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## Does higher education help immigrants find a job? A survival analysis

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Federal Employment Agency

IAB

# IAB-Discussion Paper

6/2011

Articles on labour market issues

## Does higher education help immigrants find a job?

A survival analysis

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Carola Burkert  
Alfred Garloff  
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# Does higher education help immigrants find a job?

A survival analysis

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Mit der Reihe „IAB-Discussion Paper“ will das Forschungsinstitut der Bundesagentur für Arbeit den Dialog mit der externen Wissenschaft intensivieren. Durch die rasche Verbreitung von Forschungsergebnissen über das Internet soll noch vor Drucklegung Kritik angeregt und Qualität gesichert werden.

The “IAB-Discussion Paper” is published by the research institute of the German Federal Employment Agency in order to intensify the dialogue with the scientific community. The prompt publication of the latest research results via the internet intends to stimulate criticism and to ensure research quality at an early stage before printing.

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## Abstract

We analyse the role that education signals play in the transition rates from unemployment to finding a job. We compare the results for Ethnic Germans with those for foreigners from the same origin countries and Native Germans. In the first case, the two have the same labour-market access but different migration backgrounds. In the second case, the migration background is similar, but labour-market access is not. We find that Ethnic Germans fare better than foreigners because more of them are able to accredit their foreign degrees and hence can apply for a job as a medium- or high-skilled individual which both have faster transition rates than the low-skilled. However, both foreigners and Ethnic Germans with accredited degrees have similar transition rates. Finally, if education signals are acquired in Germany, the differences between all three groups vanish more or less completely.

## Zusammenfassung

Wir untersuchen die Rolle der Bildungssignale beim Übergang aus der Arbeitslosigkeit in die Beschäftigung. Die Ergebnisse für (Spät-)Aussiedler werden mit denen für Ausländer aus denselben Herkunftsländern und Deutsche ohne Migrationshintergrund verglichen. Dabei haben Ausländer einen ähnlichen Migrationshintergrund, aber einen anderen Arbeitsmarktzugang. Beim Vergleich mit Deutschen ohne Migrationshintergrund ist es genau umgekehrt. Das Recht der (Spät-)Aussiedler auf ein Anerkennungsverfahren hilft ihnen, im Vergleich zu Ausländern öfter als (Hoch-)Qualifizierte eingestuft zu werden und somit höhere Abgangsraten aus der Arbeitslosigkeit zu haben als Personen ohne (anerkannten) Berufsabschluss. Allerdings gibt es keine Unterschiede zwischen beiden Migrantengruppen sobald ein Abschluss anerkannt wird. Auch die Unterschiede zu den Deutschen ohne Migrationshintergrund sind nicht mehr vorhanden, wenn Abschlüsse im Inland erworben werden.

**JEL classification:** J24, J61, J64

**Keywords:** human-capital, screening, migration, labour-market integration, education, survival analysis

# 1 Introduction

The educational level a person has is without doubt a central determinant for her or his labour-market success. In this paper, we analyse the relationship between educational degrees, participation in labour-market programmes and their effects on unemployment duration. We do this for three distinct groups of different origins to test how vocational signals relate to the hazard to regular employment for each group. The German labour market provides us with an immigration group of particular interest, namely Ethnic Germans. We compare them with Native Germans as well as foreigners with the same nationality as the home countries of the Ethnic Germans. In the first case, we are comparing people with German nationality, the same unrestricted access to the labour-market as natives but different migration backgrounds. In the second case, the people have a similar migration background but different legal restrictions when it comes to taking up a job. For example, an employer can only employ such a foreigner if first the local job office certifies that there is no equally qualified native (or a foreigner with similar labour-market access as natives) available for the job.

In Germany, labour market and career opportunities are highly determined by formal certificates (see Konietzka 1999). Unemployment rates of low qualified people or people without formal accreditation of their degrees have well above average unemployment rates (see Reinberg/Hummel 2002, 2005, 2007). However, contrary to what one would expect, Brück-Klingberg et al. (2009) and Brück-Klingberg et al. (2007) find that especially the highly qualified Ethnic Germans exhibit high unemployment rates.

By means of a survival analysis, the aim of this paper is to provide a more in-depth analysis of the relationship between education and the transition from unemployment to regular employment using a new and rich administrative dataset. The main focus is on two factors: firstly, the influence of vocational qualifications on the exit rate from unemployment, and secondly, the role that labour-market policy plays in finding a job. Although both factors are labour-market signals which should ideally help match the individual better to labour-market needs, in the case of migrants there is one important difference between the two: namely, that the vocational degrees are often obtained abroad before immigration whereas the labour-market policies are carried out in Germany. Hence, in the latter case, the certificate obtained at the end of such a measure is one which is absolutely identical with the one obtained by Native Germans.

Our main results are that active labour-market measures do seem to contain largely similar informational contents: their effect on the hazard rate out of unemployment to finding a regular job is similar in magnitude across all groups. This is not the case for those educational degrees that are mostly obtained abroad. There are large and significant differences between the signal values for Native Germans on the one hand and the values for the immigrants on the other hand. Thus, although Ethnic Germans have particular accreditation rights that other migrant groups do not, this

does not seem to help them to fully overcome the information problem foreign educational signals conveys. In this context, it is justified to ask whether the current validation procedures are cost-effective and whether the recently suggested facilitation of a formal acknowledgement of foreign education signals will lead to the expected success.<sup>1</sup>

We focus on Ethnic Germans as they are not only a large immigration group in Germany but also because they have special rights compared to other immigrants. Due to their German origins they not only automatically obtain German citizenship (and hence unrestricted access to the labour market) but also special state benefits such as language courses or financial support. They are also the only migrant group which has a legal right of a formal validation of all occupational degrees acquired in their home country (see Englmann/Müller 2007).

Since 1950 roughly 4.5 Million Ethnic Germans (*Aussiedler*, or – if they immigrated in 1993 or later – *Spätaussiedler*) have immigrated to Germany. According to the official German Microcensus, in 2008 there were 3.2 Million (Spät-)Aussiedler living in Germany (Statisches Bundesamt 2010: Table 2I). Hence, they represent the biggest migrant group on the German labour market.<sup>2</sup> Recent studies have shown that (see Brück-Klingberg et al. 2009; Hochfellner/Wapler 2010), many of the Ethnic Germans – especially those who immigrated relatively early – have managed to integrate themselves successfully into the labour market. However, there is also a substantial number which are unemployed.

The difficulties Ethnic Germans have in transferring their qualifications to the German labour market has also been studied by Konietzka/Kreyenfeld (2002). Their main conclusion is that only if Ethnic Germans gain access to their trained occupations they are able to perform well in the labour market. However, they have a much smaller database than we (117 Ethnic Germans) and look at different aspects of labour-market performance such as employment rates, wages and status in jobs and hence more on the values of labour-market signals within a job and not – as here – on the value of signals in finding a job. Bauer/Zimmermann (1997) analyse earnings differentials and unemployment risks between Ethnic and Native Germans. Similar to our paradoxical findings that the higher educated have more difficulties than the less educated, they find that Ethnic Germans with a schooling degree which is officially accepted in Germany have a significantly higher unemployment risk than those whose schooling degree is not accepted. However, their results are based on labour-market conditions in the late 80s and 90s which have substantially changed since then.

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<sup>1</sup> In an interview with the FTD (18.10.2010), the German minister for education, Schavan, suggested that a facilitation of formal acknowledgement would improve the situation for up to 300,000 qualified workers.

<sup>2</sup> The next largest group is the Turkish population with roughly 2.5 million.

The setup of the paper is as follows: In Section 2 we discuss the theoretical implications derived from sorting theory with respect to educational signals obtained at home and abroad. In Section 3 the aims and scope of the quantitatively most important active labour-market measures are discussed. In Section 4 we present our main hypotheses. This is followed by a description of the data we use and some main descriptive findings related to the labour-market performance of Ethnic Germans in Section 5. Section 6 presents the survival analysis. A conclusion is presented in Section 7.

## 2 The Signalling Value of Educational Degrees

Our paper focuses on the signalling/screening (collectively known as sorting) theory of the labour market (Spence 1973, 1974). It assumes that certain important characteristics of individuals are not observable to employers, who then have to use other information to infer these characteristics. Under certain assumptions the optimal educational choice depends on these unobservable characteristics. For example, if ability is an important characteristic for the output an individual produces that is not observable to the firm and if more able individuals acquire on average higher education and this fact is known to the employer, then he will be willing to reward individuals for their educational degrees, because it contains important indirect information on ability. This information is inferred from educational signals which act as a proxy for expected productivity. Hence, more education is predicted to be associated with higher productivity which should c.p. make an individual more attractive for potential employers, i.e. lead to shorter unemployment durations.<sup>3</sup>

The fact that different groups (here: Ethnic Germans, Native Germans and foreigners from the same home countries as Ethnic Germans) have different chances of finding a job has been the subject of economic debate ever since Phelps (1972). The idea is that if firms are trying to guess the potential productivity of an applicant, they may use information about average characteristics of the group to which the applicant belongs to. In this case, “statistical discrimination” will occur even in the absence of personal prejudice. Hence, statistical discrimination can be viewed as part of the screening process (see Hornig/Rottmann/Wapler 2011 for more details).

The two main explanations for statistical discrimination are that either employers believe that there are in fact average productivity differences between groups. This is called rational stereotyping. The second explanation is that employers are able to observe the productivity less accurately for one group than for the other, i.e. the variance of the signal is higher for one group than the other. This type has been labelled screening discrimination by Cornell/Welch (1996) but was first analysed by Aigner/Cain (1977).<sup>4</sup> It is this second type of discrimination which is important for our analysis as Ethnic Germans to a large extent obtain degrees from abroad. According to the Institut der deutschen Wirtschaft Köln (2009), roughly 60 percent of the

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<sup>3</sup> See Hornig/Rottmann/Wapler (2011) for a more detailed discussion.

<sup>4</sup> See Pinkston (2006) for an overview of the literature on screening discrimination.



immigrants with vocational training coming from Poland or one of the states of the former Soviet Union obtained their degrees in their respective home countries. The shares are even higher for those with university degrees. Around 80 percent of the academics coming from the former Soviet Union and 63 percent of those immigrating from Poland first graduated before coming to Germany. Hence, employers have less information regarding the quality of these degrees than for formally similar degrees from Germany.

### 3 Active Labour-Market Programmes (ALMP) in Germany

The main objective of active labour-market programmes is to integrate job-seekers into regular jobs in order to avoid or at least shorten periods of unemployment. The most important instruments (with respect to the number of individuals participating) of active labour-market policy in Germany are vocational training (short and long-term<sup>5</sup>), training measures, wage subsidies and job-creation schemes.

Further vocational training maintains updates and extends professional qualifications and can thus be regarded as a human-capital investment. For a long time it has been one of the most important programmes in Germany. It can be broadly divided into three categories: qualification programmes, training within “practice firms” and long retraining programmes (for individuals without completed or with outdated vocational training). The effectiveness of further vocational training programmes has been analysed in a considerable number of studies.<sup>6</sup> The results imply that further vocational training programmes had in the longer run mostly significant positive effects on the employment prospects of participants. However, since programme effects are rather weak, it may take some time until the estimated programme effect turns positive.

Starting in the year 1998, short training programmes (*Trainingsmaßnahmen*) are the ones with the highest number of programme entries. They can have different objectives (see Kurtz 2003) such as improving qualifications, testing the willingness to work of the unemployed or to provide job-search assistance. Most of these programmes are very short, not exceeding two months. Biewen et al. (2007) found mostly positive effects of short training-programmes, Hujer/Thomsen (2010) showed that the chance of entering employment is significantly higher for individuals participating and Wunsch/Lechner (2008) found insignificant effects. To take into account the substantial heterogeneity of this kind of programmes Wolff/Jozwiak (2007) distinguished between short classroom training and short training within firms for unemployed receiving means-tested unemployment benefits (*“Arbeitslosengeld II”*). They found that both variants have positive effects, which are much larger for short training within firms.

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<sup>5</sup> We define short-term vocational training as being less than six months. Long-term vocational training can be for up to three years to learn a new profession.

<sup>6</sup> See for instance Card/Kluve/Weber (2010) for an international comparison and Bernhard et al. (2009); Biewen et al. (2007); Fitzenberger/Osikominu/Volter (2008); Lechner/Miquel/Wunsch (2005, 2007) or Rinne/Schneider/Uhlendorff (2010) for Germany-specific results.

A number of programmes foster a direct integration of the unemployed into the primary labour market. Of particular importance are the different kinds of wage subsidies. We can differentiate between several different employment subsidies. The most important is the setting-in allowance (*Eingliederungszuschuss*), which is paid to employers for a fixed period of time if they hire formerly unemployed elderly, handicapped people or people with special labour-market integration difficulties. Normally, the subsidy is paid for a maximum of twelve months and employers who make use of this benefit are compelled to keep the worker for the same amount of months as they received the subsidy (with the exception of the elderly and handicapped). Jaenichen/Stephan (2009) showed – in line with the international literature on wage subsidies – that they have a favourable effect on the employment prospects of participants. In a “natural experiment” Boockmann et al. (2007) found nearly no significant effects and concluded that deadweight effects – those subsidised would have been hired anyway – are a major problem of wage subsidies.

Job-creation programmes have been an important instrument in the past, but in its old form nearly disappeared after 2004 (particularly in western Germany). They were designed for individuals with considerable integration difficulties and usually took place in the public and non-profit sectors. The primary aim of the measures was to maintain the employability of the participants and to bring individuals with long labour-market absence back into contact with work. They were generally limited to twelve months but often individuals were assigned more than one such measure. Since 2005 a new variant of public job creation for long term unemployed (“*Arbeitsgelegenheiten*”/*Ein-Euro-Jobs*) is quantitatively the most important programme for unemployed receiving social assistance. Evaluating their predecessors (“*Arbeitsbeschaffungsmaßnahmen*” and “*Strukturanpassungsmaßnahmen*”), Caliendo/Hujer/Thomsen (2006, 2008a, b) and Hujer/Thomsen (2010) estimated heterogeneous effects on participants. However, they were mostly negative or insignificant in the long-run. For the new “Ein-Euro-Jobs” Hohmeyer/Wolff (2007) found slightly positive effects in particular for participants from West Germany and individuals out of regular employment for a longer time period.

## 4 Hypotheses for the Empirical Analysis

In this paper we concentrate on the role which education plays in the labour-market integration process. It is well known that immigrants (at least in Germany) on average have lower education levels than natives. In addition, even if they have degrees from their home countries, the transferability of these in Germany is unclear. There is an information problem for the employers: Even if the certificate is formally accredited, it is often difficult to know, whether a certificate obtained abroad is similar (for example with regard to productivity) to one obtained in Germany.

We concentrate on a particular group of immigrants, the Ethnic Germans not only because they are a quantitatively large group but also because they have special

privileges amongst migrants with regard to accreditation of foreign certificates.<sup>7</sup> We therefore expect that relatively more Ethnic Germans have formally accredited degrees than other migrants who – if they have non-accredited degrees – are classified as without vocational training even if they had such training in their home country. Hence, the official approval procedures that help Ethnic Germans to have their degrees officially acknowledged as being equivalent to German ones might help to partly overcome the signalling problem a foreign degree contains.

In our data, the accredited education information is recorded. Thus, if the accreditation procedure were to work perfectly, we would expect that the accredited education information has the same educational information as that of Native Germans. In this case, the educational degree should have similar effects with regard to the labour-market success and thus on the duration in unemployment. Note however, that even if the accreditation procedure does not work perfectly, it could still help solve a part of the information problem, even if not the whole problem. In this case, the variance of the education signal obtained abroad and acknowledged is higher than the variance of the education signal directly obtained in Germany, but lower than the variance of education signals obtained abroad and not acknowledged through an official procedure. We summarise these arguments in the following hypotheses:

Hypothesis 1: Since more Ethnic Germans than foreigners have their degrees accredited, the average quality of their signal will be better (i.e. have less variance). We therefore expect Ethnic Germans to have higher average transition rates than foreigners but lower ones than Native Germans.

Hypothesis 2: The group of formally low-skilled foreigners will contain more people with unaccredited vocational qualifications than is the case amongst the low-skilled Ethnic Germans. This can lead to two opposing effects: On the one hand this could mean that the average productivity of low-skilled foreigners is higher and we expect them to have the highest transition rates. If on the other hand the expected productivities that employers associate with the low-skilled are very similar for all groups, then the variance of the signal will be highest for foreigners. In this case, we expect the highest transition rates amongst the low-skilled for Native Germans and them also to be higher for the Ethnic Germans relative to foreigners.

Hypothesis 3: If either a foreigner or an Ethnic German manages to have his or her foreign degree accredited, then the signal quality should be the same for both groups. In this case, the transition rates between medium- or high-skilled foreigners and Ethnic Germans should be the same.

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<sup>7</sup> See § 10, BVertrG for details.

To further check whether it is the quality of the education signal or other reasons for potentially different unemployment durations, we use for all three groups education information for which we know that the contents are identical, namely measures of active labour-market policy performed by the German Federal Employment Agency. We expect that the educational signals that these measures convey, as opposed to the education information concerning occupational degrees, do not differ across groups. When they differ, it might be that discrimination plays a role. This leads to hypothesis 4.

Hypothesis 4: When individuals participate in measures of ALMP where the contents are observable and identical for different groups, the variance of the signal is the same for all. Thus, these measures are expected to have similar effects for different participant groups.

These four hypotheses are tested for Germany in Section 6.2.2. First, we describe our data.

## 5 Data and Descriptive Findings

### 5.1 Data

Until recently, in official German statistics concerning migration or ethnic background, only the nationality was recorded. As Ethnic Germans obtain the German nationality as soon as they immigrate to Germany, it was more or less impossible to identify them in official statistics. Hence, research used either social scientific survey data such as the German Socio-Economic Panel (GSOEP) or qualitative research methods to analyse this migration group. However, the GSOEP does not contain enough information for our purposes. Firstly, the identification of Ethnic Germans is not entirely uniquely possible (see Fuchs/Sixt 2008). Secondly, it only has a special sample of those Ethnic Germans who migrated to Germany around 1990. However, a large number migrated much later and information about the labour-market performance of these later cohorts is much more scarce. Thirdly, the GSOEP is an annual household panel containing annual information.

Instead, we use a new and unique longitudinal data basis which enables us to identify Ethnic Germans to a high percentage for the first time in administrative data. The data are register data from the German Federal Employment Agency (GFEA) enabling us to track individual job biographies on a daily basis. The data covers information on whether a person is unemployed, in a labour-market programme administered by the GFEA, is employed in a job liable to social-security contributions or in a so-called “mini-job”.<sup>8</sup> It covers the time span from the beginning of the year 2000 until the end of 2008. While the non-migrant sample consists of a two percent random sample of Native Germans, the migrant samples are a complete count of all Ethnic Germans and foreigners in the observed period.

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<sup>8</sup> In mini-jobs normally contain a maximum monthly wage of 400,- Euros and are not liable to social-security contributions.

We use this data set to create a completely new database for Ethnic Germans which overcomes the difficulties mentioned above with the other data on this migration group. Within the IEB there are several means of identifying Ethnic Germans:

- They are classified as Ethnic Germans in the “FuU”-Database (containing information on participation in active-labour market programmes based on administrative data of the GFEA) which covers the time span 1980 – 1997.
- The immigration status "Ethnic German" is recorded within the first five years after arriving in Germany if a person is registered unemployed or as a job-seeker after January 1st 2000.
- A person receives “*Eingliederungsgeld*” – a special welcome payment to Ethnic Germans after January 1st 1990.
- A person participates in a special German language course designed for Ethnic Germans after January 1st 1999.

We only need to identify a person as an Ethnic German by one of these methods and at one point in time. As a person always has the same identification number in all spells of the data, it is then simply possible to transmit the information containing the migration status to all other spells of that person.

Due to the introduction of the so-called “*Hartz IV*” reform in 2005 which changed the legal basis for the benefit payments to Ethnic Germans as well as a resulting change in the internal software used by the Federal Employment Agency, we are only able to identify Ethnic Germans which migrated before 2005.

Information on educational degrees is also of great importance for our analysis. This information stems from employers. However, as Fitzenberger/Osikominu/Völter (2006) argue, these notifications seem to be slightly unreliable, since no financial payments depend on this report. Hence, we use information about a person’s education level from other observations in the IEB (times in unemployment or during ALMP participation) to try and get a more plausible report on education. More precisely, since a person generally has to show her certificates to a placement officer at the job centre, we use the education information from unemployment spells and transmit this to all subsequent spells in which education information is missing. If there is still no information about a person’s educational degree, we check if there is information in an employment spell and replace as many missings as possible.

As our dataset is completely new, in Table 1 we compare some descriptive findings obtained from the IEB with those obtained from the German microcensus – the official yearly survey of 1% of all households in Germany.

**Table 1**  
**Comparison of the IEB with the German Microcensus, 25 – 54 year old Ethnic Germans, 2008**

<b>Number of Individuals in Datasets, 30.06.2008 (25 to under 55 year olds)</b>			
	<b>Microcensus 2008</b>	<b>IEB Absolute</b>	<b>Relative Difference to Microcensus</b>
<b>Sex</b>			
Male	498.254	400.981	-24,3
Female	460.445	390.364	-18,0
<b>Age</b>			
25-35	188.626	144.742	-30,3
35-45	314.456	272.078	-15,6
45-55	455.617	374.525	-21,7
<b>Vocational Degree (absolute number)</b>			
Unknown	8.732	33.083	73,6
Without vocational training	244.238	214.911	-13,6
With vocational training	611.044	467.600	-30,7
University degree	94.685	75.751	-25,0
<b>Vocational Degree (relative number)</b>			
Unknown	0,9	4,2	78,2
Without vocational training	25,5	27,2	6,2
With vocational training	63,7	59,1	-7,9
University degree	9,9	9,6	-3,2

Source: IEB, Microcensus 2008, scientific use file

As can be seen from the table, there are slightly more Ethnic Germans according to the microcensus data. Even if the absolute numbers with respect to the vocational training a person has differ, the relative shares are similar. The reason for these differences is that there are almost no individuals with unknown information with regard to their vocational training in the microcensus.

Table 1 also lists the number of unemployed according to their vocational degree. This group is of special interest here, as we want to identify the unemployed correctly to be able to track their subsequent employment. As can be seen from the table, apart from the people with an unknown educational degree, the absolute numbers are similar.

## 5.2 Descriptive Findings

The primary purpose of this paper is to perform a survival analysis to find out which factors help Ethnic Germans leave unemployment and whether these factors differ between Ethnic Germans and foreigners or Native Germans. To this end, we focus on times in which a person is either registered as unemployed or – as we are also interested in the role that labour-market programmes play – currently attending a labour-market programme (in which case they are generally not officially counted as unemployed). Hence, in our analysis, we focus on the broader concept of “factual unemployment” which includes both officially unemployed people as well as individuals in labour-market programmes. Table 2 below presents an overview of some

descriptive statistics. Due to methodological reasons discussed in Section 6.1, we restrict our inflows to the time from January 2000 until December 2004. Hence, in Table 2 (in the final two rows) we present descriptive findings regarding factual unemployment spells in this time interval. Further, due to the fact that both the socio-demographic composition of the immigrants as well as the labour-market conditions they faced when they came to Germany differed substantially over the years, we divide the Ethnic Germans into three different migration cohorts.<sup>9</sup>

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<sup>9</sup> As we only have the precise date of entry for those Ethnic Germans which we identify using the “registered as unemployed spell” (the second method listed on page 12; roughly 40 % of the Ethnic Germans in our sample), we use the year of their first entry in the IEB as a proxy. With respect to the foreigners in our sample, we cannot tell from the data whether they migrated themselves or were born in Germany and have foreign parents.

**Table 2**  
**Descriptive Labour-Market Statistics for Unemployed Ethnic Germans, Native Germans and Foreigners aged 25 to under 55**

Variable \ Group	Ethnic Germans (Year of first spell in IEB)						Native Germans (2 % sample)		Foreigners	
	before 1993		1993 – 1999		2000 – 2004		Men	Women	Men	Women
	Men	Women	Men	Women	Men	Women				
Median age during factual unemployment (in years)	41.8	41.8	39.6	40.3	38.3	39.2	37.4	37.7	36.3	36.5
Highest occupational degree (30.06.2004 in %)										
No vocational training	20.7	24.5	29.9	30.5	45.5	43.3	8.5	10.3	51.4	51.8
Vocational training	71.5	65.6	59.0	52.4	39.8	39.1	79.8	77.8	40.0	33.9
University (incl. of Applied Science) degree	7.6	9.7	11.1	16.9	14.1	17.0	11.6	11.7	8.4	14.0
Unknown/missing <sup>a)</sup>	0.1	0.1	0.0	0.2	0.5	0.7	0.1	0.2	0.2	0.3
Average number of factual unemployment spells per person in 2000 – 2004 <sup>b)</sup>	2.4	2.1	2.3	2.0	2.0	1.8	2.1	1.8	1.8	1.6
Average duration of factual unemployment spells in 2000 – 2004 (in days) <sup>b)</sup>	512	582	512	556	541	558	456	495	348	366

<sup>a)</sup> Excluded from the regression analysis

<sup>b)</sup> Unemployment spell starts between 2nd January 2000 and 31st December 2004

Source: IEB

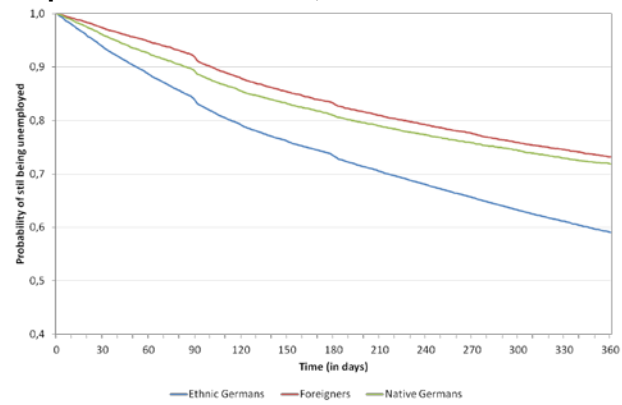


As can be seen from the table, the Ethnic Germans are older than both the Native Germans and the foreigners in the sample. With regard to the education of Ethnic Germans, a much higher share than amongst the Native Germans has no vocational training. However, by far the highest share of low-qualified people is amongst the foreigners (44 %). With respect to the high-skilled, the share of (accredited) academics amongst the Ethnic Germans is – especially amongst the later cohorts – higher than for the Native Germans or foreigners. Within the different immigration cohorts amongst the Ethnic Germans, it can clearly be seen that the later immigrants have lower shares with vocational degrees.

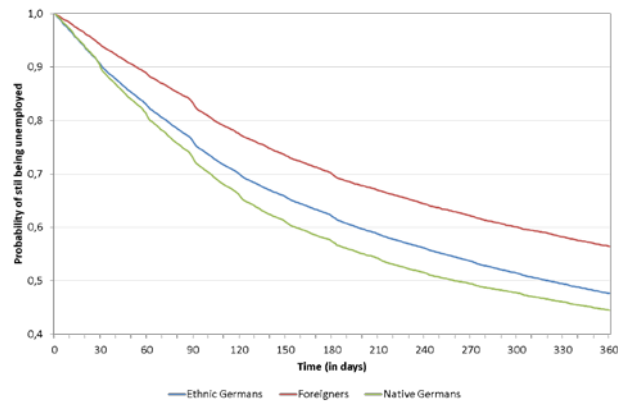
From the final two rows of Table 2 it can be seen that Ethnic Germans are both unemployed more often and that unemployment periods on average last longer than is the case for the other two groups. The aim of this paper is to better understand the factors that help or hinder Ethnic Germans from leaving unemployment.

As a first step, we perform Kaplan-Meier estimates. As we assume that educational signals play an important role in the transition process, we differentiate these with respect to the educational levels. In addition, these estimates are carried out for men and women separately. Figure 1 shows the situation for males of different groups and vocational levels. Perhaps surprisingly, instead of the high-skilled, irrespective of the group, it is always the medium-skilled (i.e. those with vocational training) which have the highest transition rates. After one year, only 44 percent of the Native Germans, 47 percent of the Ethnic Germans and 56 percent of the foreigners are still unemployed. Thus, the differences between the medium-skilled male Ethnic and Native Germans do not seem to be very pronounced. The second surprising fact is that – at least amongst the Ethnic Germans and the foreigners – it is the high-skilled who remain unemployed the longest (i.e. have the lowest transition rates). After 365 days, the respective shares are 66 and 75 percent. Within the Native German males, it is the low-skilled with the lowest transition rates: after one year, 71 percent are still unemployed. Hence, on average and not taking into account any of the factors such as age and labour-market experience discussed below in the multivariate regression analysis, the low-skilled Native German males still manage to find a new job sooner than high-skilled foreigners.

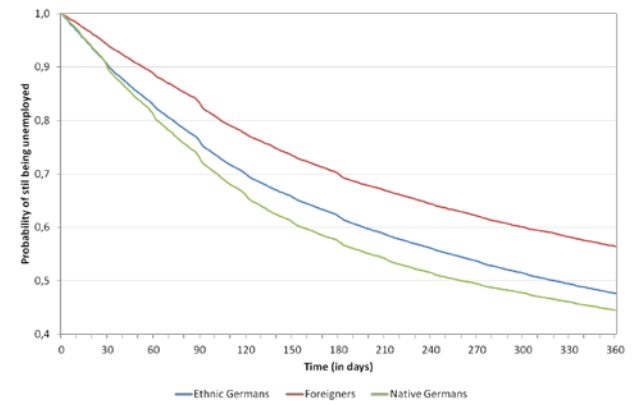
**Figure 1**  
Kaplan-Meier Estimates, Males



Low-Skilled

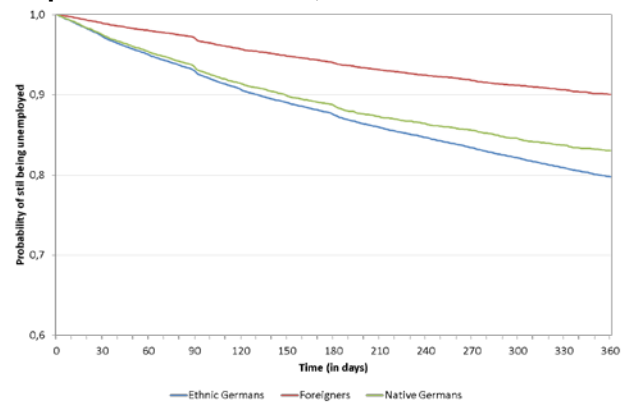


Medium-Skilled

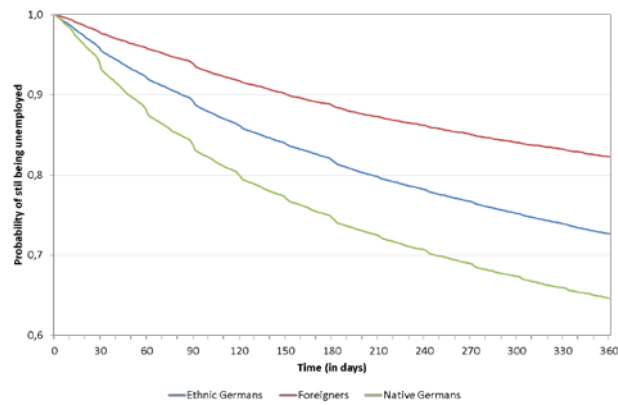


High-Skilled

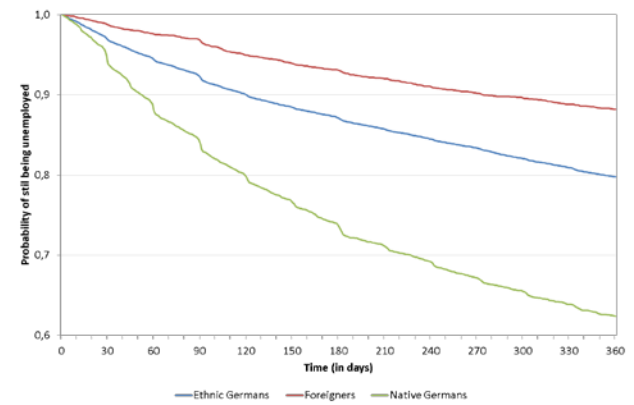
**Figure 2**  
Kaplan-Meier Estimates, Females



Low-Skilled



Medium-Skilled



High-Skilled

Source: IEB

The situation for females differs from that for males (see Figure 2). For all three groups and all skill levels, females always have lower transition rates (i.e. remain unemployed longer) than their male counterparts. This difference is most pronounced amongst those with vocational training. It is highest for Ethnic Germans with vocational training where the female transition rate after 365 days is 25 percentage points (54 percent) higher than the rate for males.

In addition, with the slight exception of the Native Germans, the differences between the lowest and highest transition rates within one group are smaller for females than for males. Further, in contrast to the male Native Germans, the high-skilled female Native Germans have higher transition rates than those females with vocational training. This is not the case for the Ethnic Germans and foreigners, where – just as is the case for males – the females with vocational training leave unemployment soonest. Finally, within each group, it is always the low-skilled females which have the most difficulty in leaving unemployment.

## 6 Survival Analysis

### 6.1 Methodology

Clearly, the Kaplan-Meier estimates demonstrate that the survival rates differ between the groups, between the qualification levels and also between males and females within a group. In this section we therefore perform multivariate survival analysis regressions to analyse the differences in transitions between Ethnic and Native Germans as well as our group of foreigners from factual unemployment to employment. A transition is counted if the new job is unsubsidised, full-time, lasts at least seven days and is subject to social security contributions. In addition, to avoid distortions caused by people still in the education system, we only perform the analysis for people who are 25 years old or over at the start of their unemployment spell. Similarly, as the labour-force participation rate drops steadily for people aged 55 or over mainly due to early retirement, we (independently) censor all observations for people of this age.<sup>10</sup>

Due to data limitations, our variable concerning the vocational training of an unemployed person or participant of an active labour-market programme is missing for the years 2005 – 2008. In addition – again for data reasons – we have more difficulties in identifying Ethnic Germans who arrived in 2005 or later. Therefore, we restrict our inflows into factual unemployment to the time period January 2000 until December 2004.<sup>11</sup> Outflows are measured from the beginning of the sample (i.e. January 2000) until the end of 2008 (for different inflow and end-sample dates, see, for example, Wooldridge 2002: 694 ff.).

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<sup>10</sup>For example Fitzenberger/Wilke (2010) find that a large part of unemployment amongst the elderly is due to early retirement.

<sup>11</sup>As our data starts on 1<sup>st</sup> January 2000 we cannot tell whether an unemployment spell started at this date or is a continued period of unemployment which started earlier. For this reason, our earliest inflows start on 2<sup>nd</sup> January 2000.

As Ethnic Germans who do not already have a job offer when they migrate to Germany need to register themselves as unemployed in order to receive their welcome payment, we ignore their first unemployment spell and the subsequent first job in Germany for the duration analysis (of course not for the identification of the status), since we have reasons to believe that the duration of this first unemployment spell might be driven by different factors than subsequent unemployment spells. For this reason, we restrict our analysis to unemployment spells for people who have worked at least 30 days in Germany before they become unemployed.<sup>12</sup>

Because of the rich data set, we are able to use piecewise-constant (PWC) models with a flexible baseline hazard, which can proxy almost every functional form. We could in principle allow for a very flexible form, up to daily specific hazards, given the richness of the data. However, due to limitations of computer capacity and due to computational problems, we instead restricted ourselves to using a specification with 20 time dummies. We use both economic expectations and the institutional structure of the unemployment system to try to merge those time periods where time dummies seem to be similar.<sup>13</sup> In addition, first, the interpretation of the time structure is easier interpreting 20 dummies, instead of around 2500 as the maximum of the 9 years period. Second, numerical maximisation routines work better using a smaller number of time dummies. We treat the main variables of interest, i.e. our vocational education variables and the variables for the labour-market programmes as time-varying and hence split the model when changes in these variables within an unemployment spell occur. All other covariates (with the exception of the 20 time dummies) are set to the values at the beginning of the unemployment spells.

A further advantage of the piecewise-constant model is that it allows the identification of an unobserved heterogeneity term even if we have only single spell data, thus diminishing the risk of identifying spurious duration dependence. In our dataset, however, due to the long observation period, we observe multiple failures for a large proportion of the sample. I.e. individuals that have been previously unemployed and have found a job, become unemployed again, thus yielding the possibility to identify an individual specific effect. This has been seen in the literature as a huge advantage in identifying causal effects (see van den Berg 2001).

Technically, we treat multiple factual unemployment spells for an individual as ordered events of the same type. I.e. the second unemployment spell can only start once the first one has finished (called the conditional risk set model; see Prentice/Williams/Peterson 1981 for more details). However, we assume that analy-

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<sup>12</sup>We performed the same regressions only imposing a minimum of seven days. Seeing as the results are quantitatively and qualitatively very similar but the 30-day regression performed better with regard to the Akaike and Schwarz-Bayes Information Criteria, we only present the 30-day regression results here.

<sup>13</sup>We calculate separate baseline hazard rates for every week in the first month, then monthly splits for spells up to one year after unemployment began, and then time spells of 120 days up to a duration of more than 900 days of unemployment (more than 2½ years).

sis time starts at zero for each new unemployment spell. As a robustness check we also perform the analysis using the Cox Model and hence do not impose an assumption regarding the functional form of the baseline hazard. Just as with the piecewise-constant model, the Cox model also assumes that changes in the covariates lead to a proportional shift of the baseline hazard. Thus, as a further robustness check, we estimate an accelerated-failure-time model to check whether the parameters of interest behave similarly in a non-proportional hazard model.

The mixed proportional hazard model (MPH) assumes that the hazard is separable in time, covariates and unobserved heterogeneity and usually imposes the following specification to guarantee the hazard  $h$  to be positive:

$$h(t|x) = \lambda(t) * \text{Exp}(x * \beta) * v$$

where  $\lambda(t)$  is the baseline hazard,  $\text{Exp}(x*\beta)$  is the scaling factor and  $v$  is unobserved heterogeneity.

Thus, the proportionality assumption requires that the covariates have the same multiplicative effect on the baseline hazard at any time, as has the unobserved heterogeneity, which is treated as a left out (individual dummy) variable. Arguably, the proportionality assumption is a strong one, but is seen in the literature as similar to the linearity assumption in regression analysis. In principal,  $\lambda(t)$  can take on an arbitrary form, as can  $v$ .

Elbers/Ridder (1982) and Heckman/Singer (1984) show that the MPH model is non-parametrically identified with the above specification of the model, continuous covariates and bounded unobserved heterogeneity.<sup>14</sup> Here, we invoke stronger assumptions by imposing an, albeit flexible, functional form for the baseline hazard and a functional form for the unobserved heterogeneity. Thus, identification is guaranteed.

In addition, as described above, our rich data set allows repeated spells for many individuals. This simplifies identification since, in the empirical application, it is difficult to separately identify unobserved heterogeneity and duration dependence with single-spell data (see van den Berg 2001). We implement the estimation with repeated spells such that we assume an unobserved heterogeneity distribution of the gamma type and assuming that the unobserved heterogeneity term takes on always the same value for individuals that have more than one (factual) unemployment

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<sup>14</sup>More precisely, the first paper requires  $\lambda$  to vary with one covariate that takes on at least two different values and the expectation of the unobserved heterogeneity to exist, whereas the latter requires  $\lambda$  to vary with one covariate that varies continuously on some interval and the distribution of  $v$  to not have a too fat tail.

spell.<sup>15</sup> The estimation is then carried out by estimating the parameters of the gamma distribution and integrating out unobserved heterogeneity.

## 6.2 Results

### 6.2.1 Main Results

In Table 3 on page 22 we present the results for six PWC models with gamma unobserved heterogeneity separately for men and women and the three groups as our base results.<sup>16</sup> In the presentation of the results, we concentrate on the education variables, the variables concerning the labour-market programmes of the GFEA and the duration dependence.

As to be expected from the above and already seen in the Kaplan-Meier estimations, there are substantial differences between the effects of vocational training both between the groups and between males and females within each group. These findings continue to hold even after controlling for numerous other factors. The effects of vocational education are by far the highest for the Native Germans. This is true for both the medium- and high-skilled. In addition, as one would expect, we also observe that the high-skilled (i.e. university graduates) have higher transition rates than the medium (i.e. vocational training degree) and low-skilled (i.e. no degree). In the case of the Ethnic Germans, men with vocational training fare better than those with university degrees. High-skilled female Ethnic Germans do have higher transition rates than the medium-skilled but the differences in the coefficients for the two skill levels are far less pronounced than amongst female Native Germans. In the case of foreigners, the high-skilled do not exhibit significantly higher transition rates than the low-skilled.

There are several potential explanations as to why the high-skilled immigrants seem to fare less well than the medium-skilled. First, it could be that – seeing as they have managed to formally accredit their education certificates from abroad – they restrict their search to high-skilled jobs for which competition with the Native Germans is particularly high. Second, as discussed above, it could be that employers are unsure about their true abilities, i.e. how their foreign degree translates into labour-market productivity in Germany. Third, it could be that there is a qualifcational mismatch, i.e. the competences obtained abroad are not needed in Germany. Finally, the results of the comparison between Ethnic Germans and foreigners could be a sign that the high-skilled foreigners have greater difficulties in having their foreign degrees accredited in Germany and hence that many of those formally classified as low-skilled are in fact high-skilled.

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<sup>15</sup>As shown by van den Berg (2001: 89 ff.), the use of the gamma distribution is justified if the interaction between the time dummies and the “major” covariates is negative for “long” duration times. In addition, the choice of the gamma distribution can be justified by a limit result of Ridder/Verbakel (1986) and Ridder (1987). Finally, combining the exponential and gamma distribution also has the advantage that an analytical solution exists.

<sup>16</sup>The full results can be found in Table A.1 in the appendix.

**Table 3**  
**Main Estimation Results, Hazard Ratios by Group and Gender**

	Ethnic Germans		Foreigners		Native Germans	
	Men	Woman	Men	Women	Men	Women
<i>Vocational Training</i> (Reference: No vocational training)						
With vocational training	1,179***	1,103***	1,168***	1,174**	1,373***	1,245***
University degree	1,074***	1,149***	1,077	1,143	1,622***	1,441***
<i>Labour-market programmes</i> (Reference: No programme)						
Job-creation schemes	0,055***	0,050***	0,068***	0,079***	0,068***	0,075***
Long-term vocational training	0,111***	0,125***	0,175***	0,154***	0,133***	0,123***
Short-term vocational training	0,422***	0,529***	0,632***	0,620*	0,560***	0,774**
Training measures	1,582***	1,305***	1,554***	1,320*	1,596***	1,447***
Wage subsidy	16,220***	24,400***	17,060***	22,610***	10,640***	15,650***
Other measures	0,458***	0,630***	0,336***	0,740***	0,239***	0,345***
<i>Completed labour-market programmes</i> (Reference: No programme)						
Job-creation schemes	0,646***	0,571***	0,476**	1,255	0,726***	0,723**
Long-term vocational training	1,818***	2,048***	1,876***	2,731***	1,547***	1,376***
Short-term vocational training	1,489***	1,263***	1,406**	1,323	1,639***	1,479***
Training measures	1,448***	1,211***	1,223***	1,356***	1,547***	1,470***
Wage subsidy	2,387***	3,306***	3,889***	2,246	2,242***	2,197***
Other measures	1,134***	1,153***	1,066	1,333**	1,082*	1,006
<i>Time intervals</i> (Reference: 21-27 days)						
0 – 6 days	0,981	0,861***	0,927	0,871	0,851***	0,857*
7 – 13 days	0,942***	0,910***	0,903	1,018	0,960	0,943
14 – 20 days	1,060***	1,024	0,963	1,247*	0,959	1,033
28 – 57 days	0,973*	0,993	0,991	1,051	1,149***	1,235***
58 – 87 days	1,072***	0,936**	1,216***	1,086	1,277***	1,074
88 – 117 days	1,300***	1,178***	1,691***	1,393***	1,537***	1,285***
118 – 147 days	1,096***	1,112***	1,329***	1,128	1,365***	1,053
148 – 177 days	0,967*	1,007	1,185**	0,984	1,118**	0,984
178 – 207 days	1,004	1,141***	1,190**	1,099	1,164***	1,027
208 – 237 days	0,804***	0,785***	0,973	0,756*	1,035	0,824**
268 – 297 days	0,765***	0,764***	0,885	0,701**	0,871**	0,846*
298 – 327 days	0,731***	0,681***	0,932	0,817	0,797***	0,791**
328 – 357 days	0,668***	0,668***	0,800**	0,703*	0,813***	0,760***
358 – 477 days	0,630***	0,629***	0,823*	0,589**	0,825***	0,733***
478 – 597 days	0,681***	0,713***	0,719***	0,642***	0,827***	0,904
598 – 717 days	0,592***	0,542***	0,665***	0,543***	0,708***	0,651***
718 – 897 days	0,556***	0,506***	0,610***	0,503***	0,600***	0,589***
898 – 1093 days	0,637 ***	0,601 ***	0,595 ***	0,555***	0,847***	0,792**
More than 1093 days	0,599 ***	0,557 ***	0,608 ***	0,655**	0,705***	0,752***
N	4.033.798	1.866.509	318.266	172.266	766.757	435.424
AIC	994.470	362.845	69.776	24.263	186.073	78.505
BIC	997.575	365.768	72.263	26.616	188.787	81.087
Link test						
$x\beta$	1.008***	1.003***	1.015***	1.007***	1.022***	1.011***
$(x\beta)^2$	0.001**	0.000	0.002	0.001	0.004***	0.002
LR-test of no unobserved heterogeneity	1,3E+4***	1,1E+4***	776.6***	461.5***	2,607.1***	1,276.9***

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: IEB; own calculations

In contrast to the educational signals, the signals sent by the participation in or completion of a labour-market programme in Germany should be the same for all groups because the employers should have the same amount of information about such measures irrespective of the group to which an applicant belongs to. In order to test this, we perform regressions by skill levels with interaction terms between the (com-

pleted) labour-market programmes and the immigrants. The results are presented in Table 4 below.<sup>17</sup>

Finally, as can be seen from the final rows in Table 3, we find a considerable amount of duration dependency in the exit rate from unemployment. After one month in the case of Native Germans and after three months for all groups, there are significantly higher transition rates relative to the baseline reference time interval between three and four weeks. At least for male Native Germans and foreigners as well as female Ethnic Germans, we also find a jump in the exit rate after half a year. We assume that this is due to both the fact that benefit payments may be cut after these time intervals (which is particularly the case if the person was only briefly employed) as well as the fact that after certain time intervals the placement officer will become more active. However, clearly longer unemployment durations have a more or less continuously decreasing transition rate.

**Table 4**  
**Group Dummies, Interaction Effects between Labour-Market Programmes and Ethnic Germans or Foreigners by Skill Levels**

	Males			Females		
	Low-Skilled	Medium-Skilled	High-Skilled	Low-Skilled	Medium-Skilled	High-Skilled
Ethnic Germans	0.895***			0.891***		
Foreigners	0.655***			0.526***		
Ethnic Germans	1.023	0.918***	0.771***	0.948	1.003	0.852**
Foreigners	0.789***	0.647***	0.645***	0.570***	0.606***	0.532***
Ethnic Germans in job-creation schemes	0.002	0.000	0.002	-0.003*	0.000	0.000
Foreigners in job-creation schemes	0.007*	0.000	0.007**	0.000	0.003	-0.024
Ethnic Germans in long-term job-training	-0.001*	0.000	0.000	-0.001	0.000	0.001
Foreigners in long-term job-training	0.002*	0.003***	0.001	0.003**	0.002***	0.002*
Ethnic Germans in short-term job-training	-0.001	-0.001***	-0.001**	0.000	-0.001***	-0.001***
Foreigners in long-term job-training	0.001	0.001*	-0.001	0.000	0.001	-0.003*
Ethnic Germans in training measures	0.000	0.000*	0.000	-0.001	0.000	0.000
Foreigners in training measures	-0.001	-0.001**	0.000	-0.001	-0.001	0.000
Ethnic Germans with wage subsidies	-0.002	0.001	-0.002	0.003*	0.001	0.000
Foreigners with wage subsidies	-0.007	0.003	-0.007*	0.001	-0.003	0.032
Ethnic Germans in other programmes	0.000	0.002**	0.002**	-0.001	0.001***	0.002***
Foreigners in other programmes	0.000	0.002***	0.003***	0.000	0.001***	0.002***
Ethnic Germans with completed job-creation schemes	0.002	0.000	0.000	-0.001	0.000	-0.001*
Foreigners with completed job-creation schemes	0.000	0.000	0.000	-0.003	0.001	0.002
Ethnic Germans with completed long-term job-training	0.001*	0.000	0.000	0.000	0.000	0.000
Foreigners with completed long-term job-training	0.000	-0.001	-0.001	0.001	0.000	-0.002
Ethnic Germans with completed short-term job-training	0.000	-0.001***	0.000	0.002*	-0.001**	-0.001***
Foreigners with completed long-term job-training	-0.001	-0.002***	-0.002*	0.004*	-0.001**	-0.002**
Ethnic Germans with completed training measures	0.000	0.000***	-0.001***	-0.001*	-0.001***	-0.001***
Foreigners with completed training measures	-0.001***	-0.002***	-0.001***	-0.001**	-0.001***	-0.001*
Ethnic Germans with previous wage subsidies	0.001	0.000	0.000	0.000	0.001*	-0.001
Foreigners with previous wage subsidies	0.003	0.000	-0.001	-0.041	0.000	-0.041
Ethnic Germans with completed other programmes	0.000	0.000**	0.000	0.000	0.000	0.000
Foreigners with completed other programmes	0.000	0.000	-0.002***	0.001	0.000	0.000

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: IEB

<sup>17</sup>The coefficients are calculated taking into account the non-linear nature of the piecewise-constant model. See Norton/Wang/Ai (2004) for more details.



Table 4 gives results for a joint estimation for the duration out of unemployment for the three groups and all education levels, but for men and women separately in rows one and two. Beginning with row three results are given for separate estimations according to skill group and sex including interaction effects for labour-market programmes and the origin (i.e. foreigner or Ethnic German). Whereas Table 3 indicates huge and significant partial correlations of the labour-market programmes with the hazard out of unemployment, Table 4 (from row 5) clearly highlights the fact that there are very few significant differences between foreigners, Ethnic Germans and Native Germans. Hence, in contrast to the educational signals, the labour-market effects of the programme signals are very similar not only between the groups but also within each group between males and females.

### 6.2.2 Testing the Hypotheses

Turning to the hypotheses raised in Section 4, we find the following: First, hypothesis one postulated that the average signal quality will be highest for Native Germans, second highest for the Ethnic Germans and lowest for the foreigners. Rows one and two of Table 4 show that in a pooled estimation across the three groups and over all education levels the ranking is as predicted: Native Germans are faster out of unemployment than Ethnic Germans, and foreigners are slowest, both for men and for women. We tested this ranking using t-tests for the foreigner dummy against the Ethnic German dummy and found them to be highly significant.

The second hypothesis argued that we either expect low-skilled foreigners to have the highest transition rates or the same ranking order as above amongst the low-skilled as these are a mix of people who really have no vocational training as well as those whose foreign degrees were not accredited. The results (rows 3 and 4 of Table 4) clearly show the positive effect of higher expected productivities is outweighed by the negative effect of a lower signal quality. However, the transition rates between low-skilled Ethnic and Native Germans are statistically the same. This could further indicate that these people mostly find low-skilled jobs where the education signal simply is not important for the task to be performed.

From hypothesis three we expect that the job-finding rates be the same for foreigners and Ethnic Germans who manage to have their degrees accredited, i.e. for the medium- and high-skilled amongst them. Evidence for this can be seen in the first two rows of Table 3. Under the assumption of independent regressions, we performed t-tests under the assumption, that the coefficients within one skill level are different amongst the two immigrant groups. We are able to reject this hypothesis for both skill levels as well as for males and females.

Finally, hypothesis four ascertained that labour-market programmes by the GFEA would convey the same informational content for every group and thus lead to similar correlations with the hazard rate. This is mostly confirmed by the interaction terms in Table 4. Admittedly, there are some significant differences, especially for the medium skilled. However, these are very small in magnitude and hence do not seem to be economically important. In addition, the group of medium-skilled is by far

the largest group with around 500.000 individuals just counting the Ethnic Germans. Hence, it is not astonishing that we obtain some very small significant results. Overall, from our point of view, the results convincingly show that labour-market programmes lead to the same exit rates out of unemployment irrespective of the (ethnic) group an individual belongs to.

### 6.2.3 Robustness checks

In order to check the robustness of our results, we perform several checks. To save space, in Table 5 we only present the results of our main signalling variables.<sup>18</sup> The first robustness check is to estimate the coefficients using an accelerated failure-time model. As this model estimates the effect on the expected duration rather than on the survival rates, we expect negative coefficients where in Table 3 and Table 4 we observed hazard ratios above one. As can be seen from the table below, this is exactly what we find.

The next check we perform is to run a Cox regression instead of the piecewise-constant model. The differences in the hazard ratios for the vocational-training variables to those in Table 3 are very small. Even for the labour-market programmes – although larger in magnitude – our main results remain qualitatively the same.

The third robustness check is to use the educational level originally recorded in the data and not the adjusted education information as presented above. Again, the differences in the hazard ratios are negligible. In fact, they are even smaller than with the Cox regression.

**Table 5**  
**Robustness Checks: Results of Main Variables by Groups and Gender**

	Ethnic Germans		Foreigners		Native Germans	
	Men	Woman	Men	Women	Men	Women
<b>Accelerated Failure-Time Regression (Coefficients)</b>						
<i>Vocational Training</i> (Reference: No vocational training)						
With vocational training	-0,192***	-0,123***	-0,172***	-0,191***	-0,288***	-0,195***
University degree	-0,107***	-0,143***	-0,121	-0,222	-0,418***	-0,351***
<i>Labour-market programmes</i> (Reference: No programme)						
Job-creation schemes	3,260***	3,185***	2,795***	3,042***	2,934***	2,933***
Long-term vocational training	3,011***	2,815***	2,446***	2,570***	2,659***	2,714***
Short-term vocational training	1,195***	0,862***	0,627***	0,554	0,746***	0,339*
Training measures	-0,708***	-0,427***	-0,728***	-0,531**	-0,750***	-0,610***
Wage subsidy	-2,796***	-3,090***	-2,779***	-3,818***	-2,240***	-2,943***
Other measures	0,946***	0,501***	1,045***	0,033	1,552***	1,134***

<sup>18</sup>In addition, as the results are similar (but poorer with respect to the information criteria), we do not present the results for the alternative model where we choose a minimum employment time of 7 instead of 30 days before entering our analysis. Results are available upon request.

	Ethnic Germans		Foreigners		Native Germans	
	Men	Woman	Men	Women	Men	Women
<i>Completed labour-market programmes</i> (Reference: No programme)						
Job-creation schemes	0,607***	0,831***	1,471***	-0,700	0,361**	0,322
Long-term vocational training	-3,152***	-2,766***	-2,517***	-3,799***	-2,050***	-1,845***
Short-term vocational training	-1,161***	-0,582***	-0,831**	-0,475	-1,230***	-1,012***
Training measures	-0,673***	-0,309***	-0,348***	-0,462***	-0,725***	-0,629***
Wage subsidy	-1,856***	-2,068***	-3,161***	-1,289	-1,817***	-1,482***
Other measures	-0,368***	-0,276***	-0,132	-0,502**	-0,302***	-0,178
<b>Cox Model (Hazard Ratios)</b>						
<i>Vocational Training</i> (Reference: No vocational training)						
With vocational training	1,152***	1,083***	1,124***	1,175***	1,334***	1,219***
University degree	1,084***	1,142***	1,050	1,136	1,494***	1,375***
<i>Labour-market programmes</i> (Reference: No programme)						
Job-creation schemes	0,062***	0,061***	0,082***	0,100**	0,0821***	0,096***
Long-term vocational training	0,145***	0,194***	0,234***	0,239***	0,177***	0,185***
Short-term vocational training	0,469***	0,573***	0,705***	0,722	0,63***	0,872
Training measures	1,561***	1,248***	1,524***	1,298*	1,621***	1,472***
Wage subsidy	15,880***	21,990***	15,180***	19,520***	10,4***	14,62***
Other measures	0,491***	0,682***	0,364***	0,725***	0,277***	0,402***
<i>Completed labour-market programmes</i> (Reference: No programme)						
Job-creation schemes	0,820***	0,823***	0,593*	1,469	0,891*	0,976
Long-term vocational training	1,978***	2,260***	1,997***	2,473***	1,793***	1,611***
Short-term vocational training	1,438***	1,251***	1,331**	1,250	1,563***	1,396***
Training measures	1,321***	1,138***	1,131**	1,262***	1,386***	1,351***
Wage subsidy	1,752***	1,887***	2,808***	1,387	1,672***	1,524**
Other measures	1,170***	1,186***	1,159**	1,292**	1,162***	1,107*
<b>Uncorrected Educational Signal (Hazard Ratios)</b>						
<i>Vocational Training</i> (Reference: No vocational training)						
With vocational training	1,152***	1,126***	1,072*	1,174**	1,279***	1,110**
University degree	1,070***	1,103***	1,049	1,118	1,461***	1,272***
<i>Labour-market programmes</i> (Reference: No programme)						
Job-creation schemes	0,054***	0,049***	0,069***	0,079***	0,069***	0,072***
Long-term vocational training	0,110***	0,127***	0,173***	0,167***	0,134***	0,127***
Short-term vocational training	0,413***	0,524***	0,606***	0,597*	0,547***	0,761**
Training measures	1,576***	1,287***	1,545***	1,307*	1,584***	1,443***
Wage subsidy	16,110***	24,120***	15,880***	22,190***	10,210***	16,140***
Other measures	0,453***	0,621***	0,331***	0,716***	0,235***	0,346***
<i>Completed labour-market programmes</i> (Reference: No programme)						
Job-creation schemes	0,624***	0,559***	0,460**	1,029	0,730***	0,668***
Long-term vocational training	1,797***	1,948***	1,861***	2,651***	1,536***	1,320***
Short-term vocational training	1,474***	1,261***	1,407**	1,323	1,586***	1,421***
Training measures	1,451***	1,210***	1,225***	1,388***	1,558***	1,480***
Wage subsidy	2,437***	3,278***	3,987***	2,867	2,159***	2,387***
Other measures	1,118***	1,149***	1,089	1,292*	1,073*	1,013

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

Source: IEB

We also tested the significance of our interaction effects as shown in Table 4 first for the Cox model and second the piecewise-constant models with the recorded (and not adjusted) education. Neither the magnitude of coefficients which were significant nor which coefficients were significant at all changed much with these regressions.

Hence, we conclude that our main findings in Section 6.2.1 are robust with respect to different specifications.

## 7 Conclusion

In this paper we analyse the impact of different types of education on the hazard of leaving unemployment for a regular non-subsidised full-time job. We compare the relationship of different education variables for different groups of individuals, namely Native Germans, Ethnic Germans and foreigners from those countries where Ethnic Germans typically originate from. In our view the group of Ethnic Germans is particularly interesting since they have particularly good access to the German labour market. We consider the right of having an official accreditation procedure as well as having unrestricted access to the labour market as important advantages with respect to potential labour-market success.

We suspect, first, that this accreditation procedure increases the signalling quality of foreign degrees and hence helps job-seekers in the job-finding process. This hypothesis is confirmed in the empirical analysis: Ethnic Germans are faster out of unemployment than foreigners. This result holds both for men and women and is highly significant. In addition, first, this higher accreditation rate also means that more Ethnic Germans are classified as medium- or high-skilled which both have higher unemployment exit rates than the low-skilled. Second, the signal variance amongst the low-skilled will be highest amongst the foreigners as here there is the most uncertainty about whether they have no formal education or simply no accredited formal education. This is confirmed by the empirical analysis where we find that the low-skilled foreigners are by far the group with the lowest exit rates within this skill level.

However, irrespective of whether a person is a foreigner or an Ethnic German, if she manages to have her degree accredited, the signal value should be similar for both – especially as we restrict our group of foreigners to have the same nationalities (and hence countries of origin) as the Ethnic Germans' typical home countries. We find evidence in support of this hypothesis as there are no significant differences between the education coefficients for the two immigrant groups.

Finally, hypothesis four ascertained that labour-market programmes performed in Germany convey the same informational content for every group and thus lead to similar correlations with the hazard rate. This is mostly confirmed in our data although – especially for the medium-skilled – we find contrary results. However, these are very small in economic terms.

Hence, especially from these last two findings, we find that nationality and ethnic roots on their own do not to make a difference at least with regard to finding a new job after a period of unemployment.

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## Appendix

The values of all covariates are measured at the time at which an unemployment spell starts. Table A1 gives most covariates for one basic specification, where we separate the three groups and men and women.

**Table A.1**  
**Results of Full-Model by Group and Gender**

	Ethnic Germans		Foreigners		Native Germans	
	Men	Woman	Men	Women	Men	Women
Proportion of time in German labour market spent working (in %)	4.505***	2.892***	2.874***	3.272***	4.966***	3.289***
Years in German labour market	0.959***	0.976***	0.973***	0.975***	0.991***	1.003
<i>Age</i> (Reference: 40 – 45)						
25 – 30	1.065***	0.874***	1.107**	1.029	1.308***	1.516***
30 – 35	1.030**	0.922***	1.103*	0.959	1.281***	1.102*
35 – 40	1.002	1.010	1.088*	1.026	1.142***	1.014
45 – 50	0.899***	0.885***	0.989	0.792**	0.884***	0.867**
50 – 55	0.731***	0.681***	0.765***	0.548***	0.602***	0.585***
<i>Unemployment Benefits</i>						
Unemployment benefits I	0.489***	0.419***	0.497***	0.393***	0.498***	0.434***
Unemployment benefits II	0.872***	0.761***	1.099	0.772	1.026	0.849*
<i>Schooling degree</i> (Reference: No school degree)						
Lower secondary school	1.025**	1.053**	1.010	1.061	1.040	0.908
Intermediary school	1.046***	1.055**	0.979	1.094	1.117***	1.042
Technical college entrance degree/Upper secondary school	0.955*	1.027	0.964	1.133	1.145**	1.224**
Unknown	1.287***	1.433***	1.553*	1.742	1.714***	1.648*
<i>Vocational Training</i> (Reference: No vocational training)						
With vocational training	1.179***	1.103***	1.168***	1.174**	1.370***	1.238***
University degree	1.074***	1.149***	1.077	1.143	1.623***	1.435***
<i>Labour-market programmes</i> (Reference: No programme)						
Job-creation schemes	0.055***	0.051***	0.068***	0.079***	0.069***	0.075***
Long-term vocational training	0.111***	0.125***	0.175***	0.154***	0.133***	0.123***
Short-term vocational training	0.422***	0.530***	0.632***	0.620*	0.557***	0.773**
Training measures	1.583***	1.304***	1.554***	1.320*	1.595***	1.448***
Wage subsidy	16.290***	24.340***	17.060***	22.610***	10.530***	15.710***
Other measures	0.457***	0.630***	0.336***	0.740***	0.241***	0.347***
<i>Completed labour-market programmes</i> (Reference: No programme)						
Job-creation schemes	0.646***	0.573***	0.476**	1.255	0.727***	0.718**
Long-term vocational training	1.819***	2.048***	1.876***	2.731***	1.545***	1.373***
Short-term vocational training	1.488***	1.264***	1.406**	1.323	1.645***	1.478***
Training measures	1.448***	1.211***	1.223***	1.356***	1.549***	1.469***
Wage subsidy	2.387***	3.296***	3.889***	2.246	2.245***	2.212***
Other measures	1.134***	1.150***	1.066	1.333**	1.082*	1.015
<i>Profession</i> (Reference group: office clerks)						
Farmers, fishermen	1.454***	1.366***	1.504***	2.457***	2.052***	1.393***
Miners	2.109***	2.696	1.380	0.000	0.968	1.222
Quarry men, manufacturers of building materials	1.906***	1.383***	2.186***	1.516	2.126***	1.344
Chemical workers, plastic products machine operators	1.196***	1.245***	1.084	1.021	1.265**	1.081
Paper-products machine operators, printers	1.132*	1.256***	1.144	0.993	0.990	0.801



	Ethnic Germans		Foreigners		Native Germans	
	Men	Woman	Men	Women	Men	Women
Wood treaters, woodworking-machine tool setters and operators	1.366***	1.074	1.193	2.381	1.235	1.010
Metal production process controllers, metal processing plant operators	1.458***	1.153**	1.300*	1.217	1.654***	1.445*
Locksmiths and mechanics	1.433***	1.265**	1.312**	2.346**	1.601***	0.984
Electricians	1.643***	1.132	1.332*	1.010	1.682***	1.216
Machinery workers, Metal workers	1.254***	1.282***	1.044	1.272*	1.035	1.331***
Handicraft workers in textile, leather and related materials	1.095	1.095**	0.785	1.268	0.999	1.184
Butchers, fishmongers, bakers and related food preparers	1.375***	1.491***	1.135	1.497***	1.534***	1.251***
Construction workers	1.574***	0.874	1.699***	1.690	1.796***	0.459**
Interior designers and decorators, upholsterers and related workers	1.555***	1.077	1.515***	1.351	1.628***	0.956
Carpenters and joiners	1.259***	0.954	1.324*	3.713*	1.506***	0.667
Painters, varnishers and related workers	1.641***	1.320**	1.545***	0.461	1.855***	1.296
Product graders and testers	1.386***	1.507***	1.087	1.420**	1.266***	1.259**
Manufacturing labourers	1.247***	1.297***	1.136	1.554*	1.349*	1.360
Machine operators	1.733***	1.299*	1.569***	2.025	2.053***	0.666
Engineers	1.252***	0.839*	1.159	0.833	1.313***	0.910
Technicians	1.229***	1.172**	0.790	0.972	1.394***	0.953
Retail and wholesale trade managers	0.922	0.924*	0.902	1.208	1.060	0.951
Service staff	1.056	1.085	1.242	1.201	0.964	1.006
Transportation clerks	1.518***	1.259***	1.163	1.166	1.724***	0.959
Security guards	1.048	0.936	0.883	0.919	1.200***	0.938
Journalists, artists	1.117	0.646***	1.512**	1.170	1.410***	0.902
Health workers	2.078***	1.539***	1.176	1.572***	1.578***	1.296***
Social workers, teachers	1.145*	1.208***	0.865	1.043	1.230***	1.155**
Hygiene workers, cleaners	1.174***	0.984	0.965	1.181	1.281***	1.211***
Others	1.273***	1.089	1.340	1.785	1.196	0.642*
Unknown	1.170***	0.832***	0.955	0.922	0.926	0.437***
<i>Macroeconomic Conditions</i>						
Labour-market dynamics	1.009***	1.010***	1.014***	1.007	1.011***	1.004
<i>Labour-market region dummies (Not included here<sup>a</sup>)</i>						
<i>Year in which unemployment starts (Reference: 2004)</i>						
2000	1.200***	1.342***	1.211***	1.441***	0.933*	1.136*
2001	0.866***	0.947***	0.941	1.009	0.764***	0.881***
2002	0.695***	0.736***	0.780***	0.697***	0.691***	0.698***
2003	0.777***	0.750***	0.804***	0.758***	0.777***	0.705***
<i>Month in which unemployment starts (Reference: September)</i>						
January	1.464***	1.199***	1.627***	1.272*	1.376***	1.190***
February	1.434***	1.106***	1.554***	1.195	1.537***	1.075
March	1.263***	1.147***	1.463***	1.112	1.373***	1.134*
April	1.182***	1.150***	1.205**	1.101	1.138***	0.995
May	1.191***	1.159***	1.371***	1.113	1.154***	1.004
June	1.168***	1.133***	1.433***	1.165	1.256***	1.049
July	1.105***	1.069**	1.172**	0.952	1.108**	0.972
August	1.072***	1.123***	1.138*	0.965	1.122***	1.050
October	0.974*	1.027	1.096	1.114	0.969	0.987
November	1.026*	1.135***	1.101	1.097	0.995	1.087
December	1.427***	1.429***	1.547***	1.209	1.310***	1.215***
<i>Time intervals (Reference: 21-27 days)</i>						
0 – 6 days	0.981	0.861***	0.927	0.871	0.851***	0.859*
7 – 13 days	0.942***	0.910***	0.903	1.018	0.964	0.941
14 – 20 days	1.060***	1.025	0.963	1.247*	0.963	1.031
28 – 57 days	0.973*	0.993	0.991	1.051	1.150***	1.232***
58 – 87 days	1.072***	0.936**	1.216***	1.086	1.277***	1.071
88 – 117 days	1.300***	1.179***	1.691***	1.393***	1.537***	1.282***
118 – 147 days	1.096***	1.112***	1.329***	1.128	1.364***	1.050

	Ethnic Germans		Foreigners		Native Germans	
	Men	Woman	Men	Women	Men	Women
148 – 177 days	0.967*	1.008	1.185**	0.984	1.118**	0.979
178 – 207 days	1.003	1.141***	1.190**	1.099	1.165***	1.023
208 – 237 days	0.804***	0.785***	0.973	0.756*	1.032	0.822**
268 – 297 days	0.765***	0.764***	0.885	0.701**	0.873**	0.843*
298 – 327 days	0.732***	0.680***	0.932	0.817	0.795***	0.791**
328 – 357 days	0.667***	0.667***	0.800**	0.703*	0.815***	0.761***
358 – 477 days	0.630***	0.627***	0.823*	0.589**	0.826***	0.737***
478 – 597 days	0.681***	0.713***	0.719***	0.642***	0.828***	0.903
598 – 717 days	0.592***	0.541***	0.665***	0.543***	0.710***	0.651***
718 – 897 days	0.556***	0.506***	0.610***	0.503***	0.599***	0.585***
898 – 1093 days	0.636***	0.601***	0.595***	0.555***	0.847***	0.789**
More than 1093 days	0.599***	0.557***	0.608***	0.655**	0.704***	0.751***
N	4,030,623	1,864,964	318,266	172,266	769,883	437,010
AIC	993,690	362,619	69,776	24,263	186,861	78,746
BIC	996,795	365,542	72,263	26,616	189,576	81,328
Link test						
$x\beta$	1.008***	1.003***	1.015***	1.007***	1.022***	1.011***
$(x\beta)^2$	0.001**	0.000	0.002	0.001	0.004***	0.002
LR-test of no unobserved heterogeneity	1,3E+4***	1,1E+4***	776.6 ***	461.5***	2,632.3***	1,280.1***

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

<sup>a)</sup> Regions are classified according to the scheme developed by Eckey/Kosfeld/Türck (2006)

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