemployment, self-employment). The single destination models are presented both considering heterogeneity and not considering heterogeneity. We present a number of models for each type of transition where we consecutively add more relevant controls. In model A we control only for the different population groups and for duration; in model B we also control for educational level, gender, age and age squared; in model C we control for socioeconomic status; in model D we control for industry; in model E we control for contract type; and, finally, in model F we control for language difficulties. Year and

residence dummies are included in all models.

In table 4.7 we see the results of the complementary log-log model with heterogeneity for exits from employment to unemployment. We include interactions between the population groups and the crisis, so the reference group is UK natives before the crisis. The EU14 and the non-EU migrants do not show any significant differences from the natives for the probability of exiting the initial state before the crisis. Only for the non-EU do we see a slight smaller probability of exiting, significant at 10% level, in model E, after we control for demographic characteristics, socioeconomic status, industry and type of contract. The second generation migrants are more likely to exit to unemployment than the natives before the crisis, a difference that gets smaller as we control for more demographic and labour market relevant characteristics. The difference disappears once we control for type of contract. Interestingly, the A8 are less likely to exit towards unemployment than the natives, and as we control for more characteristics, this difference is actually getting higher.

During the crisis, the probability of exiting towards unemployment is significantly higher for the UK natives, and it declines as we control for characteristics. The EU14, non-EU and second generation migrants do not seem to differ from the UK natives during the crisis. Finally, the A8 are affected the most by the crisis compared to all other groups. This could imply some sort of convergence between their outcomes and the outcomes of the other population groups during the crisis.

Regarding the rest of the characteristics, looking at model F, age has an increasingly mitigating effect on the probability of entering unemployment, men are more likely to become unemployed than women, and higher educational levels decrease this probability as well, a pattern that can also be seen for higher socioeconomic status. Manufacturing and construction are the two industries that seem to suffer the highest transitions to unemployment, while public services, administrative, educational and health professions are the ones that suffer the least compared to all other jobs. As would be expected, permanent contracts prevent transitions to unemployment. Language difficulties do not seem to have an effect on these transitions, something that might be due to the fact that language fluency could be an important criterion that determines whether a migrant worker will get a higher skilled job or in a specific industry, allowing thus the language

effect to be absorbed by other labour market relevant variables. Finally, the transition to unemployment seems to decline the longer a person is employed, once the first three months of high risk of exit has been "survived" in the job successfully.

We also conduct the above analysis without controlling for heterogeneity (Appendix D). Comparing the two groups of results, we see that when heterogeneity is ignored, then the estimated coefficients are slightly underestimated

In Table 4.8 we can see the results for exits from dependent employment to underemployment. For the period before the crisis, there are hardly any differences between the EU14 immigrants or the second generation immigrants and the natives. The non-EU immigrants are significantly more likely to do such a transition before the crisis, compared to the natives. The A8 seem to be performing similarly to the natives, but as we control for more characteristics in models C-F we can see that they are actually significantly less likely than the natives to become underemployed before the crisis.

Once again, the UK natives seem to be hit hard by the crisis, and see a significant increase at their underemployment levels during the crisis. The EU14 show no difference in behaviour with respect to the UK-born during the crisis. The second generation migrants seem to suffer the highest increase in the underemployment transition rates compared to the natives, a difference that declines as we control for more labour market relevant characteristics. The A8 still outperform the UK natives during the crisis, and the non-EU do worse than the natives during this period as before. Again, we don't see any great differences between the model including heterogeneity and the simple one, even though the coefficients are larger for the heterogeneity model.

The duration in the job, if we exclude the first three months which seem to experience the smallest probability of transiting to underemployment, seem to decrease initially and then increase for longer durations. Age seems to have a negative effect on transitions to underemployment, but once we control for industry, type of contract and socioeconomic status, the effect becomes positive. Intermediately and lower educated individuals seem to suffer higher transitions than higher educated ones, while a low socioeconomic status is once again related to very high hazards of underemployment. Men are less likely to become underemployed than women and individuals with permanent contracts find themselves less likely to be underemployed than individuals with temporary contracts.

Once again language difficulties seem to be insignificant.

Table 4.7: Complementary log-log with Heterogeneity, Exits from Dependent Employment to Unemployment

Complementary log-log with Heterogeneity, Exits from Dependent Employment to Unemployment												
Variables	**Model A**	s.e.	**Model B**	s.e.	**Model C**	s.e.	**Model D**	s.e.	**Model E**	s.e.	**Model F**	s.e
A8	-1.138***	(-0.24)	-1.073***	(-0.25)	-1.552***	(-0.28)	-1.626***	(-0.28)	-1.810***	(-0.29)	-1.365**	(-0.61)
EU14	-0.056	(-0.18)	0.092	(-0.18)	0.058	(-0.19)	0.045	(-0.19)	0.010	(-0.20)	-0.817	(-1.04)
Non-EU	-0.155	(-0.09)	0.032	(-0.10)	-0.093	(-0.10)	-0.079	(-0.10)	-0.190*	(-0.11)	-0.256	(-0.32)
2nd Gen.	0.248**	(-0.11)	0.272**	(-0.11)	0.257**	(-0.12)	0.248**	(-0.12)	0.191	(-0.12)	0.601	(-0.63)
Crisis	0.826***	(-0.08)	0.820***	(-0.08)	0.780***	(-0.08)	0.790***	(-0.08)	0.680***	(-0.08)	0.703***	(-0.09)
A8*Crisis	0.474	(-0.29)	0.498*	(-0.29)	0.759**	(-0.32)	0.747**	(-0.32)	0.779**	(-0.33)	0.599	(-0.70)
EU14*Crisis	-0.251	(-0.24)	-0.246	(-0.24)	-0.205	(-0.25)	-0.177	(-0.25)	-0.196	(-0.26)	0.430	(-1.26)
Non-EU*Crisis	0.026	(-0.12)	0.043	(-0.12)	0.034	(-0.13)	0.023	(-0.13)	0.041	(-0.13)	-0.353	(-0.42)
2nd Gen*Crisis	0.042	(-0.14)	0.041	(-0.14)	0.027	(-0.15)	0.034	(-0.15)	0.026	(-0.16)	0.031	(-0.83)
3 months	-7.650***	(-0.14)	-6.649***	(-0.44)	-7.813***	(-0.42)	-7.582***	(-0.42)	-7.178***	(-0.30)	-7.187***	(-0.32)
6 months	-6.358***	(-0.13)	-5.334***	(-0.42)	-6.472***	(-0.40)	-6.237***	(-0.40)	-5.679***	(-0.28)	-5.640***	(-0.30)
9 months	-6.638***	(-0.13)	-5.592***	(-0.41)	-6.682***	(-0.39)	-6.428***	(-0.39)	-5.744***	(-0.27)	-5.714***	(-0.29)
12 months	-6.916***	(-0.13)	-5.867***	(-0.40)	-6.960***	(-0.38)	-6.717***	(-0.38)	-5.947***	(-0.27)	-5.908***	(-0.28)
15 months	-7.174***	(-0.14)	-6.110***	(-0.40)	-7.157***	(-0.37)	-6.917***	(-0.37)	-6.084***	(-0.27)	-6.073***	(-0.28)
18 months	-7.515***	(-0.14)	-6.436***	(-0.40)	-7.482***	(-0.37)	-7.248***	(-0.37)	-6.384***	(-0.27)	-6.384***	(-0.29)
21 months	-7.620***	(-0.14)	-6.541***	(-0.40)	-7.585***	(-0.37)	-7.343***	(-0.37)	-6.440***	(-0.27)	-6.457***	(-0.29)
24 months	-7.741***	(-0.15)	-6.659***	(-0.40)	-7.699***	(-0.37)	-7.456***	(-0.37)	-6.526***	(-0.27)	-6.491***	(-0.29)
36 months	-7.803***	(-0.13)	-6.694***	(-0.39)	-7.740***	(-0.36)	-7.506***	(-0.36)	-6.533***	(-0.26)	-6.559***	(-0.28)
48 months	-8.016***	(-0.14)	-6.884***	(-0.39)	-7.925***	(-0.36)	-7.697***	(-0.36)	-6.667***	(-0.27)	-6.674***	(-0.29)
72 months	-8.064***	(-0.16)	-6.915***	(-0.39)	-7.916***	(-0.36)	-7.702***	(-0.36)	-6.593***	(-0.28)	-6.702***	(-0.30)
Age			-0.092***	(-0.01)	-0.066***	(-0.01)	-0.062***	(-0.01)	-0.037***	(-0.01)	-0.036***	(-0.01)
Age squared			0.001***	(-0.00)	0.001***	(-0.00)	0.001***	(-0.00)	0.000**	(-0.00)	0.000*	(-0.00)
Male			0.398***	(-0.04)	0.419***	(-0.04)	0.278***	(-0.04)	0.269***	(-0.04)	0.310***	(-0.05)
Low Education			0.605***	(-0.05)	0.314***	(-0.06)	0.262***	(-0.06)	0.449***	(-0.06)	0.462***	(-0.07)
Intermediate Education			0.332***	(-0.05)	0.147***	(-0.06)	0.124**	(-0.06)	0.231***	(-0.06)	0.232***	(-0.07)
Intermediate Socio-Econ					0.455***	(-0.06)	0.470***	(-0.06)	0.402***	(-0.06)	0.404***	(-0.07)
Low Socio-Econ					0.639***	(-0.05)	0.617***	(-0.05)	0.546***	(-0.05)	0.555***	(-0.06)
Agriculture & fishing							0.014	(-0.21)	0.170	(-0.23)	0.218	(-0.24)
Energy & water							-0.502***	(-0.18)	-0.395**	(-0.19)	-0.458**	(-0.20)
Manufacturing							0.084	(-0.09)	0.248***	(-0.09)	0.239**	(-0.10)
Construction							0.063	(-0.09)	0.272***	(-0.10)	0.294***	(-0.10)
Distribution, hotels & restaurants							-0.152**	(-0.08)	0.091	(-0.08)	0.123	(-0.09)
Transport & communication							-0.172*	(-0.09)	-0.070	(-0.10)	-0.010	(-0.11)
Banking, finance & insurance etc							-0.025	(-0.08)	0.121	(-0.09)	0.160*	(-0.09)
Public admin, educ & health							-0.586***	(-0.08)	-0.652***	(-0.09)	-0.611***	(-0.09)
Permanent Contract									-1.930***	(-0.07)	-1.966***	(-0.07)
Language Difficulty											0.345	(-0.39)
Constant	-3.956***	(-1.17)	-0.607	(-1.56)	0.134	(-0.63)	0.060	(-0.68)	0.583***	(-0.21)	0.493**	(-0.24)
Observations	2,439,302		2,418,504		2,413,998		2,394,525		2,393,881		1,920,218	
Number of pid	116,998		116,067		115,734		114,631		114,565		90,718	

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table 4.8: Complementary log-log with Heterogeneity, Exits from Dependent Employment to Under-employment

Complementary log-log with Heterogeneity, Exits from Dependent Employment to Under-employment												
Variables	**Model A**	s.e.	**Model B**	s.e.	**Model C**	s.e.	**Model D**	s.e.	**Model E**	s.e.	**Model F**	s.e
A8	-0.220*	(-0.12)	-0.160	(-0.12)	-0.521***	(-0.12)	-0.418***	(-0.12)	-0.468***	(-0.12)	-0.399	(-0.31)
EU14	-0.045	(-0.13)	0.034	(-0.13)	-0.003	(-0.13)	0.005	(-0.13)	-0.009	(-0.13)	0.241	(-0.46)
Non-EU	0.235***	(-0.06)	0.358***	(-0.06)	0.240***	(-0.06)	0.235***	(-0.06)	0.200***	(-0.06)	0.473***	(-0.16)
2nd Gen.	0.056	(-0.09)	0.068	(-0.09)	0.070	(-0.09)	0.067	(-0.09)	0.042	(-0.09)	0.291	(-0.51)
Crisis	0.864***	(-0.05)	0.865***	(-0.05)	0.862***	(-0.05)	0.853***	(-0.05)	0.815***	(-0.05)	0.818***	(-0.06)
A8*Crisis	0.128	(-0.14)	0.110	(-0.14)	0.119	(-0.14)	0.124	(-0.14)	0.136	(-0.14)	0.086	(-0.37)
EU14*Crisis	0.009	(-0.16)	0.014	(-0.16)	0.005	(-0.16)	0.001	(-0.16)	-0.006	(-0.16)	0.669	(-0.52)
Non-EU*Crisis	0.042	(-0.07)	0.038	(-0.07)	0.035	(-0.07)	0.035	(-0.07)	0.039	(-0.07)	-0.076	(-0.19)
2nd Gen*Crisis	0.203*	(-0.10)	0.207**	(-0.10)	0.202*	(-0.10)	0.199*	(-0.10)	0.199*	(-0.10)	-0.132	(-0.66)
3 months	-9.584***	(-0.22)	-9.314***	(-0.25)	-10.030***	(-0.25)	-9.899***	(-0.25)	-9.457***	(-0.27)	-9.666***	(-0.31)
6 months	-8.065***	(-0.22)	-7.790***	(-0.24)	-8.499***	(-0.25)	-8.370***	(-0.25)	-7.887***	(-0.27)	-8.115***	(-0.30)
9 months	-8.081***	(-0.22)	-7.807***	(-0.24)	-8.509***	(-0.25)	-8.380***	(-0.25)	-7.858***	(-0.26)	-8.082***	(-0.30)
12 months	-8.185***	(-0.22)	-7.901***	(-0.25)	-8.599***	(-0.25)	-8.469***	(-0.25)	-7.917***	(-0.26)	-8.161***	(-0.30)
15 months	-8.264***	(-0.22)	-7.983***	(-0.25)	-8.677***	(-0.25)	-8.546***	(-0.25)	-7.970***	(-0.26)	-8.207***	(-0.30)
18 months	-8.236***	(-0.22)	-7.949***	(-0.25)	-8.638***	(-0.25)	-8.507***	(-0.25)	-7.914***	(-0.26)	-8.167***	(-0.30)
21 months	-8.331***	(-0.22)	-8.043***	(-0.25)	-8.728***	(-0.25)	-8.596***	(-0.25)	-7.987***	(-0.26)	-8.219***	(-0.30)
24 months	-8.386***	(-0.22)	-8.089***	(-0.25)	-8.773***	(-0.25)	-8.639***	(-0.25)	-8.018***	(-0.26)	-8.227***	(-0.30)
36 months	-8.404***	(-0.22)	-8.105***	(-0.24)	-8.783***	(-0.25)	-8.647***	(-0.25)	-8.005***	(-0.26)	-8.211***	(-0.29)
48 months	-8.370***	(-0.22)	-8.058***	(-0.25)	-8.731***	(-0.25)	-8.593***	(-0.25)	-7.918***	(-0.26)	-8.128***	(-0.29)
72 months	-8.360***	(-0.22)	-8.037***	(-0.25)	-8.702***	(-0.25)	-8.564***	(-0.25)	-7.852***	(-0.26)	-8.080***	(-0.29)
Age			-0.019***	(-0.01)	0.006	(-0.01)	0.006	(-0.01)	0.019***	(-0.01)	0.022***	(-0.01)
Age squared			0.000	(-0.00)	-0.000***	(-0.00)	-0.000***	(-0.00)	-0.000***	(-0.00)	-0.000***	(-0.00)
Male			-0.179***	(-0.02)	-0.207***	(-0.02)	-0.076***	(-0.02)	-0.082***	(-0.02)	-0.128***	(-0.03)
Low Education			0.444***	(-0.03)	0.051	(-0.03)	0.093***	(-0.03)	0.171***	(-0.03)	0.231***	(-0.04)
Intermediate Education			0.327***	(-0.03)	0.100***	(-0.03)	0.120***	(-0.03)	0.166***	(-0.03)	0.238***	(-0.04)
Intermediate Socio-Econ					0.270***	(-0.04)	0.285***	(-0.04)	0.269***	(-0.04)	0.303***	(-0.04)
Low Socio-Econ					0.778***	(-0.03)	0.789***	(-0.03)	0.783***	(-0.03)	0.816***	(-0.04)
Agriculture & fishing							-0.816***	(-0.18)	-0.761***	(-0.18)	-0.755***	(-0.21)
Energy & water							-0.878***	(-0.12)	-0.828***	(-0.12)	-0.871***	(-0.14)
Manufacturing							-0.459***	(-0.06)	-0.411***	(-0.06)	-0.437***	(-0.06)
Construction							-0.489***	(-0.06)	-0.430***	(-0.07)	-0.444***	(-0.07)
Distribution, hotels & restaurants							-0.174***	(-0.05)	-0.088*	(-0.05)	-0.091*	(-0.05)
Transport & communication							-0.282***	(-0.06)	-0.249***	(-0.06)	-0.264***	(-0.07)
Banking, finance & insurance etc							-0.240***	(-0.05)	-0.188***	(-0.05)	-0.216***	(-0.06)
Public admin, educ & health							-0.012	(-0.05)	-0.022	(-0.05)	-0.052	(-0.05)
Permanent Contract									-1.050***	(-0.04)	-1.156***	(-0.05)
Language Difficulty											0.143	(-0.21)
Constant	-7.614***	(-1.79)	-8.962**	(-3.58)	-11.140	(-16.44)	-10.160*	(-5.90)	-1.675*	(-0.95)	-1.037*	(-0.55)
Observations	2,280,352		2,261,645		2,259,906		2,240,827		2,240,220		1,802,588	
Number of pid	109,065		108,251		108,157		107,097		107,046		85,072	

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

4.5.3 Competing Risks Model

The effect sizes in the competing risks model are not of the same in magnitude as those found in the models for single destination exits towards unemployment and underemployment, due to the fact that different specifications are used. This part of the analysis intends to inform on which exit happens faster, as well as whether migrants are more likely than natives to exit towards any of the other two possible destinations[6].

In figure D.1, we see the predicted probabilities of exit towards the four possible destination states for the period before and the period during the crisis. The exit that precedes the others is underemployment, followed by exits to unemployment, inactivity and, finally, self-employment. Exits towards inactivity happen faster than exits towards unemployment for those that survive to longer durations of employment. The increase of the probability to exit for the longer durations might be biased due to the fact that it also captures the effect of the crisis, since longer durations of employment are only observed at later dates.

Looking at table 4.9[7], we see from models A and B that being an A8 immigrant as opposed to being a UK native is decreasing the relative risk ratio towards unemployment by a factor 0.3 (model A) or by a factor 0.2 (model B), and the relative risk ratio towards inactivity by 0.2 (model A) and 0.3 (model B). In model A, where we do not control for any demographic or labour market relevant characteristics of the individuals, being an A8 immigrant seems to decrease the relative risk ratio towards self employment by a factor 0.3 as well. Being an EU14, non-EU, or second generation migrant does not change the relative risk ratio of exiting employment towards self-employment and inactivity significantly when compared to the natives. This, however, might be due to fewer exits towards those destinations. Finally, the results for model C might not be very robust due to the smaller number of observations for some exits.

Finally, figures D.2 and D.3 display the change of the hazard of exiting towards each one of the possible exits, for the periods before and during the crisis. What is worth noting

[6]This part of the analysis assumes independent outcomes. The assumption was verified by conducting the Hausman test for the Independence of Irrelevant Alternatives assumption. The null was rejected with $Prob > chi2 = 0.8018$

[7]Full results for the competing risks models can be found in the Appendix: D.17, D.18, and D.19.

here is that one can see more clearly that apart from the exit towards unemployment, which is declining with duration of employment, the rest of the exits are U-shaped. However, the increase of the hazard for longer durations of employment might be due to the crisis. Even with this bias included, exits to unemployment do not seem to increase with duration in employment, an observation that might be related to the costs of losing employees who have acquired job specific human capital over time.

Table 4.9: Competing Risks Model, Model A

	Unemployed		Inactive		Self Employed		Underemployed	
				Model A				
A8	-1.056***	(0.26)	-1.404***	(0.34)	-1.256**	(0.45)	-0.216	(0.12)
EU14	-0.096	(0.20)	-0.016	(0.20)	-0.190	(0.31)	-0.046	(0.13)
non-EU	-0.239*	(0.11)	-0.127	(0.11)	-0.168	(0.16)	0.237***	(0.06)
2nd Gen.	0.319**	(0.12)	0.109	(0.14)	0.090	(0.20)	0.055	(0.09)
Crisis	0.876***	(0.09)	0.608***	(0.09)	0.839***	(0.13)	0.859***	(0.05)
A8*crisis	0.402	(0.31)	0.863*	(0.38)	0.903	(0.51)	0.128	(0.14)
EU14*crisis	-0.106	(0.26)	-0.084	(0.27)	0.171	(0.38)	0.010	(0.16)
non-EU*crisis	0.079	(0.13)	-0.055	(0.14)	0.096	(0.19)	0.043	(0.07)
2nd Gen.*crisis	0.009	(0.15)	0.086	(0.18)	-0.153	(0.27)	0.205*	(0.10)
				Model B				
A8	-1.661***	(0.30)	-1.327***	(0.36)	0.175	(0.45)	-0.465***	(0.12)
EU14	-0.032	(0.21)	0.066	(0.24)	0.012	(0.30)	-0.010	(0.13)
non-EU	-0.273*	(0.12)	-0.029	(0.12)	0.042	(0.16)	0.197***	(0.06)
2nd Gen.	0.247*	(0.12)	0.174	(0.16)	0.217	(0.20)	0.041	(0.09)
Crisis	0.720***	(0.11)	0.644***	(0.12)	0.780***	(0.16)	0.804***	(0.06)
A8*crisis	0.716*	(0.35)	0.574	(0.42)	0.790	(0.50)	0.141	(0.14)
EU14*crisis	-0.020	(0.27)	-0.123	(0.30)	0.156	(0.38)	-0.005	(0.16)
non-EU*crisis	0.113	(0.14)	-0.128	(0.16)	0.042	(0.20)	0.039	(0.07)
2nd Gen.*crisis	0.021	(0.16)	0.189	(0.20)	-0.269	(0.27)	0.198	(0.10)
				Model C				
A8	-1.551*	(0.72)	-0.192	(0.55)	0.549	(0.81)	-0.423	(0.31)
EU14	-0.559	(0.98)	-19.733***	(0.20)	0.997	(1.07)	0.221	(0.46)
non-EU	-0.430	(0.35)	-0.329	(0.40)	-0.256	(0.54)	0.441**	(0.15)
2nd Gen.	0.831	(0.59)	-19.508***	(0.18)	1.326*	(0.56)	0.283	(0.50)
Crisis	0.735***	(0.12)	0.668***	(0.14)	0.766***	(0.18)	0.801***	(0.07)
A8*crisis	0.649	(0.84)	-0.557	(0.76)	0.721	(0.90)	0.114	(0.36)
EU14*crisis	-0.111	(1.41)	-0.392*	(0.17)	-0.816	(1.55)	0.657	(0.52)
non-EU*crisis	-0.058	(0.48)	0.335	(0.52)	-0.357	(0.82)	-0.064	(0.19)
2nd Gen.*crisis	-0.218	(0.83)	-0.258	(0.25)	-0.541	(1.08)	-0.127	(0.65)

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

* Model A has no controls apart from region, year-quarter and the piecewise constant hazard; Model B controls for age, age squared, gender, education, socioeconomic status, type of contract; Model C controls also for language difficulty.
* Number of observation: Model A (2,298,987), Model B (2,251,878), and Model C (1,812,720).

4.5.4 Limitations

In this chapter exits from dependent employment have been studied as job separations, and also as exits towards specific destinations (unemployment, underemployment, inactivity, and self-employment). An important issue that arises is the fact that when job separations occur due to early attrition from the sample, no information about the reasons behind this attrition is available. This could be creating bias due to measurement error, as migrants have one extra reason for job separations that the natives don't; it might be the case that migrants experience job separations because they decide to return home. This might show a higher hazard of job separation for this population group while, all else equal, such a difference might not have been significant. Even more, since migrants are likely to be engaged in seasonal work, meaning that they might only migrate for a specific number of months a year and then return home, this could also make separation rates seem higher without actual unemployment in the UK to increase equally as much since the individuals do not remain in the country. Finally, lack of this information does not allow us to identify the mechanism behind higher separation hazards for immigrants compared to natives. In general, lack of information on the reasons behind any of the specific exits prevents us from identifying the mechanisms that create differences in the hazards of specific exits between natives and migrants as well, where those exist conditional on observable characteristics.

4.6 Conclusion

This paper evaluated the effects of the recent economic crisis on the job separation rates of natives and immigrants in the UK. The significance of the crisis on job separations became evident and was recorded by various scholars (Smith, 2011). The adverse effects of the economic downturn did not homogenously affect all population groups. Individuals who are traditionally considered more vulnerable in the labour market were affected to a greater extent (younger, less educated, lower skilled workers). The high

prevalence of some of these characteristics in the group of A8 immigrants creates the expectation of job separation rates commensurate with the separations that are observed for those characteristics. The same holds when there is high occurrence of the opposite characteristics (higher education, higher socioeconomic status) in other immigrant groups (non-EU, EU14 immigrants). However, some of the findings for the A8 immigrants contradict this.

The mixed proportional hazard models on job separations, with early attrition from the sample being considered as job separation as well, showed that all immigrant groups were at higher risk than the natives. This holds especially for the A8 and the non-EU migrants. Interestingly, those differences were mitigated during the crisis, a result that might be driven by lower inflows of immigrants in the country during the crisis. Another point worth mentioning is that the differences in the hazards of the A8 and non-EU immigrants compared to the natives seem to rely mainly on observable characteristics in the case of the A8 migrants and on unobservable characteristics in the case of the non-EU migrants.

After analysing a competing risks model with job outflows towards unemployment inactivity, self-employment and underemployment, two main points are worth making; firstly the A8 immigrants perform considerably better than native workers with demographic and labour market characteristics similar to theirs before the crisis, by displaying lower separation rates towards unemployment, inactivity and underemployment. More importantly, this effect is only revealed after specific characteristics are controlled for and immigrant and native workers differ in their outcomes due to unobservable characteristics; reservation wage, ability, motivation, networks, human capital, and more.

The second important point is the verification that the crisis increased the job separation rates significantly. This means that part of the increased unemployment observed during the crisis is indeed due to increased job losses. It also means that unemployment rates did not increase equally as much as job separations would imply, since during the crisis job separations led to increased inactivity, self-employment and underemployment as well.

The limitations of this paper are mainly due to the lack of properly recording possible out-migration of immigrants. The extent to which such attrition is actually creating im-

portant biases remains to be tested when administrative or more detailed longitudinal data become available.

Future research on this topic could entail gaining a better understanding of the effects of out-migration on the final outcomes. Additional sources of income could be considered as another determinant of the possible exits (personal savings, eligibility for welfare benefits or family/household income). This is another aspect for which immigrants might differ substantially from the natives, and it would be very informative about immigrants' choices to disentangle the effect of disposable or potential income from other determinants. Furthermore, a categorisation based on income, education or socioeconomic level would allow us to identify whether immigrants or natives are positively or negatively selected out of employment.

5

Conclusion

This thesis assessed the labour market outcomes, the use of the welfare state provisions and the vulnerability of the immigrants who entered the UK under different immigration regimes, all compared to the relative outcomes of the UK natives. The thesis was motivated by the great sacrifice of human capital of immigrants originating from relatively poorer countries and enter the United Kingdom under free migration, and the implications of this phenomenon. This work aspired to shed light on the incentives of the migrants under free migration, and see how those translate into labour market actions once the migration decision is not filtered by the host country but is solely determined by the economic migrants themselves. The research conducted used the UK as a host country. Migration from the old and new EU member states were considered as free migration to the UK, while migrations from non-EU countries were considered as restricted migrations in the UK.

An initial assessment of the probability of downgrading (accepting lower skill jobs) and upgrading (accepting higher skilled jobs) was conducted in order to indicate how im-

migrants who enter the UK under free migration laws have usually different job market trajectories in the UK than immigrants who enter after visa approval. We also investigated how those differences grow smaller after accumulating years of experience in the UK or after acquiring some education in the UK. Our findings suggest that all immigrant groups are on average more likely to downgrade and less likely to upgrade than natives, with A8 migrants having the most robust results. We also found that the working experience in the UK has a mitigating effect on the probability of downgrading. Another event that was found to have an adverse effect on downgrading is the attainment of at least one year of education in the UK.

In the first chapter we estimated the joint decision over the labour market behavior of an individual and her/his welfare use. The benefits were separated in two groups; unemployment benefits (contributory and non-contributory of Job Seekers Allowance) and income based not-unemployment related benefits (income support allowance, employment and support allowance, state pension, family benefit, child benefit,and housing/council tax benefit). We estimated two models based on the types of the welfare benefits considered; for the unemployment related benefits, where a usual prerequisite for these claims is a positive unemployment status, we used a recursive bivariate probability model, and for the income related benefits, where the unemployment status is not one of the main eligibility criteria, we used a seemingly unrelated bivariate probability model. For the first model, we instrumented the employment outcomes with an indicator of previous job market classifications of the individuals a year ago.

We found that in both models the two outcomes are highly negatively correlated and that the correlations are significant. We did not find strong evidence that the employment levels of immigrants who entered the UK under free migration are determined by the differences in the purchasing parities of the host and home countries. However, this result might not necessarily invalidate the initial theory. A different proxy for the differences in the purchasing parities of the home and the host countries could possibly be more appropriate, or perhaps the effect might be clearer if the intensive margins are used as an outcome.

In the second chapter we investigated the effects of the economic crisis of 2008 on the labour market performance of natives and immigrants in the UK. More specifically we

assessed the vulnerability of the different immigrant groups compared to the natives with respect to their hazards of exiting unemployment before and during the crisis. We found that the non-EU, the second generation and the A8 immigrants were performing worse than the natives for the period before the crisis. However, in the case of A8 and second generations immigrants, these differences seem to be due to the specific employment patterns they followed (type of employment and reason of losing last job). For the period during the crisis the non-EU and the second generation migrants found themselves in an even worse position compared to the natives, while the EU14 and the A8 did not have any significant differences in their hazards of exiting unemployment compared to the natives. A possible reason for this may be out-migrations of EU immigrants at times of hardship, an event that is not possible to identify with certainty using the Quarterly Labour Force Survey.

In the third chapter we evaluated the effects of the recent economic crisis on the job separation rates of natives and immigrants in the UK. We considered attrition from the sample as job separation and compared the hazards of this exit to exits specifically towards unemployment or underemployment. Comparing the hazards of the job separations in general to the exits towards specific exits, it becomes obvious that early attrition for the A8 immigrants seems to be the most likely exit for this group, leaving them with lower risks towards unemployment or underemployment when compared to the natives. Further research should focus on whether restricted and unrestricted migrations that lead to downgrading boost temporary or permanent migrations. This is one very important missing part of the above analysis, as out-selection of migrants might create biases that cannot be controlled for if not observed. Furthermore, there is still the need to identify which part of the result is driven by a mismatch of skills in the labour market or the poor knowledge of the language of the host country, and which part is driven by discrimination in the labour market.

This thesis contributes to the better understanding of immigrants' labour market outcomes and their subsequent choices under free migration by introducing some new information from empirical analysis. Focusing on the group of interest, the A8 immigrants, our findings support previous research that has suggested that the new EU migrants had lower welfare claims relative to natives (Dustmann et al., 2009), and

also higher downgrading probabilities, again, when compared to natives (Clark and Drinkwater, 2008b). On the other hand, our findings on the labour market outcomes of this group conditional on observable characteristics during the crisis, contradict the expectation created by similar studies on other EU destination countries that have found that the recent economic crisis increased the unemployment levels of new EU migrants relative to those of natives (Bratsberg et al., 2014), (Orrenius and Zavodny, 2011).

We, also, contribute to previous research by indicating how A8 migrants are not only more likely to downgrade, but they are also less likely to upgrade than natives, which could imply poor assimilation for this group in the host country. On their benefit claims, we showed that welfare dependence is better seen as the result of a joint decision process where labour market outcomes is the other output. Regarding the effects of the crisis on the labour market outcomes of the A8 immigrants compared to the natives, we found that conditional on observable characteristics, the A8 seem to converge to the unemployment levels of natives during the crisis. The findings from the duration analysis approach in chapters two and three could support that this convergence might be due to out-migration of this group.

The A8 immigrants had higher separation rates than the natives before and during the crisis. Higher separation rates for this group compared to natives could support the possibility of out-migration during the crisis as one more contributor to lower unemployment rates. This finding could contribute to the public policy debate over the benefits of free migration of the A8 migrants in the UK labour market, since it suggests that A8 migrants might be a useful source of labour who are able to respond to economic shocks by out-migrating, thus reducing the burden on economic support mechanisms. This thesis aspires to help understand the reality of the EU labour market after the most recent accessions, and help policy makers be more proactive in the future in order to make the most out of migration flows that cannot be determined by them.

APPENDIX A

Appendix A

Table A.1: High Education: Levels of Socioeconomic status per Country of Origin

	UK	EU14	SecGen	A8	nonEU
higher managerial	32.78	37.42	31.7	7.42	29.66
lower managerial	43.25	35.78	38.71	9.52	29.28
intermediate occupations	7.53	7.63	10.49	7.19	7.85
small employers	5.2	5.14	4.3	5.06	7.09
lower supervisory	2.44	2.47	2.64	9.8	4.25
semi-routine occupations	3.69	4.7	5.63	25.42	8.51
routine occupations	1.27	2.36	1.4	31.5	4.12
never worked, unemployed	3.83	4.51	5.12	4.08	9.23

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

Table A.2: Intermediate Education: Levels of Socioeconomic status per Country of Origin

	UK	EU14	SecGen	A8	nonEU
higher managerial	12.63	12.26	10.47	0.68	8.15
lower managerial	31.24	31.03	28.62	3.71	21.72
intermediate occupations	15.76	12.66	16.22	2.53	10.43
small employers	7.5	7.49	7.11	6.59	9.88
lower supervisory	7.77	7.17	7.49	9.67	7.41
semi-routine occupations	12.49	12.95	14.62	28.07	16.2
routine occupations	5.79	7.48	5.41	43.14	9.67
never worked, unemployed	6.82	8.94	10.06	5.6	16.55

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

Table A.3: Low Education: Levels of Socioeconomic status per Country of Origin

	UK	EU14	SecGen	A8	nonEU
higher managerial	5.14	3.5	4.22	0.18	2.68
lower managerial	16.4	13.44	15.76	0.63	9.86
intermediate occupations	9.91	7.46	9.59	0.45	5.1
small employers	10.19	11.07	9.94	3.95	11.1
lower supervisory	12.59	11.9	11.45	5.39	8.07
semi-routine occupations	17.43	17.51	17.77	23.43	17.29
routine occupations	14.35	17.89	12.66	51.8	13.61
never worked, unemployed	13.99	17.24	18.61	14.18	32.29

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

Table A.4: Descriptive Statistics of the Sample

	UK	EU14	SecGen	A8	nonEU
Age	45.2	44.4	39.9	30.0	42.0
Gender (male)	48.0%	43.8%	48.3%	52.2%	46.1%
Years in UK	.	26.0	.	2.3	19.8
Disability Status	23.5%	19.6%	22.3%	3.1%	20.0%
Marital Status	58.9%	56.1%	48.6%	42.3%	66.7%
Number of Children	0.7	0.7	0.8	0.6	1.0
Children in HH	37.1%	36.3%	43.4%	38.0%	52.3%
Low Education	57.4%	36.2%	46.3%	10.2%	27.4%
Intermediate Education	26.1%	31.8%	30.3%	53.6%	35.1%
High Education	16.5%	32.0%	23.4%	36.2%	37.5%
Education in the UK	100.0%	38.8%	100.0%	1.0%	30.7%
Potential UK Experience	26.4	19.7	20.8	2.2	15.7
Number of Observations					
2004	199,134	4,902	8,923	114	16,647
2005	260,294	6,339	11,814	554	22,950
2006	250,083	5,900	13,105	1,315	23,800
2007	247,115	6,219	13,128	2,679	24,128
2008	241,728	6,319	12,580	2,936	24,643
2009	231,986	5,760	12,576	2,832	23,958
2010	56,344	1,363	2,974	715	5,747

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.
[1] This sub-sample includes only individuals in employment.

[2] The "Potential UK Experience" is counted in years.

Table A.5: Probit Results for Downgrading/Upgrading from High Education

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
VARIABLES	H1	H2	H3	H4	H5	H6	H7
Age	0.00222***	0.00174***	-0.00374***	0.00189***	-0.000887***	-0.00205***	-0.00103***
	(0.000149)	(0.000172)	(0.000137)	(7.79e-05)	(7.79e-05)	(0.000119)	(7.98e-05)
Male	0.207***	-0.171***	-0.0482***	0.0169***	0.0131***	-0.0273***	0.00669***
	(0.00337)	(0.00355)	(0.00191)	(0.00167)	(0.00112)	(0.00148)	(0.000898)
Disability	-0.0656***	-0.00113	0.0153***	0.0110***	0.0155***	0.0229***	0.00906***
	(0.00472)	(0.00516)	(0.00310)	(0.00253)	(0.00213)	(0.00271)	(0.00170)
Married	0.0543***	0.0136***	-0.0194***	-0.00703***	-0.00916***	-0.0188***	-0.0114***
	(0.00399)	(0.00420)	(0.00228)	(0.00204)	(0.00139)	(0.00180)	(0.00115)
Children in HH	-0.0232***	-0.00106	0.00221	0.00219	0.00193	0.00876***	0.00442**
	(0.00676)	(0.00729)	(0.00398)	(0.00338)	(0.00239)	(0.00297)	(0.00204)
Number of Children	-0.000176	-0.0175***	-0.00146	0.00684***	-0.000275	0.00702***	0.00124
	(0.00329)	(0.00359)	(0.00204)	(0.00156)	(0.00117)	(0.00141)	(0.000986)
Observations	260,348	260,348	260,348	260,348	260,348	260,348	260,348

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.
[1] This table includes only individuals who have been classified as highly educated.
[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Reported marginal effects.

Table A.6: Probit Results for Downgrading/Upgrading from Intermediate Education

VARIABLES	I1	I2	I3	I4	I5	I6	I7
Age	0.00266***	0.00379***	-0.00229***	0.00201***	-0.00162***	-0.00433***	-0.00269***
	(7.75e-05)	(0.000114)	(0.000106)	(7.57e-05)	(7.92e-05)	(0.000115)	(9.06e-05)
Male	0.113***	-0.0430***	-0.143***	0.0573***	0.0574***	-0.0785***	0.0328***
	(0.00207)	(0.00280)	(0.00212)	(0.00174)	(0.00169)	(0.00196)	(0.00149)
Disability	-0.0331***	-0.0274***	-0.00404	0.00278	0.0125***	0.0342***	0.0227***
	(0.00228)	(0.00351)	(0.00284)	(0.00217)	(0.00228)	(0.00290)	(0.00224)
Married	0.0322***	0.0249***	0.00379	0.00499***	-0.0123***	-0.0289***	-0.0279***
	(0.00226)	(0.00322)	(0.00252)	(0.00193)	(0.00194)	(0.00240)	(0.00176)
Children in HH	-0.00165	-0.0156***	-0.00608	-0.00658**	0.00137	0.0160***	0.00240
	(0.00373)	(0.00526)	(0.00407)	(0.00309)	(0.00303)	(0.00361)	(0.00264)
Number of Children	-0.0106***	-0.0271***	-0.00896***	0.0140***	0.000831	0.0166***	0.0102***
	(0.00181)	(0.00263)	(0.00206)	(0.00145)	(0.00151)	(0.00175)	(0.00131)
Observations	376,189	376,189	376,189	376,189	376,189	376,189	376,189

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

[1] This table includes only individuals who have been classified as highly educated.

[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Reported marginal effects.

Table A.7: Probit Results for Downgrading/Upgrading from Low Education

VARIABLES	L1	L2	L3	L4	L5	L6	L7
Age	0.000286***	-0.000592***	-0.000848***	0.00181***	-0.000951***	-0.000468***	0.000218**
	(4.90e-05)	(8.00e-05)	(6.79e-05)	(7.41e-05)	(7.22e-05)	(8.95e-05)	(8.67e-05)
Male	0.0501***	-0.0225***	-0.147***	0.111***	0.101***	-0.147***	0.0537***
	(0.000997)	(0.00173)	(0.00144)	(0.00141)	(0.00150)	(0.00180)	(0.00165)
Disability	-0.0201***	-0.0301***	-0.0145***	-0.00666***	0.00483***	0.0297***	0.0401***
	(0.00103)	(0.00188)	(0.00152)	(0.00159)	(0.00176)	(0.00208)	(0.00201)
Married	0.0183***	0.0360***	0.0128***	0.00127	0.000777	-0.0288***	-0.0434***
	(0.00111)	(0.00189)	(0.00150)	(0.00163)	(0.00173)	(0.00199)	(0.00192)
Children in HH	0.00774***	0.0113***	-0.00237	0.00114	-0.00342	-0.0100***	-0.00753**
	(0.00206)	(0.00336)	(0.00260)	(0.00274)	(0.00295)	(0.00329)	(0.00318)
Number of Children	-0.00590***	-0.0199***	-0.0105***	0.0125***	-0.00466***	0.0141***	0.0106***
	(0.000975)	(0.00161)	(0.00127)	(0.00125)	(0.00142)	(0.00155)	(0.00151)
Observations	716,582	716,582	716,582	716,582	716,582	716,582	716,582

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

[1] This table includes only individuals who have been classified as highly educated.

[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Reported marginal effects.

Table A.8: Probit Results for Downgrading/Upgrading from High Education

VARIABLES	H1	H2	H3	H4	H5	H6	H7
Age	0.0150***	-0.00664***	-0.00570***	-0.000501	-0.00135***	-0.00105***	-0.000703***
	(0.000722)	(0.000805)	(0.000472)	(0.000376)	(0.000245)	(0.000263)	(0.000157)
Male	0.202***	-0.168***	-0.0472***	0.0178***	0.0135***	-0.0273***	0.00681***
	(0.00338)	(0.00356)	(0.00190)	(0.00168)	(0.00112)	(0.00147)	(0.000896)
Disability	-0.0649***	-0.00178	0.0152***	0.0106***	0.0151***	0.0234***	0.00919***
	(0.00471)	(0.00516)	(0.00310)	(0.00251)	(0.00211)	(0.00271)	(0.00171)
Married	0.0566***	0.0128***	-0.0197***	-0.00731***	-0.00933***	-0.0193***	-0.0115***
	(0.00399)	(0.00420)	(0.00229)	(0.00205)	(0.00139)	(0.00181)	(0.00116)
Children in HH	-0.0240***	0.000378	0.00243	0.00221	0.00183	0.00835***	0.00413**
	(0.00674)	(0.00729)	(0.00398)	(0.00339)	(0.00240)	(0.00297)	(0.00203)
Number of Children	-0.000538	-0.0179***	-0.00142	0.00688***	-0.000190	0.00761***	0.00141
	(0.00329)	(0.00359)	(0.00204)	(0.00156)	(0.00118)	(0.00141)	(0.000986)
Years in UK	-0.00468*	0.00919***	-0.00111	-0.000262	0.00152*	-4.53e-05	-0.000527
	(0.00276)	(0.00299)	(0.00152)	(0.00118)	(0.000830)	(0.00103)	(0.000587)
UK job experience	-0.0129***	0.00844***	0.00191***	0.00239***	0.000384	-0.00128***	-0.000490***
	(0.000728)	(0.000810)	(0.000485)	(0.000376)	(0.000252)	(0.000283)	(0.000178)
UK education	0.0913***	0.0226	-0.0338***	-0.00752	-0.0228***	-0.0342***	-0.0160***
	(0.0128)	(0.0154)	(0.00933)	(0.00681)	(0.00673)	(0.00776)	(0.00466)
Observations	260,348	260,348	260,348	260,348	260,348	260,348	260,348

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

[1] This table includes only individuals who have been classified as highly educated.

[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Reported marginal effects.

Table A.9: Probit Results for Downgrading/Upgrading from Intermediate Education

VARIABLES	I1	I2	I3	I4	I5	I6	I7
Age	0.00839***	0.00870***	-0.00454***	0.000972**	-0.00261***	-0.00536***	-0.00211***
	(0.000597)	(0.000793)	(0.000802)	(0.000411)	(0.000468)	(0.000521)	(0.000297)
Male	0.112***	-0.0437***	-0.142***	0.0574***	0.0576***	-0.0784***	0.0328***
	(0.00207)	(0.00280)	(0.00212)	(0.00174)	(0.00170)	(0.00195)	(0.00149)
Disability	-0.0329***	-0.0277***	-0.00430	0.00271	0.0124***	0.0345***	0.0231***
	(0.00228)	(0.00351)	(0.00284)	(0.00216)	(0.00228)	(0.00290)	(0.00224)
Married	0.0325***	0.0258***	0.00403	0.00467**	-0.0124***	-0.0293***	-0.0281***
	(0.00226)	(0.00322)	(0.00252)	(0.00193)	(0.00194)	(0.00240)	(0.00177)
Children in HH	-0.00177	-0.0162***	-0.00536	-0.00655**	0.00126	0.0163***	0.00249
	(0.00373)	(0.00526)	(0.00407)	(0.00310)	(0.00302)	(0.00361)	(0.00264)
Number of Children	-0.0105***	-0.0269***	-0.00906***	0.0140***	0.000860	0.0167***	0.0104***
	(0.00181)	(0.00263)	(0.00206)	(0.00145)	(0.00151)	(0.00175)	(0.00131)
Years in UK	0.00216	0.00323	0.00419*	-0.00190	0.00193	8.51e-05	-0.00195
	(0.00208)	(0.00281)	(0.00232)	(0.00134)	(0.00149)	(0.00184)	(0.00124)
UK job experience	-0.00575***	-0.00499***	0.00207**	0.00107***	0.000971**	0.000881*	-0.000680**
	(0.000598)	(0.000795)	(0.000803)	(0.000405)	(0.000468)	(0.000527)	(0.000309)
UK education	0.0662***	0.0912***	0.0103	-0.0319***	-0.0309***	-0.0710***	-0.0693***
	(0.00869)	(0.0151)	(0.0132)	(0.0111)	(0.0110)	(0.0141)	(0.0124)
Observations	376,189	376,189	376,189	376,189	376,189	376,189	376,189

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

[1] This table includes only individuals who have been classified as highly educated.

[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Reported marginal effects.

Table A.10: Probit Results for Downgrading/Upgrading from Low Education

VARIABLES	L1	L2	L3	L4	L5	L6	L7
Age	0.0129***	0.0188***	0.00904***	-0.00317***	-0.00968***	-0.00792***	-0.0122***
	(0.000982)	(0.00111)	(0.000744)	(0.000791)	(0.000976)	(0.000983)	(0.00108)
Male	0.0502***	-0.0221***	-0.147***	0.111***	0.101***	-0.147***	0.0533***
	(0.000995)	(0.00173)	(0.00144)	(0.00141)	(0.00150)	(0.00180)	(0.00165)
Disability	-0.0191***	-0.0285***	-0.0136***	-0.00724***	0.00388**	0.0290***	0.0389***
	(0.00104)	(0.00188)	(0.00152)	(0.00159)	(0.00175)	(0.00208)	(0.00200)
Married	0.0185***	0.0364***	0.0130***	0.00122	0.000866	-0.0292***	-0.0442***
	(0.00110)	(0.00189)	(0.00150)	(0.00163)	(0.00173)	(0.00199)	(0.00192)
Children in HH	0.00659***	0.00937***	-0.00306	0.00185	-0.00263	-0.00909***	-0.00575*
	(0.00206)	(0.00335)	(0.00260)	(0.00275)	(0.00295)	(0.00329)	(0.00319)
Number of Children	-0.00548***	-0.0192***	-0.0102***	0.0122***	-0.00499***	0.0137***	0.00999***
	(0.000982)	(0.00162)	(0.00127)	(0.00125)	(0.00143)	(0.00155)	(0.00152)
Years in UK	-0.00207	-0.00196	0.00234	0.00118	0.00233	-0.000131	0.000812
	(0.00167)	(0.00258)	(0.00199)	(0.00177)	(0.00207)	(0.00226)	(0.00219)
UK job experience	-0.0123***	-0.0188***	-0.00964***	0.00484***	0.00841***	0.00723***	0.0119***
	(0.000961)	(0.00109)	(0.000726)	(0.000770)	(0.000958)	(0.000961)	(0.00106)
UK education	0.0590***	0.152***	0.0906***	-0.0280**	-0.0998***	-0.130***	-0.201***
	(0.00103)	(0.00598)	(0.00455)	(0.0119)	(0.0179)	(0.0178)	(0.0201)
Observations	715,728	716,553	716,553	716,582	716,582	716,582	716,582

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

[1] This table includes only individuals who have been classified as highly educated.

[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Reported marginal effects.

Table A.11: Probit Results for Downgrading/Upgrading from High Education

VARIABLES	H1	H2	H3	H5	H6	H7
Age	0.0166***	-0.000133	-0.0118***	-0.000455	-0.00398***	-0.00224***
	(0.00141)	(0.00173)	(0.00145)	(0.000560)	(0.000971)	(0.000645)
Male	0.139***	-0.0849***	-0.0583***	0.0178***	-0.0381***	0.0193***
	(0.00739)	(0.00811)	(0.00588)	(0.00289)	(0.00487)	(0.00345)
Disability	-0.0567***	-0.0184	0.0227**	0.0101*	0.0363***	0.0159**
	(0.0118)	(0.0138)	(0.0111)	(0.00597)	(0.00996)	(0.00705)
Married	0.0550***	0.0268***	-0.0313***	-0.0103***	-0.0278***	-0.0174***
	(0.00923)	(0.0102)	(0.00757)	(0.00354)	(0.00615)	(0.00433)
Children in HH	0.00996	-0.0613***	0.00338	0.00288	0.0257**	0.00672
	(0.0163)	(0.0179)	(0.0139)	(0.00702)	(0.0114)	(0.00772)
Number of Children	-0.0284***	0.00412	-0.00276	0.00134	0.0178***	0.00704*
	(0.00839)	(0.00969)	(0.00758)	(0.00361)	(0.00562)	(0.00391)
Years in UK	0.00419	0.00467	0.00958*	0.000132	-0.000308	-0.00901***
	(0.00652)	(0.00733)	(0.00539)	(0.00259)	(0.00399)	(0.00269)
UK job experience	-0.00929***	0.00468**	0.00429***	-0.000365	-0.000911	6.61e-05
	(0.00160)	(0.00188)	(0.00156)	(0.000676)	(0.00112)	(0.000771)
UK education	0.0443	0.0566*	-0.0605**	0.00332	-0.0761***	-0.00282
	(0.0271)	(0.0321)	(0.0293)	(0.00959)	(0.0274)	(0.0148)
Job Centre	-0.0266*	-0.140***	0.107***	0.00340	0.0181	0.0330***
	(0.0148)	(0.0165)	(0.0149)	(0.00583)	(0.0123)	(0.00768)
Careers Office	0.183**	0.0472	-0.105***	0.00722	-0.0734***	-0.0235*
	(0.0713)	(0.0676)	(0.0207)	(0.0299)	(0.0234)	(0.0140)
Job Club	-0.0315	-0.0919	0.0977			0.195
	(0.135)	(0.195)	(0.188)			(0.175)
Private Agency	0.0396***	-0.0699***	0.0779***	-0.0102***	-0.0598***	0.00927**
	(0.0109)	(0.0123)	(0.00982)	(0.00353)	(0.00624)	(0.00468)
Inside Information	-0.0121	-0.0747***	0.000588	0.0205***	0.0116	0.0484***
	(0.01000)	(0.0114)	(0.00840)	(0.00471)	(0.00746)	(0.00576)
Direct Application	0.0339***	-0.0509***	-0.0188**	0.00633	0.00478	0.0276***
	(0.0108)	(0.0119)	(0.00817)	(0.00432)	(0.00748)	(0.00527)
Other way	0.0844***	-0.0143	-0.0449***	0.000951	-0.0421***	-0.000231
	(0.0115)	(0.0126)	(0.00835)	(0.00444)	(0.00717)	(0.00463)
Observations	31,799	31,799	31,799	31,540	31,581	31,563

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

[1] This table includes only individuals who have been classified as highly educated.

[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Reported marginal effects.

Table A.12: Probit Results for Downgrading/Upgrading from Intermediate Education

VARIABLES	I1	I2	I3	I5	I6	I7
Age	-0.0205***	-0.0536***	0.0323***	-0.0136*	0.00382	0.0425***
	(0.00678)	(0.0115)	(0.0123)	(0.00695)	(0.0120)	(0.00925)
Male	0.0684***	0.00721	-0.143***	0.0774***	-0.0905***	0.0767***
	(0.00405)	(0.00597)	(0.00561)	(0.00406)	(0.00576)	(0.00489)
Disability	-0.0199***	-0.0239***	-0.0114	0.0103*	0.0358***	0.0235***
	(0.00479)	(0.00822)	(0.00841)	(0.00611)	(0.00932)	(0.00796)
Married	0.0308***	0.0294***	-0.00589	-0.00480	-0.0204***	-0.0341***
	(0.00468)	(0.00748)	(0.00744)	(0.00501)	(0.00774)	(0.00611)
Children in HH	-0.00447	-0.0325***	0.00518	0.00382	0.0137	0.00597
	(0.00723)	(0.0110)	(0.0106)	(0.00704)	(0.0106)	(0.00905)
Number of Children	-0.0104***	-0.0176***	-0.0169***	-0.00176	0.0278***	0.0181***
	(0.00370)	(0.00594)	(0.00573)	(0.00369)	(0.00551)	(0.00482)
Years in UK	-0.000877	0.0119*	0.0163**	0.00402	-0.00543	-0.0102**
	(0.00393)	(0.00674)	(0.00699)	(0.00368)	(0.00606)	(0.00494)
UK job experience	-0.00172*	-0.00288*	-0.00482***	0.00186**	-0.00285**	0.00114
	(0.000885)	(0.00155)	(0.00170)	(0.000938)	(0.00139)	(0.00106)
UK education	0.0450***	0.0890***	0.0201	-0.0227	-0.0936**	-0.0602
	(0.0162)	(0.0303)	(0.0352)	(0.0279)	(0.0414)	(0.0373)
Job Centre	0.0191	-0.00853	0.220***	-0.00252	-0.138***	-0.0610***
	(0.0304)	(0.0458)	(0.0511)	(0.0265)	(0.0291)	(0.0216)
Careers Office	-	-0.0516	-0.0322	-0.0479	-0.0179	0.180*
		(0.0853)	(0.100)	(0.0321)	(0.0849)	(0.104)
Job Club	0.0582***	-0.00959	0.109***	-0.0418***	-0.121***	-0.00723
	(0.00759)	(0.0102)	(0.0112)	(0.00515)	(0.00874)	(0.00738)
Private Agency	-0.00437	-0.0461***	-0.0559***	0.0222***	0.00138	0.0761***
	(0.00479)	(0.00775)	(0.00753)	(0.00533)	(0.00812)	(0.00661)
Inside Information	-0.0165***	-0.0281***	-0.0665***	0.0183***	0.0543***	0.0380***
	(0.00511)	(0.00883)	(0.00823)	(0.00596)	(0.00942)	(0.00719)
Direct Application	0.0446***	0.0485***	-0.0633***	0.00327	-0.0695***	0.0145*
	(0.00669)	(0.0101)	(0.00900)	(0.00627)	(0.00929)	(0.00760)
Other way						
Observations	44,456	44,585	44,577	44,516	44,569	44,533

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

[1] This table includes only individuals who have been classified as highly educated.

[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Reported marginal effects.

Table A.13: Probit Results for Downgrading/Upgrading from Low Education

VARIABLES	L1	L2	L3	L5	L6	L7
Age	0.00610***	0.00855***	0.00815***	-0.00230	-0.00782***	-0.00363*
	(0.00189)	(0.00190)	(0.00190)	(0.00179)	(0.00218)	(0.00216)
Male	0.0385***	0.000278	-0.153***	0.128***	-0.161***	0.149***
	(0.00244)	(0.00442)	(0.00424)	(0.00384)	(0.00546)	(0.00527)
Disability	-0.0109***	-0.0254***	-0.0122**	-0.0130***	0.0168**	0.0517***
	(0.00271)	(0.00515)	(0.00519)	(0.00478)	(0.00695)	(0.00703)
Married	0.0110***	0.0277***	0.0187***	-0.000193	-0.0201***	-0.0442***
	(0.00262)	(0.00498)	(0.00476)	(0.00447)	(0.00624)	(0.00612)
Children in HH	0.00231	0.00359	-0.0114	0.00337	0.000702	0.00537
	(0.00454)	(0.00799)	(0.00738)	(0.00687)	(0.00949)	(0.00937)
Number of Children	-0.00330	-0.0188***	-0.00959***	-0.00355	0.0190***	0.0125***
	(0.00223)	(0.00387)	(0.00362)	(0.00323)	(0.00446)	(0.00447)
Years in UK	0.00283	-0.00828	-0.00528	-0.00413	0.0168**	-0.00263
	(0.00397)	(0.00706)	(0.00625)	(0.00554)	(0.00818)	(0.00749)
UK job experience	-0.00556***	-0.00736***	-0.00932***	0.00196	0.00653***	0.00380*
	(0.00184)	(0.00187)	(0.00186)	(0.00178)	(0.00216)	(0.00213)
UK education	0.0370***	0.0883***	0.107***	0.0437	-0.144**	-0.180***
	(0.00609)	(0.0210)	(0.0161)	(0.0351)	(0.0584)	(0.0599)
Job Centre	-0.0185***	-0.0424***	-0.0132	-0.0103	0.0179*	0.0648***
	(0.00359)	(0.00780)	(0.00815)	(0.00689)	(0.0107)	(0.0101)
Careers Office	0.0581	0.0240	0.0554	0.0262	-0.0429	-0.0723**
	(0.0370)	(0.0479)	(0.0451)	(0.0428)	(0.0523)	(0.0359)
Job Club	0.0535	-0.0473	-0.118***	0.00223	0.0673	0.0464
	(0.0587)	(0.0544)	(0.0292)	(0.0618)	(0.0916)	(0.0712)
Private Agency	0.0451***	0.0228**	0.0708***	-0.0357***	-0.115***	0.00410
	(0.00629)	(0.00915)	(0.00982)	(0.00666)	(0.00984)	(0.00956)
Inside Information	-0.0125***	-0.0312***	-0.0663***	0.0162***	-0.0169**	0.109***
	(0.00289)	(0.00552)	(0.00534)	(0.00498)	(0.00699)	(0.00687)
Direct Application	-0.0150***	-0.0237***	-0.0691***	0.0229***	0.0371***	0.0487***
	(0.00324)	(0.00659)	(0.00610)	(0.00605)	(0.00854)	(0.00793)
Other way	0.0310***	0.0830***	-0.0440***	0.0165**	-0.0908***	-0.00379
	(0.00477)	(0.00829)	(0.00692)	(0.00649)	(0.00841)	(0.00814)
Observations	61,201	62,202	62,206	62,208	62,283	62,254

Source: *QLFS,* 2004 *Second Quarter*- 2010 *Second Quarter*.

[1] This table includes only individuals who have been classified as highly educated.

[2] Each outcome is for a different socioeconomic status: (1) higher managerial and professional, (2) lower managerial and professional, (3) intermediate occupations, (4) small employers and own account workers, (5) lower supervisory and technical, (6) semi-routine occupations, (7) routine occupations.

[3] Reported marginal effects.

APPENDIX B

Appendix B

B.1 Theoretical Framework

The theoretical framework presented below is a basic structure that helps us explain the assumptions and the basic mechanisms that create differences in the incentives of the natives and the immigrants in the labour market. Before proceeding any further, we should stress the fact that this framework does not aspire to explain the mechanisms that lead to the observed levels of employment and benefit claims. Such a model would not be possible to estimate given data limitations, and thus we estimate a reduced form model. The following framework is based on the basic model of the neoclassical theory of labour supply as it is presented by Cahuc and Zylberberg (2004).

The basic assumptions are the following; a person might find herself in two possible states, employment or unemployment/inactivity. The agents belong in groups i denoted by their country name. The countries belong to the greater groups $\mathrm{A}8$, UK or $\mathrm{EU}14$. We

assume that any immigrant will spend a proportion p of her income gained in the UK, where $p \in [0, 1]$, in the UK and the rest of her income $(1 - p)$ will be spent in her home country, either as remittances today, or as savings to be spent later upon return.

We consider the purchasing power of each country with respect to the purchasing power of the UK taking into account the relevant exchange rates. We call this measure P_i, where $i \in \{\text{country of origin}\}$, and normalize it to have the value 1 for the UK at every point in time[1]. This indicator includes information regarding the income distributions of the countries of origin. The purchasing power of each country belongs in one of the larger groups P_{A8}, P_{EU14} and P_{UK} accordingly. We also assume that the unemployment benefit or the income support is lower than the minimum wage $b < w_{min}$, which is a safe assumption to make (Spicker, 2011).

We make some further assumptions regarding the costs that follow the undertaking of a specific job. The basic neoclassical model of labour supply considers the opportunity cost of leisure when the agent is maximizing her utility taking into account her time constraint. However, a specific level of wage might include much more than just an economic outcome; it could include the desirability of the job[2]. In the same spirit, we can think of the opportunity costs that follow the choice of a job. Such costs are deprivation of human capital when a person of higher education chooses to be employed in an elementary profession, the sacrifice of social life due to a job that requires shifts, or the sacrifice of the stability within a social framework by choosing to be mobile enough in order to get employed in seasonal jobs upon offer. Such costs will be denoted by C_j, where j is an indicator of the individual and is the sum of the downgrading that follows a mismatch of skills and the level of the job one undertakes, the sacrifice of stability due to internal migration, the sacrifice of social life due to a job that requires shifts and/or more.

The objective of each individual is to maximize their utility choosing between consumption (C) and leisure (L), which is denoted by $U(C, L)$ taking into account the budget constraint $C \leq wL + R_0$, where R_0 is the maximum possible income[3]. However there

[1] The formula used is $(P_{i,t}/P_{UK,t})$ where i is the country of origin and t the point in time.

[2] Benefits of the job, social status, accumulation of human capital, etc, (Cahuc and Zylberberg, 2004).

[3] We keep the notation as it is presented in Cahuc and Zylberberg (2004).

is a diversification between the optimal point for the native and for the immigrant, which is related to the initial conditions we stated above. In the subsections that follow, we will present first the interior solution for the above maximization problem for the native and then for the immigrant, and afterwards the corner solution for these two types in turn.

B.1.1 Interior Solution

Native

The objective function for the native is: $U(C, L)$ and the budget constraint she faces is $C \leq R_0 - wL$. Thus the lagrangian can be written in the form: $L(C, L, \mu) = U(C, L) + \mu(R_0 - C - wL)$.

The first order conditions will give us:

$$\left.\begin{aligned} U_C(C, L) - \mu = 0 \\ U_L(C, L) - \mu w = 0 \\ \mu(R_0 - C - wL) = 0 \text{ with } \mu \geq 0 \\ \text{but } \mu = U_C(C, L) > 0 \\ \text{thus the solution is on } C + wL = R_0 \end{aligned}\right\} \begin{aligned} &\frac{U_L(C^*, L^*)}{U_C(C^*, L^*)} = w \\ &C^* + wL^* = R_0 \end{aligned}$$

Immigrant

The objective function for the immigrant is: $U(C, L)$ and the budget constraint she faces is $C \leq R_0 - pwL - (1-p)\frac{w}{P_i}L$ [4]. Thus the lagrangian can be written in the form: $L(C, L, \mu) = U(C, L) + \mu(R_0 - C - pwL - (1-p)\frac{w}{P_i}L)$.

[4] Please refer to subsection A.1.4, Proof 1 for the proof over the form of the budget constraint of the immigrant.

The first order conditions will give us:

$$\left.\begin{aligned} U_C(C,L) - \mu &= 0 \\ U_L(C,L) - \mu p w - \mu(1-p)\frac{w}{P_i} &= 0 \\ \mu(R_0 - C - pwL - (1-p)\frac{w}{P_i}L) = 0 \text{ with } \mu &\geq 0 \\ \text{but } \mu = U_C(C,L) &> 0 \\ \text{thus the solution is on } C = R_0 - pwL - (1-p)\frac{w}{P_i}L & \end{aligned}\right\} \begin{aligned} \frac{U_L(C^*,L^*)}{U_C(C^*,L^*)} &= pw + (1-p)\frac{w}{P_i} \\ C^* + pwL^* + (1-p)\frac{w}{P_i} &= R_0 \end{aligned}$$

Implications

If we assume that we have two individuals, one native and one immigrant, who are identical in such a way that

$$\frac{U_L(C^*,L^*)}{U_C(C^*,L^*)}\,|_{native} \;=\; \frac{U_L(C^*,L^*)}{U_C(C^*,L^*)}\,|_{immigrant}$$

then it will also be that - for the real wages of the native and the immigrant -, $w_{native} = w_{immigrant}$.

However, we know that the real wage of the immigrant is also equal to $w_I = pw + (1-p)\frac{w}{P_I}$ for any real wage level w that is going to be spent entirely in the UK. Then there should exist such a level of real wage w_* for which it should also hold that $w_{immigrant} = pw_* + (1-p)\frac{w_*}{P_i} = w_{native}$, and that will be the level of real wage paid to the immigrant for which the immigrant will find herself at the equilibrium stated. It can be easily proven[5] that if $w_* = w_{native}$ and $P_I < 1 = P_{UK}$ then $w_{immigrant} > \frac{U_L(C^*,L^*)}{U_C(C^*,L^*)}\,|_{native}$. However, $w_{immigrant} > \frac{U_L(C^*,L^*)}{U_C(C^*,L^*)}\,|_{native}$ is the condition under which the agent offers strictly positive quantity of hours, thus at this wage level, the immigrant has an incentive to offer a strictly positive number of hours,

[5] Please refer to subsection A.1.4, Proof 2 for the proof.

while at the same level of real wage, the identical native is at an equilibrium and has no incentive of offering any more hours of work.

B.1.2 Corner Solution

When the native is working zero hours and thus, uses all her available time for leisure then the following two conditions hold; $L_0 = L$ and $C = R$. The marginal rate of substitution at this point is also the formula that gives us the reservation wage of the agent, the wage at which she is indifferent between entering the labour market or not; $\frac{U_L(R,L)}{U_C R,L} = w_R$.
As we saw earlier, this reservation wage will be equal to $w_I^R = pw_R + (1-p)\frac{w_R}{P_I}$ for an identical immigrant. We also proved that if $P_I < 1$ then $w_I^R > w_R$. Then, there should be a reservation wage w_0 such that $pw_0 + (1-p)\frac{w_0}{P_I} = w_R$. It can be easily be proven[6] that if $P_I < 1$ then $w_0 < w_R$, which implies that the immigrant has a lower reservation wage than the native.

B.1.3 Cost Margins

As we stated earlier, the real wage w does not only imply an economic outcome, but the level of desirability for the undertaken job as well. We already proved that for two identical individuals who have the same marginal rates of substitution between consumption and leisure, if the immigrant is going to spend a proportion of her income in her home country, which has a lower income distribution than the host country, then her reservation wage is going to be lower and she will have an incentive to strictly offer more hours of work than the native.
At the equilibrium point of any two identical individuals, a native and an immigrant, there shall be a difference between their paid equilibrium wages: $w_{native} > w_{immigrant}$, which will be greater the smaller the P_I will be. Thus, if we consider $w(P_I) = w_{native} - w_{immigrant}$, it should be $\partial w(P_I)/\partial P_I < 0$. This difference between the two wages does

[6] Please refer to subsection A.1.4, Proof 3 for the proof.

not only capture the economic outcome but also the desirability of the profession. If we reverse this argument it will be the case that the difference between the two wages is the maximum cost (c) resulting from an undesired profession that the individual is willing to undertake. Thus, it will be that $c \leq w_{native} - w_{immigrant}$. A corollary following this statement will then be that the cost itself is a function of the level of purchasing power of the home country of the immigrant P_I.

B.1.4 Proofs

Proof 1:
The budget constraint is given by $C \leq w_I h + R$, where w_I is the real wage for the immigrant, h are the hours of work of the immigrant and R is a benefit that the immigrant is eligible for (income support, unemployment benefit, etc). Under the assumptions we made earlier, the relation of the immigrant's real wage to the nominal wage shall be $w_I = pW + (1-p)\frac{W}{P_i}$, and the relation of the nominal wage to the real wage for a native shall be $w = \frac{W}{P_{UK}} = W$ since we normalized $P_{UK} = 1$ at any point in time. Thus, the immigrant's real wage can be rewritten as $w_I = pw + (1-p)\frac{w}{P_i}$ and her budget constraint as $C \leq pwh + (1-p)\frac{w}{P_i}h + R$.

We also know that the hours of work equal the total available number of hours (L_0) minus the hours dedicated to leisure (L), $h = L_0 - L$ so the budget constraint can be rewritten as $C \leq pw(L_0 - L) + (1-p)\frac{w}{P_i}(L_0 - L) + R$. Furthermore, the total possible available income R_0 is equal to $R_0 = R + w_I L_0 \Rightarrow R = R_0 - w_I L_0 \Rightarrow R = R_0 - pwL_0 + (1-p)\frac{w}{P_i}L_0$. Substituting this relation into the budget constraint, we get:

$$C \leq pwh + (1-p)\frac{w}{P_i}h + R_0 - pwL_0 + (1-p)\frac{w}{P_i}L_0 \Rightarrow$$
$$C \leq R_0 - pwL - (1-p)\frac{w}{P_I}L$$

Proof 2:

If $\frac{U_L(C^*,L^*)}{U_C(C^*,L^*)} = w$ then the agent is at equilibrium. If $\frac{U_L(C^*,L^*)}{U_C(C^*,L^*)} < w$ then the agent has an incentive to sacrifice even more hours of leisure in order to work more. Given that $p \in [0,1]$, under which conditions will it be the case that when $w_* = w_{native}$, the real wage for the immigrant will be greater than the real wage of the native $w_{immigrant} > w_{native}$, and thus give an incentive to the immigrant to sacrifice even more hours of leisure $\frac{U_L(C^*,L^*)}{U_C(C^*,L^*)} < w_{immigrant}$?

If $w_* = w_{native}$ then $w_{immigrant} = pw_* + (1-p)\frac{w_*}{P_I} > w_{native}$, given that $p \in (0,1)$ if and only if:

$$w_{immigrant} > w_{native} \Rightarrow pw_* + (1-p)\frac{w_*}{P_I} > w_* \Rightarrow w_*(p + (1-p)\frac{1}{P_I}) > w_* \Rightarrow$$
$$p + (1-p)\frac{1}{P_I} > 1 \Rightarrow (1-p)\frac{1}{P_I} > 1-p \Rightarrow \frac{1}{P_I} > 1 \Rightarrow P_I < 1$$

Thus, the above condition holds only if the purchasing power of the home country of the immigrant is lower than the purchasing power of the UK (which is normalized to one).

Proof 3:

There is w_0 such that $\frac{U_L(R,L)}{U_C(C,L)} = pw_0 + (1-p)\frac{w_0}{p_I} = w_R$.

What is the relation between w_0 and w_R?

$$pw_0 + (1-p)\frac{w_0}{p_I} = w_R \Rightarrow w_0(p + (1-p)\frac{1}{p_I}) = w_R \Rightarrow (p + (1-p)\frac{1}{p_I}) = \frac{w_R}{w_0}$$

We have proved that $(p + (1-p)\frac{1}{p_I}) > 1$ for $P_I < 1$. Thus for $\frac{1}{P_I} > 1$ it should be that:

$$\left.\begin{aligned}(p + (1-p)\frac{1}{p_I}) = \frac{w_R}{w_0}\\ (p + (1-p)\frac{1}{p_I}) > 1\end{aligned}\right\} \Rightarrow \frac{w_R}{w_0} > 1 \Rightarrow w_R > w_0$$

Table B.1: Comparative Price Levels of Final Consumption by Private Households Including Indirect Taxes (UK=1)

	2004	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
EU (28 countries)										
Belgium	0.98	0.97	0.97	0.94	1.07	1.16	1.02	1.01	0.94	0.97
Czech Republic	0.51	0.53	0.55	0.55	0.75	0.76	0.69	0.68	0.61	0.60
Denmark	1.29	1.28	1.25	1.20	1.36	1.48	1.30	1.30	1.19	1.22
Germany	0.97	0.94	0.93	0.89	1.00	1.11	0.96	0.94	0.86	0.89
Estonia	0.58	0.59	0.62	0.64	0.74	0.80	0.69	0.70	0.66	0.68
Ireland	1.16	1.12	1.13	1.09	1.26	1.30	1.10	1.09	1.02	1.05
Greece	0.81	0.80	0.80	0.79	0.89	0.98	0.88	0.87	0.79	0.78
Spain	0.84	0.83	0.83	0.81	0.92	1.01	0.90	0.89	0.82	0.82
France	1.01	0.99	0.98	0.95	1.07	1.16	1.02	1.01	0.94	0.96
Italy	0.97	0.95	0.94	0.90	0.99	1.08	0.94	0.95	0.89	0.90
Latvia	0.52	0.52	0.55	0.58	0.73	0.79	0.65	0.67	0.63	0.62
Lithuania	0.49	0.50	0.52	0.53	0.64	0.69	0.59	0.59	0.55	0.55
Luxembourg	0.95	1.02	1.01	1.01	1.14	1.26	1.13	1.11	1.02	1.06
Hungary	0.57	0.58	0.55	0.59	0.67	0.65	0.58	0.57	0.53	0.52
Netherlands	0.98	0.95	0.94	0.89	1.01	1.11	1.00	0.99	0.93	0.97
Austria	0.95	0.93	0.92	0.90	1.02	1.11	0.97	0.97	0.91	0.94
Poland	0.49	0.56	0.56	0.54	0.67	0.60	0.56	0.54	0.48	0.49
Portugal	0.81	0.78	0.77	0.75	0.85	0.92	0.81	0.78	0.72	0.71
Slovenia	0.70	0.69	0.69	0.69	0.80	0.91	0.80	0.78	0.72	0.73
Slovakia	0.51	0.50	0.52	0.55	0.68	0.76	0.65	0.65	0.60	0.61
Finland	1.14	1.13	1.11	1.05	1.17	1.28	1.13	1.12	1.04	1.07
Sweden	1.12	1.08	1.07	1.01	1.10	1.11	1.11	1.15	1.11	1.15
United Kingdom	1	1	1	1	1	1	1	1	1	1

Source: *EUROSTAT*.

Table B.2: Tenancy types

	UK	EU14	A8
Owned outright	27.4	22.0	0.9
Being bought with mortgage	47.3	39.5	8.8
Part rent, part mortgage	0.4	0.4	0.4
Rented	24.2	37.3	89.5
Rent free/squatting	0.7	0.8	0.4
Number of Observations	2,164,401	52,110	24,642

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.

Table B.3: Income related benefits

	UK	EU14	A8
Income Support	0.8	0.7	0.2
ESA	8.5	5.3	1.2
State Pension	28.6	27.3	0.2
Family Benefit	0.1	0.1	0.5
Child Benefit	42.3	45.3	73.8
Housing/Council Tax Ben.	19.7	21.4	24.2
Number of Observations	906,035	20,358	6,755

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.

Table B.4: Job classification one year ago

	UK	**EU14**	**A8**
Managers and senior occ.	14.7	16.1	2.4
Professional occ.	15.1	22.4	3.8
Associate professionals	14.3	16.1	3.9
Administrative	12.4	9.5	5.0
Skilled trades occ.	11.4	7.7	13.8
Personal services	8.5	7.8	7.1
Sales and customer serv.	6.7	4.7	3.3
Process, plant	7.2	5.4	22.2
Elementary occ.	9.6	10.4	38.5
Number of Observations	325,434	7,883	4,131

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.

Table B.5: Probability of Employment

	1	2	3	4
A8	0.145***	-0.0287***	0.0263	0.0458***
	(0.00391)	(0.00593)	(0.0863)	(0.00440)
EU14	-0.00238	-0.0357***	0.0103	0.0343**
	(0.00387)	(0.00432)	(0.0689)	(0.0155)
Gender (%male)		0.131***	0.131***	0.0100***
		(0.00119)	(0.00121)	(0.000839)
Age		0.0669***	0.0669***	0.0131***
		(0.000281)	(0.000284)	(0.000187)
Age squared		-0.000859***	-0.000859***	-0.000159***
		(3.28e-06)	(3.33e-06)	(2.16e-06)
Number of children in HH		-0.0907***	-0.0906***	-0.00731***
		(0.00112)	(0.00114)	(0.000755)
Has dependent children in HH		0.0481***	0.0477***	0.00384**
		(0.00232)	(0.00235)	(0.00149)
Disability		-0.307***	-0.306***	-0.0330***
		(0.00154)	(0.00159)	(0.00122)
Married		0.0846***	0.0852***	0.0120***
		(0.00142)	(0.00144)	(0.000870)
High Education		0.119***	0.120***	0.00973***
		(0.00146)	(0.00149)	(0.00106)
Intermediate Education		0.0869***	0.0873***	0.00829***
		(0.00133)	(0.00135)	(0.000844)
CPL			0.00106**	0.000628**
			(0.000524)	(0.000318)
A8*CPL			-6.24e-05	-0.00144**
			(0.00121)	(0.000677)
EU14*CPL			-0.000419	-0.000558
			(0.000641)	(0.000382)
Managers and senior occ.				0.0219***
				(0.00106)
Professional occ.				0.0256***
				(0.00107)
Associate professionals				0.0238***
				(0.00103)
Administrative				0.0177***
				(0.00109)
Skilled trades occ.				0.0184***
				(0.00110)
Personal services				0.0192***
				(0.00112)
Sales and customer serv.				0.00930***
				(0.00136)
Process, plant				0.0107***
				(0.00134)
Observations	2,310,769	2,286,103	2,228,399	337,702

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.

[1] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.

[2] Reported marginal effects.

[3] The reference categories are UK native, female, without children, without disability, with high education (based on the model), elementary profession.

[4] We also include year-quarter and regional dummies.

Table B.6: Probability of Employment, only males

	1	2	3	4
A8	0.175***	0.0462***	0.138***	0.0429***
	(0.00378)	(0.00666)	(0.0514)	(0.00183)
EU14	0.0145***	-0.00973*	0.0975	0.0354**
	(0.00530)	(0.00553)	(0.0600)	(0.0142)
Age		0.0539***	0.0539***	0.0114***
		(0.000328)	(0.000331)	(0.000237)
Age squared		-0.000693***	-0.000693***	-0.000140***
		(3.84e-06)	(3.88e-06)	(2.71e-06)
Number of children in HH		-0.0456***	-0.0456***	-0.00747***
		(0.00157)	(0.00159)	(0.00101)
Has dependent children in HH		0.0699***	0.0696***	0.0135***
		(0.00299)	(0.00303)	(0.00198)
Disability		-0.311***	-0.310***	-0.0328***
		(0.00219)	(0.00225)	(0.00165)
Married		0.136***	0.137***	0.0208***
		(0.00196)	(0.00199)	(0.00124)
High Education		0.0762***	0.0767***	0.00894***
		(0.00182)	(0.00184)	(0.00137)
Intermediate Education		0.0520***	0.0523***	0.00567***
		(0.00169)	(0.00171)	(0.00114)
CPL			0.00120*	0.000699
			(0.000706)	(0.000434)
A8CPL			-0.00149	-0.00177*
			(0.00171)	(0.000943)
EU14CPL			-0.00119	-0.000615
			(0.000874)	(0.000528)
Managers and senior occ.				0.0210***
				(0.00130)
Professional occ.				0.0243***
				(0.00132)
Associate professionals				0.0212***
				(0.00130)
Administrative				0.0151***
				(0.00174)
Skilled trades occ.				0.0183***
				(0.00125)
Personal services				0.0167***
				(0.00211)
Sales and customer serv.				0.00893***
				(0.00203)
Process, plant				0.0121***
				(0.00142)
Observations	1,106,035	1,094,200	1,066,584	175,560

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.

[1] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.

[2] Reported marginal effects.

[3] The reference categories are UK native, without children, without disability, with high education (based on the model), elementary profession.

[4] We also include year-quarter and regional dummies.

Table B.7: Probability of Employment, only females

	1	2	3	4
A8	0.115***	-0.0931***	-0.0660	0.0416**
	(0.00640)	(0.00859)	(0.136)	(0.0207)
EU14	-0.00672	-0.0559***	-0.0954	0.0197
	(0.00542)	(0.00624)	(0.108)	(0.0418)
Age		0.0787***	0.0787***	0.0151***
		(0.000449)	(0.000454)	(0.000292)
Age squared		-0.00102***	-0.00102***	-0.000182***
		(5.29e-06)	(5.36e-06)	(3.42e-06)
Number of children in HH		-0.124***	-0.124***	-0.00821***
		(0.00164)	(0.00166)	(0.00112)
Has dependent children in HH		-0.00705**	-0.00761**	-0.00763***
		(0.00350)	(0.00355)	(0.00226)
Disability		-0.300***	-0.300***	-0.0333***
		(0.00214)	(0.00224)	(0.00180)
Married		0.0261***	0.0268***	0.00248**
		(0.00201)	(0.00204)	(0.00123)
High Education		0.156***	0.156***	0.0110***
		(0.00222)	(0.00227)	(0.00161)
Intermediate Education		0.119***	0.120***	0.0115***
		(0.00197)	(0.00201)	(0.00124)
CPL			0.000941	0.000427
			(0.000750)	(0.000466)
A8CPL			0.000324	-0.00111
			(0.00169)	(0.000972)
EU14CPL			0.000328	-0.000327
			(0.000912)	(0.000553)
Managers and senior occ.				0.0190***
				(0.00180)
Professional occ.				0.0248***
				(0.00175)
Associate professionals				0.0243***
				(0.00163)
Administrative				0.0179***
				(0.00161)
Skilled trades occ.				0.0149***
				(0.00306)
Personal services				0.0200***
				(0.00159)
Sales and customer serv.				0.00811***
				(0.00195)
Process, plant				-0.000951
				(0.00378)
Observations	1,204,734	1,191,903	1,161,815	162,142

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.

[1] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.

[2] Reported marginal effects.

[3] The reference categories are UK native, without children, without disability, with high education (based on the model), elementary profession.

[4] We also include year-quarter and regional dummies.

Table B.8: Probability of claiming unemployment benefits

	1	2
A8	-0.0110***	-0.00706***
	(0.000924)	(0.000544)
EU14	-0.00452***	-0.000145
	(0.000924)	(0.000735)
Gender (%male)		0.0109***
		(0.000236)
Age		7.00e-05
		(4.29e-05)
Age squared		-7.58e-06***
		(5.00e-07)
Number of children in HH		0.00138***
		(0.000196)
Has dependent children in HH		-0.00529***
		(0.000378)
Disability		0.00766***
		(0.000306)
Married		-0.0198***
		(0.000322)
High Education		-0.0113***
		(0.000190)
Intermediate Education		-0.00605***
		(0.000200)
Observations	2,305,854	2,281,864

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.
[1] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.
[2] Reported marginal effects.
[3] The reference categories are UK native, without children, without disability, with high education (based on the model), elementary profession.
[4] We also include year-quarter and regional dummies.

Table B.9: Probability of claiming income related benefits

	1	2	3
A8	-0.130***	0.0363***	-0.102***
	(0.00499)	(0.00725)	(0.00608)
EU14	-0.00690*	-0.00958**	-0.0351***
	(0.00413)	(0.00460)	(0.00445)
Gender (%male)		-0.420***	-0.425***
		(0.00122)	(0.00124)
Age		-0.0465***	-0.0432***
		(0.000362)	(0.000374)
Age squared		0.000737***	0.000713***
		(4.14e-06)	(4.34e-06)
Number of children in HH		0.0696***	0.0618***
		(0.00120)	(0.00123)
Has dependent children in HH		0.530***	0.555***
		(0.00236)	(0.00237)
Disability		0.325***	0.299***
		(0.00176)	(0.00181)
Married		-0.122***	-0.0721***
		(0.00158)	(0.00163)
High Education		-0.0983***	-0.0591***
		(0.00174)	(0.00184)
Intermediate Education		-0.0586***	-0.0298***
		(0.00159)	(0.00164)
Owned outright			-0.184***
			(0.00203)
Bought with mortgage or loan			-0.239***
			(0.00183)
Part rent, part mortgage			-0.131***
			(0.00823)
Rent free/squatting			-0.158***
			(0.00611)
Observations	2,305,854	2,281,864	2,280,978

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.
[1] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.
[2] Reported marginal effects.
[3] The reference categories are UK native, without children, without disability, with high education (based on the model), renting house.
[4] We also include year-quarter and regional dummies.

Table B.10: Seemingly unrelated bivariate probit

	P(11)	**P(10)**
A8	0.00978	-0.0793***
	(0.0297)	(0.0293)
EU14	-0.0318	0.00451
	(0.0294)	(0.0293)
Gender (%male)	-0.220***	-0.203***
	(0.000935)	(0.000840)
Age	0.000125	-0.0459***
	(0.000253)	(0.000219)
Age squared	0.000104***	0.000640***
	(3.00e-06)	(2.58e-06)
Number of children in HH	0.00511***	0.0614***
	(0.000863)	(0.000730)
Has dependent children in HH	0.412***	0.132***
	(0.00209)	(0.00170)
Disability	0.0346***	0.268***
	(0.00105)	(0.00147)
Married	-0.0236***	-0.0660***
	(0.00108)	(0.000996)
High Education	0.00386***	-0.0735***
	(0.00137)	(0.000936)
Intermediate Education	0.0125***	-0.0509***
	(0.00115)	(0.000894)
Owned outright	-0.0979***	-0.0510***
	(0.00126)	(0.000733)
Bought with mortgage or loan	-0.101***	-0.0482***
	(0.00123)	(0.000596)
Part rent, part mortgage	-0.0428***	-0.0222***
	(0.00565)	(0.00325)
Rent free/squatting	-0.0735***	-0.0414***
	(0.00385)	(0.00262)
CPL	0.000344	-0.000344
	(0.000237)	(0.000237)
A8CPL	-0.00114**	0.00114**
	(0.000534)	(0.000534)
EU14CPL	-2.18e-05	2.18e-05
	(0.000290)	(0.000290)
Observations	2,223,388	2,223,388

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.
[1] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.
[2] Reported marginal effects.
[3] The reference categories are UK native, without children, without disability, with high education (based on the model), renting house.
[4] We also include year-quarter and regional dummies.

Table B.11: Recursive Bivariate Probit Results

VARIABLES	Probability of Claiming Unemployment Benefits
Employed	-1.891***
	(0.140)
A8	-0.256***
	(0.089)
EU14	0.037
	(0.063)
Male	0.411***
	(0.023)
Age	0.069***
	(0.008)
Age squared	-0.001***
	(0.000)
Number of Children in HH	0.022
	(0.020)
Has dependent Children in HH	-0.238***
	(0.042)
Disability	0.035
	(0.030)
Married	-0.445***
	(0.024)
High education	-0.447***
	(0.032)
Intermediate education	-0.159***
	(0.023)
Observations	334,913

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Source: *QLFS,* 2005 *Second Quarter*- 2013 *Fourth Quarter*.
[1] The p-values to indicate significance are denoted by * p$<$ 0.05, ** p$<$ 0.01, *** p$<$ 0.001.
[2] Reported marginal effects, outcome P(11) is probability of claiming benefits if employed, outcome P(10) is probability of claiming benefits if unemployed.
[3] The reference categories are UK native, female, without children, without disability, with high education (based on the model).
[4] We also include year-quarter and regional dummies.
[5] This is the results from the recursive bivariate model model with outcomes "Probability of employment" and "Probability of claiming Unemployment Benefits".

APPENDIX C

Appendix C

Table C.1: Exits to Employment and Inactivity for the Duration Analysis

	UK	**EU14**	**2nd Gen.**	**A8**	**nonEU**
Number of Observations	43,504	1,190	4,117	693	6,532
Number of Individuals	20,639	574	1,961	386	3,172
Percentage of each group in the sample	77.6	2.1	7.4	1.2	11.7
Length in Panel	3.8	3.7	3.9	2.9	3.8
Number of Exits					
To Dependent Employment	4,915	145	387	72	586
To Inactivity	2,500	58	200	21	395
Number of Exits (%)					
To Dependent Employment	23.8	25.3	19.7	18.7	18.5
To Inactivity	12.1	10.1	10.2	5.4	12.5
Number of Censored Observations	13,238	375	1,359	297	2,184
Number of Censored Observations (%)	64.1	65.3	69.3	76.9	68.9
Number of Observations by year					
2005	4,463	134	450	28	717
2006	6,831	173	701	73	1,146
2007	6,167	209	642	152	1,003
2008	6,396	176	596	124	967
2009	9,201	211	847	130	1,287
2010	8,330	227	750	153	1,104
2011	2,116	60	131	33	308
Mean Survival Time*	5.1	5.1	5.5	5.1	5.4
	(0.0)	(0.1)	(0.1)	(0.2)	(0.0)

[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] This sub-sample includes unemployed individuals and individuals who exited in dependent employment and inactivity.

Table C.2: Multinomial Probit

	Before the Crisis			
	(1)	(2)	(3)	(4)
VARIABLES	Employee	Unemployed	Self Employed	Inactive
EU14	-0.0223***	0.00713***	-0.0123***	0.0274***
	(0.00651)	(0.00232)	(0.00415)	(0.00544)
2nd Gen	-0.0369***	0.0192***	0.00346	0.0143***
	(0.00448)	(0.00170)	(0.00321)	(0.00345)
A8	0.00428	0.0117***	-0.0321***	0.0161*
	(0.00996)	(0.00369)	(0.00625)	(0.00878)
non-EU	-0.129***	0.0314***	-0.00130	0.0988***
	(0.00370)	(0.00163)	(0.00237)	(0.00322)
Age	0.0236***	-0.00508***	0.00686***	-0.0254***
	(0.000533)	(0.000173)	(0.000399)	(0.000397)
Married	0.0509***	-0.0266***	0.00976***	-0.0340***
	(0.00210)	(0.000745)	(0.00143)	(0.00167)
Has Children	0.0152***	-0.00655***	-0.00895***	0.000301
	(0.00337)	(0.00114)	(0.00233)	(0.00259)
Num. of Children	-0.0717***	0.00449***	0.0117***	0.0555***
	(0.00157)	(0.000540)	(0.00105)	(0.00117)
Disabled	-0.265***	0.0135***	-0.0407***	0.292***
	(0.00240)	(0.000900)	(0.00132)	(0.00229)
Intermediate Educ.	0.0668***	-0.0130***	-0.00519***	-0.0485***
	(0.00218)	(0.000746)	(0.00151)	(0.00172)
High Educ.	0.0858***	-0.0182***	0.0103***	-0.0779***
	(0.00250)	(0.000806)	(0.00182)	(0.00189)
Observations	753,188	753,188	753,188	753,188

[1] Source: *QLFS,* 2005 *Second Quarter*- 2008 *First Quarter*.

[2] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.

[3] The reference categories are UK native, female, without children, without disability, not married, with high education.

[4] We also include interactions of population groups with crisis so the reference group is UK before crisis.

[5] The estimated marginal effects are provided and their standard errors in parenthesis.

Table C.3: Multinomial Probit

	During the Crisis			
	(1)	(2)	(3)	(4)
VARIABLES	Employee	Unemployed	Self Employed	Inactive
EU14	-0.0287***	0.00574*	-0.00249	0.0255***
	(0.00682)	(0.00294)	(0.00445)	(0.00552)
2nd Gen	-0.0446***	0.0199***	0.00252	0.0222***
	(0.00471)	(0.00205)	(0.00332)	(0.00365)
A8	-0.0116	-0.00405	-0.0168***	0.0325***
	(0.00846)	(0.00308)	(0.00539)	(0.00744)
non-EU	-0.119***	0.0293***	-0.000960	0.0910***
	(0.00371)	(0.00184)	(0.00237)	(0.00321)
Age	0.0302***	-0.00661***	0.00776***	-0.0313***
	(0.000542)	(0.000210)	(0.000408)	(0.000394)
Married	0.0639***	-0.0415***	0.0134***	-0.0358***
	(0.00212)	(0.000944)	(0.00141)	(0.00166)
Has Children	0.0152***	-0.00583***	-0.00223	-0.00712***
	(0.00350)	(0.00146)	(0.00241)	(0.00265)
Num. of Children	-0.0713***	0.00551***	0.00757***	0.0583***
	(0.00162)	(0.000691)	(0.00109)	(0.00120)
Disabled	-0.245***	0.00652***	-0.0405***	0.279***
	(0.00242)	(0.00101)	(0.00134)	(0.00229)
Intermediate Educ.	0.0718***	-0.0189***	-0.00460***	-0.0482***
	(0.00228)	(0.000952)	(0.00156)	(0.00177)
High Educ.	0.0947***	-0.0300***	0.00724***	-0.0719***
	(0.00257)	(0.000991)	(0.00183)	(0.00195)
Observations	716,396	716,396	716,396	716,396

[1] Source: *QLFS,* 2008 *Second Quarter*- 2011 *First Quarter*.

[2] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.

[3] The reference categories are UK native, female, without children, without disability, not married, with high education.

[4] We also include interactions of population groups with crisis so the reference group is UK before crisis.

[5] The estimated marginal effects are provided and their standard errors in parenthesis.

Table C.4: Single Exits to Dependent Employment

Model	(2)	(3)	(4)
Age	0.006	0.005	-0.019
	(0.007)	(0.008)	(0.025)
Age2	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
Married	0.425***	0.399***	0.673***
	(0.033)	(0.035)	(0.117)
Children in HH	0.161***	0.183***	0.133
	(0.048)	(0.053)	(0.173)
Number of children	-0.159***	-0.162***	-0.170*
	(0.024)	(0.027)	(0.093)
Disability	-0.364***	-0.298***	-0.398***
	(0.038)	(0.041)	(0.136)
Low Education	-0.580***	-0.406***	-0.401***
	(0.037)	(0.045)	(0.135)
Intermediated Education	-0.253***	-0.159***	-0.008
	(0.038)	(0.044)	(0.130)
Observations	25,559	20,858	15,711

[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.

[3] The reference categories are UK native, female, without children, without disability, not married, with high education, dismissed/made redundant, elementary profession, self-employed.

[4] We also include interactions of population groups with crisis so the reference group is UK before crisis on the first group of models and the reference group is UK during the crisis on the second group of models.

[5] In model 1 we control for time and regional dummies, in model 2 we control for demographic characteristics as well (age, age squared, disability, marital status, children dummy and number of children), in model 3 we also control for occupation type at previous occupation and finally in model 4 we also control for reason for losing last job and type of last job (self-employment or dependent employment).

Table C.5: Single Exits to Dependent Employment

Model	(3)	(4)
Managers, Directors and Senior Official	0.199***	0.638***
	(0.056)	(0.179)
Professional Occupations	0.317***	0.486**
	(0.066)	(0.211)
Associate Professional and Technical Oc	0.314***	0.520***
	(0.056)	(0.178)
Administrative and Secretarial Oc	0.354***	0.602***
	(0.053)	(0.162)
Skilled Trades Occupations	-0.006	0.268
	(0.054)	(0.183)
Caring, Leisure and Other Service Oc	0.304***	0.420**
	(0.061)	(0.192)
Sales and Customer Service Occ	0.241***	0.442***
	(0.052)	(0.158)
Process, Plant and Machine Operatives	0.086	0.526***
	(0.056)	(0.174)
Temporary Job		0.926***
		(0.132)
Resigned		1.067***
		(0.126)
Other		0.442***
		(0.140)
Employee		0.689***
		(0.239)
Observations	20,858	15,711

[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.

[3] The reference categories are UK native, female, without children, without disability, not married, with high education, dismissed/made redundant, elementary profession, self-employed.

[4] We also include interactions of population groups with crisis so the reference group is UK before crisis on the first group of models and the reference group is UK during the crisis on the second group of models.

[5] In model 1 we control for time and regional dummies, in model 2 we control for demographic characteristics as well (age, age squared, disability, marital status, children dummy and number of children), in model 3 we also control for occupation type at previous occupation and finally in model 4 we also control for reason for losing last job and type of last job (self-employment or dependent employment).

Table C.6: Single Exits to Dependent Employment

Model	(1)	(2)	(3)	(4)
6 Months	-1.488***	-1.195***	-1.351***	-4.066***
	(0.114)	(0.169)	(0.193)	(0.681)
9 Months	-1.710***	-1.372***	-1.517***	-4.959***
	(0.115)	(0.169)	(0.193)	(0.684)
12 Months	-2.030***	-1.655***	-1.796***	-5.469***
	(0.117)	(0.171)	(0.195)	(0.707)
15 Months	-2.193***	-1.788***	-1.891***	-5.615***
	(0.119)	(0.174)	(0.197)	(0.718)
18 Months	-2.359***	-1.950***	-2.072***	-5.453***
	(0.125)	(0.178)	(0.202)	(0.722)
$>$ 18 Months	-2.570***	-2.117***	-2.239***	-6.042***
	(0.123)	(0.177)	(0.200)	(0.723)
Observations	26,130	25,559	20,858	15,711

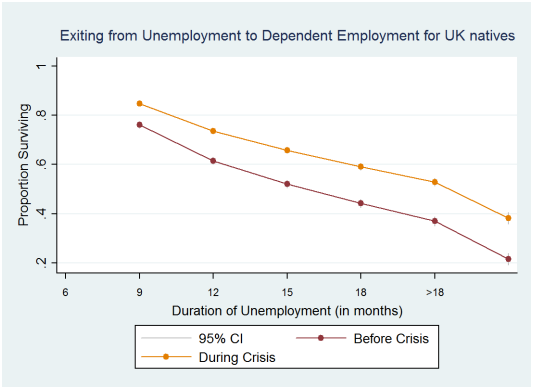
[1] Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

[2] The p-values to indicate significance are denoted by * p<0.05, ** p<0.01, *** p<0.001.

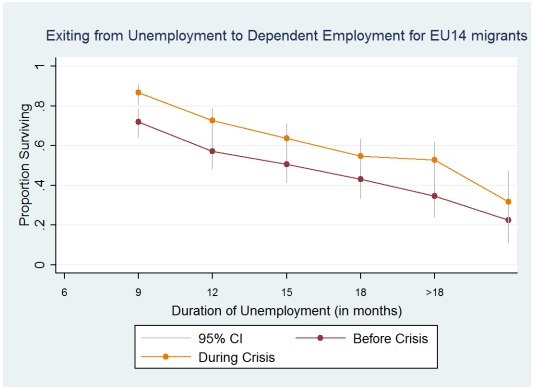
[3] The reference categories are UK native, female, without children, without disability, not married, with high education, dismissed/made redundant, elementary profession, self-employed.

[4] We also include interactions of population groups with crisis so the reference group is UK before crisis on the first group of models and the reference group is UK during the crisis on the second group of models.

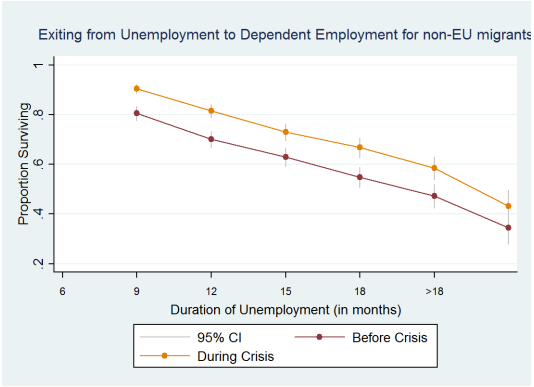
[5] In model 1 we control for time and regional dummies, in model 2 we control for demographic characteristics as well (age, age squared, disability, marital status, children dummy and number of children), in model 3 we also control for occupation type at previous occupation and finally in model 4 we also control for reason for losing last job and type of last job (self-employment or dependent employment).



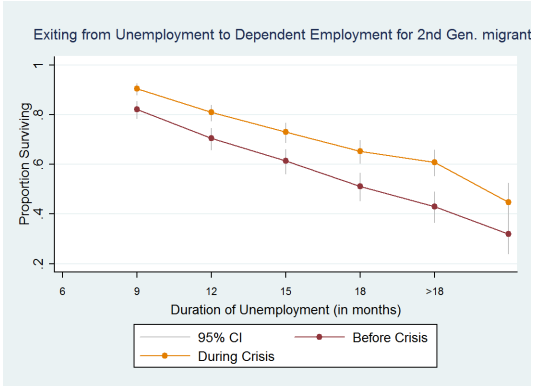
(a) UK



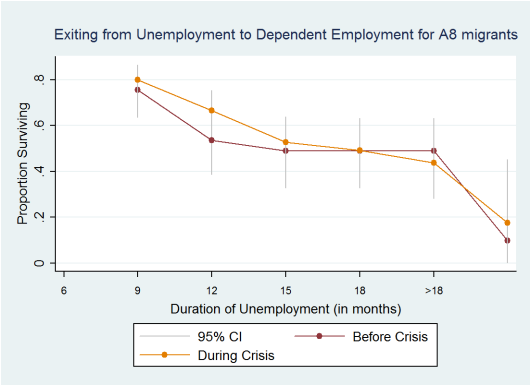
(b) EU14



(c) non EU



(d) 2nd Generation



(e) A8

Figure C.1: Exits to Dependent Employment before and during the Crisis per Population Group

APPENDIX D

Appendix D

Table D.1: Job Separations per Duration in Dependent Employment

Time Interval	Non-Exit	Exit	Non-Exit	Exit
t<=3 months	275,021	888	99.68	0.32
3 months< t <=6 months	244,814	3,823	98.46	1.54
6 months< t <=9 months	215,576	3,429	98.43	1.57
9 months< t <=12 months	189,980	2,719	98.59	1.41
12 months< t <=15 month	166,842	2,382	98.59	1.41
15 months< t <=18 month	146,026	1,883	98.73	1.27
18 months< t <=21 month	128,128	1,616	98.75	1.25
22 months< t <=24 month	112,589	1,383	98.79	1.21
24 months< t <=36 month	317,993	4,610	98.57	1.43
36 months< t <=48 month	163,218	2,824	98.3	1.7
48 months< t <=72 month	86,224	2,181	97.53	2.47

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table D.2: Job Separations per year

Year	Non-Exit	Exit	Non-Exit	Exit
2005	103,482	507	99.51	0.49
2006	313,175	2,633	99.17	0.83
2007	433,868	4,207	99.04	0.96
2008	470,730	5,137	98.92	1.08
2009	409,475	5,896	98.58	1.42
2010	283,486	6,392	97.79	2.21
2011	32,195	2,966	91.56	8.44

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table D.3: Data Characteristics, Exits from Dependent Employment to Unemployment

	UK	EU14	2nd Gen.	A8	non EU
Number of Observations	1,909,534	60,523	115,273	85,375	268,597
Number of Individuals	90,334	3,128	5,918	4,508	13,110
% of Group in Sample	78.3	2.5	4.7	3.5	11.0
Average length in Panel	34.8	32.7	32.7	31.8	33.7
Number of Exits	3,039	74	227	59	342
% of Individuals	3.4	2.4	3.8	1.3	2.6
Number of Censored Obs.	87,295	3,054	5,691	4,449	12,768
% of Individuals	96.6	97.6	96.2	98.7	97.4
Number of Observations by year					
2005	98,841	3,125	6,337	3,682	14,430
2006	292,874	9,400	19,088	12,386	41,611
2007	402,673	12,769	25,454	19,661	56,144
2008	435,299	13,812	27,222	20,823	62,493
2009	380,490	12,028	22,606	16,382	53,800
2010	266,447	8,401	13,286	11,095	36,026
2011	32,910	988	1,280	1,346	4,093
Mean Survival time*	68.5	69.2	67.7	70.1	69.1
	(0.07)	(0.38)	(0.33)	(0.28)	(0.17)

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

* Calculated restricted to longest follow-up time.

Table D.4: Data Characteristics, Exits from Dependent Employment to Unemployment per Duration Interval

Time	Non-Exit	Exit	Non-Exit (%)	Exit (%)
(0,3]	335,994	283	99.9	0.1
(3,6]	296,492	937	99.7	0.3
(6,9]	258,716	639	99.8	0.3
(9,12]	226,410	436	99.8	0.2
(12,15]	197,213	301	99.9	0.2
(15,18]	172,487	193	99.9	0.1
(18,21]	151,215	159	99.9	0.1
(22,24]	132,680	129	99.9	0.1
(24,36]	373,111	369	99.9	0.1
(36,48]	190,544	185	99.9	0.1
(48,72]	100,699	110	99.9	0.1

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

* Time is measured in months.

Table D.5: Data Characteristics, Exits from Dependent Employment to Unemployment per Year

Year	Non-Exit	Exit	Non-Exit (%)	Exit (%)
2005	126,272	143	99.9	0.1
2006	374,847	512	99.9	0.1
2007	516,134	567	99.9	0.1
2008	558,907	742	99.9	0.1
2009	484,443	863	99.8	0.2
2010	334,521	734	99.8	0.2
2011	40,437	180	99.6	0.4

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table D.6: Exits from Dependent Employment to Underemployment

	UK	EU14	2nd Gen.	A8	non EU
Number of Observations	1794964	56,866	107,657	77,407	243,458
Number of Individuals	84,736	2,920	5,504	4,046	11,859
% of Group in Sample	78.7	2.5	4.7	3.4	10.7
Average length in Panel	34.8	32.6	32.5	31.8	33.5
Number of Exits	7,087	196	458	252	1,121
% of Individuals	8.4	6.7	8.3	6.2	9.5
Number of Censored Obs.	77,649	2,724	5,046	3,794	10,738
% of Individuals	91.6	93.3	91.7	93.8	90.5
Number of Observations by year					
2005	94,993	2,976	6,053	3,379	13,346
2006	279,676	8,864	18,051	11,298	38,546
2007	383,478	12,144	24,114	17,997	51,724
2008	411,043	13,155	25,466	19,034	56,700
2009	354,227	11,264	20,774	14,757	48,052
2010	242,446	7,584	12,072	9,775	31,628
2011	29,101	879	1,127	1,167	3,462
Mean Survival time*	62.1	62.9	61.1	63.0	60.3

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

* Calculated restricted to longest follow-up time.

Table D.7: Exits from Dependent Employment to Underemployment per Duration Interval

Time	Non-Exit	Exit	Non-Exit	Exit
(0,3]	313,106	311	99.9	0.1
(3,6]	276,326	1,276	99.5	0.5
(6,9]	241,319	1,117	99.5	0.5
(9,12]	211,052	897	99.6	0.4
(12,15]	184,233	741	99.6	0.4
(15,18]	161,095	688	99.6	0.4
(18,21]	141,269	573	99.6	0.4
(21,24]	124,095	497	99.6	0.4
(24,36]	348,776	1,467	99.6	0.4
(36,48]	177,266	930	99.5	0.5
(48,72]	92,701	617	99.3	0.7

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

* Time is in months

Table D.8: Exits from Dependent Employment to Underemployment per Year

Year	Non-Exit	Exit	Non-Exit %	Exit %
2005	120,500	247	99.8	0.2
2006	355,524	911	99.7	0.3
2007	488,106	1,351	99.7	0.3
2008	523,662	1,736	99.7	0.3
2009	446,973	2,101	99.5	0.5
2010	301,248	2,257	99.3	0.7
2011	35,225	511	98.6	1.4

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table D.9: Exits from Dependent Employment to Multiple Destinations

	UK	EU14	2nd Gen.	A8	non EU
Number of Observations	1811636	57,388	108,672	77,742	245,240
Number of Individuals	84,737	2,922	5,501	4,047	11,858
% of Group in Sample	78.7	2.5	4.7	3.4	10.7
Average length in Panel	34.8	32.7	32.7	31.9	33.5
Number of Exits					
Unemployment	2,548	65	200	49	263
Inactivity	2,091	59	136	39	224
Self-Employment	1,006	31	60	23	127
Underemployment	7,087	196	458	252	1,121
% of Individuals					
Unemployment	3.0	2.2	3.6	1.2	2.2
Inactivity	2.5	2.0	2.5	1.0	1.9
Self-Employment	1.2	1.1	1.1	0.6	1.1
Underemployment	8.4	6.7	8.3	6.2	9.5
Number of Censored Obs.	72,005	2,571	4,647	3,684	10,123
% of Individuals	85.0	88.0	84.5	91.0	85.4
Number of Observations by year					
2005	95,811	3,007	6,089	3,381	13,398
2006	281,870	8,927	18,238	11,326	38,794
2007	386,275	12,240	24,311	18,040	52,031
2008	414,499	13,266	25,697	19,125	57,035
2009	357,755	11,377	20,927	14,840	48,470
2010	245,771	7,686	12,257	9,852	31,993
2011	29,655	885	1,153	1,178	3,519
Mean Survival time*	56.4	57.3	54.6	59.6	55.8

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter.*

* Calculated restricted to longest follow-up time.

Table D.10: Exits from Dependent Employment to Multiple Destinations per Duration Interval

Time Interval	Non-Exit	Exit	Non-Exit %	Exit %
(0,3]	315,158	748	99.8	0.2
(3,6]	278,817	2,762	99.0	1.0
(6,9]	243,113	2,197	99.1	0.9
(9,12]	212,322	1,652	99.2	0.8
(12,15]	185,243	1,296	99.3	0.7
(15,18]	161,816	1,103	99.3	0.7
(18,21]	141,904	908	99.4	0.6
(21,24]	124,617	776	99.4	0.6
(24,36]	350,296	2,279	99.4	0.6
(36,48]	178,142	1,407	99.2	0.8
(48,72]	93,215	907	99.0	1.0

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

* The multiple destinations are unemployment, underemployment, inactivity and self-employment.

Table D.11: Exits from Dependent Employment to Multiple Destinations per Year

Year	Non-Exit	Exit	Non-Exit %	Exit %
2005	121,157	529	99.6	0.4
2006	357,314	1,841	99.5	0.5
2007	490,387	2,510	99.5	0.5
2008	526,488	3,134	99.4	0.6
2009	449,789	3,580	99.2	0.8
2010	303,963	3,596	98.8	1.2
2011	35,545	845	97.7	2.3

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

* The multiple destinations are unemployment, under-employment, inactivity and self-employment.

Table D.12: Data Characteristics, Exits from Dependent Employment to Unemployment

	UK	EU14	2nd Gen.	A8	non EU
Age	37.7	36.3	33.2	31.3	37.0
Gender (% male)	0.48	0.49	0.49	0.55	0.52
Education					
Low	47.1	21.9	31.2	8.8	16.7
Intermediate	31.4	32.4	32.7	54.4	35.6
High	21.5	45.6	36.2	36.8	47.7
Number of Obs.	1,897,886	60,102	114,399	83,778	262,339
Socioeconomic Status					
Higher	40.3	53.1	47.8	9.6	45.2
Intermediate	16.0	12.8	17.0	4.4	11.6
Lower	43.5	34.0	34.9	85.7	43.0
Never Worked/Not Classified	0.2	0.1	0.4	0.3	0.2
Number of Obs.	1,909,534	60,523	115,273	85,375	268,597
Industry					
Agriculture & fishing	0.55	0.57	0.18	2.8	0.37
Energy & water	1.69	1.28	1.49	1.03	1.02
Manufacturing	9.99	9.66	7.03	31.36	8.5
Construction	6.88	3.91	4.6	4.59	3.53
Distribution, hotels & restaurants	20.34	20.86	21.09	27.98	22.26
Transport & communication	7.32	8.54	8.05	10.8	7.83
Banking, finance & insurance etc	16.93	22.99	23.02	8.48	20.73
Public admin, educ & health	30.45	26.97	29.46	8.79	31.44
Other services	5.84	5.21	5.07	4.17	4.33
Number of Obs.	1,895,051	60,126	114,255	83,969	265,571
Contract Type					
Permanent	92.64	91.35	91.44	90.76	89.96
Not permanent in some way	7.36	8.65	8.56	9.24	10.04
Number of Obs.	1,909,201	60,511	115,226	85,147	268,441
Language difficulties (led to job loss)					
No	.	83.1	97.5	80.4	87.2
Yes	.	16.9	2.5	19.6	12.8
Number of Obs.	.	3,386	2,640	11,807	23,008

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter.*

Table D.13: Exits from Dependent Employment to Underemployment, Descriptive Statistics

	UK	EU14	2nd Gen.	A8	non EU
Age	37.9	36.4	33.3	31.2	37.0
Gender (% male)	0.49	0.49	0.49	0.54	0.52
Education					
Low	46.8	21.5	30.8	8.7	16.2
Intermediate	31.2	32.3	32.2	54.3	35.4
High	22.1	46.3	36.9	37.0	48.4
Number of Obs.	1,784,245	56,490	106,889	75,990	238,031
Socioeconomic Status					
Higher	41.6	54.3	49.4	10.1	47.0
Intermediate	16.1	12.2	16.8	4.4	11.8
Lower	42.2	33.5	33.7	85.2	41.1
Never Worked/Not Classified	0.1	0.0	0.2	0.3	0.1
Number of Obs.	1,794,964	56,866	107,657	77,407	243,458
Industry					
Agriculture & fishing	0.55	0.59	0.21	2.94	0.33
Energy & water	1.75	1.25	1.56	1.1	1.06
Manufacturing	10.28	9.81	7.31	31.25	8.64
Construction	7.02	3.96	4.63	4.43	3.57
Distribution, hotels & restaurants	19.7	20.07	20.37	28.37	21.4
Transport & communication	7.35	8.5	7.94	10.6	7.81
Banking, finance & insurance etc	17.26	23.36	23.39	8.68	21.09
Public admin, educ & health	30.38	27.15	29.67	8.56	31.8
Other services	5.71	5.3	4.94	4.07	4.29
Number of Obs.	1,780,765	56,476	106,674	75,939	240,789
Contract Type					
Permanent	93.09	92.06	92.08	91.38	90.36
Not permanent in some way	6.91	7.94	7.92	8.62	9.64
Number of Obs.	1,794,646	56,857	107,632	77,214	243,296
Language difficulties (led to job loss)					
No	.	85.1	97.2	80.4	88.18
Yes	.	14.9	2.8	19.6	11.82
Number of Obs.	.	2,853	2,195	10,041	19,327

Source: Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table D.14: Exits from Dependent Employment to multiple Destinations, Descriptive Statistics

	UK	EU14	2nd Gen.	A8	non EU
Age	37.9	36.4	33.3	31.2	37.0
Gender (% male)	0.5	0.5	0.5	0.5	0.5
Education					
Low	46.8	21.6	30.8	8.7	16.24
Intermediate	31.2	32.3	32.3	54.3	35.4
High	22.0	46.1	36.9	37.0	48.36
Number of Obs.	1,799,591	56,951	107,858	76,293	239,802
Socioeconomic Status					
Higher	41.3	54.2	48.9	10.1	46.8
Intermediate	16.7	12.6	17.3	5.0	12.22
Lower	41.7	33.1	33.3	84.2	40.61
Never Worked/Not Classified	0.4	0.2	0.5	0.7	0.37
Number of Obs.	1,811,636	57,388	108,672	77,742	245,240
Industry					
Agriculture & fishing	0.56	0.59	0.2	2.93	0.32
Energy & water	1.74	1.32	1.55	1.1	1.06
Manufacturing	10.25	9.79	7.27	31.15	8.64
Construction	7.05	3.94	4.65	4.49	3.6
Distribution, hotels & restaurants	19.68	20.07	20.36	28.38	21.4
Transport & communication	7.35	8.58	7.92	10.59	7.83
Banking, finance & insurance etc	17.29	23.28	23.4	8.71	21.1
Public admin, educ & health	30.3	27.01	29.62	8.57	31.75
Other services	5.77	5.42	5.04	4.09	4.3
Number of Obs.	1,797,568	57,060	107,660	76,307	242,542
Contract Type					
Permanent	92.88	91.96	91.86	91.33	90.2
Not permanent in some way	7.12	8.04	8.14	8.67	9.8
Number of Obs.	1,811,307	57,376	108,647	77,549	245,075
Language difficulties (led to job loss)					
No	.	85.0	97.31	80.41	88.17
Yes	.	15.0	2.69	19.59	11.83
Number of Obs.	.	2,896	2,307	10,225	19,753

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table D.15: Complementary log-log, Exits from Dependent Employment to Unemployment

Complementary Log-log Models of Exits to Unemployment												
Variables	**Model A**	s.e.	**Model B**	s.e.	**Model C**	s.e.	**Model D**	s.e.	**Model E**	s.e.	**Model F**	s.e
A8	-1.138***	(-0.24)	-1.066***	(-0.24)	-1.519***	(-0.28)	-1.590***	(-0.28)	-1.698***	(-0.28)	-1.313**	(-0.60)
EU14	-0.056	(-0.18)	0.093	(-0.18)	0.060	(-0.19)	0.048	(-0.19)	0.026	(-0.19)	-0.838	(-0.98)
non-EU	-0.155	(-0.09)	0.030	(-0.10)	-0.093	(-0.10)	-0.079	(-0.10)	-0.187*	(-0.10)	-0.272	(-0.30)
2nd Gen	0.248**	(-0.11)	0.270**	(-0.11)	0.252**	(-0.11)	0.243**	(-0.12)	0.173	(-0.12)	0.522	(-0.59)
Crisis	0.826***	(-0.11)	0.813***	(-0.11)	0.763***	(-0.11)	0.775***	(-0.11)	0.652***	(-0.10)	0.674***	(-0.11)
A8*Crisis	0.474	(-0.29)	0.500*	(-0.29)	0.762**	(-0.32)	0.749**	(-0.32)	0.748**	(-0.32)	0.636	(-0.68)
EU14*Crisis	-0.251	(-0.24)	-0.242	(-0.24)	-0.199	(-0.24)	-0.172	(-0.24)	-0.198	(-0.24)	0.510	(-1.22)
nonEU*Crisis	0.027	(-0.12)	0.045	(-0.12)	0.038	(-0.12)	0.026	(-0.12)	0.039	(-0.13)	-0.317	(-0.41)
2nd Gen.*Crisis	0.042	(-0.14)	0.037	(-0.14)	0.019	(-0.15)	0.026	(-0.15)	0.008	(-0.15)	0.065	(-0.76)
3 months	-7.641***	(-0.13)	-6.395***	(-0.20)	-7.245***	(-0.22)	-7.064***	(-0.22)	-6.385***	(-0.22)	-6.465***	(-0.24)
6 months	-6.349***	(-0.12)	-5.088***	(-0.20)	-5.925***	(-0.21)	-5.738***	(-0.22)	-4.974***	(-0.22)	-5.002***	(-0.24)
9 months	-6.629***	(-0.13)	-5.354***	(-0.20)	-6.157***	(-0.21)	-5.949***	(-0.22)	-5.112***	(-0.22)	-5.145***	(-0.24)
12 months	-6.907***	(-0.13)	-5.635***	(-0.20)	-6.450***	(-0.21)	-6.252***	(-0.22)	-5.354***	(-0.22)	-5.375***	(-0.24)
15 months	-7.165***	(-0.13)	-5.882***	(-0.20)	-6.657***	(-0.22)	-6.461***	(-0.22)	-5.513***	(-0.22)	-5.558***	(-0.24)
18 months	-7.506***	(-0.14)	-6.210***	(-0.21)	-6.989***	(-0.22)	-6.797***	(-0.23)	-5.826***	(-0.23)	-5.882***	(-0.25)
21 months	-7.611***	(-0.14)	-6.317***	(-0.21)	-7.096***	(-0.22)	-6.897***	(-0.23)	-5.892***	(-0.23)	-5.964***	(-0.25)
24 months	-7.731***	(-0.15)	-6.436***	(-0.22)	-7.214***	(-0.23)	-7.014***	(-0.24)	-5.988***	(-0.23)	-6.007***	(-0.25)
36 months	-7.794***	(-0.13)	-6.474***	(-0.21)	-7.262***	(-0.22)	-7.070***	(-0.23)	-6.011***	(-0.22)	-6.087***	(-0.24)
48 months	-8.007***	(-0.14)	-6.666***	(-0.22)	-7.454***	(-0.23)	-7.268***	(-0.24)	-6.162***	(-0.24)	-6.216***	(-0.26)
72 months	-8.055***	(-0.16)	-6.701***	(-0.23)	-7.457***	(-0.24)	-7.284***	(-0.24)	-6.109***	(-0.24)	-6.257***	(-0.26)
Age			-0.090***	(-0.01)	-0.063***	(-0.01)	-0.059***	(-0.01)	-0.031***	(-0.01)	-0.030***	(-0.01)
Age squared			0.001***	(-0.00)	0.001***	(-0.00)	0.001***	(-0.00)	0.000*	(-0.00)	0.000	(-0.00)
Male			0.391***	(-0.03)	0.400***	(-0.04)	0.267***	(-0.04)	0.250***	(-0.04)	0.286***	(-0.04)
Low Education			0.594***	(-0.05)	0.301***	(-0.06)	0.253***	(-0.06)	0.408***	(-0.06)	0.419***	(-0.06)
Intermediate Education			0.327***	(-0.05)	0.142***	(-0.05)	0.121**	(-0.06)	0.208***	(-0.06)	0.206***	(-0.06)
Intermediate Socio-Econ					0.434***	(-0.06)	0.451***	(-0.06)	0.377***	(-0.06)	0.381***	(-0.06)
Low Socio-Econ					0.612***	(-0.05)	0.593***	(-0.05)	0.497***	(-0.05)	0.512***	(-0.05)
Agriculture & fishing							0.008	(-0.21)	0.153	(-0.20)	0.198	(-0.22)
Energy & water							-0.479***	(-0.17)	-0.346**	(-0.17)	-0.415**	(-0.19)
Manufacturing							0.077	(-0.08)	0.223***	(-0.08)	0.216**	(-0.09)
Construction							0.066	(-0.09)	0.248***	(-0.09)	0.266***	(-0.09)
Distribution, hotels & restaurants							-0.146**	(-0.07)	0.086	(-0.08)	0.114	(-0.08)
Transport & communication							-0.164*	(-0.09)	-0.060	(-0.09)	-0.008	(-0.10)
Banking, finance & insurance etc							-0.020	(-0.08)	0.113	(-0.08)	0.146*	(-0.09)
Public admin, educ & health							-0.566***	(-0.08)	-0.589***	(-0.08)	-0.561***	(-0.09)
Permanent Contract									-1.726***	(-0.04)	-1.771***	(-0.04)
Language Difficulty											0.356	(-0.35)
Observations	2,439,302		2,418,504		2,413,998		2,394,525		2,393,881		1,920,218	

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table D.16: Complementary log-log, Exits from Dependent Employment to Under-employment

Complementary Log-log Models of Exits to Under-employment												
Variables	**Model A**	s.e.	**Model B**	s.e.	**Model C**	s.e.	**Model D**	s.e.	**Model E**	s.e.	**Model F**	s.e
A8	-0.220*	(-0.12)	-0.160	(-0.12)	-0.521***	(-0.12)	-0.418***	(-0.12)	-0.462***	(-0.12)	-0.407	(-0.31)
EU14	-0.045	(-0.13)	0.034	(-0.13)	-0.003	(-0.13)	0.005	(-0.13)	-0.009	(-0.13)	0.223	(-0.46)
non-EU	0.235***	(-0.06)	0.358***	(-0.06)	0.240***	(-0.06)	0.235***	(-0.06)	0.199***	(-0.06)	0.457***	(-0.15)
2nd Gen	0.056	(-0.09)	0.068	(-0.09)	0.070	(-0.09)	0.067	(-0.09)	0.040	(-0.09)	0.288	(-0.50)
Crisis	0.864***	(-0.07)	0.865***	(-0.07)	0.862***	(-0.07)	0.853***	(-0.07)	0.810***	(-0.06)	0.808***	(-0.07)
A8*Crisis	0.128	(-0.14)	0.110	(-0.14)	0.119	(-0.14)	0.124	(-0.14)	0.138	(-0.14)	0.113	(-0.36)
EU14*Crisis	0.009	(-0.16)	0.014	(-0.15)	0.005	(-0.15)	0.001	(-0.15)	-0.004	(-0.16)	0.654	(-0.52)
nonEU*Crisis	0.042	(-0.07)	0.038	(-0.07)	0.035	(-0.07)	0.035	(-0.07)	0.034	(-0.07)	-0.072	(-0.18)
2nd Gen.*Crisis	0.203**	(-0.10)	0.207**	(-0.10)	0.202*	(-0.10)	0.199*	(-0.10)	0.196*	(-0.10)	-0.126	(-0.64)
3 months	-9.583***	(-0.22)	-9.313***	(-0.25)	-10.030***	(-0.25)	-9.899***	(-0.26)	-9.354***	(-0.26)	-9.468***	(-0.29)
6 months	-8.064***	(-0.22)	-7.790***	(-0.25)	-8.499***	(-0.25)	-8.370***	(-0.25)	-7.789***	(-0.25)	-7.927***	(-0.28)
9 months	-8.080***	(-0.22)	-7.807***	(-0.25)	-8.509***	(-0.25)	-8.380***	(-0.25)	-7.767***	(-0.25)	-7.907***	(-0.28)
12 months	-8.184***	(-0.22)	-7.901***	(-0.25)	-8.599***	(-0.25)	-8.469***	(-0.25)	-7.830***	(-0.25)	-7.996***	(-0.28)
15 months	-8.264***	(-0.22)	-7.983***	(-0.25)	-8.677***	(-0.25)	-8.546***	(-0.25)	-7.887***	(-0.25)	-8.050***	(-0.28)
18 months	-8.236***	(-0.22)	-7.949***	(-0.25)	-8.638***	(-0.25)	-8.507***	(-0.25)	-7.835***	(-0.25)	-8.017***	(-0.28)
21 months	-8.331***	(-0.22)	-8.043***	(-0.25)	-8.728***	(-0.25)	-8.596***	(-0.25)	-7.911***	(-0.25)	-8.076***	(-0.28)
24 months	-8.385***	(-0.22)	-8.089***	(-0.25)	-8.773***	(-0.25)	-8.639***	(-0.25)	-7.945***	(-0.25)	-8.090***	(-0.28)
36 months	-8.404***	(-0.22)	-8.105***	(-0.25)	-8.783***	(-0.25)	-8.647***	(-0.25)	-7.939***	(-0.25)	-8.087***	(-0.28)
48 months	-8.369***	(-0.22)	-8.058***	(-0.25)	-8.731***	(-0.25)	-8.592***	(-0.25)	-7.861***	(-0.25)	-8.023***	(-0.28)
72 months	-8.360***	(-0.22)	-8.037***	(-0.25)	-8.702***	(-0.25)	-8.564***	(-0.26)	-7.808***	(-0.26)	-7.999***	(-0.29)
Age			-0.019***	(-0.01)	0.006	(-0.01)	0.006	(-0.01)	0.018***	(-0.01)	0.021***	(-0.01)
Age squared			0.000	(-0.00)	-0.000***	(-0.00)	-0.000***	(-0.00)	-0.000***	(-0.00)	-0.000***	(-0.00)
Male			-0.179***	(-0.02)	-0.207***	(-0.02)	-0.076***	(-0.02)	-0.080***	(-0.02)	-0.122***	(-0.03)
Low Education			0.444***	(-0.03)	0.051	(-0.03)	0.093***	(-0.03)	0.167***	(-0.03)	0.221***	(-0.04)
Intermediate Education			0.327***	(-0.03)	0.100***	(-0.03)	0.120***	(-0.03)	0.164***	(-0.03)	0.229***	(-0.04)
Intermediate Socio-Econ					0.270***	(-0.04)	0.285***	(-0.04)	0.265***	(-0.04)	0.295***	(-0.04)
Low Socio-Econ					0.778***	(-0.03)	0.789***	(-0.03)	0.769***	(-0.03)	0.789***	(-0.03)
Agriculture & fishing							-0.816***	(-0.18)	-0.748***	(-0.18)	-0.731***	(-0.20)
Energy & water							-0.878***	(-0.12)	-0.814***	(-0.12)	-0.841***	(-0.14)
Manufacturing							-0.459***	(-0.06)	-0.402***	(-0.06)	-0.417***	(-0.06)
Construction							-0.489***	(-0.06)	-0.420***	(-0.06)	-0.424***	(-0.07)
Distribution, hotels & restaurants							-0.174***	(-0.05)	-0.085*	(-0.05)	-0.084	(-0.05)
Transport & communication							-0.282***	(-0.06)	-0.243***	(-0.06)	-0.250***	(-0.07)
Banking, finance & insurance etc							-0.240***	(-0.05)	-0.183***	(-0.05)	-0.204***	(-0.06)
Public admin, educ & health							-0.012	(-0.05)	-0.020	(-0.05)	-0.046	(-0.05)
Permanent Contract									-1.024***	(-0.03)	-1.100***	(-0.03)
Language Difficulty											0.158	(-0.19)
Observations	2,280,352		2,261,645		2,259,906		2,240,827		2,240,220		1,802,588	

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table D.17: Competing Risks Model, Model A

	Unemployed		Inactive		Self Employed		Underemployed	
A8	-1.056***	(0.26)	-1.404***	(0.34)	-1.256**	(0.45)	-0.216	(0.12)
EU14	-0.096	(0.20)	-0.016	(0.20)	-0.190	(0.31)	-0.046	(0.13)
non-EU	-0.239*	(0.11)	-0.127	(0.11)	-0.168	(0.16)	0.237***	(0.06)
2nd Gen.	0.319**	(0.12)	0.109	(0.14)	0.090	(0.20)	0.055	(0.09)
Crisis	0.876***	(0.09)	0.608***	(0.09)	0.839***	(0.13)	0.859***	(0.05)
A8*crisis	0.402	(0.31)	0.863*	(0.38)	0.903	(0.51)	0.128	(0.14)
EU14*crisis	-0.106	(0.26)	-0.084	(0.27)	0.171	(0.38)	0.010	(0.16)
non-EU*crisis	0.079	(0.13)	-0.055	(0.14)	0.096	(0.19)	0.043	(0.07)
2nd Gen.*crisis	0.009	(0.15)	0.086	(0.18)	-0.153	(0.27)	0.205*	(0.10)
3 months	-7.650***	(0.14)	-8.063***	(0.16)	-9.571***	(0.29)	-9.583***	(0.22)
6 months	-6.382***	(0.13)	-6.775***	(0.15)	-7.928***	(0.26)	-8.071***	(0.22)
9 months	-6.669***	(0.13)	-6.901***	(0.15)	-8.032***	(0.27)	-8.085***	(0.22)
12 months	-6.950***	(0.14)	-7.131***	(0.15)	-8.196***	(0.27)	-8.188***	(0.22)
15 months	-7.215***	(0.14)	-7.307***	(0.16)	-8.245***	(0.27)	-8.267***	(0.22)
18 months	-7.489***	(0.15)	-7.512***	(0.16)	-8.212***	(0.27)	-8.237***	(0.22)
21 months	-7.680***	(0.15)	-7.403***	(0.16)	-8.600***	(0.28)	-8.332***	(0.22)
24 months	-7.718***	(0.16)	-7.546***	(0.17)	-8.673***	(0.29)	-8.387***	(0.22)
36 months	-7.777***	(0.14)	-7.537***	(0.15)	-8.679***	(0.27)	-8.405***	(0.22)
48 months	-7.976***	(0.15)	-7.473***	(0.16)	-8.502***	(0.28)	-8.369***	(0.22)
72 months	-8.090***	(0.17)	-7.406***	(0.17)	-8.591***	(0.29)	-8.359***	(0.22)
Observations	2,298,987		2,298,987		2,298,987		2,298,987	

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

Table D.18: Competing Risks Model, Model B

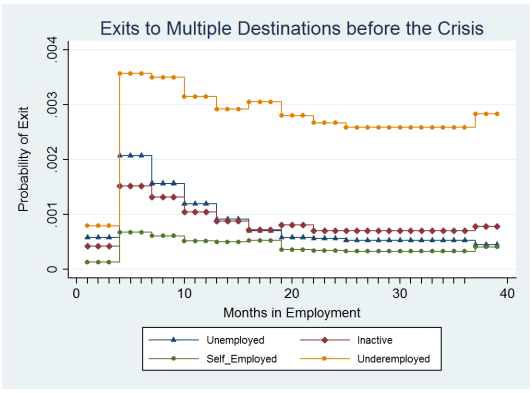
	Unemployed		Inactive		Self_employed		Underemployed	
A8	-1.661***	(0.30)	-1.327***	(0.36)	0.175	(0.45)	-0.465***	(0.12)
EU14	-0.032	(0.21)	0.066	(0.24)	0.012	(0.30)	-0.010	(0.13)
non-EU	-0.273*	(0.12)	-0.029	(0.12)	0.042	(0.16)	0.197***	(0.06)
2nd Gen.	0.247*	(0.12)	0.174	(0.16)	0.217	(0.20)	0.041	(0.09)
Crisis	0.720***	(0.11)	0.644***	(0.12)	0.780***	(0.16)	0.804***	(0.06)
A8*crisis	0.716*	(0.35)	0.574	(0.42)	0.790	(0.50)	0.141	(0.14)
EU14*crisis	-0.020	(0.27)	-0.123	(0.30)	0.156	(0.38)	-0.005	(0.16)
non-EU*crisis	0.113	(0.14)	-0.128	(0.16)	0.042	(0.20)	0.039	(0.07)
2nd Gen.*crisis	0.021	(0.16)	0.189	(0.20)	-0.269	(0.27)	0.198	(0.10)
3 months	-6.399***	(0.24)	-6.092***	(0.27)	-10.983***	(0.45)	-9.332***	(0.26)
6 months	-4.991***	(0.24)	-4.666***	(0.26)	-9.284***	(0.43)	-7.777***	(0.25)
9 months	-5.148***	(0.24)	-4.668***	(0.26)	-9.330***	(0.43)	-7.753***	(0.25)
12 months	-5.387***	(0.24)	-4.829***	(0.26)	-9.460***	(0.44)	-7.815***	(0.25)
15 months	-5.576***	(0.24)	-5.047***	(0.26)	-9.471***	(0.44)	-7.870***	(0.25)
18 months	-5.821***	(0.25)	-5.196***	(0.27)	-9.419***	(0.44)	-7.817***	(0.25)
21 months	-5.961***	(0.25)	-5.035***	(0.27)	-9.804***	(0.45)	-7.893***	(0.25)
24 months	-5.983***	(0.25)	-5.125***	(0.27)	-9.869***	(0.45)	-7.927***	(0.25)
36 months	-6.002***	(0.24)	-5.139***	(0.26)	-9.878***	(0.44)	-7.920***	(0.25)
48 months	-6.149***	(0.25)	-5.086***	(0.27)	-9.680***	(0.44)	-7.842***	(0.25)
72 months	-6.154***	(0.26)	-5.064***	(0.28)	-9.742***	(0.45)	-7.787***	(0.26)
Age	-0.029**	(0.01)	-0.080***	(0.01)	0.108***	(0.02)	0.017**	(0.01)
Age squared	0.000	(0.00)	0.001***	(0.00)	-0.001***	(0.00)	-0.000***	(0.00)
Male	0.274***	(0.04)	-0.729***	(0.05)	1.181***	(0.06)	-0.084***	(0.02)
Low Education	0.383***	(0.06)	0.011	(0.07)	0.211**	(0.08)	0.165***	(0.03)
Intermediate Education	0.214***	(0.06)	-0.066	(0.07)	-0.085	(0.08)	0.164***	(0.03)
Intermediate Socio-Econ	0.323***	(0.06)	0.279***	(0.07)	2.132***	(0.07)	0.234***	(0.04)
Low Socio-Econ	0.464***	(0.05)	0.610***	(0.06)	-19.207***	(0.06)	0.781***	(0.03)
Agriculture & fishing	0.141	(0.23)	0.409	(0.27)	0.307	(0.25)	-0.743***	(0.18)
Energy & water	-0.265	(0.18)	-0.559*	(0.27)	-1.662***	(0.29)	-0.807***	(0.12)
Manufacturing	0.244**	(0.09)	-0.000	(0.12)	-1.336***	(0.14)	-0.398***	(0.06)
Construction	0.293**	(0.10)	-0.008	(0.14)	0.103	(0.10)	-0.419***	(0.06)
Distribution, hotels & restaurants	0.028	(0.08)	0.158	(0.10)	-0.711***	(0.12)	-0.085	(0.05)
Transport & communication	-0.105	(0.10)	0.054	(0.12)	-1.017***	(0.13)	-0.240***	(0.06)
Banking, finance & insurance etc	0.091	(0.09)	0.101	(0.10)	-0.974***	(0.10)	-0.177***	(0.05)
Public admin, educ & health	-0.629***	(0.09)	-0.223*	(0.10)	-1.711***	(0.11)	-0.012	(0.05)
Permanent Contract	-1.727***	(0.04)	-1.662***	(0.05)	-1.322***	(0.08)	-1.024***	(0.03)
Observations	2,251,878		2,251,878		2,251,878		2,251,878	

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

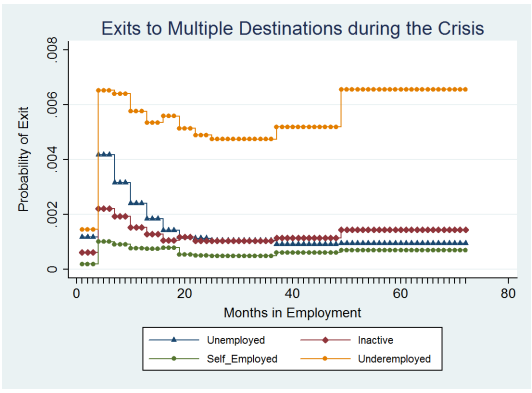
Table D.19: Competing Risks Model, Model C

	Unemployed		Inactive		Self_employed		Underemployed	
A8	-1.551*	(0.72)	-0.192	(0.55)	0.549	(0.81)	-0.423	(0.31)
EU14	-0.559	(0.98)	-19.733***	(0.20)	0.997	(1.07)	0.221	(0.46)
non-EU	-0.430	(0.35)	-0.329	(0.40)	-0.256	(0.54)	0.441**	(0.15)
2nd Gen.	0.831	(0.59)	-19.508***	(0.18)	1.326*	(0.56)	0.283	(0.50)
Crisis	0.735***	(0.12)	0.668***	(0.14)	0.766***	(0.18)	0.801***	(0.07)
A8*crisis	0.649	(0.84)	-0.557	(0.76)	0.721	(0.90)	0.114	(0.36)
EU14*crisis	-0.111	(1.41)	-0.392*	(0.17)	-0.816	(1.55)	0.657	(0.52)
non-EU*crisis	-0.058	(0.48)	0.335	(0.52)	-0.357	(0.82)	-0.064	(0.19)
2nd Gen.*crisis	-0.218	(0.83)	-0.258	(0.25)	-0.541	(1.08)	-0.127	(0.65)
3 months	-6.492***	(0.26)	-6.214***	(0.29)	-10.978***	(0.50)	-9.445***	(0.29)
6 months	-5.031***	(0.26)	-4.771***	(0.28)	-9.383***	(0.48)	-7.916***	(0.28)
9 months	-5.196***	(0.26)	-4.765***	(0.28)	-9.483***	(0.48)	-7.892***	(0.28)
12 months	-5.425***	(0.26)	-4.866***	(0.28)	-9.573***	(0.49)	-7.979***	(0.28)
15 months	-5.642***	(0.26)	-5.281***	(0.29)	-9.552***	(0.49)	-8.031***	(0.28)
18 months	-5.868***	(0.27)	-5.337***	(0.29)	-9.430***	(0.49)	-7.998***	(0.29)
21 months	-6.060***	(0.27)	-5.186***	(0.29)	-9.912***	(0.50)	-8.057***	(0.28)
24 months	-6.027***	(0.27)	-5.384***	(0.30)	-9.955***	(0.50)	-8.070***	(0.29)
36 months	-6.102***	(0.26)	-5.310***	(0.28)	-9.969***	(0.49)	-8.066***	(0.28)
48 months	-6.238***	(0.28)	-5.206***	(0.29)	-9.721***	(0.49)	-8.002***	(0.29)
72 months	-6.334***	(0.29)	-5.178***	(0.30)	-9.774***	(0.50)	-7.976***	(0.29)
Age	-0.027**	(0.01)	-0.077***	(0.01)	0.109***	(0.02)	0.020**	(0.01)
Age squared	0.000	(0.00)	0.001***	(0.00)	-0.001***	(0.00)	-0.000***	(0.00)
Male	0.320***	(0.05)	-0.678***	(0.06)	1.205***	(0.07)	-0.127***	(0.03)
Low Education	0.376***	(0.07)	0.034	(0.08)	0.169*	(0.09)	0.218***	(0.04)
Intermediate Education	0.202**	(0.07)	-0.044	(0.08)	-0.126	(0.09)	0.229***	(0.04)
Intermediate Socio-Econ	0.328***	(0.07)	0.239**	(0.08)	2.169***	(0.08)	0.264***	(0.04)
Low Socio-Econ	0.471***	(0.06)	0.594***	(0.07)	-19.137***	(0.07)	0.801***	(0.03)
Agriculture & fishing	0.143	(0.24)	0.611*	(0.27)	0.428	(0.26)	-0.727***	(0.21)
Energy & water	-0.354	(0.20)	-0.472	(0.28)	-1.750***	(0.32)	-0.832***	(0.14)
Manufacturing	0.215*	(0.10)	-0.027	(0.13)	-1.323***	(0.15)	-0.414***	(0.06)
Construction	0.306**	(0.10)	0.030	(0.14)	0.114	(0.11)	-0.423***	(0.07)
Distribution, hotels & restaurants	0.040	(0.09)	0.159	(0.11)	-0.747***	(0.13)	-0.085	(0.05)
Transport & communication	-0.063	(0.11)	0.017	(0.13)	-1.084***	(0.14)	-0.248***	(0.07)
Banking, finance & insurance etc	0.126	(0.09)	0.145	(0.11)	-0.931***	(0.11)	-0.198***	(0.06)
Public admin, educ & health	-0.610***	(0.09)	-0.202	(0.10)	-1.767***	(0.12)	-0.038	(0.05)
Permanent Contract	-1.761***	(0.05)	-1.707***	(0.06)	-1.414***	(0.09)	-1.101***	(0.03)
Language Difficulty	0.493	(0.44)	0.381	(0.52)	1.560*	(0.61)	0.156	(0.19)
Observations	1812760		1812760		1812760		1812760	

Source: *QLFS,* 2005 *Second Quarter*- 2011 *First Quarter*.

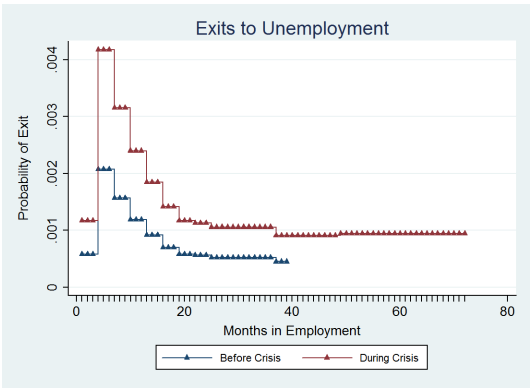


(a) Before Crisis

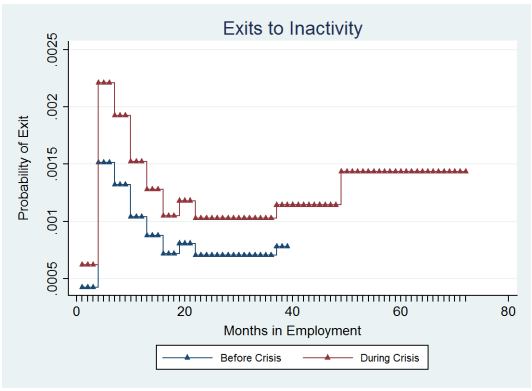


(b) During Crisis

Figure D.1: Multiple Exits

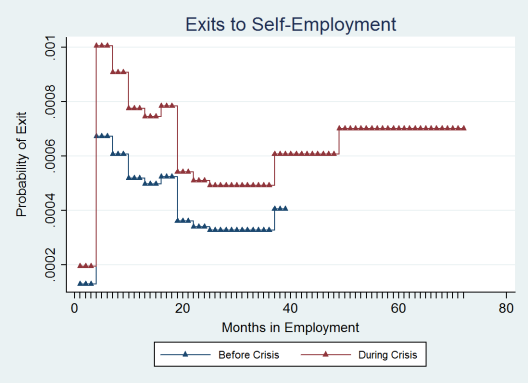


(a) Unemployment

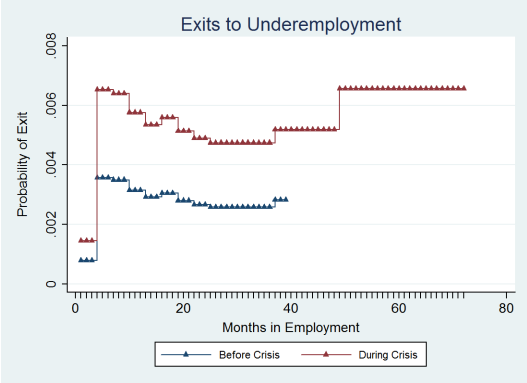


(b) Inactivity

Figure D.2: Exits before and during the Crisis



(a) Self Employment



(b) Underemployment

Figure D.3: Exits before and during the Crisis

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