Institut für Arbeitsmarkt- und Berufsforschung
Die Forschungseinrichtung der Bundesagentur für Arbeit

IAB

IAB-Bibliothek 369

Die Buchreihe des Instituts für Arbeitsmarkt- und Berufsforschung

Economic integration of migrants in Germany

Hanna Brenzel

Dissertationen

wbv

Institut für Arbeitsmarkt- und Berufsforschung
Die Forschungseinrichtung der Bundesagentur für Arbeit

IAB

IAB-Bibliothek 369

Die Buchreihe des Instituts für Arbeitsmarkt- und Berufsforschung

Economic integration of migrants in Germany

Hanna Brenzel

Dissertationen

wbv

Bibliografische Information der Deutschen Nationalbibliothek

Die Deutsche Nationalbibliothek verzeichnet diese Publikation in der Deutschen Nationalbibliografie; detaillierte bibliografische Daten sind im Internet über http://dnb.ddb.de abrufbar.

Freie wissenschaftliche Arbeit zur Erlangung des akademischen Grades
(Dr. rer. pol.) vorgelegt bei Prof. Dr. Herbert Brücker
Lehrstuhl für Volkswirtschaftslehre,
insbesondere Integration Europäischer Arbeitsmärkte
Wirtschafts- und Sozialwissenschaftliche Fakultät
Otto-Friedrich-Universität Bamberg von Frau Hanna Brenzel, M.Sc.

Als Dissertation genehmigt
von der Fakultät Sozial- und Wirtschaftswissenschaften
der Otto-Friedrich-Universität Bamberg

Promotionsvermerk

Tag der Einreichung:	25. September 2017
Tag der mündlichen Prüfung:	22. März 2018
Vorsitzender des Promotionsausschusses:	Univ.-Professor Dr. Guido Heineck
Gutachter/in:	Prof. Dr. Herbert Brücker
	Prof. Dr. Uwe Blien
	Prof. Dr. Silke Anger

Herausgeber der Reihe IAB-Bibliothek: Institut für Arbeitsmarkt- und Berufsforschung der Bundesagentur für Arbeit (IAB), Regensburger Straße 100, 90478 Nürnberg, Telefon (09 11) 179-0 ■ **Redaktion:** Martina Dorsch, Institut für Arbeitsmarkt- und Berufsforschung der Bundesagentur für Arbeit, Telefon (09 11) 179-32 06, E-Mail: martina.dorsch@iab.de ■ **Gesamtherstellung:** wbv Media, Bielefeld (wbv.de) ■

In der „IAB-Bibliothek" werden umfangreiche Einzelarbeiten aus dem IAB oder im Auftrag des IAB oder der BA durchgeführte Untersuchungen veröffentlicht. Beiträge, die mit dem Namen des Verfassers gekennzeichnet sind, geben nicht unbedingt die Meinung des IAB bzw. der Bundesagentur für Arbeit wieder.

ISBN 978-3-7639-4124-7 (Print)
ISBN 978-3-7639-4125-4 (E-Book)
ISSN: 1865-4096
Best.-Nr. 300980 www.iabshop.de www.iab.de

Contents

Acknowledgments

I would like to sincerely thank my first supervisor, Prof. Dr. Herbert Brücker, who guided me by discussing my projects and motivating me during this time. I would also like to thank my second supervisor, Prof. Dr. Uwe Blien, who was always interested in it wherever possible. Furthermore, I am grateful to Prof. Dr. Silke Anger and Prof. Dr. Enzo Weber for critically reading and commenting on chapter 3 and chapter 2, respectively. In particular, I would like to express my heartfelt thanks to my GradAB-Mentor, Anette who had always an open ear and supported me by discussing every topic carefully and by giving the most valuable feedback. I benefited a lot from her knowledge and her thoughtful and motivating suggestions. I also owe great debt of gratitude to my colleague Parvati who provided access to one of the datasets. Without her work on the record linkage of the data set chapter 4 would not have been possible in this way. The scholarship within the Joint Graduate Program of the IAB and the University of Erlangen-Nürnberg (GradAB) and the simultaneous employment at the IAB provided both financial security and an excellent scientific environment during the time I wrote my thesis. I am thankful for the fruitful formal and informal discussions, exchanges and talks I had with my GradAB colleagues. Among all, I would especially like to highlight Malte and Marie who co-authored two of my papers included within this thesis. Working together with them was a great pleasure and motivated and encouraged me to successfully complete my dissertation. Furthermore, I would like to thank Anne, Ben, Dana, Heiko, Judith, Lucas, Martina, Micha, Ute, Yuliya and all others who critically read and commented on parts of my thesis or helped me with LaTex. In addition, I also like to thank all the researchers I met on conferences and workshops who discussed my work with me and gave me valuable feedback. Finally, I express my deepest appreciation to my family who supported me during the time of this work and endured me even within the stressful phases. This applies in particular to Manu who motivated and encouraged me and always kept his faith in me.

List of Figures

List of Tables

1 Introduction

1.1 Motivation

Within the last decade, Germany witnessed a massive immigration which exceeded the 2 million mark for the first time in German migration history. Both, changes in the institutional framework conditions, and shocks, e.g., EU-enlargement and financial and economic crises, can explain these large migration inflows to Germany. Regarding the first explanation, the European Union's eastward enlargement in 2004 and 2007, for instance, changed the institutional framework for ten European countries, resulting in free movement of persons from these new EU-member states and promoting EU-internal migration. Additionally, unlimited access to the German labor market was gained after the seven-year transition period in 2011 for the 2004 cohort and 2014 for the 2007 cohort regarding the free movement of workers. This access reinforced the scale of migration to Germany.

Concerning shocks as explanation for the increase of immigration, the global financial crisis in 2007, followed by a deterioration in the general economy and recession, provoked migration movements within the EU and towards Germany. Southern European countries especially, were heavily affected by the economic crisis which led to increased immigration from these countries. Moreover, the poor economic situation in Spain, Greece and Italy, compared to that of Germany, induced a migration-diversion effect which heavily increased the immigration of Romanians and Bulgarians to Germany who formerly have been absorbed by Spain, Greece and Italy (Bertoli et al., 2013).

These developments brought, inter alia, the migration issue and the question of integration into the open. The recent refugee crisis intensified this trend and dominates current political and public debates. Especially the question about positive and negative impacts on the receiving country are at the focus of these debates, and not infrequently myths and reality come into conflict. For this reason it becomes even more important to gain profound academic knowledge about the integration process of migrants and the implications of migration for society to offer advice for political decision-makers.

Parallel to these immigration developments, Germany witnesses an aging population due to decreasing fertility rates and longer life expectancy (Rowthorn, 2008). This demographic change causes intergenerational fiscal imbalance and raises the risk of an upcoming labor shortage. Migration is often suggested as a solution to the problem of decreasing populations. For example, Coleman (2008) showed that migration can sustain population size or at least moderate the decline. Bonin et al. (2000) argued that migration can decrease the fiscal burden

induced by the change of the age structure in Germany. Moreover, Brunow and Brenzel (2012) showed that a culturally diverse labor force has the potential to raise regional income through increased productivity and through a greater variety of consumption goods induced by migrant-specific skills. However, according to Ottaviano and Peri (2005) and Rowthorn (2008), the benefits of a culturally diverse population depend also on the degree of integration. Namely, migrants who have newly arrived and are not yet integrated or those migrants who failed to get a job yield fewer benefits than integrated migrants. Furthermore, failed labor market integration of migrants causes a burden on public authorities and decreases the social acceptance within receiving countries. Dependence on welfare payments and other government transfers, which is highly correlated with unemployment, reduces the chance of a self-determined life and impede social integration (Riphahn, 2004; Riphahn et al., 2013).

Against this backdrop, the integration of migrants is a key concern for Germany, especially in attempting to counteract the impact of the demographic change and the impending labor shortage by migration. Therefore it is crucial to understand and investigate the integration process of migrants and their performance in the labor market not least to maximize the labor supply of migrants and their contributions to the receiving society.

As all three essays within this thesis concentrate on the integration process of migrants[1] within Germany, a brief overview of the German migration history follows here, before a short summary of the underlying theories, research methods, and main findings of the essays is given.

1.2 A short history of immigration to Germany

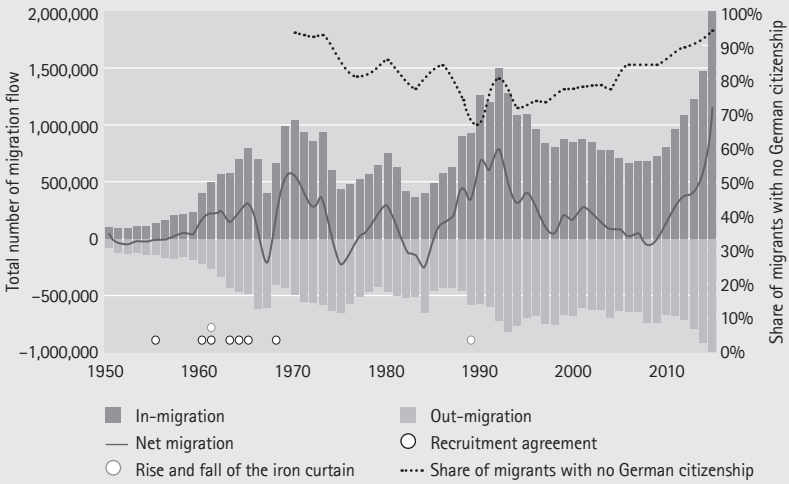
For a long time, Germany claimed that it was not an immigration country. However, since record-keeping in 1950 was implemented, almost 47 million immigration to Germany had been registered by 2015.[2] Early German migration history was mainly dominated by labor recruitment agreements which started in the mid 1950s and ended with the Yugoslavian labor market agreement in 1968. Within this time, Germany pursued an active recruitment policy as an answer to the upcoming labor shortage induced by the increased industrial production. This recruitment led to an inflow of almost 11 million individuals from Italy, Spain,

1 In the following, the term "migrants" and "immigrants" are used as synonyms. If not marked explicitly, migrants are defined as first generation migrants born outside Germany.

2 The migration statistic is a case-related statistic which implies the possibility that individuals are included more than once. Natives are included within the migration statistic. However, since 1970, migrants with no German citizenship can be identified separately, Figure 1.1 explicitly illustrates the foreign migration population share.

Greece, Turkey, Morocco, Portugal, Tunisia and Yugoslavia which are known as guest workers (Schmidt, 1997).

Figure 1.1: Immigration and emigration across Germany's borders between 1950–2015



Source: Own illustration, following Fuchs et al. (2015). Data is drawn from the Federal Statistical Office.
Note: Before 1990 only former territory of the Federal Republic, after 1991 Germany. Up to and including 1956, without Saarland. In 2004, elevated migration numbers of Germans due to statistical revisions.

In 1970, the annual number of immigration reached the 1 million mark for the first time (Figure 1.1). However, as a result of the oil price shock in 1973 and the following economic crises, the German government decided to impose a total recruitment halt in order to terminate the government organized labor migration and to stop immigration to Germany.

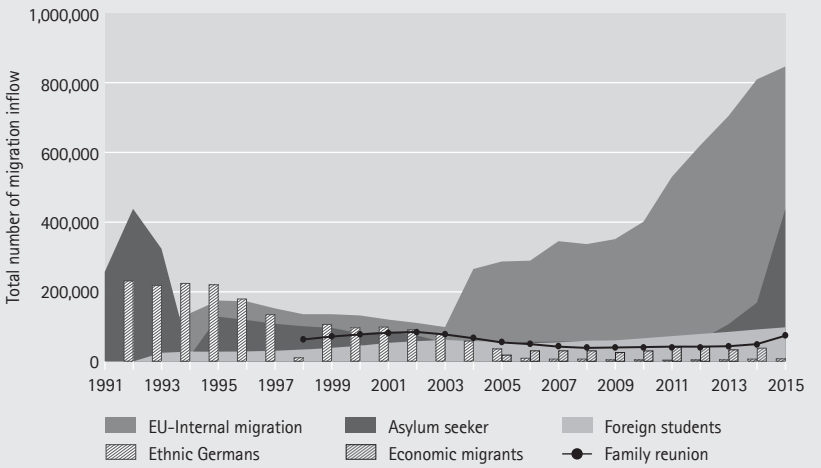
The immigration policy of Germany thus changed fundamentally from a demand-oriented labor migration policy to family reunification and humanitarian migration. On the one hand, the legal change decreased the total number of labor migrants but created, on the other hand, incentives for the guest workers to bring their family members to Germany. This resulted in turning them from temporary migrants into permanent migrants (González-Ferrer, 2007).

In the late 1980s, concurrent with the collapse of the Soviet Union and the fall of the Iron Curtain, the migration history of Germany changed again. Especially the migration inflows in the early 1990s were characterized by ethnic Germans and asylum seekers triggered by the civil war in Yugoslavia (see Figure 1.2). This altered the composition of the existing foreign (born) population substantially within Germany and was reinforced by the enlargement of the European Union in the mid 2000s. As Figure 1.2 suggests, the immigration pattern, dominated by ethnic

Germans and asylum seekers within the early 1990s, was mainly replaced and overtaken by EU-internal migration in the 2000s. However, with the exacerbation of the conflict in Syria and other crisis-stricken countries, the share of asylum seekers dramatically increased in the current years. From 2010 onwards, the immigration steadily increased and reached its highest value on record. More than 2.1 million inflows were registered in 2015. Of course, this sharp increase was mainly influenced by people seeking protection, but still, more than 50 percent of the influx were EU-internal migrants.

To sum up, the migration history of Germany clearly shows that Germany increasingly emerged as an immigration country, initially starting with five percent of the overall population being foreign in 1970 to almost 12 percent in 2015. In the course of these events, the immigration policy and debates concerning the integration of immigrants into the labor market and society has spurred growing interest within Germany. Differences in labor market participation rates, wages, unemployment rates, and occupational positions are just a few of the possible indicators measuring successful or unsuccessful labor market integration of migrants.

Figure 1.2: Immigrant groups to Germany between 1991–2015



Source: Own illustration. Data is drawn from the annual report of the Federal Office for Migration and Refugees 2015.
Note: EU-internal migration: Until 2003: EU-14; 2004 to 2006: EU-24; 2007 to 2012: EU-26, from 2013: EU-27.

1.3 Contents of the three essays

1.3.1 Two different approaches explaining the immigrant-native wage gap

Within the integration literature, wage differentials and labor market assimilation patterns are the major topics. With his seminal work, Chiswick (1978) initiated a worldwide academic and political debate on the assimilation patterns of migrants which has continued to date. According to his study, migrants start with lower wages compared to natives initially after migration, but with time spent in the host country, their wages converge and sometimes even overtake those of natives. The most commonly used explanation for the lower initial wages is imperfect transferability of human capital which immigrants gathered in their home country. Accumulating host-country specific human capital such as language skills, knowledge about the host-country labor market or institutional settings, leads to a higher wage growth compared to natives and thus to wage convergence.

Another conventional way to explain the wage differentials between migrants and natives is the dissimilarity in characteristics. For example, if migrants are self-selected in either a positive or negative respect due to an endogenous migration decision (Borjas, 1987), or there exists a general educational gap between the origin and receiving country, migrants differ in their endowments which drives a wage gap between migrants and natives (Becker, 1964; Mincer, 1974).

Regarding the wage convergence and catching-up process of migrants within Germany, empirical studies provide no uniform picture.[3] For example, Dustmann (1993), Licht and Steiner (1994), Schmidt (1997) and Algan et al. (2010) found rather weak assimilation patterns for Germany and a remaining substantial wage gap even after considering differences in endowments. Traditional approaches that determine wage differentials, such as the human capital theory, seem not able to fully explain labor market performance differences between migrants and natives. Given this still unsolved question concerning the immigrant-native wage gap, Chapters 2 and 3 offer two new approaches explaining the worse labor market performance of migrants by using different datasets.

Job mobility and the immigrant-native wage gap

Chapter 2 draws on the job mobility and the signaling theory to explain remaining wage gaps and even diverging wages between migrants and natives. The main

3 A comprehensive review of existing empirical studies on the assimilation process of migrants in Germany can be found in Bauer et al. (2005).

focus lies on job mobility patterns in early careers of migrants and natives. In the following, three different explanations for job mobility are briefly summarized which illustrate positive effects of voluntary job changes. Based on the signaling theory, negative effects of involuntary job changes can be explained.

The first explanation is based on the basic model of job search theory. In this basic model, a worker selects a reservation wage before an offer is received. If the offered wage exceeds the reservation wage or at least equals the reservation wage, the job offer will be accepted. Due to the assumption of high search costs, the worker is assumed to stop searching for another job and to work at the same firm until retirement (Burdett, 1978; Cahuc and Zylberberg, 2004). By extending the basic model of job search theory, Burdett (1978) and Jovanovic (1979a) made it possible to explain why people continue to job search once they are employed and that these job changes do have a positive effect on future earnings. Burdett (1978) shows, that stopping job search when employed is only the best strategy if the cost of looking for a job while employed is high relative to the cost when unemployed. If this has to be rejected, another strategy yields greater expected payoffs: instead of choosing only one reservation wage, two different reservation wages *X* and *Y* are chosen, whereby *Y* exceeds *X*. Unemployed workers will accept any offer if and only if the wage offered is at least as great as *X* (Burdett, 1978). If the offered wage is smaller than *Y* and the cost of looking for a job while employed is not as high relative to the cost when unemployed, the worker will continue his search while employed until he finds a job with a wage equal to *Y* or greater. The basic assumption of this model is that the worker's productivity remains constant while employed within a particular job. The higher wage, therefore, only evokes by a job change, which yields a higher wage level and, hence, job mobility has a positive effect on lifetime earnings.

The second explanation is based on-the-job-training approach by Mortensen (1988). He assumes that a worker's productivity is no longer constant while employed in a particular job. Therefore the productivity of an individual increases with tenure due to training on the job, learning by doing and other forms of investment in job-specific human capital (Mortensen, 1988). But with experience and tenure, the growth rate of productivity increases on a decreasing rate, and hence, the wage growth increases on a decreasing rate. So, changing a job and starting a new one implies to be on a steeper earning profile segment than someone who has been employed in the job for many periods. The latter one therefore will be associated with a relatively flatter wage profile. Job mobility thus leads to steeper wage growth but could imply temporarily lower wage levels due to nontransferable specific human capital. The worker only maintains his stock of human capital which is general and can be transferred to the new job.

The third explanation, is based on the matching approach, promoted by Jovanovic (1979b). He defines, in contrast to the two models above, jobs as "experience goods" instead of "pure search-goods". As the model says, jobs are experience goods and so a worker and the firm learn to correctly judge the quality of the current match over time (Jovanovic, 1979b), resulting in wage adjustments according to the actual productivity of the worker. This implies that earnings may either decrease or increase in a given job. Due to imperfect information and uncertainty of a worker's productivity in a current job, mismatches may occur and entry wages are based on the expected value of productivity given the information at the beginning of the particular job. Job mobility, therefore, serves as a mechanism where workers locate themselves in jobs where they are able to maximize their productivity (García Pérez and Rebollo Sanz, 2005), which leads to the assumption that individuals who are relatively productive on a particular job will remain on that job, whereas, individuals in poor matches will quit the job they are currently employed in (Schmelzer, 2011).

Besides these voluntary job changes presented above there also occur involuntary job changes, such as layoffs and displacements by plant closure which might differ in their impact on future earnings. The main idea behind the asymmetric-information model of layoffs by Gibbons and Katz (1991) is that in the signaling equilibrium a firm lays off its least productive workers. According to this fact, firms know about the lower ability of the laid-off workers and will offer them only low wages in their prospective jobs. Therefore, the model of Gibbons and Katz (1991) predicts that the post-displacement wages of workers depend and differ according to the reason of displacement. The lay-off event can therefore be seen as a signal which influences future wages because it provides additional information for employers about the productivity of the particular worker besides the observable characteristics like qualification or education. The empirical analysis of Gibbons and Katz (1991) supports the asymmetric-information model of layoffs and confirms the stigma effect due to the cause of displacement. The post-displacement earnings of laid-off white-collar workers are significantly lower than those of workers who were displaced by plant closings and endure significantly shorter post-displacement unemployment spells.

According to the job mobility, voluntary job changes in early careers influence future earnings in a positive way, whereby involuntary changes have a negative impact on wages. Due to higher search costs for migrants compared to natives, a higher probability of job losses ("last in, first out"), and the higher acceptance of offers with lower wages, it can be assumed that migrants behave differently in their job mobility patterns. This may lead to wage differences between immigrants and natives due to different numbers of job changes or due to the respective returns to job mobility for migrants. Supposing both mechanisms have an effect

on the wage profiles, parts of the wage gap between natives and migrants should be explained by considering job mobility patterns. Using the ALWA-ADIAB dataset, the empirical findings in Chapter 2 confirm this assumption and depict differences in mobility patterns between migrants and natives, which influence the wage trajectories and explain the wage gap between both groups. This new approach supplements the existing labor market integration literature in explaining wage differentials between migrants and natives and provides further insights into the unsolved question of remaining wage differentials. The longitudinal design and the rich set of variables of the underlying dataset allow employment trajectories to be measured in more detail than they have been previously. For example, mobility patterns can be examined on a monthly basis, and job changes can be distinguished by their different reasons. Both are unique features that are particularly relevant for addressing the specific research question.

Non-cognitive skills and the immigrant–native wage gap

In Chapter 3, a different approach – borrowed from the gender wage gap debate – is utilized to explain wage differentials between migrants and natives. The idea draws upon a behavioral model of earnings proposed by Bowles et al. (2001b,a), in which non-cognitive skills are incorporated and these skills influence wage-settings. The motivation to additionally incorporate non-cognitive skills, besides cognitive and demographic characteristics in a traditional wage model arise, among others, to the questions why *"apparently similar individuals receive quite different earnings"* and why *"seemingly irrelevant personal characteristics, including beauty, height, obesity, and even whether one keeps a clean house, are often robust predictors of earnings"*, which cannot be answered by the canonical human capital model (Bowles et al., 2001b).

In this behavioral model, a principal-agent relationship between employer and employee is assumed with asymmetric information regarding the employee's supplied effort level (Bowles et al., 2001b,a). While contracting the supplied hours of work, the effort level of an employee can not be fixed which ends in a contractually incomplete employment relationship and hence an endogenous effort delivered by the employee. As enforceable wages can at best specify the required hours but not the employee's effort, employers might be willing to pay for incentive-enhancing preferences that ensure and elicit the employee's effort (Bowles et al., 2001b).

According to a standard wage model, an employer chooses the hours of work and wage to maximize profits, keeping in mind, that higher wages may induce more effort due to higher cost of job loss. Wages are thus used to elicit effort as proposed by efficiency-wage theory. Depending on the offered wage, an employee

then chooses effort to maximize utility. If we now assume that individuals differ in their preferences such as the utility function is upward shifted by a parameter, Bowles et al. (2001b) speaks of an incentive-enhancing preference. Individuals with incentive-enhancing preferences thus work harder at every wage level as otherwise identical individuals. If these differences are recognizable by employers, the employee with incentive-enhancing traits will be paid more. Bowles et al. (2001b) propose the degree of future orientation as one example for an incentive-enhancing preference, as an employee with a lower rate of time preferences will be more careful to ensure to be retained in the future compared to an employee with a lower future orientation.

If non-cognitive skills such as personality traits differ among different employee groups or are rewarded differently among them, wage disparities occur. Following this approach, Chapter 3 contributes to the rather small body of economic literature dealing with personality traits and reveals first results regarding the relationship between personality traits and the labor market outcomes of migrants in Germany. By drawing on a linked employer-employee dataset (LPP), not only individual-level information is taken into consideration, but establishment-level information can also be included in the analyses which has previously not been done to this extent. The empirical results confirm differences in the average personality traits and show that personality traits are rewarded or punished differently depending on the focused group. In a second step, Oaxaca-Blinder decomposition technique is used to show, for the first time, that including personality traits decreases the unexplained portion of wage differentials between migrants and natives and thus contributes to the immigrant-native wage gap.

1.3.2 Family migration

Research on the labor market integration of migrants predominantly focuses on male migrants within an individual-level framework. Both labor market performance in a family context as well as single female migrants are rather rarely discussed within international migration literature. At the same time, family reunification and the share of women in international migration is gaining importance. For example, in 2015, female migrants accounted for more than 52 percent of the total stock of migrants in Europe (United Nations, 2016). According to the German Federal Statistical Office, the share of female foreigners increased by more than 10 percentage points during the last 45 years to almost 50 percent in 2015. Not only has the share of female migrants increased recently, but the subsequent immigration of spouses is growing in importance within Germany (Büttner and Stichs, 2014). However, in comparison to economic migrants, the migration decision

of spouses is, in principal, based on private reasons and thus differences in terms of their social situation might appear. Not least because of this, family migration or in particular subsequent immigration of spouses has been the subject of controversial public debates. For obtaining a holistic picture of the labor market integration of migrants, it is essential not to focus only on male migrants and assume that all migrants moved as single individuals, but rather to consider the family structure at the time of migration and how this affects the integration process of both male and female migrants.

Thus, Chapter 4 addresses the labor market implications of migration in a partnership and family context and analyzes whether there is any systematic variation in the labor market performance of single and family migrants. Two main strands of theory of the labor market integration process of family migrants exist. Following Mincer (1978), the question of migration should be examined in the family context rather than in the individual context, as long as more than one adult member lives within the household. The so-called tied movers – subordinate their migration decision to their spouse – move even though migration implies no maximization of the individual utility. Consequently, the tied mover status leads to less favorable economic position after migration compared to other migrants which might be reflected by lower labor market participation, lower earnings or higher probability of over-qualification.

The second theory which predicts labor market participation of family migrants was developed by Long (1980). He argues that due to credit constraints of immigrant families, adult household members have to specialize. One spouse accumulates host-country specific human capital, whereas the other spouse has to serve as a borrowing function in order to finance the human capital accumulation, implying a higher probability of labor market participation initially after migration. However, as soon as one household member gathers enough host-country specific human capital, the other one reduces his/her working hours or even withdraws from the labor market.

Based on the tied mover theory and the family investment theory, the labor market participation of family migrants – measured by three different indicators – is analyzed in Chapter 4. Drawing on the new IAB-SOEP Migration Sample, not only a distinction of family and single migrants is feasible, but it is also possible to distinguish between different types of family migrants, allowing to depict a more precise picture of the integration process of family migrants. Additionally, and unlike previous research, the subdivision into different family types facilitates a comparison of migrants among each other. The empirical results confirm not just differences between family and single migrants, but also variation among the different types.

1.4 Data basis

The data base for this thesis consists of three different datasets of the Institute for Employment Research (IAB). The analyses in Chapter 2 draw on the ALWA-ADIAB dataset, Chapter 3 uses the LPP and Chapter 4 draws on the IAB-SOEP Migration Sample. In the following a brief overview of the three underlying datasets is given and their suitability for the underlying research questions examined in this thesis is provided. Detailed descriptions and sample restrictions are provided within each chapter.

1.4.1 ALWA-ADIAB

The ALWA-ADIAB dataset is a combination of survey and administrative data. The survey data is drawn from the retrospective survey "Working and Learning in a Changing World" which belongs to the research-project "Qualifications, Competencies and Working Life" (Antoni et al., 2010). The population represents all individuals who were born between 1956 and 1998 and were registered at the resident registration office in July 2007, irrespective of their language skills, nationality and employment status (Antoni et al., 2010). Overall 10,404 interviews were conducted.

The main purpose of the project was to establish a data basis that is able to detect the interplay between basic cognitive competences and educational processes. Therefore, the survey was conducted in two parts. By drawing on computer-assistant telephone interviews, detailed information on educational and occupational histories, as well as housing and family history were surveyed retrospectively. The second part of the survey contains literacy and numeracy tests, which were carried out for those respondents who agreed to participate in such tests (Antoni et al., 2010).

Based on the detailed survey of life course data and especially employment biographies, the dataset represents a perfect basis for the question to be investigated in Chapter 2. Respondents had to report every single period of employment, including all secondary activities or second jobs. Especially, the detailed documentation of employment changes, or employment interruptions, and the surveying of the specific reason for the changes make this dataset so valuable and suitable for the research question answered in Chapter 2. By linking the survey data to the administrative data of the Federal Employment Agency, information on wages on a daily basis can be derived, which completes the dataset. At the end, the ALWA-ADIAB provides a rich set of survey based information on sociodemographic characteristics which are only partially and incompletely available in the

administrative data combined with highly reliable process generated information on daily wages.

1.4.2 LPP

Chapter 3 draws on the Linked Personal Panel (LPP) which technically consists of a linked-employer-employee dataset based on the IAB-Establishment Panel Survey (BP). The survey belongs to the research-project "Quality of work and economic success" which focuses on sustainable Human Resource management approaches and their influence on individuals' ability to work (Bellmann et al., 2015). Nevertheless, a large number of different research questions around this topic can be analyzed with the LPP. The main feature of the dataset is the combination of survey and administrative data, both on individual-level as well as on establishment-level.

The employer survey is a representative sample of establishments which participated in the 2011 and 2012 waves of the BP with more than 50 employees subject to social security. Only establishments in the agriculture, forestry, fishing and public sector are excluded (Broszeit and Wolter, 2015). Contrary to the employer survey, the Employee History of the IAB (BeH) is used for the sampling of the employee survey which yields representativity of all employees subject to social insurance contributions and those in marginal employment, however, limited to the establishments interviewed (Bellmann et al., 2015).

One main part of the employee survey contains specific questions on personal characteristics. Among others, a variety of statements were included which allow detection of the Big Five personality traits of the interviewed employee. Based on the combination of detailed establishment and individual information from different data sources, this dataset provides unique opportunities for the analysis of the association between the Big Five and wages. Unlike administrative data, this LPP allows to identify migrants according to their country of birth as well as includes information of the Big Five personality traits in combination with important establishment characteristics. The combination of these three features is quite rarely observable but essential to answer the research question in Chapter 3.

1.4.3 IAB-SOEP Migration Sample

The research question in Chapter 4 is based on the new IAB-SOEP Migration Sample which is part of the renowned Socio-Economic Panel (SOEP) at the German Institute for Economic Research. This sample takes into account the changing structure of migration to Germany since 1995 (Brücker et al., 2014). Unlike the

previous samples of the SOEP, this migration sample can be linked – depending on the consent of the respondents to the linkage – to the administrative data of the IAB, the Integrated Employment Biographies (IEB).

As the administrative data of the IAB is used as the sampling frame, the population of the IAB-SOEP Migration Sample represents individuals who have ever been either unemployed or job seeking or who have obtained means tested benefits or paid social security contributions and entered the registered data in 1994 the first time. As there is no information about the country of birth within this registered data, a migrant was identified by whether or not a person ever had non-German nationality (Brücker et al., 2014). Moreover, migrants were also identified by participation of specific programs or via onomastic procedures. Counting up all four waves of the IAB-SOEP Migration Sample, 7,131 individuals were interviewed at least once.

The main feature of the IAB-SOEP Migration Sample is the coverage of detailed migrationrelated issues and complete biographies in their origin country (Brücker et al., 2014). One main topic within the survey relates to the situation in partnership at the point in time of migration, which makes this survey highly valuable to investigate family migration issues. Moreover, as the survey encompass both an individual and household questionnaire, detailed information about the household composition, at least on a yearly basis, can be conducted. Combining the comprehensive survey information with highly reliable data on employment biographies in the registered data represents a perfect basis to study the interplay between relationship or family composition and the labor market integration process of migrants.

1.5 Structure of the thesis

Put it briefly, the thesis raises the economic integration of migrants from various perspectives and contributes to the existing literature by offering new explanations for the immigrant-native wage gap and the labor market performance of single and family migrants. The thesis contains three self-sufficient essays embedded in Chapters 2, 3 and 4 which are linked by the theme of labor market performance. Chapters 2 and 3 take the wage gap between migrants and natives into consideration whereas Chapter 4 focuses on the differences of family and single migrants in terms of their labor market integration. Each of the following Chapters 2–4 starts with an introduction and ends with a conclusion. The final chapter 5 of the thesis summarizes the main findings, highlights limitations and further research possibilities, and reflects on policy implications. Supplementary materials for Chapter 2, 3 and 4 are included in the corresponding appendices.

2 Job mobility as a new explanation for the immigrant–native wage gap: A longitudinal analysis of the German labor market[1]

2.1 Introduction

The integration of immigrants into the labor market is a key concern in industrialized countries and is considered in public and academic debates. In this context, wages are of major importance because they are one of the key measures of economic and social integration. Often, substantial differences exist between the wages of immigrants and natives, indicating friction in labor market integration. A broad strand of the migration literature thus addresses the immigrant-native wage gap (Aldashev et al., 2012; Chiswick, 1978; Chiswick and Miller, 2009; Borjas, 1985). However, the size of the gap varies considerably depending on the population of interest and the means of analysis.

Theoretically, the emergence of wage differences can be explained by human capital theory, which includes the depreciation of human capital with migration and differences in individual characteristics such as qualification. However, according to cross-sectional studies, only some parts of the wage gap can be explained by differences in endowments, and in the majority of cases an unexplained portion of the gap remains. Thus, human capital theory cannot fully explain the existing wage gap, leaving space for other approaches to address wage differentials.

We follow a new explanation and – drawing on job-shopping and signaling theory – assume that differences in employment trajectories between migrants and natives contribute to diverging wages. We thus draw on debates that emphasize the importance of job mobility for migrant integration (Fuller, 2015; Fuller and Martin, 2012). Voluntary job changes, especially within the first years of employment, should positively influence future earnings, either through an increase in the wage level or through a steeper growth rate. Involuntary changes, however, should have a negative impact. Assuming differences in the mobility behavior of migrants and natives, i.e., fewer voluntary changes and more involuntary changes, we should observe diverging wages after labor market entry. The primary goals of this article are thus first, to examine differences in job mobility and second, to analyze whether such differences contribute to wage inequality between migrants and natives. We focus on Germany, which has become the second-largest immigration

1 This chapter is joined work with Malte Reichelt and already published as: Brenzel, H.; Reichelt, M. (2017): Job mobility as a new explanation for the immigrant-native wage gap: A longitudinal analysis of the German labor market. International Migration Review, published online-first (https://doi.org/10.1111/imre.12313).
The study has been presented at the Summer School DEFAP-LASER in Applied Microeconometrics in Mailand and at the Young Economists Meeting in Brno.

destination in the OECD. The improving economy and a growing economic gap with neighboring countries have increased immigration (Bertoli et al., 2013; Brücker, 2015). In particular, labor migration has grown, and according to the OECD (2014), immigration flows have increased by over one-third from 2011 to 2012. Drawing on the longitudinal, retrospective ALWA-ADIAB data set and employing fixed effects regressions, we indeed find evidence that differences in job mobility between these two groups explain a substantial part of the wage gap. Because migrants have fewer voluntary and internal and more involuntary job transitions, wage trajectories diverge over the life course.

The paper is organized as follows. We first provide a brief overview of the main theories used to explain immigrant-native wage gaps. We then derive our hypotheses on the incidence and impact of differing job mobility employing job-shopping and signaling theory. Subsequently, we describe the ALWA-ADIAB data set, sample restrictions, main variables and operationalizations. The empirical section includes descriptive evidence on wage trajectories, job mobility rates and transition probabilities, before turning to the main results of multiple fixed effect regressions in which we analyze the effect of job mobility on the immigrant-native wage gap. Further, we describe a series of checks and analyses we conducted to assure the robustness of our findings. The paper concludes with our primary findings and a discussion of the limitations of the study as well as of potential areas for future research.

2.2 Theoretical background and previous literature

2.2.1 The immigrant–native wage gap

The analysis of wage disparities between immigrants and natives has a long history in the literature on the economic and social integration of migrants. Empirical studies on Germany and other industrialized countries agree that a gap exists between native and migrant earnings, utilizing various theories to explain the emergence and persistence of this gap (Seifert, 1997; Velling, 1995; Lehmer and Ludsteck, 2011).

The human capital theory, which addresses differences in the endowments of individuals, is the most prominent approach to explain wage gaps between immigrants and natives. Support for this theory is provided by Velling (1995), who shows that most of the wage differentials in the German labor market are due to differences in human capital. Dissimilarities in characteristics can be attributed to either the selectivity of migration or to a general educational gap between the host country and the country of origin (Granato and Kalter, 2001). This educational

gap is particularly relevant if there are great differences in the institutional setting, the economic status or the per-capita income between these countries. If these were the only factors, controlling for formal education and the qualifications of individuals should eradicate differences in earnings.

Nevertheless, Aldashev et al. (2012) find a considerable wage gap between native Germans and foreign-born individuals, even after considering endowment differences, and conclude that the imperfect transferability of human capital is a major factor driving wage inequality. This concept can be traced to Chiswick (1978), who stresses the importance of country-specific human capital. Moreover, the larger the distance in terms of language or cultural features between the destination and origin countries, the less transferable the human capital (Nielsen et al., 2004). When arriving in a new country, migrants suffer from disadvantages, even when they have the same demographic characteristics and qualifications as natives (Chiswick, 1978; Chiswick and Miller, 2009; Friedberg, 2000; Borjas, 1985; Basilio et al., 2014). These disadvantages may be caused by a temporary depreciation of specific human capital due to migration. Country-specific knowledge, language proficiency and labor-market skills, however, should increase with time spent in the host country, and therefore, differences should disappear over time. The effect should thus be transitory due to this so-called assimilation process (Nielsen et al., 2004). Dustmann (1993), however, does not find evidence to support this hypothesis for Germany. His findings suggest that wage inequality does not decrease over the migrant's employment history in the target labor market, although the expected length of stay in the host country does positively influence the assimilation process.

The existing theories do not appear to fully explain the wage gap between migrants and natives, and therefore, the remaining unexplained gap is usually ascribed to taste-based or statistical discrimination (Agrawal, 2013; Arrow, 1973; Phelps, 1972; Borjas, 1994; Becker, 1957). However, we argue that some measurable mechanisms that drive wage inequality have been neglected. We thus extend the above-mentioned explanations by focusing on theories that generally explain wage dispersion in the labor market, namely, job-shopping and signaling theory. To establish a career, employees often change jobs, resulting in wage growth (Fuller, 2008). Differences in the potential from or the incentives and restrictions to such mobility then contribute to diverging wages.

2.2.2 Job mobility and its impact on wage inequality

The first years of an employee's career are usually characterized by a high number of job changes during the so-called period of job shopping (Topel and Ward, 1992; Schmelzer, 2012). This type of job mobility influences both employment and wage

trajectories and, thus, supplements human capital theory to explain the existence of concave experience-earning profiles. According to Gius (2014), an average worker in the United States has approximately ten different employers throughout his working life. Usually, these changes are connected to wage growth (Fuller, 2008). Although the number of changes is generally lower in Germany (Dustmann and Pereira, 2008), an equivalent mechanism can be assumed. Explanations for this pattern are manifold, including continuous job searching, which leads to job changes in cases of higher potential earnings (Burdett, 1978; Jovanovic, 1979a) or mismatches in the labor market (Jovanovic, 1979b). The matching approach defines a job as an "experience good" and assumes that mismatches may occur due to imperfect information and uncertainty regarding the productivity of a worker in the current job. Job mobility therefore serves as a mechanism through which workers place themselves in jobs in which they are able to maximize their productivity (García Pérez and Rebollo Sanz, 2005). Individuals who are relatively productive in a particular job will thus remain in that job, whereas individuals with a poor match will quit (Schmelzer, 2012). Mortensen's (1988) on-the-job-training approach assumes that worker productivity is not constant while employed in a particular job. While the productivity of an individual increases with tenure due to training received on the job, learning by doing and other forms of investment in job-specific human capital (Mortensen, 1988), the growth rate of productivity declines over time. Thus, changing a job and starting a new one implies moving to a steeper earning profile segment. However, these theories apply only to voluntary changes, and involuntary changes through layoffs and discharges or terminations imply different triggers and effects. Gibbons and Katz (1991) assume that firms lay off their least productive workers. Potentially, new employers thus interpret layoffs as a signal of lower productivity and offer only low-paid positions. As layoffs do not occur due to negative employee behavior, the signal should be weaker than for discharges and terminations in which personal performance comes to the fore. Consequently, this creates a much stronger negative signal. However, with the exception of mass layoffs, all layoffs and discharges should generally convey a negative signal. Moreover, a future employer is not likely to know which type of layoff has occurred. Schmelzer (2012) finds support for signaling theory in his empirical work on Germany. He states that indirect job mobility, i.e., a job change via unemployment, not only has negative effects upon re-entry into the labor market but also has a long lasting consequences for future earnings whereby direct voluntary job mobility implies permanent income rewards. Accordingly, García Pérez and Rebollo Sanz (2005) find positive effects for voluntary changes and long-lasting negative consequences for involuntary changes.

2.2.3 Differences in job mobility patterns

Having focused on the general influences on individuals' earning profiles, we now turn to the question of whether migrants should exhibit different job mobility patterns than natives, and if so, whether this difference leads to wage disparities, hence helping to explain part of the wage gap between natives and migrants. As explained in the previous section, job transitions have a crucial impact on future earnings, but the effect depends on the type of transition – namely, voluntary or involuntary job changes. If we now assume that migrants' and natives' number of job changes differ and that the effect of job changes depends on the type of change, we expect that part of the wage gap could be explained simply by controlling for the number of changes. However, why should the number of voluntary and involuntary changes differ for natives and migrants? First, focusing on voluntary job changes, migrants are assumed to have higher search costs. These higher search costs can be caused by a lack of host country-specific knowledge, i.e., less information about job opportunities and employment services or weaker language proficiency. Because the intensity of a search is inversely related to the costs of a search (Keith and McWilliams, 1999), migrants should experience fewer voluntary job changes than natives. Drawing on job-shopping theory, we assume that more voluntary job changes cause higher future earnings. These assumptions lead to our first hypothesis:

H1: Fewer voluntary job changes for migrants lead to lower wages compared to natives and therefore explain part of the wage gap between them.

Second – and as a special case of voluntary job changes – migrants should have a lower probability of internally switching positions. Internal career progression can be of the upmost importance for wage growth. Assumptions about differences in the number of internal changes can be derived from the promotion literature. For example, Cobb-Clark (2001) argues that opportunities for promotion vary if jobs are segregated between different groups. If we assume that this is the case for migrants and natives, the number of internal changes should differ. Differences in internal job changes also occur due to variation in the outside options and bargaining power of migrants and natives. Again, if we assume that migrants are less visible to other employers due to less knowledge that is specific to the destination country and fewer relevant network ties (Wegener 1991), this reduces their outside options and hence leads to fewer promotions. Borrowing from the gender argument in Cobb-Clark (2001), migration status should also enter into the promotion equation if migrants and natives differ in their productivity-related

endowments in a new job. Migrants experience depreciation of human capital, mainly initially after migration, and consequently relatively lower productivity, which should lead to fewer promotion chances. We therefore assume the following:

H2: Fewer internal job changes for migrants lead to lower wages compared to natives and therefore explain part of the wage gap between them.

For involuntary changes, however, a negative effect on the wage profile must be expected. Observable characteristics such as formal qualifications or work experience are usually relevant information for potential employers. However, according to signaling theory, an involuntary change may reflect the lower ability of the employee and thus provide additional information that may hinder wage increases. Even if a formal qualification is accredited, employers may be unsure regarding the productivity of migrants. Moreover, migrants face a signaling disadvantage, especially right after entry into the labor market, because employers are better able to judge the qualifications of job applicants from their own cultural group (Cornell and Welch, 1996). Thus, employment relationships may appear to be a mismatch after a certain amount of time, resulting in higher numbers of separations for migrants, which may further explain part of the growing wage gap. Therefore, our third hypothesis is the following:

H3: More involuntary job changes for migrants lead to lower wages compared to natives and therefore explain part of the wage gap.

Despite the above-mentioned arguments, we still have to be aware that the explanation for job mobility is not fully distinguishable from the two other explanations: human capital and discrimination. For instance, human capital variables, such as work experience or education, can impact search costs via their relationship to network structures and the relative size of the labor markets in which workers can compete. Differences in internal promotions and layoffs may directly reflect discrimination. Therefore, the type and number of job changes might also result from direct or indirect discrimination. Consequently, we do not assume that traditional human capital or discrimination theories do not play a role in our analysis. However, we argue that differences in job changes, independently of what drives these differences, affect wage trajectories and offer a new explanation for the immigrant-native wage gap and reveal possible means to counteract wage differences.

2.3 Analytical approach

2.3.1 Data and sample restriction

To test the derived hypotheses, we draw on the "ALWA survey data linked to administrative data of the IAB" (ALWA-ADIAB). These data are drawn from a retrospective survey, "Working and Learning in a Changing World" (Antoni et al., 2010), which is linked to administrative data at the individual and firm levels (Antoni et al., 2011; Antoni and Seth, 2012). The survey was conducted in 2007 and 2008 and contains sociodemographic information and complete life course data for 10,177 individuals (Kleinert et al., 2011). This survey is representative of the current population in Germany that was born between 1956 and 1988. The ALWA survey uses a combination of modularized self-reports and event history calendars, which have been shown to improve completeness and dating accuracy (Drasch and Matthes, 2013). A potential drawback of the data for our research question lies in the type of survey, as the data were collected by computer-assisted telephone interviews with German speaking respondents. We thus assume that – in terms of integration – we face positive selection of migrants and therefore potentially underestimate the wage gap. Nevertheless, the longitudinal design and the rich set of variables allow employment trajectories to be measured in more detail than has been done before. The ALWA-ADIAB offers the ability to examine mobility patterns on a monthly basis. Moreover, it enables us to differentiate between voluntary, involuntary, internal and other job changes[2] – a unique feature that is particularly relevant for addressing the influences of job transitions. We restrict our analytical sample to the years from 1993 to the interview date because we lack administrative information for East Germany prior to that date. Moreover, restricting the time frame reduces the risk that event dates are incorrectly remembered by respondents. We also limit our sample to people who have had at least one employment spell. We define employment episodes as major employment spells that are not part of apprenticeships or other training measures. Moreover, we exclude employment episodes containing self-employment and the employment relationships of civil servants or freelancers. These episodes cannot be found in the administrative data, as they are not subject to social security contributions. We ignore employment episodes that were observed during schooling or upon first completing formal

2 A detailed discussion about "other changes" can be found in subsection 2.3.2

training, as we do not assume these to be regular employment episodes.[3] After restricting our sample, 7,437 employees remain, including 495 migrants. Thus, approximately 6.7 percent of our sample consists of migrants. We have 1,164,318 monthly observations of which 856,721 are in employment and 686,045 enter the multivariate analysis with no missing values.

2.3.2 Variables and operationalization

Our dependent variable is the logarithm of hourly wages. Wages are obtained from the administrative data and are thus highly reliable; however, they are right censored due to the social security contribution limit. Moreover, the spell structures of the retrospective survey and the administrative data are not completely congruent. Therefore, we utilize the method proposed by Reichelt (2015) and impute wages above the censoring limit and – using contract information from the ALWA – calculate hourly wages from the combined data set. Additionally, we exclude wages below the marginal employment limit, as these were not reported prior to 1999.[4] Our main construct of interest is migratory status. We define migrants as all people who are foreign-born and migrated to Germany after the age of six years. We thus ensure that migrants in our sample did not complete all their schooling in Germany. To control for the fact that mobility dynamics might not differ between native-born Germans and those who immigrated at young ages, we performed robustness checks defining first-generation migrants as those who were 18 or older when they immigrated. However, our results did not change substantially.[5] The main independent variable is actual experience in the German labor market. Due to our data set design, we are able to measure the actual time spent in employment instead of only potential experience. This measure is important because we assume that wages grow and diverge over the career rather than over age or the potential experience in the labor market. Together with exponentiated experience, this measure is able to capture nonlinearity in the wage trajectories and model the typical process of slowing wage growth over time. As wage growth is greatest at the beginning of a career, our primary interest lies in transitions that occur immediately after labor

3 The reason for such an assumption rests in the German vocational training system. During vocational training, trainees are employees subject to social security system, but they agree or commit themselves to remain with the firm until their training period ends. As a consequence, no regular job change is possible during this time. Moreover, their wages are much lower than those of regular employees during this time. Therefore, we argue that these are not standard employment episodes, and they are excluded from our analysis.

4 A detailed description of the imputation method can be found in the Appendix A.

5 Restricting our analyses to migrants who enter the labor market when they were 18 or older results in a smaller sample size, inducing stronger uncertainty in our estimations. However, we argue that those who immigrate at younger ages still face discrimination and higher search costs. They lack parental networks as well as the tacit knowledge of their parental labor market. Algan et al. (2010) show that the wage gap even persists across generations, arguing that the parental disadvantages partially carry over to the second generation.

market entrance. We only count job changes after migration because we assume imperfect transferability of human capital to the host country. Therefore, at least to some degree, migrants face a new start in the foreign labor market. We differentiate among four types of job changes. Respondents were asked about the termination of employment episodes. We utilize that information and create dummy variables for the first and second voluntary, involuntary, internal and other changes. We include other changes, which encompass mutually agreed upon terminations or completion of fixed-term relations as a robustness check and to receive a complete picture of job mobility and its influences on diverging wage trajectories. As this category encompasses multiple indistinguishable types of job transitions, however, we refrain from deriving hypotheses about these changes. The transitions may partially reflect voluntary changes because the employee who decided to quit the job did not want to remain with the employer after the end of a fixed-term contract. However, these changes might also reflect involuntary changes because mutually agreed upon terminations often cover up dismissals. The first and second change account for approximately 83 percent of all job transitions because most employees do not have more than two of the above-defined transitions during the observational period in ALWA. As Table 2.1 shows, half of the job changes are voluntary, which means that the employee terminated the contract. Approximately 12 percent of the episodes are terminated by the employer. 19 percent of employment episodes are terminated but followed by a new contract from the same employer, and approximately 14 percent were terminated as arranged beforehand.

Table 2.1: Type of job changes

Type of change	Number	Percentage
Voluntary	1,830	55.42
Involuntary	396	11.99
Internal	626	18.96
Other	450	13.63
Total	3,302	100

Source: ALWA-ADIAB, own calculations.

Further independent variables encompass the months spent in unemployment or in labor market inactivity. These variables are included because the effect of an involuntary change might be ascribed to the time spent without a job due to signaling and the depreciation of human capital. While unemployment measures the former, labor market inactivity should measure the latter. Moreover, we include company size to analyze whether any effects from job transitions can be ascribed to the destination of the job change. Further control variables

encompass individual measures such as civil status or the age of children in the household and interaction terms with the gender variable. We include these variables to ensure that the effects we are measuring cannot be ascribed to differences in the composition of the groups of migrants and natives. Moreover, some factors – such as overqualification, the economic sector or subsequently attained education – might influence both job mobility behavior and wage trajectories. A full list of the variables that we include in our analysis can be found in Appendix Table A.1.

2.3.3 Statistical method

To analyze how the wage gap between migrants and natives develops over time and how job mobility patterns affect the difference in wages, we utilize a Mincer-type regression and adopt the analytical approach of Schmelzer (2012), who analyses wage differentials using person fixed effects regressions and dummy variables for different types of job mobility:

$$\begin{aligned} ln(y)_{it} = {} & \beta_1 exp_{it} + \beta_2 Mig_{it} + \beta_3 exp_{it} * Mig_{it} + \beta_4 exp_{it}^2 + \beta_5 exp_{it}^2 * Mig_{it} \\ & + \beta_{Vol,n} Vol_{n,it} + \beta_{Invol,n} Invol_{n,it} + \beta_{Int,n} Int_{n,it} + \beta_k X_{k,it} + \alpha_i + \varepsilon_{it} \end{aligned} \tag{2.1}$$

where $ln(y)_{it}$ is the logarithm of the hourly wage of individual i at time t, exp_{it} measures the actual time in years spent in employment relations, Mig_{it} a dummy for migratory status, $Vol_{n,it}$ a dummy for first and second voluntary change, $Invol_{n,it}$ for the first and second involuntary change, $Int_{n,it}$ for the first and second internal change, and $X_{k,it}$ represents all k control variables. α_i is the person fixed effect controlling for all time-invariant characteristics, and ε_{it} is the individual residual at every point in time t. Because we suspect serial autocorrelation in residuals over time, we utilize Huber-White robust standard errors (Cameron and Trivedi, 2010).

The interaction of migratory status and labor market experience, measured in years, provide an indication of the development of wages over time. The inclusion of dummies for job changes then allows an evaluation of the impact on the wage gap. We estimate the average gap between migrants and natives after 1, 5 and 10 years using different model specifications. We thus obtain information regarding which variables explain portions of the wage development and, therefore, their divergence.

2.4 Results

2.4.1 Descriptive results

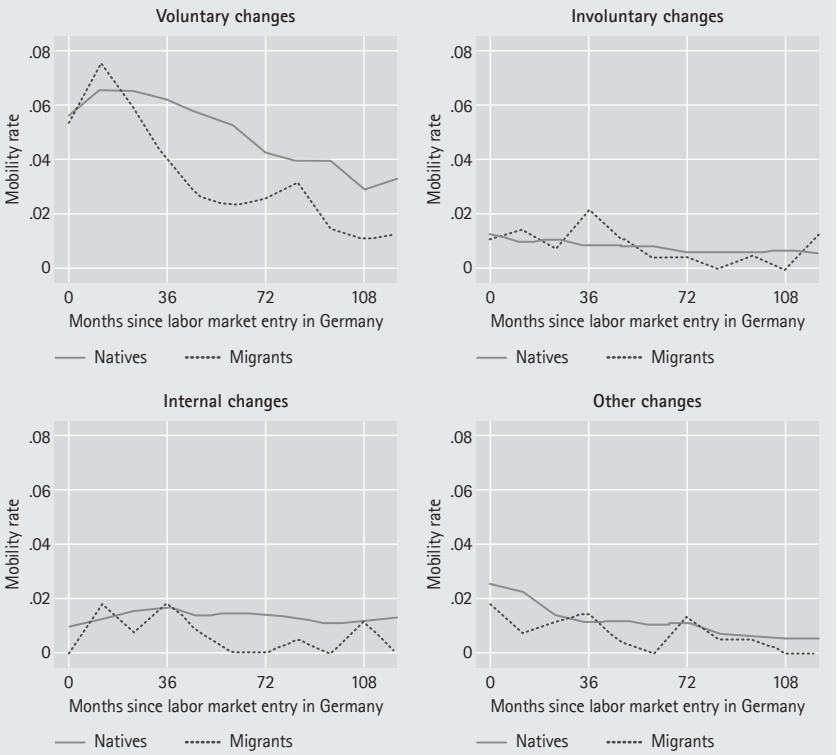
Before turning to the multivariate analyses, we first determine whether a wage gap exists and, if so, how large it is. Figure 2.1 describes the trajectories of migrant and native hourly wages after entering the German labor market. Starting from a relatively equal value, the trajectories diverge over time. Without controlling for any compositional effects, we find a gap of approximately 6 percent after 10 years of actual labor market experience, meaning that the hourly wages of migrants only amount to 94 percent of natives' wages. Again, we want to emphasize that this gap will most likely constitute the lower bound of the wage gap, as we have a positive selection of migrants on language proficiency.

Figure 2.1: Immigrant–native wage gap by actual labor market experience

Source: ALWA-ADIAB; own calculations.

Our primary interest lies in whether the wage gap persists even after controlling for the composition effects of the two groups and in how much of the gap can be explained by differences in job mobility behavior. To assess whether mobility rates indeed differ between the two groups, we first calculate the average probability of having one of the four types of job changes within a year. Figure 2.2 shows these probabilities for both natives and migrants.

Figure 2.2: Job mobility rates



Source: ALWA-ADIAB; own calculations.

Not surprisingly, the probability of voluntarily changing jobs decreases with time in the labor market. In particular, the first finding supports the notion of job shopping in the early years of a career. Internal changes, however, appear to be rather independent of labor market experience, which demonstrates that promotions within an establishment can occur at any time and appear to be driven by factors other than general labor market experience. The same appears to be true for involuntary changes. Other changes primarily encompass mutually agreed-upon contract terminations. These should mostly entail fixed-term arrangements, which are also more likely at the beginning of the career. On average, migrants appear to have lower probabilities of voluntary and internal changes. They thus have proportionally fewer changes to other employers and fewer internal transitions. However, the latter are rare events in any case. Involuntary changes seem to generally rather show the same probability for migrants and natives. However, after three to four years in the labor market, migrants show almost double the probability for an involuntary change.

To assess whether the differences in mobility rates indeed translate into different probabilities for job changes throughout the career, we calculate separate Cox models for the first and second job change of every type.[6] We find no significant differences between migrants and natives' first changes, indicating that both groups have similar transition patterns at the beginnings of their careers. However, migrants have a higher probability of a second involuntary and a lower probability of a second voluntary job change, which supports the expectation that we observe differences in transition probabilities between the two groups. The probability and the timing of all first voluntary or involuntary transitions seem to be quite similar. However, having a second voluntary change is less likely for migrants while a second involuntary change is more likely. The probability of first and second internal change does not differ between migrants and natives.

2.4.2 Multivariate results

Having shown that descriptively migrants confront a wage gap compared to natives and face significant differences in job mobility patterns, we next assess whether these results hold in a multivariate analysis and whether the differences in the number and types of job changes can explain part of the wage gap.

Table 2.2 presents five model specifications that each regress the logarithm of the hourly wage on different sets of independent variables in a fixed effects design. Model 1 is the null model, which – apart from dummies for years and East Germany – only includes the actual labor market experience of natives and migrants. Additionally, we include a squared term to capture non-linearities in the wage trajectories. The first finding is that the previously identified wage gap indeed persists and grows throughout the career. After one year, the gap amounts to only approximately 0.9 percent, whereas the difference grows to 6.6 percent after 10 years. The gap is almost consistent with the one observed in the descriptive part. Person fixed effects and yearly effects do not seem to explain the gap we previously identified. In the next step, we include control variables such as family status or children in the household. Note that the effects are estimated as within effects, meaning that the variables measure the effect of a change in the status. After controlling for these individual variables, the estimated gap increases to eight percent. The explanation for this increase lies in changes in, e.g., the number of children, which differs between migrants and natives and demonstrates significant effects on wages.

6 See Appendix Table A.2 for results of the Cox regressions.

Table 2.2: Results of fixed-effects regressions

Explanatory Variables	Fixed Effects Regressions: Log hourly wage				
	Model 1 Null model	Model 2 Controls	Model 3 Changes	Model 4 Company size and sectors	Model 5 Employment gaps
Labor market experience (in years)					
Natives (ref)	0.041***	0.037***	0.036***	0.035***	0.042***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.002)
Migrants	−0.009*	−0.011**	−0.009*	−0.010**	−0.010**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Labor market experience²					
Natives (ref)	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Migrants	0.000	0.000*	0.000	0.000*	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Type of changes					
Voluntary change (first)			0.080***	0.075***	0.073***
			(0.014)	(0.014)	(0.014)
Voluntary change (second)			0.031**	0.026*	0.025*
			(0.014)	(0.014)	(0.014)
Involuntary change (first)			−0.035**	−0.037***	−0.025*
			(0.014)	(0.013)	(0.014)
Involuntary change (second)			−0.062***	−0.066***	−0.045**
			(0.017)	(0.017)	(0.018)
Internal change (first)			0.107***	0.107***	0.102***
			(0.014)	(0.013)	(0.014)
Internal change (second)			0.047*	0.050**	0.045*
			(0.025)	(0.025)	(0.025)
Other change (first)			0.038**	0.044**	0.045**
			(0.019)	(0.018)	(0.019)
Other change (second)			0.009	0.016	0.025
			(0.031)	(0.031)	(0.031)
Company size (ref: Under 4)					
5–9				−0.007	−0.009
				(0.024)	(0.024)
10–19				0.033	0.036
				(0.024)	(0.024)
20–99				0.047*	0.048*
				(0.024)	(0.024)
100–199				0.072***	0.072***
				(0.026)	(0.026)
200–1999				0.105***	0.104***
				(0.025)	(0.025)
2000 +				0.153***	0.155***
				(0.032)	(0.032)
Months without employment or unemployment					0.002***
					(0.000)
Months in unemployment					−0.003***
					(0.001)
Controls		Yes	Yes	Yes	Yes
Average wage gap in percent (1 year)	0.91*	1.10**	0.89*	0.95*	.94*
Average wage gapin percent (5 year)	3.97*	4.80**	3.83*	4.11*	4.05*
Average wage gapin percent (10 year)	6.57*	7.97**	6.25*	6.72*	6.63*
N Persons		5,822 (natives: 5,436; migrants: 386)			
N Person periods		686,045 (natives: 647,609; migrants: 38,436)			
R-squared within	0.120	0.150	0.163	0.172	0.176
R-squared between	0.062	0.126	0.127	0.180	0.140

Source: ALWA-ADIAB, own calculations. Robust standard errors in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$

In our third model, we also include our main variables of interest: dummies for job changes. Differentiating between voluntary, involuntary, internal and other changes, we include variables for the first and the second change. Controlling for these different types of changes, we can explain approximately 21.5 percent of the immigrant-native wage gap after 10 years of actual labor market experience because the gap decreases to 6.3 percent. Voluntary changes to other establishments and changes within the same company significantly increase hourly wages. More precisely, the first voluntary change increases the hourly wage by approximately eight percent, and an additional voluntary change increases the wage by another three percent. We find similar effects for internal transitions. We estimate a wage increase of approximately 10 percent for the first change, whereas the second change increases the wage by approximately five percent. Internal transitions include but are not limited to promotions, which explain the stark positive effect. To rule out that one type of transition is driving the reduction in the wage gap, we tested for the individual influences of the four different types of job mobility. We find distinct influences for all transitions and thus can conclude that both voluntary changes to another company and internal changes positively affect future earnings. As we demonstrated earlier, migrants, on average, present fewer of these transitions, which is one explanation for the sharp decrease in the immigrant-native wage gap.

In line with our expectations, the first involuntary change has a negative and significant effect on the hourly wage. A second involuntary change – a transition type that is more likely for migrants – is even more penalized and decreases the hourly wage by approximately six percent. An explanation for the lower effect of the first involuntary change might be found in signaling theory. According to the theory, a layoff event can be seen as a signal that provides additional information for employers about the employee's productivity. The resulting stigma due to the cause of displacement should therefore increase with a rising number of layoffs, which we actually observe when looking at the effect of a second involuntary change.[7] Thus, as natives and migrants have different job mobility patterns, job changes can explain a substantial part of the wage gap.

To gain a better understanding of what is driving the effects of the different changes, we include the company size and economic sectors in the fourth model. Again, it is important to remember that the estimated effect reflects the within effect. In fact, our positive and significant effect from the first and second voluntary change now decreases. In contrast, the negative effect of a first or

7 More involuntary changes may further strengthen the negative effects on wages; however, due to the small number of employees with three or more layoffs, we are not able to identify such relationships.

second involuntary change is slightly reinforced when controlling for changes in company size. As Table 2.2 shows, we find a significant and positive effect from an ascending employment stock. Due to these findings, it appears that voluntary changes often involve moves into larger companies and thus result in higher hourly wages, while involuntary changes instead lead to transitions into smaller companies accompanied by wage cuts. Including the company size and economic sectors also changes the overall wage gap after 10 years. The increase in the wage gap suggests that migrants do not move into larger companies as often as natives do, which is in line with findings of Barth et al. (2012). However, the change in the wage gap is not overly high.

In addition to the company size and economic sector, the time spent out of employment might influence future earnings and the wage gap. Therefore, in our last model, we include the duration of employment gaps estimated on a monthly basis. Assuming differences in the impact on wages according to the type of gap, we distinguish between unemployment gaps and labor market inactivity. As expected, one additional month of unemployment decreases the hourly wage by 0.3 percent, all else being equal. We observe that these gaps explain part of the negative effect of involuntary changes. The negative signal of involuntary changes thus appears to be partly conveyed by unemployment episodes. However, an additional month without employment subject to social security contributions or outside the labor force – excluding unemployment – increases the wage by approximately 0.2 percent. This positive effect relates to episodes of self-employment, civil service, freelancing and training. However, including the time spent out of employment does not substantially change the overall wage gap.

As Table 2.2 shows, including job changes generally decreases the wage gap between migrants and natives. A part of the wage gap can thus be explained by the mere number of job changes. However, we should also note that migrants and natives might not only vary in their amount of changes but that the impact of the changes might also vary between them. It can be assumed that they also experience different returns to job mobility. To assess this effect, we estimated an interaction-effects model of the different changes. We do not find significant differences in migrant- or native-specific effects: they appear to function in the same manner for both groups. The results might well be due to the relatively small sample size of migrants; however, we assume that negative signals of involuntary changes and that positive effects from internal and voluntary changes are generally given for all employee's regardless of their migratory status. Moreover, we might face bias due to unobserved heterogeneity. Individual productivity or discrimination might lead to overestimation of the effect of job changes and the corresponding impact on the total wage gap. However, our positive sample selection likely counteracts this bias,

as the job-changing behavior of migrants will resemble the behavior of natives to a greater extent. The direction of and total bias in the effects of job changes on the migrant-native wage gap thus remain unclear.

2.5 Robustness checks

To ensure the robustness of the results, we conducted a series of alternative analyses, considered different measurement definitions and used administrative data to reproduce the results. According to Lehmer and Ludsteck (2015) migrants from different countries achieve different wage gains by moving to larger firms. Accounting for this pattern, we re-estimate our analyses with migrant-firm size interaction terms. However, no such differences are detected; the interaction terms are insignificant. Furthermore, as our wage measure is drawn from administrative data and might not be consistent with the episodes reported in the survey, we shift all wage measures by six months and recalculate the analysis as an additional robustness check. The effects of the changes differ only marginally from the models we calculated using the above-described version of wages. To assess potential bias in the fixed-effects model, we calculated a pooled OLS model with cluster robust standard errors, including time-constant individual characteristics, such as sex and qualifications. The results generally point in the same direction, indicating that measurement bias should not be severe. We moreover calculate models with and without using the measure for over-qualification. Again, our results did not change. Further, we calculated all analyses using right-censored wages, which did not substantially change our results. We calculated models including 2-digit occupational codes to ensure that the effects of job changes cannot be attributed to transitions into specific occupations that pay exceptionally low or high wages, also showing similar results. Furthermore, we ran separate estimates for the different types of mobility to investigate the individual effect of each job change (see Appendix Table A.3). Internal changes can explain most of the wage difference, closely followed by voluntary changes. Since involuntary changes and other changes do not occur very often, they explain less of the disparity. Nonetheless, as the estimation results show, all types of job changes have explanatory power by their own. We recalculated the analyses using administrative data and measures as similar as possible to those given in the ALWA survey. The results, we obtained from the Sample Integrated Labour Market Biographies (SIAB) are consistent with the results obtained from the ALWA survey. The wages of natives and employees who have/had foreign citizenship develop differently over the life course. The wage gap we identify is approximately onehalf as large as the wage gap we find in the ALWA data. We suppose that this finding can be attributed to the fact that

migrants and foreigners are only partly overlapping populations. For both voluntary and involuntary changes, we find similar effects as in our main models and are able to explain a substantive part of the immigrant-native wage gap. We compared key characteristics of migrants in the survey to foreigners in the administrative data. The results show a slightly lower share of potential migrants in the SIAB data compared to the ALWA (10.7% to 12.0%).[8]

This is not surprising, as migrants who acquired German citizenship before entering the labor market would be classified as natives in the SIAB sample. Accordingly, we observe a higher share of German citizens among the groups of migrants in ALWA compared to the SIAB data. The mean age and wages are not significantly different. However, the average qualifications of migrants are – as expected – significantly higher in the ALWA sample. Although, we control for qualifications with person-fixed effects in our analyses, we might face bias due unobserved factors such as productivity. In that case, we are likely to underestimate the wage gap, as we are observing a positively selected group of migrants. We are thus considering a migrant group that should be more similar to natives than is the true migrant population, and we are likely to underestimate the impacts of voluntary and involuntary changes on the wage gap. Theory would predict a higher probability of involuntary and a lower probability of voluntary changes in the true migrant population. All results of the robustness checks are available upon request.

2.6 Conclusion

In this article, we investigated the impact of different job mobility patterns on the wage gap between migrants and natives. Our analyses generally support previous studies that find a wage gap between migrants and natives (e.g. Aldashev et al. (2012) or Lehmer and Ludsteck (2011)). However, while most of these studies focus on cross-sectional wage differences and report decomposition effects, we extend this research with a longitudinal perspective and show how wages of migrants and natives diverge during their careers. Drawing on job-shopping and signaling theory, we assume that differences in employment trajectories between migrants and natives explain part of the wage gap that emerges with time in the labor market. We thus offer a new explanation for the immigrant-native wage gap and reveal possible means to counteract wage differences. Focusing on career trajectories, our approach complements previous research

8 The comparison of the two dataset refers to the raw samples and the effective date of June 2006, which allows us to compare time varying variables. Therefore numbers will differ from those previously mentioned in the paper.

that emphasizes the multidimensional process of labor market integration and the impact of employment patterns on later out-comes (Fuller, 2015). Summing up our results, earnings generally improve during the first 10 years as predicted by theory. Furthermore, the findings confirm a flatter earnings profile for migrants than for natives and thus an increasing wage gap. To address the question of whether labor market behavior has explanatory power in analyzing the wage gap between natives and migrants, we first examined the number of job transitions for each individual over his or her entire employment history in Germany. Indeed, we find differences in mobility patterns between migrants and natives: while the probabilities for first voluntary or involuntary job changes do not differ, migrants show a lower probability for a second voluntary changes and a higher probability for a second involuntary change. In a second step, we then assessed whether the differences in the number and types of job changes can explain part of the wage gap. We therefore regressed the logarithm of the hourly wage on different sets of independent variables in a fixed effects design. The inclusion of the transition variables confirmed our hypotheses. First, voluntary and internal job changes have a positive effect on the future earnings of an individual, as job-shopping theory suggests. Second, involuntary changes negatively affect future earnings. We find that a part of the wage gap can be explained solely by the number of these job changes. Our results suggest that adapting the mobility patterns of natives would thus reduce the wage gap in the labor market. We are aware that it might not always be possible to influence job changes – especially in the case of involuntary layoffs. Even internal and voluntary changes depend on the labor market situation. However, minimizing search costs through informational seminars or other types of active search assistance provided by the Federal Employment Agency or other institutions and organizations might reduce the barriers to job changes and promote them. Similarly, awareness of the positive effects of job changes on wages can be improved, and migrants should be especially sensitized the importance of job searching in terms of wage growth. In addition to these practical implications, we must be aware that discrimination might still play a role in discussion of the intensity of job changes. Minimizing discrimination, regardless of whether it is direct or indirect, will be quite difficult and will always be a major challenge in the labor market integration of migrants. A limitation of our study lies in the question of which factors truly drive the differences in numbers of job changes. Further research should therefore attempt to assess this issue and analyze the extent to which differences in search costs determine the number of voluntary job changes and to which discrimination continues to plays a role, especially for involuntary changes. Analyzing the sources of these differences in greater detail would result in a much more complete picture and allow for concrete recommendations on

how to counteract diverging wages. The differences in mobility patterns and their impact on the immigrant-native wage gap indicate that migrants and natives face different restraints and opportunities in the labor market, emphasizing the importance of analyzing career trajectories.

3 Does personality matter? The impact of the Big Five on the migrant and gender wage gaps[1]

3.1 Introduction

We ask whether personality traits contribute towards explaining gender and migrant wage gaps. While the traditional approach to determine wage differentials focuses on human capital and job-specific variables, it is also recognized that factors other than (cognitive) skills, experience and education are rewarded in the labor market. Traditionally studied in the field of psychology, the idea that non-cognitive skills, and specifically personality traits, may play a role in wage determination and contribute to observable wage differentials has emerged in economics (Bowles et al., 2001b,a). Heckman et al. (2006) go so far as to claim that non-cognitive skills may be more important than cognitive skills for individual's labor market outcomes. Blau and Kahn (2016) state that non-cognitive skills are one of the newer explanations for gender wage gaps and conclude that they account for a small to moderate amount of wage differentials. Accordingly, personality traits are regarded as a specific skill-set, which is remunerated in the labor market. We contribute to this strand of wage differential explanations by introducing the Big Five Personality Dimensions, a concept from psychology categorizing human personality into five global traits, into Bowles et al.'s (2001b, a) framework. Few recent studies have done this, which is surprising as early research had already established a relationship between the Big Five and labor market outcomes (Barrick and Mount, 1991; Salgado, 1997).

Wage differentials between employee groups remain persistent in industrialized economies, even when controlling for education, career choices, occupations and industries. These wage differences are particularly pronounced for migrants and females. Empirical findings suggest a migrant wage gap of 8 percent to 20 percent (e.g., Brenzel and Reichelt (2017); Aldashev et al. (2012)) and a gender wage gap of around 22 percent in Germany (e.g., Anger and Schmidt (2010); Gartner and Hinz (2009)). A part of these gaps can be explained by differences in endowments. The remaining part of the differential could indicate discrimination or simply still be unexplained by means of the standard covariates. Including non-cognitive skills could therefore alleviate the extent of observed wage gaps.

1 This chapter is joined work with Marie-Christine Laible and already published in a slightly different version as Discussion Paper: Brenzel, H. and Laible, M.-C. (2016). Does personality matter? The impact of the Big Five on the migrant and gender wage gaps. IAB-Discusson Paper 26/2016, Nürnberg: Institut für Arbeitsmarkt- und Berufsforschung.
The study has been presented at the LabourNet Conference in Tampere, at the Ifo Dresden Workshop on Labor Economics and Social Policy, and at the 22nd Eurasia Business and Economics Society in Rome.

We expand the rather small body of economic literature for the Big Five and the gender wage gap and contribute to the literature by revealing first results concerning the relationship between the Big Five and the migrant wage gap in Germany. We reassess the extent of wage gaps and their possible explanations with a novel employer-employee dataset, the Linked Personnel Panel linked with the IAB-Establishment Panel Survey and individual-level administrative data. This dataset allows the inclusion of previously intangible individual characteristics, the Big Five personality dimensions, as explanatory variables. Furthermore, we can include both individual and establishment level information, whereas many previous studies are only based on the individual level. Extending the traditional wage model to the behavioral approach developed by Bowles et al. (2001b), we look at different employee groups – migrants and natives, as well as men and women – to analyze the explanatory power of personality. In order to do this, we first investigate whether differences in personality traits exist between these groups. Then we analyze how the Big Five contribute towards explaining wage differentials, with a specific focus on differences between the employee groups.

3.2 Related empirical literature

3.2.1 The Big Five and migration status

There is some evidence that countries differ in their average personality which implies differences between immigrants and natives. Allik and McCrae (2004) examine cultural differences in personality traits and claim rather a geographical grouping of cultures than climate reasons as long time assumed to be the major explanation. Moreover, McCrae et al. (1999) compare the average Big Five scores for Germany, Italy, Portugal, Croatia and South Korea and show significant differences between these countries. Accordingly, Europeans and Americans generally score higher in extroversion than Asians or Africans (Allik and McCrae, 2004; McCrae and Terracciano, 2005).

Besides cultural differences in average personality traits, however, migrants are likely to be self-selected and differ from individuals staying in their home country.[2] Jokela (2009) examines the influence of personality on migration patterns in the United States. His findings suggest that personality traits such as openness to experience, low agreeableness and high extroversion are related to the migration probability within and between U.S. states, while conscientiousness and neuroticism do not influence the migration pattern. Silventoinen et al. (2008) find evidence for the

2 For example, Jaeger et al. (2010) provide evidence that risk takers are more willing to migrate.

self-selection of people who migrated. Their findings confirm that people with high extroversion were more likely to migrate but in contrast to Jokela (2009), they report an influence of neuroticism on migration patterns. Boneva et al. (1998) support the findings for agreeableness in an indirect way by analyzing the relationship between affiliation and migration probability. High affiliation motives, which are related to high agreeableness (Jokela, 2009) show a correlation with low desires to move to another country. Furthermore, higher achievement and power motivation also increase the probability to migrate (Boneva et al., 1998; Boneva and Frieze, 2001). Recent work by Bütikofer and Peri (2016) supports the idea of self-selection of migrants too. Thus, individuals with high adaptability are more likely to migrate than those with low adaptability, especially individuals with lower education or cognitive skills. High adaptability seems to reduce non-monetary costs of migration and therefore increase the migration probability according to the occupational choice model by Roy (1951).

3.2.2 The Big Five and gender

Reviews on gender differences in preferences and psychological attributes can be found in Croson and Gneezy (2009) and Bertrand (2011). The literature suggests that women are both more agreeable and more neurotic than men. Further differences can be found in competitive attributes, risk aversion, negotiation skills and social preferences such as altruism, inequality aversion and reciprocity. Costa Jr et al. (2001) demonstrate that across nations, women tend to score higher in neuroticism, extroversion, agreeableness and conscientiousness; with the highest difference found in neuroticism. Furthermore, gender differences are more pronounced in gender-egalitarian cultures. A possible explanation for these differences is found in Social Role Theory, which predicts that gender roles are slow to change and men and women still occupy different roles (Eagly, 1987). Thus, gender differences in personality could reflect traditional gender roles in society. This idea is supported by Croson and Gneezy (2009) conclusion that evidence exists for both the nature and nurture hypothesis of gender differences.

3.2.3 Non-cognitive traits in a wage framework

As the literature indicates that mean differences in personality traits for employee groups exist, the next question to be asked is whether these differences matter for wages. Thus far, one theoretical approach specifically models non-cognitive traits in a wage framework. Starting with the observation that factors other than human capital are rewarded in the labor market, Bowles et al. (2001b) and Bowles et al. (2001a) propose a behavioral model of earnings in which incentive-enhancing

preferences, i.e. non-cognitive traits, are incorporated. The authors base their work on incentive problems similar to principal-agency theory, such that employers have to incentivize their employees to increase employee effort. This is where individual non-cognitive traits come into the framework. It is assumed that certain employee characteristics can facilitate incentive-setting schemes, as employees with different traits have different reactions to incentives. Through wage-setting, employers reward favorable personality traits independently of traditional wage determinants such as human capital and job-specific factors.

In this model, personality traits are included in a standard maximization problem. The employer chooses the wages and hours worked to maximize profits and, in line with efficiency-wage theory, higher wages elicit more effort. The employee then chooses his level of effort to maximize his utility. The model includes a parameter in the employee's utility function that captures personality traits and shifts the employee's response function. Thus, an increase in incentive-enhancing traits induces the employee to work harder at every wage rate. If otherwise identical employees have different levels of incentive-enhancing preferences and the employer is able to identify these differences, the employee with favorable traits is paid more. Bowles et al. (2001b) and Bowles et al. (2001a) use the degree of future orientation, personal efficacy and locus of control as examples for incentive-enhancing preferences.

Thus far, there are limited empirical tests of this behavioral approach. An overview of the early research on the consequences of personality traits can be found in Bowles et al. (2001a) and Nyhus and Pons (2005). As no prior literature exists for the relationship between the migrant wage gap and personality traits, the following section focuses on the gender wage gap only. For the US, Mueller and Plug (2006), as well as Fortin (2008), demonstrate that non-cognitive traits play a significant role in explaining gender wage gaps. Fortin (2008) does not examine the Big Five, however Mueller and Plug (2006) document that differences in the Big Five can explain five percent to 16 percent of the gender wage gap. In this study, men who were antagonistic, open and emotionally stable had earnings advantages over otherwise equal men. Women attained advantages for being conscientious and open. While the returns to agreeableness were different, positive returns to openness were similar across the genders.

Nyhus and Pons (2005) use Dutch data to show that emotional stability is positively associated with wages for both genders. Agreeableness is related to significantly lower wages for women. While the returns of the Big Five could vary between educational groups, it seems that the patterns of rewards for personality traits hold across all occupations (Nyhus and Pons, 2005). Using the 2005 wave of the British Household Panel Study, Heineck (2011) examines the extent to which

the Big Five affect wages. He finds a positive relationship between openness to experience and a negative relationship between agreeableness and wages. For women, neuroticism is negatively associated with wages. The author determines no relationship for extroversion and earnings; however he finds a nonlinear association for conscientiousness. Cobb-Clark and Tan (2011) examine whether differences in the locus of control, self-efficacy and the Big Five influence occupational attainment in Australia. They find that men and women with similar non-cognitive skills enter occupations at different rates, but that women's non-cognitive skills give them a slight wage advantage. Additionally, they report different results for the Big Five for each occupation.

Two studies regard gender wage differentials and personality traits for Germany using the GSOEP. Heineck and Anger (2010) examine scores for the IQ, locus of control, reciprocity and the Big Five for 2006. Their results indicate that personality is an important predictor of earnings, which affects men and women differently. For both genders, an external locus of control leads to wage penalties. However, openness to experience seems to have positive effects for women in Mincer wage equations and negative effects for men, while the opposite holds for extroversion. Agreeableness is not associated with male wages, but has negative effects on female wages. Conscientiousness is always positive for men; however it is negative or insignificant for women. Neuroticism shows no statistical relation to wages for both genders. Using the GSOEP for 2005, Braakmann (2009) looks at the Big Five for Germans between 25 and 55 years of age. His findings show that higher levels of conscientiousness and reciprocity are associated with a higher probability of being full-time employed for both genders, while high levels of agreeableness, neuroticism and external locus of control have the opposite effect. In a sample of full-time workers, higher levels of openness to experience are only associated with higher wages for men, while extroversion has no significant effect for either gender. Conscientiousness and agreeableness are both negatively related to wages; however the negative effects of the latter are stronger for women, while the opposite holds for conscientiousness. In summary, it seems that the personality dimensions are subject to heterogeneous mechanisms, which may explain the inconclusive results of the literature.

3.3 Research questions and derived hypotheses

We formulate three research questions and according hypotheses following the prior literature. First, we ask whether differences in personality traits exist between employee groups and hypothesize that men and women, as well as migrants and natives differ in their average personality scores:

H1: Men and women differ in their average personality traits, as do migrants and natives.

Second, we ask whether personality traits contribute towards explaining wages. We assume that personality traits have a direct, as well as an indirect wage effect. Concerning the direct wage effect, personality can be regarded as a bundle of productive skills that are valued in the labor market. Accordingly, wages depend on the nature and the magnitude of the trait possessed, as well the return for each trait and the Big Five can result in productivity differences that are rewarded in the labor market.

Indirect wage effects can work through different channels: First, when we allow that the traits are not equally productive across occupations and that individuals choose occupations that offer the highest rewards for their trait combination, indirect wage effects can manifest through occupational sorting. Similarly, indirect wage effects can occur through education, as for example being open to experience increases the intent to attend a university (Peter and Storck, 2015) and personality traits can interact with family backgrounds to determine educational attainment (Lundberg, 2013). Third, wage bargaining effects can influence wage levels, where high levels of agreeableness negatively impact wage negotiations. Next, employer learning could play a role in so far as there is evidence that employers initially use observable characteristics, such as self-esteem and schooling, to determine wages and only learn about cognitive skills and motivation over time (Petre, 2014). Finally, coming from the employer's, customer's or co-worker's side, (taste-based) discrimination is possible.

We assume that personality traits are rewarded differently for different groups in the labor market. In combination with employer learning theory, personality traits could have a large effect on wages specifically for migrants, due to higher information insecurity and asymmetry. Thus, we hypothesize that for migrants, some traits such as openness to experience could be considered more important than for natives, which could impact the observable wage differentials. Condensing the heterogeneous evidence in the prior literature, we expect:

H2: Extroversion, conscientiousness and openness to experience have a positive relationship with wages, though the effects could vary across groups.

H3: Neuroticism is punished, irrespective of migratory status or gender.

H4: Irrespective of the groups, agreeableness is not favorable to wages.

Under the assumptions that employee groups differ in their average traits and that traits are not rewarded equally across employee groups in the labor market, we further ask whether controlling for personality traits contributes to explaining wage gaps and anticipate that they do:

H5: The Big Five contribute to explaining the gender and migrant wage gaps in Germany.

3.4 Data and methods

3.4.1 Sample description

The following analyses are based on novel linked employer-employee data of the Institute for Employment Research (IAB) called the Linked Personnel Panel (LPP). This dataset is a supplement to the renowned IAB-Establishment Panel Survey (BP), in which BP establishments are surveyed about additional topics.

The BP is a representative panel survey of Germany's labor demand (Fischer et al., 2009). Approximately 16,000 establishments, representing all federal states, industries and sizes, have been surveyed annually since 1993 in West and 1996 in East Germany. The sample is drawn from all German establishments with at least one employee subject to social security.

The first wave of the LPP was carried out in 2012/2013 and consists of two parts: an employer and an employee survey (Broszeit and Wolter, 2015). The employer survey is a representative sample of 1,219 establishments who participated in the 2011 and 2012 waves of the BP and have more than 50 employees subject to social security.[3] These establishments were surveyed about their human resources management, remuneration structure, values and corporate culture. Additionally, a sample of employees of the participating establishments in the LPP was drawn and 7,508 employees were surveyed in order to complement the establishment survey by the employees' perspectives on job-related, personal and socio-demographic issues (Bellmann et al., 2015). Among other things, personal characteristics are surveyed by the Big Five personality traits. Furthermore, for individuals consenting to linkage to other data stored with the IAB,[4] information from the Integrated Employment Biographies (IEB) is added to further enrich the data set with individual-level

3 Establishments are stratified by the establishment size, sectors and region. Agriculture, forestry, fishing and public sector are excluded. See Broszeit and Wolter (2015) for a detailed description of the sampling frame.

4 83 percent agreed to merge the data with other data sources (see Bellmann et al. (2015)).

information on tenure and duration of unemployment. The data therefore provides unique opportunities for the analysis of the association between the Big Five and wages. We are able to draw on establishment and individual information from different data sources. Consequently, we do not rely on only regarding one side of the coin, i.e. either the individual side or the employer side, as previous studies had to do. Thus, we use the employee, as well as the employer part of the LPP, establishment characteristics from the BP, as well as additional information from the IEB.

After restricting our sample to those observations that have matches in all data sets and excluding marginally employed individuals from our sample, 5,693 individual observations working in 820 different establishments remain for our analyses. 13 percent of all individuals did not report their wages. Therefore, we draw on a regression technique and impute the missing cases separately for each of the two samples.[5] According to our research questions, two different samples are constructed. First, only male individuals living in West Germany are included in the migration sample. This is due to the small number of female migrants and migrants living in East Germany. Migrants are defined as individuals born outside of Germany, however we cannot distinguish further between those who migrated before the age of six or after. Overall, 349 male migrants and 2,705 male natives are included in our multivariate analysis. Second, in the gender sample, we exclude all migrants in order to gain a clear effect of the gender wage gap without convoluted migrant effects. In contrast to the migration sample, we do not exclude employees living in East Germany. However, we do exclude the individuals who have indicated having no or "other" schooling, as their number is negligible and they may confound the analysis. 3,596 men and 1,252 women are available for the gender analyses.

3.4.2 The methods

First, we regard an extended Mincer Earnings Equation following Bowles et al. (2001b,a):

$$ln(w_i) = \beta_0 + \beta_1 M_i + \beta_2 P_i + \beta_3 X_i + \beta_4 F_i + \mu_i \tag{3.1}$$

where $ln(w_i)$ is the logarithm of the hourly wage,[6] computed via the hours worked and the gross monthly wages, including bonus payments. M_i contains the traditional Mincer variables education, age and age squared. P_i consists of

5 16 percent of migrant wages, 14 percent of native wages, 14 percent of female wages and 13 percent of male wages were imputed. We additionally estimated all models without imputed observations and the results do not change significantly.

6 If the contractual working hours were not reported, the missing values were replaced by the actual hours worked.

the Big Five Personality traits. Furthermore, X_i is a vector of control variables for individual and establishment characteristics such as hours worked, blue-collar worker, collective agreement, works council, size of establishment, exports, share of female employees, tenure, unemployment, regions and sectors. We regard the migration status and gender in two separate estimations, therefore the focal variables F_i are respectively a dummy indicating whether an employee is a native of Germany or a migrant; or a dummy indicating whether the individual is female or male. μ_i represents the error term. In the second step, we use Oaxaca-Blinder decompositions to break down the overall mean of the migrant and gender wage gaps respectively (Blinder, 1973; Oaxaca, 1973). The decomposition has the following form:

$$\underbrace{ln\overline{w}^1 - ln\overline{w}^2}_{\textit{mean wage gap}} = \underbrace{(\overline{Z}^1 - \overline{Z}^2)\beta^1}_{\textit{explained by means of regressors}} + \underbrace{(\beta^1 - \beta^2)\overline{Z}^2}_{\textit{unexplained ``discrimination''}} \quad (3.2)$$

where w denotes the log hourly wages, Z contains the variables of the wage equations (captured by M_i, P_i, X_i in equation 3.1), β are the estimated coefficients and the super-scripts 1 and 2 describe the status migrant/native or respectively male/female. The mean wage gap between the groups can be decomposed in a part that is explained by the regressors and a part that remains unexplained and is often coined as "discrimination or unobserved factors". The Oaxaca-Blinder decomposition is subject to some limitations: Results vary with the base category chosen for categorical variables, decomposing differences in other statistics than the mean is not possible and it demands the assumption of a linear relationship between the outcome variable and the explanatory variables (Fortin et al., 2010). If, for example, different effects at the upper and lower parts of the wage distribution exist, the overall mean effect might be misleading. To take possible differential effects across the wage distribution into account, we use an unconditional quantile regression approach by applying the Recentered Influence Function (RIF) (Firpo et al., 2009). Thereby, we are able to compute coefficients for distributional statistics besides the mean (Fortin et al., 2010) and we can observe whether the Big Five's impact is different across the wage distribution. Formally, we first compute the sample quantile $\hat{Q}_\tau$ and apply kernel methods to estimate the density at that point ($\hat{f}_y(\hat{Q}_\tau)$). As the RIF of a quantile Q_τ is given by

$$RIF(y;\, Q_{tau}) = Q_\tau + \frac{\tau - I\{y \leq Q_{tau}\}}{f_y(Q_\tau)} \quad (3.3)$$

we plug in the sample estimates for Q_τ to obtain the RIF of each quantile. Term *I(.)* in equation 3.3 is an indication function that takes the value one if the outcome variable is smaller or equal to the respective quantile (Fortin et al., 2010). Then, the RIF becomes the new dependent variable of the regressions. Thus, the main idea of this procedure is to estimate the effect of being a migrant or a female, as well as the effects of the Big Five and further controls on the percentiles of the RIF of the log hourly wages. Then, the impact of the variables of interest on the unconditional percentiles of the log hourly wage distribution is estimated using the prior regression (Fortin et al., 2010), i.e. the RIF of the log hourly wage distribution for the τ^{th} percentile is regressed on the explanatory variables by Ordinary Least Squares (OLS). The advantage of this method over a standard quantile regression is that the unconditional percentiles of the wage distribution can be estimated, as opposed to the percentiles conditioned on every other explanatory variable. This means that we can estimate the impact of changing the distribution of the focal explanatory variables – migrant, female and Big Five – on the marginal distribution of log hourly wages.

3.4.3 Mitigating endogeneity concerns

In all of the models described above, concerns of reverse causality could arise, as the labor market outcome is measured at the same time as the personality traits. However, these concerns can be mitigated by psychological research indicating that personality traits are predominantly stable throughout an individual's lifespan (Costa et al., 2000). More importantly for this study, the Big Five are considered to be stable after they have developed in childhood. The plaster hypothesis goes as far as to claim that all personality traits stop changing completely after 30, even though the authors concede that slight changes across the life span are possible (Srivastava et al., 2003).

Generally, personality traits are considered stable for working-age individuals (Cobb-Clark and Schurer, 2011). Moreover, rank-orders of individual personality are constant as well (Roberts and DelVeccio, 2000). Additionally, it has been shown that a large portion of 40–60 percent of the personality dimensions is hereditary with a recent twin study claiming up to two thirds of the traits being hereditary (Jang et al., 1996; Bouchard and Loehlin, 2001; Kandler et al., 2010). This finding furthermore emphasizes the stability of personality traits.

There is little evidence that adverse life events have an impact on the Big Five, and while labor market outcomes are found to be associated with personality changes, the individuals have to experience more than five adverse employment or income events for these events to have an effect (Cobb-Clark and Schurer, 2012).

Overall, the largest accumulative effects of intensive employment- and income-related shocks across all Big Five amount to $1 for men and even less for women. Thus, Cobb-Clark and Schurer (2011) and Cobb-Clark and Schurer (2012) judge personality traits to be stable for working adults. Anger et al. (2017) come to a similar conclusion: personality traits measured by the Big Five remain nearly unchanged after involuntary job loss due to plant closure, except for individuals with above-average educational attainment. For this specific group, a positive effect on openness is observed. Specht et al. (2011) also conclude that experiencing unemployment does not affect neither mean-level nor rank-order stability of personality traits.

Taking into account this evidence, endogeneity issues could emerge when personality is altered by success or failure in the labor market. In this case, the estimated effects could be overstated and would have to be interpreted as upper bounds of the true personality effects. However, we assume that the problem of reverse causality can be regarded as negligible, as large parts of the examined personality traits are hereditary and thus relatively constant for adults. Moreover, individuals in our sample are mainly adults with rather long tenure (Table B.1 of the Appendix), therefore we can exclude recent personality altering labor market events. Furthermore, in our context, the act of migration itself could be considered as an adverse life event. However, there are few recent migrants in our sample and most importantly, we are interested in the effects of personality on wages after migration. Thus, for our analysis it is not important whether a migrant experienced a personality change upon migration, as we are only interested in the personality trait present when the job is acquired. Nevertheless, to account for potential endogeneity due to recent migration, we control for the time spent in Germany. Finally, we want to point out that we do not claim causality, rather we are interested in the correlation and following (Fortin, 2008) we are concerned to see if personality traits are omitted variables that might create biases in estimated wage differentials.

3.5 Descriptive statistics

To gain an overview about the wages and Mincer variables that are included in our estimations, Table 3.1 provides summary statistics separately for the gender and migration sample (Table B.1 of the Appendix reports the full sample summary statistics). The overall hourly wage means indicate supporting evidence of a wage gap between the different groups.

Table 3.1: Summary statistics of main variables

	Migration Sample				Gender Sample			
	Migrants[a]		Natives		Women		Men	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Wage								
Hourly wage	22.06	9.59	28.01	14.51	19.12	10.99	25.72	14.47
Log hourly wage	3.02	0.39	3.23	0.45	2.84	0.46	3.12	0.50
Age	40.99	10.60	43.92	10.46	43.54	10.72	44.03	10.63
Education[b]								
Lower Secondary	0.35	0.48	0.35	0.48	0.17	0.38	0.31	0.46
Secondary School	0.36	0.48	0.31	0.46	0.49	0.50	0.38	0.48
Higher education	0.23	0.42	0.34	0.47	0.34	0.47	0.31	0.46
Region of origin[c]								
Europe	0.57	0.50						
Asia	0.41	0.49						
Date of migration[d]								
1970–1979	0.16	0.37						
1980–1989	0.25	0.43						
1990–1999	0.51	0.50						
Observations	349		2,705		1,252		3,596	

Source: LPP, BHP, IEB, own computations. Results are weighted.

[a] Only male migrants living in West Germany are regarded.

[b] Observations with no education and other type of education were excluded for the sample of native men and women. Means and standard deviations for the categories "no education" and "other education" for the migration sample are not shown due to data security reasons.

[c] The country of origin is not available in more detail. Means and standard deviations for the category "rest" for the migration sample are not shown due to data security reasons.

[d] Means and standard deviations for the categories "before 1970" and "after 2000" for the migration sample are not shown due to data security reasons.

As expected, West German native men earn the most. With around 22 Euros per hour, foreign men earn less than native men but still more than native women. With regard to the age structure, no major differences are visible between men and women. Only immigrant men are slightly younger than their native counterparts. The shares of education are almost equally distributed among native men and women. However, women have a higher share of secondary education, whereas the share of women with a lower secondary education is below that of the men's share. Big differences occur concerning the shares of native and foreign men. Migrants have a higher share of secondary education, whereas the share of migrants with a higher education is below that of the natives' share.

To correctly evaluate the results of the analyses, a closer look at the migration sample is necessary: half of the migrants immigrated to Germany between 1990

and 1999. 25 percent came during the years 1980 and 1989, around 20 percent before the 1980s and recent migrants are represented scarcely in the dataset. Language barriers in the interviews should thus not be of concern. Additionally, more than half of the migrants are from Europe. As we are faced with a positive selection of migrants, we acknowledge that the wage gap observed in the data might be underestimated.

3.5.1 Description of the Big Five personality dimensions

The Big Five Personality Dimensions, also referred to as five factor model, is a concept from the field of psychology which postulates that human personality can be categorized into five global traits, each of which has underlying clusters of more specific factors. Table 3.2 shows the five traits and the characteristics commonly associated with them (Barrick and Mount, 1991).

Table 3.2: The Big Five personality dimensions

Trait	Characteristics associated with the trait
Extroversion – Intraversion	sociable, gregarious (vs. reserved), assertive, talkative, active
Neuroticism – Emotional Stability	anxious/nervous (vs. relaxed), depressed, angry, embarrassed, emotional, worried, insecure
Agreeableness – Antagonism	courteous/considerate/kind (vs. rude), flexible, trusting, goodnatured, cooperative, forgiving, soft-hearted, tolerant
Conscientiousness – Lack of Direction	dependability: careful, thorough, responsible, organized, planful volitional aspects: hardworking (vs. lazy), achievement-oriented/effective, persevering
Open to Experience – Closed to Experience	imaginative, cultured, curious/eager for knowledge, original, broad-minded, intelligent, artistically sensitive

Source: Barrick and Mount (1991). Underlined are the characteristics that were itemized in the LPP questionnaire and on which the analyses are based.

In the LPP, the Big Five were inquired about in a battery of items with answer options taken from a 5-point Likert scale. Each personality dimension was covered with three items, with the exception of openness to experience, which was covered with four items. For each dimension, we created an index. We furthermore standardized the trait to have a mean of zero and a standard deviation of one. Negative values of a trait, for example agreeableness, mean that the opposite of the trait, i.e. antagonism, is more distinct.

To check whether the variability in personality dimensions may arise from measurement error, Cronbach's Alpha is calculated for each personality dimension. This statistic measures the internal consistency of items, as well as the amount of

interrelatedness between them. The values for Cronbach's Alpha are relatively low,[7] however the size is directly related to the small number of items per personality trait (Gosling et al., 2003). Furthermore, a factor analysis shows that the respective items load on the desired personality dimensions. Following these results, we are confident that the personality indices created from the items reflect the correct traits.

The results from t-tests for the migration sample demonstrate lower scores in extroversion and higher scores in neuroticism for foreign men, while foreign men do not significantly differ from native men in the remaining three traits.[8] However, no large positive values of conscientiousness were observed for either sample, which might impact the estimation results.[9] According to the literature, migrants should not only differ from natives with respect to their personality traits, but personality traits should also vary according to nationalities. Table 3.3 presents the average Big Five for the continent of origin and shows that migrants not only differ from Germans in general, but that non-German Europeans also differ from Asians.

Table 3.3: Average Big Five scores by continent of origin

Land of Origin	Big Five				
	Extroversion	Neuroticism	Conscientiousness	Agreeableness	Openness
Europe	–0.065	0.075	–0.018	0.016	0.030
Asia	–0.334	0.140	–0.271	–0.039	–0.202
Germany	–0.015	–0.128	–0.084	–0.063	–0.012

Source: LPP, BHP, IEB, own computations.

A slightly different picture occurs for the average Big Five Scores in the gender sample shown in Table 3.4. Women score significantly higher in extroversion, neuroticism, conscientiousness and agreeableness than men. Only the scores of openness are not significantly different according to t-tests.[10] These means contribute to the conclusion that the genders differ in their average personality. Taking this evidence on differing average Big Five scores into consideration, we conclude that our first hypothesis cannot be rejected.

7 Cronbach's Alphas in our estimation sample have the following values: agreeableness: 0.48; openness to experience: 0.55; conscientiousness: 0.58; extroversion: 0.61; neuroticism: 0.54. These are comparable to those found in the SOEP (Kampkötter et al., 2015) and similar to those found in Braakmann (2009); Heineck and Anger (2010); Mueller and Plug (2006).

8 Appendix Table B.3 shows the t-test results for the migrant sample.

9 Appendix Figure B.1 and B.2 represent the personality trait distribution within the sample.

10 Appendix Table B.4 shows the t-test results for the gender sample.

Table 3.4: Average Big Five scores by gender

	Big Five				
Gender	Extroversion	Neuroticism	Conscientiousness	Agreeableness	Openness
Male	–0.001	–0.104	–0.046	–0.059	0.009
Female	0.093	0.144	0.175	0.144	0.0.13

Source: LPP, BHP, IEB, own computations.

3.6 Results

3.6.1 Baseline Mincer equations

In a first step, we estimate three consecutive regressions with OLS. First, a simple Mincer wage equation with a gender and migrant dummy is analyzed. In the second regression, main control variables are included. In the third model, we extend the Mincer wage equation by the personality trait indices.

Table 3.5 presents the results for the variables of interest. In all three regressions, foreign men and native women earn less than native men. If only the Mincer variables are included, women earn almost 30 percent less than native men, foreign men around three percent. Controlling for establishment-specific characteristics such as the log establishment size, sector, dummies for collective bargaining agreements and works councils, the share of female employees, and person-specific characteristics such as working time, worker status and the unemployment history etc., strongly decreases the gender wage difference to around 25 percent. In contrast, the wage gap between migrants and natives almost doubles.

In the third column, information about the personality traits is included. This reduces the negative coefficient both for the migrant and female dummies compared to the second model. At the same time, the (adjusted) goodness of fit of the model increases which implies that personality traits increase the explanatory power of the wage model. Extroversion and openness to experience have a positive effect on the log hourly wage, whereas neuroticism and agreeableness negatively influence wages. All but conscientiousness are statistically significant.

The insignificant effect of conscientiousness might be due to ambiguous mechanisms at work. Heineck (2011) finds for example, that both a lack of direction and extreme conscientiousness are harmful. However, we cannot reveal an inverse u-shaped relationship for conscientiousness, which may be related to the cropped distribution of this personality trait. In line with our results, Nyhus and Pons (2005) also do not find a significant relationship between wages and

conscientiousness. Concerning our second hypothesis, we therefore reject the assumption that conscientiousness has a positive relationship with wages, while the reverse is true for extroversion and openness to experience.

Table 3.5: OLS results for the overall sample

	Model 1	Model 2	Model 3
Migrant	−0.027 (0.026)	−0.061*** (0.020)	−0.053*** (0.020)
Female	−0.291*** (0.019)	−0.251*** (0.015)	−0.240*** (0.015)
Big Five			
Extroversion			0.014*** (0.005)
Neuroticism			−0.031*** (0.005)
Conscientiousness			−0.008 (0.005)
Agreeableness			−0.019*** (0.005)
Openness			0.011** (0.005)
Controls	age, age squared, education	age, age squared, education, hours worked, blue-collar worker, collective agreement, works council, size of establishment, exports, share of female employees, tenure, unemployment, regions, sectors	
Observations	5,248	5,248	5,248
R-squared	0.235	0.578	0.584
Adjusted R-squared	0.234	0.576	0.582

Source: LPP, BHP, IEB, own computations. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Clustered robust standard errors in parentheses.

Regarding the effect size, the Big Five make a meaningful contribution to explaining the variance in wages. For example, a one standard deviation increase in neuroticism is associated with an hourly wage penalty of approximately three percent. Thus, the effects are not only statistically significant, but also economically important.

3.6.2 Wage differences between the groups

Comparing our findings of the two wage gaps with those reported by the gender (e.g. Statistisches Bundesamt (2015); Huffman et al. (2016)) and the migration

literature for Germany (e.g. Constant and Massey (2005); Peters (2008); Lehmer and Ludsteck (2011); Aldashev et al. (2012)), we observe a relatively high gender wage gap and a relatively low migrant wage gap. A first explanation for the low migrant wage gap can be found in the positive selection of migrants in the sample, as migrants are relatively similar in terms of age and education, as well as hours worked compared to natives. Furthermore, few migrants in the sample have recently come to Germany and over half of them are from Europe. Thus, we can assume that they are well assimilated, which could explain the lower wage gap.

An explanation for the gender wage gap is harder to come by, as the females in our sample are well-educated and the gap does not change much when we re-estimate the regressions for a full-time sample. Similarly, when we additionally include occupational segments according to Matthes et al. (2015) to control for occupational effects, the wage gaps do not change.[11] When further looking at interactions between the five occupational segments and gender, the results seems to be driven by production and mercantile occupations, which are also the only two occupation segments in which males and females are roughly equitably distributed. We further assume that the sample design influences the wage gaps. The sample is selective to the degree that establishments with fewer than 50 employees and those in the public sector are excluded, as well as civil servants and the self-employed. This means that the distribution of women and migrants in the sample compared to the whole distribution in Germany is not representative.

Digging deeper and applying the idea that wages may differ according to establishment structures, we construct a variable indicating whether an establishment is male-dominated, i.e. less than 30 percent of the employees are female, versus female-dominated, i.e. less than 30 percent of the employees are male. The third category is called mixed and defines establishments that lie in-between the extremes. We borrow these cut-offs from the occupation literature which defines a task as a female or male task according to a 30/70 percent threshold.

We hypothesize that the migrant wage gap is relatively small, because migrants are mainly employed in male-dominated establishments, in which the characteristic of being male is more important than the attribute of being a migrant. Further, we suppose that the gender wage gap is more pronounced within male-dominated establishments and less within female-dominated establishments, following the social psychology literature for cultural and gender stereotyping (compare for example Koenig et al. (2011)). As certain characteristics are usually attributed to one gender, these perceptions also lead to the ascription to specific gender roles,

11 All estimations were run with the occupational segments as additional controls. As the results do not change substantially and migrants and females are not distributed equally across the segments, the results are not reported.

such as for example the "think manager – think male paradigm". These stereotypes may unconsciously be more salient in male-dominated establishments, thus leading to male migrants having the more desirable "work role" attribute ascribed to them, as opposed to female natives being perceived less so, thereby leading to a higher gender wage gap and a lower migrant wage gap than expected.

Table 3.6: OLS results differentiated between types of establishment

	Male-dominated establishments	Mixed establishments	Female-dominated establishments[a]
Migrant	–0.035 (0.022)	–0.133*** (0.046)	–0.281* (0.045)
Female	–0.275*** (0.019)	–0.233*** (0.022)	–0.166*** (0.055)
Big Five			
Extroversion	0.013** (0.006)	0.015 (0.009)	0.022 (0.018)
Neuroticism	–0.027*** (0.005)	–0.043*** (0.010)	–0.005 (0.015)
Conscientiousness	–0.013 (0.006)	0.006 (0.010)	–0.005 (0.019)
Agreeableness	–0.017*** (0.005)	–0.027*** (0.010)	–0.001 (0.023)
Openness	0.015** (0.006)	0.007 (0.009)	–0.010 (0.019)
Controls	Yes	Yes	Yes
Observations	3,493	1,482	273
R-squared	0.573	0.584	0.561
Adjusted R-squared	0.57	0.576	0.511

Source: LPP, BHP, IEB, own computations. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Clustered robust standard errors in parentheses.

Controls: age, age squared, education, hours worked, blue-collar worker, collective agreement, works council, log size of establishment, exports, share of female employees, tenure, unemployment, regions, sectors.

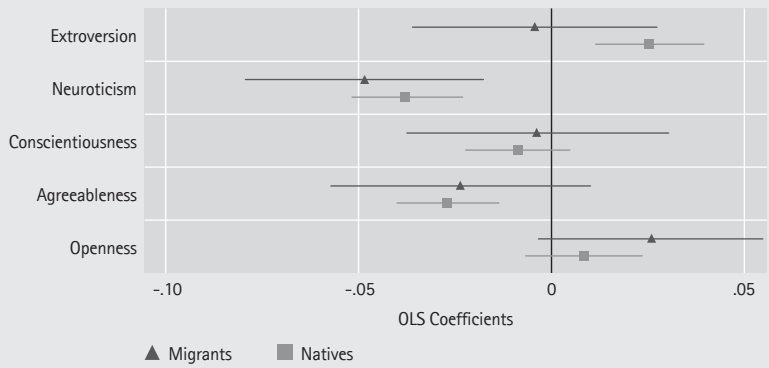
[a] The results for the sample of female-dominated establishments have to be treated with some caution as the model F-statistic is not reported. The model still has a good R-squared statistic and the results are reported for their economic salience.

In order to test these hypotheses, we rerun the third regression separately for male-dominated, female-dominated and mixed establishments (Table 3.6). We find salient differences of the wage gaps among the establishment groups. Gender wage inequality is higher in male-dominated establishments than in mixed or female-dominated establishments. At the same time, the wage inequality between migrants and natives is more pronounced in mixed and female-dominated establishments.

3.6.3 Split samples

To detect whether heterogeneous effects are observable for the different groups, separate wage equations are estimated.[12] Regarding the results for the migration sample of Figure 3.1, we see that the coefficients' signs are identical for both groups, with the exception of extroversion and tests confirm that the coefficients for extroversion are significantly different from each other at the 10% level. For the other four traits, there are differences with respect to the coefficients' significance and magnitude. Consequently, different traits seem to be important for the two employee groups. Most strikingly, openness to experience seems to play an important role for a migrant's wage, while the coefficient is insignificant and small for a native. An interpretation for this result could be that the underlying characteristics associated with being open for experience, such as originality, intelligence and broadmindedness, are more important for migrants than for natives. This seems reasonable insofar as employer learning or stereotyping, as well as asymmetric information play a role in the wage determination of migrant men.

Figure 3.1: OLS results for the migrant sample



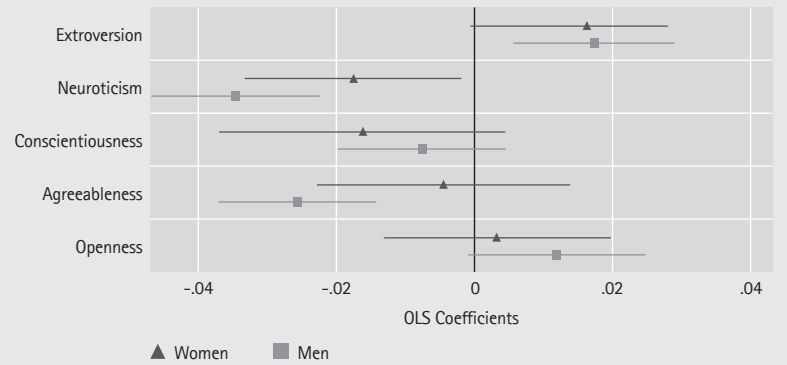
Source: LPP, BHP, IEB, own computations. Average marginal effects with 95% confidence interval.

All coefficients of the personality variables have the same signs in the gender sample (Figure 3.2). Most worth mentioning are the coefficients for neuroticism and agreeableness which are significantly different from each other at the 10% level. Men seem to be punished more for being neurotic than women. One could interpret, that women are stereotyped as being neurotic and due to the stereotype are less punished for this trait. Additionally, men are also punished for being agreeable,

12 Appendix Table B.5 provides the corresponding coefficients of the results displayed in Figures 3.1 and 3.2.

whereas this trait does not play a role in the female wage determination. A possible explanation could be that agreeable men are less aggressive in wage negotiations, which is reflected in the magnitude and significance of the coefficient.

Figure 3.2: OLS results for the gender sample



Source: LPP, BHP, IEB, own computations. Average marginal effects with 95% confidence interval.

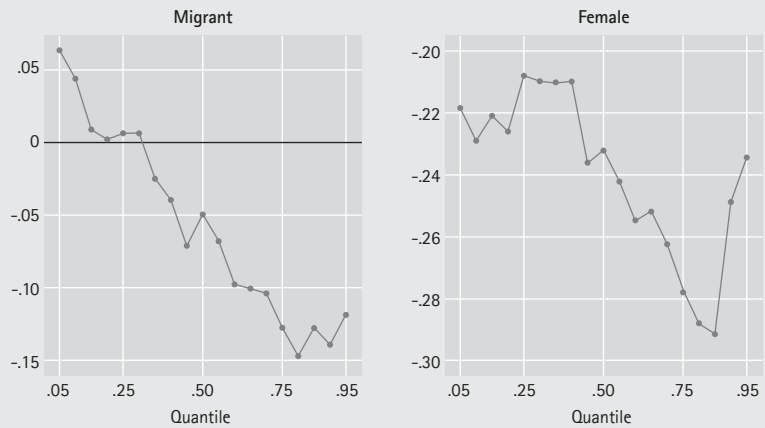
In summary, we conclude that the answer to our second research question is in the affirmative. Extroversion has a positive relationship with wages for natives, men and women, but not for migrants (*H2*), while openness to experience only seems important for men and migrants (*H2*). Conscientiousness does not have significant results for any of the samples (*H2*). However, we find that neuroticism is always punished in the labor market, irrespective of an individual's migratory status (*H3*), while agreeableness only seems to matter for males and natives (*H4*).

3.6.4 Unconditional quantile regressions

As the literature points to possible differences in wage gaps in different percentiles of the wage distribution (Arulampalam et al., 2007; Lehmer and Ludsteck, 2011; Barrett et al., 2012; Boudarbat and Lemieux, 2014; Huffman et al., 2016), we estimate unconditional quantile regressions for the overall model (model 3 of Table 3.5). When plotting the results of the unconditional quantile regression, we see clear negative effects across the wage distribution for migrants and females (Figure 3.3). Up to the 40th percentile, the results for the migrant dummy are not significant; therefore, the positive wage effect in the lower percentiles has to be interpreted with caution. However, moving along the wage distribution, the negative wage effect of being a migrant increases. At the same time, no matter the location in the wage distribution, being a woman always has a significant negative impact.

This effect is especially pronounced in the upper percentiles past the median. Thus, the negative wage effects of being a migrant or a female are corroborated by the quantile regressions. Furthermore, we learn that in upper percentiles of the wage distribution, this negative effect is more pronounced for both migrants and women.

Figure 3.3: Unconditional quantile plot for the migrant and gender sample



Source: LPP, BHP, IEB, own computations.

To test the assumption that the Big Five's influence is not the same across the wage distribution, we additionally report unconditional quantile regression results for the Big Five coefficients (see Appendix Figure B.3). The coefficients are not significantly different from each other, which indicates that the effects of the Big Five remain constant across the wage distribution. Nevertheless, the Big Five coefficients for the individual quantiles are significant by themselves, with the exception of conscientiousness (see Table B.6 of the Appendix). Thus, an interesting insight is that the overall OLS effect of extroversion and agreeableness are each driven by the 50th and 75th quantile, while the effect for openness to experience is driven by the 25th quantile. Neuroticism reveals significant coefficients for all quantiles. Since the results of the unconditional quantile regressions indicate that the effects of the Big Five do not vary much across the wage distribution, we do not delve deeper into the investigation of split samples in terms of unconditional quantile regressions.

3.6.5 Oaxaca-Blinder decomposition

To enhance our understanding of the relationship between the Big Five and wages, we look at Oaxaca-Blinder wage decompositions. Table 3.7 presents the main results

for the migration sample, whereby the models are defined as in Table 3.5.[13] We consecutively add controls to the basic Mincer-type equation in order to illustrate the contribution of endowments to the explanation of the migrant wage gap.

Table 3.7: Oaxaca-Blinder decomposition for the migrant sample

	Model 1	Model 2	Model 3
Predicted Difference	0.194***	0.194***	0.194***
	(0.026)	(0.026)	(0.026)
Explained	0.073***	0.136***	0.146***
	(0.015)	(0.021)	(0.021)
	38%	70%	75%
Unexplained	0.122***	0.058***	0.048**
	(0.028)	(0.022)	(0.022)
	62%	30%	25%
Controls	age, age squared, education	age, age squared, education, hours worked, blue-collar worker, collective agreement, works council, size of establishment, exports, share of female employees, tenure, unemployment, regions, sectors	Big Five
Observations	3,057	3,057	3,057

Source: LPP, BHP, IEB, own computations. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Clustered robust standard errors in parentheses.
Reference group is "Natives" when "Migrant" is the reference group, the main results shown here do not change substantially.

Table 3.7 shows that natives earn more than migrants with a predicted difference of almost 20 percent. The Mincer equation variables of model 1 explain 38 percent of this wage gap. Adding the additional controls, this percentage increases to approximately 70 percent. Finally, when including the Big Five, 75 percent of the gap can be explained by the means of our controls.

Looking at the decomposition in more detail, the results indicate that mainly the number of months in unemployment, the blue-collar status and age significantly contribute to the explained part of the gap. Concerning the Big Five, the result is mainly driven by extroversion and neuroticism, which are also the two personality traits which significantly differed between the groups.

Turning to the gender sample, the results are not as clear cut; however, they are in support of hypothesis five. Table 3.8 reports the main results and shows a significant gender wage difference of almost 29 percent.[14]

13 Appendix Table B.7 reports all coefficients.

14 Appendix Table B.8 reports all coefficients.

Table 3.8: Oaxaca-Blinder decomposition for the gender sample

	Model 1	Model 2	Model 3
Predicted Difference	0.289***	0.289***	0.289***
	(0.020)	(0.021)	(0.021)
Explained	0.003	0.030	0.043
	(0.008)	(0.026)	(0.026)
	−1%	10%	15%
Unexplained	0.292***	0.259***	0.246***
	(0.019)	(0.019)	(0.020)
	101%	90%	85%
Controls	age, age squared, education	age, age squared, education, hours worked, blue-collar worker, collective agreement, works council, size of establishment, exports, share of female employees, tenure, unemployment, regions, sectors	Big Five
Observations	4,848	4,848	4,848

Source: LPP, BHP, IEB, own computations. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Clustered robust standard errors in parentheses.
Reference group is "Men". When "Women"is the reference group, the main results shown here do not change substantially.

The unexplained part of the gender wage gap is highly significant and decreases with the inclusion of the controls in model 2 and again with the inclusion of the Big Five in model 3 This result indicates that the Big Five help decrease the unexplained part of the wage gap. However, the explained part of the decomposition is not significant for any of the three models. It could be that some of the variables cancel each other out.

Looking closer at the decomposition in model 3, among others weekly working time, blue-collar status, months in unemployment and the share of women in the establishment contribute significantly to explaining the wage gap. Furthermore, extroversion, neuroticism and agreeableness significantly contribute to the explained part of the gender wage gap. Hence, the inclusion of the Big Five also plays a role in the determination of the gender wage gap.

In summary, our third research question can also be answered in the affirmative. The decomposition exercises show that non-cognitive traits should not be overlooked when regarding wage differentials. This supports the results of the OLS analyses, which showed that the Big Five are significantly associated with wages. For both the migrant and gender wage gaps the Big Five personality traits significantly contribute to explaining wage gaps.

We conclude that excluding the Big Five in the analyses of wages may bias results due to omitted variable biases.

3.7 Robustness checks

To ensure the robustness of our results and to discuss several endogeneity issues, we conduct a series of alternative analyses, considering different measurement definitions and sample restrictions to reproduce the previous results.

One concern of the analysis is reverse causality, since labor market outcomes of individuals are measured at the same time as the personality traits. To mitigate these concerns, several age-related robustness checks are done. According to the existing literature, personality can change throughout the life span, however, these changes are most pronounced in young and old ages. The plaster hypothesis states that past a threshold of 30 years changes in personality traits rarely occur (Srivastava et al., 2003). To check this assumption, we split our sample into a group aged above 30 and one below. As a small fraction (12 percent) of the individuals in our sample is below 30 we can only re-estimate with the latter group and the results barely change in this relatively homogenous age group. Another way to control for age effects is by regressing each trait on age and age squared (Nyhus and Pons, 2005). The obtained residuals, which are now free of age effects, can be then used for more reliable estimates. Recalculating the analyses with the residualized personality effect does not change our results substantially. We conclude that age effects do not play a large role for our estimations.

Personality changes owing to life-changing experiences, such as long-term unemployment, might also influence our results. One way to address this issue is by testing the robustness of our results for individuals with unemployment periods under one year and comparing the results with the ones obtained by all individuals. One year is the current threshold for long-term unemployment. However, observations with long-term unemployment periods are scarce in our sample. Again, for both samples – all individuals and only individuals with short-term unemployment periods – we obtain the same results. Based on this rather homogenous group with respect to unemployment, we believe that personality changes due to life-changing unemployment experiences should not have occurred in our sample.

Indirect effects through education are another issue discussed in the personality literature. According to Peter and Storck (2015), indirect wage effects can occur through education, as for example being open to experience increases the intent to attend a university. To address this selectivity issue, we calculate personality measures free of education effects. Again, no big differences are observable in the obtained results, indicating that education does not include indirect personality effects in our base sample.

To check whether non-linearity for the Big Five exists, we include each trait as squared terms and recalculate the base specification. Except for agreeableness,

non-linearity does not occur for none of the subgroups. Only extreme scores of agreeableness are punished in the native men sample, which could be interpreted insofar that agreeableness weakens wage bargaining power. At the same time, being highly antagonistic influences wages negatively as well. Nevertheless, this is only true for native men and only affects extreme high scores. We therefore can conclude that nonlinearity does not play a big role in our analyses.

In an additional investigation of non-linearity, we include dummy variables indicating whether an individual is in the top 25 percent or bottom 25 percent of the personality trait distribution. Overall, agreeableness and neuroticism indicate an inverse linear relationship, whereas extroversion and openness to experience show an inverse u-shaped relationship. However, few of the coefficients are significant. Concerning the split samples, a few observations are worth mentioning: Only migrants are punished for being in the bottom 25 percent of the distribution of openness, while this relationship is not visible for natives. In the gender sample, being in the bottom 25 percent of the distribution of neuroticism is rewarded, however only men are punished for being in the top 25 percent of the distribution. Regarding openness to experience, only women are punished for being in the top 25 percent of the distribution. These two latter results might indicate gender stereotyping.

We further reassess whether employer learning effects occur by interacting tenure and the personality traits. Assuming that employers are not omniscient and initially have imperfect information about a prospective worker's productivity, they consequently rely more on observable characteristics (Petre, 2014). With increasing tenure, employers learn the true value of the worker's productivity and reward them accordingly. As a consequence, rewards of personality traits may change with tenure. Additionally, assuming that imperfect information about a foreign worker's productivity is higher than about a native worker's, the employer learning effect should be stronger and more visible in the migration sample. According to Nyhus and Pons (2005) it could also be that the personality of the new employee becomes evident to the employer only over time, which should result in stronger effects with tenure. However, no such phenomenon, either one way or the other, is observable in any of our samples. Thus, neither an overall employer learning effect, nor a stronger effect for foreign men occurs. This result is in line with Heineck (2011), who also does not find employer learning effects for men or women.

As a last robustness check, we regard time variance. Under the assumption that personality does not change over time, the second wave of the LPP does not inquire about the Big Five again. Therefore, we cannot estimate a fixed effects model. However, we are able to estimate a lagged model. Due to panel attrition and a lack of consent for information linkage, our number of observations is strongly reduced.

Nevertheless, the Big Five coefficients remain robust providing evidence against reverse causality.

3.8 Concluding remarks

We investigate the impact of the Big Five personality traits on wages and wage disparities among different employee groups. Prior research has not regarded the Big Five and migrants, consequently we provide first evidence for the importance of including personality traits in the analysis of the migrant wage gap. Research on non-cognitive skills has mainly been done in the context of psychology, whereas in economics, the importance of personality traits on labor market outcomes has been neglected. Therefore, we contribute to the smaller body of economic literature that includes the Big Five in analyses associating personality with gender wage gaps. Moreover, using linked employer-employee data, we are able to include individual- and establishment-level information in our analyses, which has not been done to this extent previously.

We find that the association between the Big Five and wages is not universal, rather it differs by employee groups. This result implies that personality traits are rewarded or punished differently depending on the group regarded. Numerous tests indicate that the relationship between the Big Five and wages is robust. Furthermore, the Big Five contribute significantly to explaining wage differentials and should therefore not be ignored in the economic literature. The Big Five can be regarded as omitted variables that might induce a bias upon non-inclusion in earning equations.

In terms of economic significance, our results are non-negligible: while the effect size may seem small at first, we look at log hourly wages so that the effect on monthly income is not slight. Further we show that controlling for personality traits in Oaxaca-Blinder decompositions decreases the "unexplained" portion of wage differentials, indicating that personality explains parts of wage gaps between groups. Thus, we believe that our results further our understanding of the importance of non-cognitive skills in the labor market.

Further investigation is warranted concerning the differentiation of employee groups and one possible avenue for future research is to analyze the effects of the Big Five on blue- and white-collar workers. Our results also indicate that the establishment structure seems to play an important role in the determination of wages. Hence, an investigation of interaction between establishment characteristics, such as the establishment's share of women, and personality traits might further our understanding of the wage setting mechanisms.

4 Labor market integration of migrants: Are family migrants worse off?[1]

4.1 Introduction

The labor market integration of migrants is a key concern especially for countries with high rates of immigration. Therefore, a broad strand of literature has addressed this topic. In this regard, great attention has been dedicated to the labor market outcomes and assimilation pattern of migrants, not least because of the seminal work of Chiswick (1978). Nevertheless, most subsequent studies have solely focused on male immigrants because the contribution of immigrant women to the labor market has been considered of secondary importance and has thus received less attention. This is quite surprising since family reunification accounted for a large proportion of migration inflows in the late 90s and early 2000s. However, outside of the context of family reunification, female migrants have gained importance in international migration. In 2015, female migrants accounted more than 52 percent of the total stock of migrants in Europe (United Nations, 2016). This study therefore focuses on the integration of both male and female migrants and considers the family status at the time of migration.

From an empirical viewpoint, it is well known that the employment rate is much lower for female migrants than for male migrants. In fact, the same is true for natives, but the differences are larger among migrants. According to the statistics of the German Federal Employment Agency, in 2015, approximately 80 percent of male migrants were employed, whereas only 58 percent of female migrants were employed. By comparison, natives show a 7-percentage-point difference in the employment participation rate (Statistik der Bundesagentur für Arbeit, 2017). Hence, female migrants are often considered a hidden potential labor force. Unfortunately, the reasons of this large difference between the employment participation rates of female and male migrants have not been determined to date. Most often, family reunification is stated as one major reason. Therefore, it is of great importance to more closely examine the labor market integration process of female and male migrants within the family context.

From a theoretical viewpoint, the labor market integration of female migrants, especially married female migrants, is also not clear. Two main theories concerning the labor market behavior of family migrants exist: the family investment theory

1 The study is single-authored and has been presented at the LabourNet Conference in Tampere, at the Workshop on Labour Economics in Trier, at the 22nd Eurasia Business and Economics Society in Rome, at the 25th Annual Postgraduate Population Studies Conference (PopFest) in Stockholm, and at the 13th Conference of the European Sociological Association (ESA) in Athen.

and tied mover theory. The former states that immigrant families are credit constrained, and therefore, female migrants are more or less forced to finance their husbands' investment in human capital. Consequently, female migrants start with relatively high labor market participation, but after some time spent in the host country, they reduce their labor supply or sometimes even withdraw from the labor market (Long, 1980). In contrast to the family investment theory, the tied mover theory argues that female migrants subordinate their migration decision to their partners. Hence, family reasons outweigh economic reasons, and consequently, the participation of female migrants in the labor market after migration is initially rather low (Mincer, 1978).

Due to these contradicting theories and a lack sufficient data sources, a great empirical debate remains ongoing regarding how well female migrants are integrated into the foreign labor market. Additionally, since both hypotheses predict only the labor market participation of female migrants within a relationship, single female migrants are more or less neglected within this debate. In line with the logic of the investment and tied mover theories, differences among family migrants and single migrants should occur when analyzing their integration process.

Therefore, the main contribution of this paper to research on labor market adjustments of immigrants is to examine differences between family and single migrants in terms of their labor market integration. First, as a proxy for labor market integration, duration until first employment is reassessed by drawing on a new dataset, the IAB-SOEP Migration Sample, linked to administrative data (Trübswetter and Fendel, 2016). This linked dataset allows an explicit distinction between migrants who are single or part of a family and further a division of family migrants based on their timing of migration.[2] This is one of the main features of this dataset, since Basilio et al. (2009) showed that the sequential migration of couples affects assimilation patterns differently. Moreover, the linked dataset allows a more precise analysis of labor market entry due to daily information regarding employment status. In a second step, the duration of being employed in the years following the first job is examined in order to gain insights about the stability of employment and hence on the success of integration. Finally, the impact of being a family migrant on entry wages and wage trajectories is analyzed. In contrast to previous studies, in this paper, labor market outcomes are compared among different types of migrants instead of between migrants and native-born individuals, which represents an additional contribution to existing literature on this topic.

2 A detailed description of the different types of family migrant is given in section 4.2.3.

The paper is structured as follows: First, an overview about the underlying theories and the corresponding literature is given. The main focus here lies on the impact of family status at the time of migration on labor supply as well as on the overall assimilation pattern. Section two broaches the issue of the different types of family migrants and discusses the varying implications on labor market integration. A description of the underlying dataset, sample restriction, main variables and operationalization follows in section three. Subsequently, the results of the survival analyses and wage regressions are presented, and possible implications are discussed. Section five concludes with the main findings and addresses potential areas for future research.

4.2 Migration and family status

Labor market participation and particularly the assimilation process of immigrants has a long history in the migration literature and is established by the works of Chiswick (1978) and Mincer (1978). Following their work, a large strand of literature has developed to analyze family migration decisions and the labor supply of immigrants in the destination country and to investigate the effects of both the internal and international family migration of different groups of people. Out of this stream, two main theories concerning the labor market participation of family members have emerged: the family investment theory and the tied mover theory.

4.2.1 Family investment theory

Long (1980) was one of the first to assume that the assimilation patterns of women are driven by a family investment strategy. Analogously to Chiswick's (1978) study "The Effect of Americanization on the Earnings of Foreign-Born Men", Long (1980) analyzed the assimilation patterns of white female migrants in the United States. However, contrary to those of Chiswick, his results showed higher earnings upon arrival but a faster decline of labor supply for foreign-born females compared to their native-born counterparts (Long, 1980). As a potential explanation for the higher earnings but flatter earning profiles, Long (1980) pursued Chiswick's (1978) idea that employers are less likely to finance the firm-specific training of immigrant men and therefore speculated that the wives rather support their husband's investments by working instead of accumulating their own destination-specific human capital. This kind of borrowing function, performed by the wives, is needed because newly arrived migrant families are subject to credit constraints. As soon as the husbands gathered destination-specific human capital, wives respond by reducing their working hours or disappearing completely from the labor market.

Following these two seminal works, a large number of researchers have aimed to empirically test the family investment model. For example, Duleep and Sanders (1993) examined the labor force participation of married immigrants in the United States by explicitly accounting for the extent of the husband's investment in U.S.-specific skills. According to their findings, a woman's decision to work strongly depends on the expected growth in the husband's earnings and the years since the husband migrated. As both can be interpreted as proxies for the extent of investment in destination-specific human capital, Duleep and Sanders (1993) considered their findings to be evidence supporting the family investment theory. Baker and Benjamin (1997) extended the conventional model by assuming variation in credit constraints due to family types. For instance, they assumed that mixed families are less credit constrained since one of the family members is native born. Consequently, female migrants with native-born spouses are not under the same pressure to perform a borrowing function for their families as female migrants with foreign-born husbands (Baker and Benjamin, 1997). Using a pooled sample of the Canadian Survey of Consumer Finance, Baker and Benjamin (1997) found that immigrant women initially work more hours than their native counterparts, but as the employment is inversely correlated with the husband's years since migration, the difference erodes over time. Moreover, immigrant women who are married to foreign-born men work more than immigrant women in mixed families, but they have flatter wage profiles. From these findings, Baker and Benjamin (1997) conclude that the family investment model holds for the labor-supply of immigrant families.

Analogously, Blau et al. (2003) tested the model for immigrants' behavior in the United States, and their findings are in sharp contrast to the findings for Canada. Applying synthetic cohorts as Baker and Benjamin (1997) did, they did not confirm their findings for the United States. Blau et al. (2003) observed less working hours for immigrants compared with natives upon arrival for both husbands and wives but positive assimilation profiles in labor supply with similar magnitude for both of them. Consequently, Blau et al. (2003) argued that the family investment theory is not suitable to adequately explain the behavior of immigrants to the United States. The same analysis was also done for Germany. Specifically, Basilio et al. (2009) used an analogous set of sample specifications in order to make their findings comparable to those for Canada and the United States. In line with Blau et al. (2003), the results also do not support the family investment theory for immigrants to Germany. Immigrant spouses work less than natives with similar characteristics, but their labor supply gradually increases as the duration of residence increases (Basilio et al., 2009). However, they assumed that sequential migration of the family entails advantages for latecomers through accumulated networks and

information about the local labor market from the first mover, which leads to an easier assimilation process and might explain why latecomers assimilate both in labor supply and wages.

In a recent paper, Adserà and Ferrer (2014) reviewed the labor market participation of immigrants to Canada and concluded that immigrant women show no secondary worker behavior. According to their results, the labor supply decision of married immigrant women is similar to that observed for native married women. Mixed evidence on the family investment model was found by Cobb-Clark and Crossley (2004) for Australia. Unlike the abovementioned analysis, Cobb-Clark and Crossley (2004) were able to identify primary and secondary workers using information on who is the principal applicant. This is a great advantage since former studies had to use gender as a proxy for primary and secondary worker status, which is a rather imperfect proxy because this identification strategy does not allow explanations for immigrant behavior that are based on optimal economic specialization to be disentangled (Cobb-Clark and Crossley, 2004). According to their results, foreign-born women who are secondary workers and married to foreign-born men have a higher probability of labor market participation in the first years after migration than comparable women who are married to native-born men. The opposite is true for men who are secondary workers. For this group, the results of Cobb-Clark and Crossley (2004) are at odds with the family investment hypothesis.

4.2.2 Tied mover theory

The second approach explaining the labor market participation of family members is developed by Mincer (1978). He extended the human capital theory of migration and postulated that migration decisions in a household with two adult members are driven by net family gains instead of the maximization of individual utility. Consequently, family ties not only define migration decisions but also explain changes in employment and earnings for family members after migration (Mincer, 1978). Moreover, it is implied that family net economic gains dominate individual gains and lead to so-called tied movers or tied stayers. Tied status then implies a less favorable economic position after migration than other comparable movers. As women show discontinuous labor force participation and less market power owing to higher non-market activity and less job attachment, Mincer (1978) concluded that they are more likely to be tied movers than men. This conclusion is also confirmed by recent studies. For instance, Battu et al. (2009) showed that the main factor for migration among men in the UK, whether single or married, is employment, whereas the migration patterns of married females are dictated by their husband's employment. These findings engendered a growing body of

research on the impact of tied migration on employment and earning effects as well as other migration-induced consequences for wives. However, owing to data limitations, these studies have predominantly focused on internal migration:

The overall findings suggest that the number of weeks worked, earnings, labor force participation and probability of employment for married women are negatively influenced by migration (see, for example, Sandell (1977); Lichter (1980); Büchel (2000); Büchel and van Ham (2003); Taylor (2007); Battu et al. (2009); Quinn and Rubb (2011). However, the observed losses of women are only temporary (Battu et al., 2009; LeClere and McLaughlin, 1997; Sandell, 1977).

What all these studies have in common is that they focus on internal migration (migration within a country) and the effect of being married on female migration. Hence, most the studies have compared the labor market consequences of tied movers to comparable individuals who did not move. Studies on the consequences of international migration for tied movers are rather rare. Only recently and unlike the abovementioned studies, Le (2005) and Banerjee and Phan (2014) investigated the importance of tied mover status on immigrants' labor market adjustment in an international context. Having detailed information on visa class and on participation in the decision to migrate, Le (2005) were able to investigate differences in labor market participation of primary and tied movers to Australia. As Mincer's (1978) hypothesis suggests, the results confirmed higher participation rates for female primary movers than for tied movers. Beyond that, Le (2005) observed different characteristics and inter-temporal preferences for work and family responsibilities for tied movers relative to primary movers. Using the Longitudinal Survey of Immigrants to Canada, Banerjee and Phan (2014) were able to examine the occupational displacement of newly arrived professional immigrants during their first years in Canada. As already shown in previous studies, Banerjee and Phan (2014) also found that women are more likely to be tied movers than men. Moreover, being a tied mover leads to a drop in occupational status. Applying interaction terms between gender and tied mover status, however, confounds gender differences, and the authors concluded that the tied mover status plays a more important role than gender in determining labor market integration (Banerjee and Phan, 2014).

4.2.3 Different types of family migrants

Considering the previous evidence, one can conclude that (female) family movers might face two different and opposing labor market adjustments after migration. According to the family investment model, they should experience higher initial wages and a higher propensity of labor market participation in the early post-

migration period than comparable non-family or single migrants. According to the tied mover hypothesis, one might observe greater labor market losses in terms of lower wages, lower participation rates or over-qualification right after migration. As previous research has shown, empirical evidence for the family investment model is rather ambiguous, whereas the tied mover hypothesis has been tested only for internal migration patterns.

Irrespective of which theory dominates, in both cases and according to both theories, (female) family migrants should differ in their integration process than single migrants. Therefore, the overall main hypothesis is:

H1: (Female) family migrants differ from (female) single migrants in their labor market adjustments after migration.

Assuming additionally that the need to invest and the presence of credit constraints among immigrant families differ along the timing of migration relative to the other family members, family migrants must be considered a heterogeneous group. Therefore, their integration processes might point into opposite directions and hence outweigh the overall effect of being a family migrant. For example, Basilio et al. (2009) showed that the sequential migration of couples affects assimilation patterns differently. Therefore, dividing the family variable into different subgroups is crucial. In the underlying dataset, four different categories of family migrants are observed. Along the sequence of migration, first movers, second movers and family migrants who moved together can be distinguished from each other. According to Baker and Benjamin (1997), families where both partners are migrants are more credit constrained than mixed families. Therefore, besides the timing of migration, the following analyses additionally controls for whether the partner is from Germany or not.

The distinction allows assumptions to be made about the risk of being a tied mover. For instance, family migrants who moved second are more likely tied movers than those who moved first. Their labor market integration process and their labor market stability might be more difficult and unstable than first movers because their job-seeking activities might be restricted to the regional market chosen by the husband (Frank, 1978) and, thus, locally constrained. The same should hold for family migrants with German partners. The restricted number of available and suitable job opportunities, due to the location decision of the partner, should hamper labor market entry and should increase the risk of mismatches and thus unstable employment patterns and lower entry wages.

In contrast, those family migrants who migrated first should behave more similarly to single migrants than to other types of family migrants. First movers and

single movers should be more likely to choose their region of destination according to their maximization of expected earnings within this region. Consequently, they should show faster entry into the labor market and higher employment stability than family migrants who did not choose their location economically.

Besides the distinction of the sequence of migration within the family, a gender differentiation is also needed. According to the family investment theory assumption, female family migrants are those performing as a kind of borrowing function and should thus differ from single female migrants, whereas male family migrants should not differ from single male migrants. The prediction from the tied mover hypothesis is not as clear cut, and thus, it is unclear who is affected within the integration process. In general, female migrants are defined as the tied mover, especially when they occur as second mover. However, testing for male and female migrants separately allows one to investigate whether the tied mover or the gender effect dominates. If second movers and those who migrated together in both samples show slower job entry rates, one can conclude that the family status dominates the gender effect in determining labor market integration.

Based on the family investment and tied mover theories, several more specific hypotheses can be derived:

H2a: **Female** *family movers migrating at the same time as their partners should show faster job entry rates and higher job exit rates than* **female** *single and other family migrants because they perform as a borrowing function for their husbands (family investment theory).*
or
H2b: Second family movers and those with German partners should show slower job entry rates than single migrants because of the restriction to the regional labor market opportunities (tied mover theory).

Assuming that female migrants who moved at the same time as their partners are more likely to be tied movers, *H2b* should also apply to them.

The third hypothesis follows due to the similarity of single migrants and first movers:

H3: Family migrants who migrated as first movers should show similar labor market integration behavior as single migrants.

Overall, following both theories, differences in labor market integration between single and family migrants, especially between female migrants, are expected.

4.3 Data and methodology

4.3.1 Sample description and operationalization

The analysis draws on the "IAB-SOEP Migration Sample",[3] which is a completely new and unique micro-dataset. The dataset results from a joined project of the Institute for Employment Research (IAB) and the Socio-Economic Panel (SOEP) at the German Institute for Economic Research (Brücker et al., 2014). Its household- and individual-level questionnaire is guided by the well-known and most comprehensive household survey in Germany, the longitudinal study "Living in Germany", where specific questions relevant for research on the migration and integration of recent immigrants are included. Compared to previous surveys of the GSOEP, the survey covers migration-related issues in greater detail. For instance, the questionnaire includes information about the motives for migration, migration history, pre-migration work experience and education gathered in migrants' home countries.

The following analyses are based on the first three waves. To gather a more detailed picture on the integration process of every individual, the IAB-SOEP Migration Sample was linked to the Integrated Employment Biographies (IEB) provided by the Federal Employment Agency.[4] The IEB contains detailed information about the labor market history of every person who has ever been either unemployed or job seeking or who has obtained means tested benefits or paid social security contributions. After the sample is restricted to those observations that have matches in both datasets and after migrants who moved before the age of 18 or after the age of 55, as well as those with pre-migration employment spells in the administrative data are excluded,[5] 1,481 individual observations remain for the analyses. The restriction of the sample to individuals between 18 and 55 at the time of migration is motivated in two ways: first, it is driven by the fact that only individuals who are possible candidates for the labor force should be included in the sample, and second, individuals should be old enough to migrate due to partnership reasons.

3 For a detailed description of the sampling frame and procedure, see Brücker et al. (2014).

4 For the linkage, respondents were asked to sign a consent form. For waves I and II, 58 percent of the respondents provided consent. For the third wave, only anchor persons are already linked to the IEB, which amount to almost 30 percent of the sample. Further information about the linkage and the linked dataset can be found in Trübswetter and Fendel (2016).

5 Some migrants migrated to Germany several times. Individual specific characteristics, such as education at the time of migration or labor market experience before migration, however, are related to the last migration. Therefore, the analysis has to be based on the last date of migration, which causes some migrants to have employment spells before their last migration observation.

The single and family migrant groups are derived from the question about the family status at the time of migration. Being a family migrant, however, does not necessarily mean that one is married. The decisive criterion governing allocation to the family or single migrant group was whether a relationship existed and lasted beyond migration. If individuals were assigned to the family migrant group, they were additionally grouped according to their timing of migration.

After those observations with inconsistent information about family status at the time of migration are dropped, 710 female migrants are available for inclusion in the analyses. In all, 38 percent migrated as singles and 62 percent as family migrants. A slightly smaller number of male migrants are available, with 585 men, of which 44 percent migrated without being in a relationship at the time of migration. According to the assumptions in section 4.2.3, four different categories of family migrants are conceivable: first movers, second movers, migrants who moved together at the same time and migrants with a German partner at the time of migration. Overall, only 11 percent of female migrants moved first, whereas about one-third of all male family migrants moved first (Table 4.1). In comparison, 18 percent of male family migrants are second movers, and more than 40 percent of female family migrants are second movers. At 22 percent, female family migrants slightly exceed the share of male family migrants (17 percent) having a German partner at the time of migration. As expected, female migrants are more likely to be second movers, whereas male migrants more often moved first. However, the gender differences concerning single movers are not as high as the migration literature suggests.

Table 4.1: Distribution of marital status at the time of migration

Marital status	Female migrants		Male migrants	
	Freq.	Share[a]	Freq.	Share[a]
Single migrants	205	38	186	44
Family migrants	505	62	399	56
Different types of family migrants:				
First mover	55	11	122	30
Second mover	199	43	75	18
Moved together	164	24	148	35
German partner	87	22	54	17

Source: IAB-SOEP Migration Sample, wave I-III linked to the IEB, own computations.
[a] Shares are weighted.

4.3.2 Identification strategy

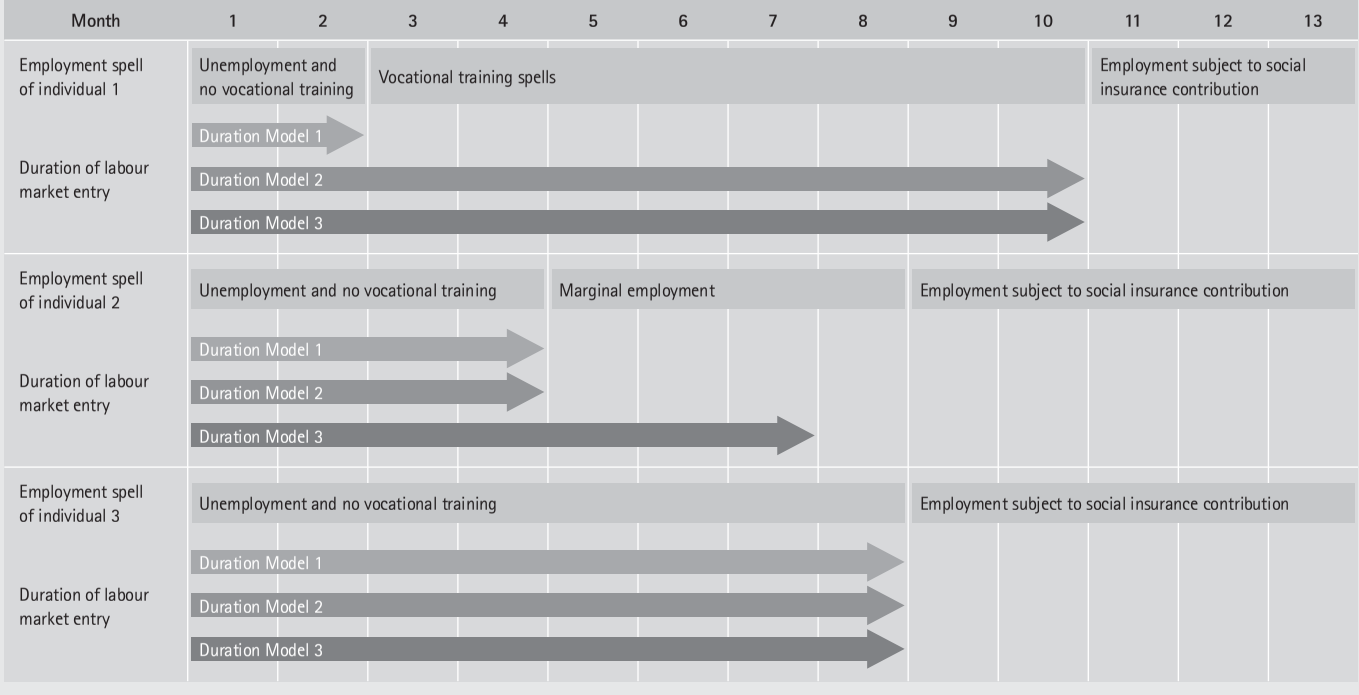
To be able to state assumptions about the labor market success of an individual three indicators are utilized: duration until first employment, duration of employment after starting to work and entry wages and wage trajectories.

Duration until first employment is used for a first approximation of labor market success. There are a myriad of options regarding which type of employment can be considered the first employment episode in Germany and thus the entry into the German labor market. For example, education spells as well as marginal employment can be considered a starting point. However, marginal employment usually implies precarious employment conditions, whereas one might argue that only employment spells that are subject to social security contributions are main employment spells and should therefore be considered the first entry into the labor market. Apprentices or vocational training are typically not seen as regular employment episodes; nevertheless, for migrants, it is one important approach for labor market integration. Accordingly, transition rates are estimated in three different ways in the following analyses: First, all employment spells (education, marginal employment and employment subject to social security contributions) are considered to be the starting point. Second, only marginal employment and employment subject to social security contributions are regarded as the first labor market entry. Third, only employment spells subject to social security contributions are considered first employment spells (see Figure 4.1). However, for readability issues, only the results using the second definition (Duration Model 2) are reported in the following analysis.[6]

However, a fast labor market entry does not necessarily allow statements to be made about the job quality and, hence, about the success of the labor market. For instance, longer transition rates might be due to higher reservation wages and thus should not be perceived as negatively in principle. Therefore, the second indicator tries to capture the labor market success by focusing on the stability of the employment as a proxy of the job quality. To examine the stability of employment, the uninterrupted duration of employment since the start of the first job in Germany is calculated. The end of an employment period is defined if the employer reports the end of the employment. Gaps less than three months, or gaps less than 366 days due to parental leave or illness, are not considered employment interruptions. According to the definition of labor market entry (see Figure 4.1), a differentiation of the three possible specifications of employment is again applied (see Appendix Table C.9 and Table C.10).

6 Results using the first and third definition of labor market entry are reported in the Appendix Table C.7 and Table C.8 and discussed in section 4.6.

Figure 4.1: Different definition of first employment



Source: Own depiction.
Legend: Individual 1 has a duration of 2 months in Model 1 where all employment spells are considered, and a duration of 10 months in Model 2 and 3. Individual 2 has the same duration in Models 1 and 2 because he/she starts with marginal employment. Individual 3 has the same duration in all three Models, because the first employment spell is employment subject to social security contributions.

Entry wages as well as wage trajectories are utilized as a third indicator of labor market success. Whereas entry wages capture labor market success in the short term, long-lasting effects are measured by wage trajectories.[7]

Assuming that the integration into the host country's labor market depends on the accumulated human capital gathered in the origin country, the pre-migration years of employment as well as the employment status one year before migration are considered. First, it allows for self-selection into different types of family migrants to be controlled. Second, patriarchal family structures before migration and, thus, possible cultural differences that influence post-migration labor market participation can be captured.

In addition to the employment history of an individual, language skills at the time of migration should affect the integration process or, more precisely, the time until the first job. Unfortunately, it is not possible to observe language improvements over time on a monthly or yearly basis; thus, only language proficiency before migration is taken into account.

The retrospective questions about partner history include information about the existence of a relationship in each year. Second, they capture information about whether the partner is living within the same household. Moreover, questions on the number and ages of children within the household give important information on labor supply, especially for women. Constructing a panel with the information about children living in the household is possible owing to the knowledge of the children's years of birth. Therefore, two dummies are generated to indicate whether children under or equal to 3 years of age or under the age of 16 years are living within the household.

Further control variables encompass individual-specific information, such as highest education obtained both abroad and in Germany,[8] age at the time of migration, legal status at migration, German citizenship status, region of origin and time of migration.

In the end, a panel design on a monthly basis with time-constant and time-varying variables is constructed in order to estimate the duration until entering the German labor market and the duration of the first uninterrupted employment episode as well as to estimate the entry wages and wage trajectories. A full list of the variables that are included in the different specifications and their variation over the sample period can be found in Appendix Tables C.1 and C.2.

---

7 Only daily wages of employees who are subject to social security contributions and full-time employees are considered in the two analyses because of lacking information concerning working hours and for the purpose of comparison.

8 As soon as the individual obtains recognition of foreign credentials, foreign education is counted as German education. The variable is thus time variant, whereas highest education obtained abroad is time invariant.

4.3.3 Statistical method

In the following, survival analysis and multiple linear regression techniques are drawn upon to examine how family status at the time of migration matters in terms of labor market success. As the hypotheses to be tested mainly concern the speed of entering the labor market and the duration in employment, survival analysis is perfectly suitable for estimating the influence of the explanatory factors. There are two more reasons to choose survival analysis techniques instead of multiple linear regression techniques: censoring and non-normality. First, the event of interest (entry into employment after migration) has not occurred to a proportion of the sample within the observation period. Consequently, the issue of right censoring must be addressed. The application of least squares techniques would imply an exclusion of all right censored observations and hence reduce the efficiency of the estimator or even lead to bias because of a systematic selection process (meaning that immigrants with fast integration might differ in relevant characteristics from other immigrants).

To control for the dynamic of duration, a piece-wise constant exponential approach is applied.[9] This type of model does not require complex assumptions about the time-dependence of the processes, though hazard ratios are allowed to vary across time periods. A piece-wise constant model thus splits the time period into several time intervals and assumes that the transition rates are constant only within the specific interval but not between the defined time periods (Blossfeld, 2007). Moreover, assuming no proportional hazard ratios for the main variables of interest, an interaction with the different time periods relaxes the proportionality assumption and models a time-dependent effect with different intercepts and different slopes in each interval. A simple piece-wise constant exponential model is defined as:

$$h_i(t;\, x_i) = h_0(t) exp\{X(t)'\beta\} \tag{4.1}$$

where X is a vector of covariates and β denotes regression coefficients. The duration is split into J time periods with split points of τ_1, τ_2, ... τ_J. One gains constant baseline hazards for each time interval such as $h_0(t) = h_j$ for t in $[\tau_{j-1}, \tau_j)$.

Besides the advantage of not requiring complex assumptions about the baseline hazards, there are also supporting arguments from a theoretical point of view. Considering the hypotheses, the potential effect of family status at the

9 To test the model fit, several alternative specifications of the functional form of the model were tested by using the LR improvement test on model fit and Akaike's information criterion. A graphical check was also exploit by plotting the cumulative hazard against the Cox-Snell residuals (Blossfeld, 2007).

time of migration on labor market entry should be rather strong initially after migration, but decreasing or even reverse over time. Concerning employment stability, it can be assumed that the job-exit probability is rather high at the beginning of the job but decreases with time, not least because of the dismissal protection after probation. Therefore, the sample was split into four different time periods at the following monthly split points: 6, 12 and 24 months and more than 24 months after migration to Germany after labor market entry.[10]

Simple ordinary least squares, as well as fixed-effects regression technique, are used to examine differences in entry wages and wage trajectories. The Mincer-type regression with person fixed effects and dummy variables for different types of family migrants is defined as:

$$\begin{aligned} ln(y)_{it} = {} & \beta_0 + \beta_1 exp_{it} + \beta_2 Family_{it} + \beta_3 exp_{it} * Family_{it} + \beta_4 exp_{it}^2 \\ & + \beta_5 exp_{it}^2 * Family_{it} + \beta_k X_{k,it} + \alpha_i + \varepsilon_{it} \end{aligned} \tag{4.2}$$

where $ln(y)_{it}$ is the logarithm of the daily wage of individual i at time t, exp_{it} measures the actual time in months spent in employment relations, $Family_{it}$ is a dummy for family vs. single status and a categorical variable for different types of family status, $X_{k,it}$ represents all k control variables, α_i is the person fixed effect controlling for all time-invariant characteristics, and ε_{it} is the individual residual at every point in time t. Because serial autocorrelation in residuals over time is suspected, Huber-White robust standard errors are utilized (Cameron and Trivedi, 2010).

4.4 Descriptive statistics

To gain first insights, descriptive analyses for the three indicators of labor market integration are applied.

4.4.1 Transition into first employment

Figure 4.2 and Figure 4.3 present the inverted smoothed Kaplan-Meier survival curves.[11] The inverted survival curves display the entry time into employment after migration differentiated by gender and by family status.[12]

10 A different splitting of the time periods did not significantly improve the model fit.

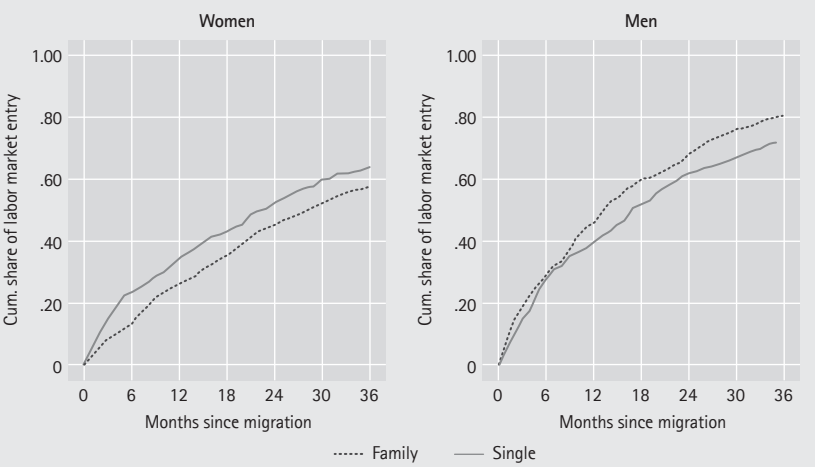
11 For readability, inverted smoothed survivor-functions for labor market entry is chosen. This helps to better illustrate the positive meaning of transition into first employment from unemployment.

12 A differentiation by the different definitions of labor market entry is reported in Appendix Figures C.1 and C.2.

Significant differences in the speed of labor market entry are observed between family and single migrants in the female sample.[13] Moreover, the results reveal that the transition rate to employment is always lower for female family migrants than for single female migrants, whereas the opposite is true for male migrants, especially after 12 months since migration. This visual impression is confirmed when the median survival time is calculated:[14] female single migrants have a median survival of 21 months, which is significantly smaller than the estimated median survival time of female family migrants (28 months). No such significant differences are estimated for the male sample. However, compared to females, males are significantly faster in entering the labor market than female migrants (median survival time: 14 months vs. to 25 months).

According to the Kaplan-Meier estimations, family and single male migrants show the same transition rates shortly after migration. After six to twelve months, family male migrants overtake single male migrants. However, the differences are quite small: after two years, almost 70 percent of male migrants entered the labor market, whereas 63 percent of single male migrants had done so. After the same period of time, 58 percent of single female migrants and 46 percent of family female migrants had transitioned to employment.

Figure 4.2: Transition rate to first employment, by family status and gender (inverted Kaplan–Meier estimates, smoothed)



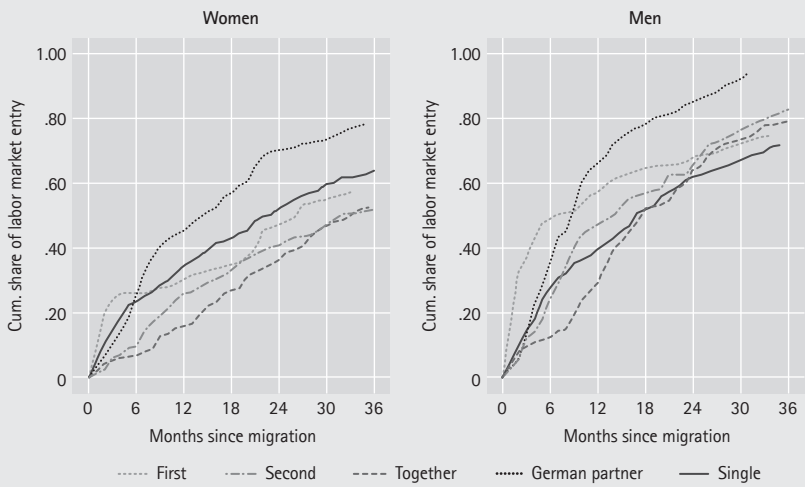
Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB, own computations.

13 The differences in the survivor functions are estimated by applying the Log-Rank and Wilcoxon test statistics. Results of the test statistics can be found in Appendix Table C.3.

14 Median survival time describes the time at which 50 percent of the individuals within the sample entered the labor market.

When the different types of family migrants are distinguished, the patterns of the inverted survival curves do not differ much between the male and female samples. However, the results from the test statistics show significant differences among the five survival curves for the family status groups.[15] For both samples, first movers seem to be faster in entering the labor market, especially within the first six months. This is more pronounced for men than women, and again, the share is clearly higher for male migrants. After six months, migrants with a German partner at the time of migration overtake those who migrated first.

Figure 4.3: Transition rate to first employment, by different types of family migrants and gender (inverted Kaplan-Meier estimates, smoothed)



Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB, own computations.

Overall the results clearly reveal that those migrating at the same time as their partner, and those migrating second have the lowest transition rates at the beginning irrespective of gender. This is in line with the results obtained by estimating the median survival times by family type: second movers (31 months) and those who moved together (33 months) have a significantly longer time without labor market entry. Interestingly, for the male sample, it seems that after two years in Germany without labor market participation, single migrants need a longer time to find a job than their counterparts. The median survival times confirm this result: first movers (7 months) and those with German partners (9 months) have a significantly shorter time without labor market entry than single male migrants (17 months). Thus,

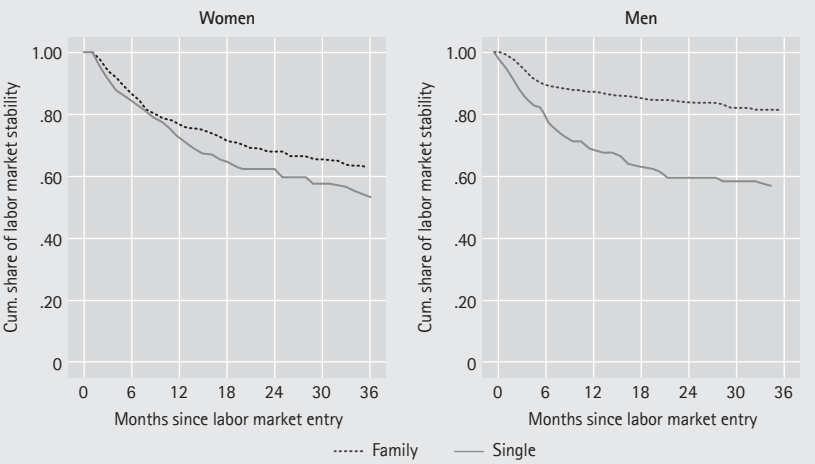
15 See Appendix Table C.4.

the descriptive results provide initial support for *H1* as well as for *H2b*, except for family migrants with German partners.

4.4.2 Employment stability

Figure 4.4 and Figure 4.5 present the smoothed Kaplan-Meier survival curves for labor market stability after first employment. The survival curves illustrate the cumulative share of individuals who remain in employment after first employment, differentiated by gender and by family status.[16]

Figure 4.4: Employment stability, by family status and gender (Kaplan-Meier estimates, smoothed)



Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB, own computations.

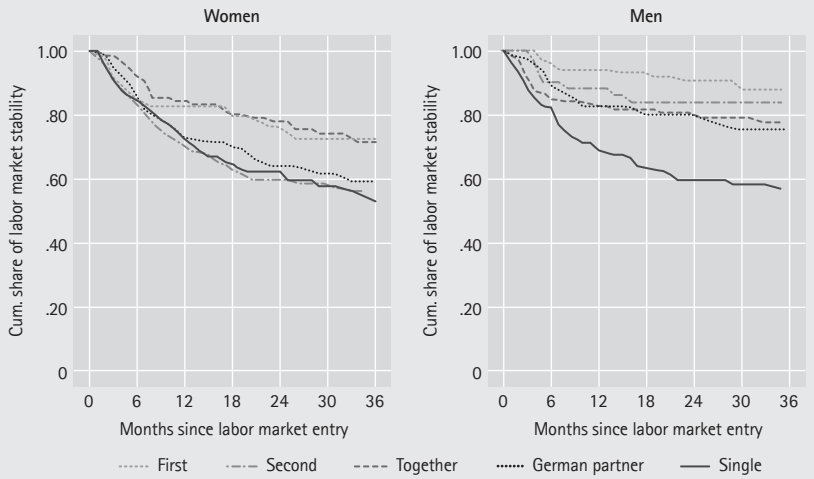
According to the family investment theory, significant differences for female family migrants should occur: fast labor market entry in order to finance their husbands investment in human capital but also fast withdraw from the labor market as soon as their husbands have gathered enough host country-specific human capital. Interestingly, the opposite is observable. For both samples, the equality of the survivor functions can be rejected.[17] However, family migrants do not withdraw faster from the labor market; rather, single migrants seem to have worse employment stability after first employment. After 12 months since labor market entry, only less than 70 percent of male single migrants but more than 85 percent of male family migrants show uninterrupted employment durations.

16 A differentiation by the different definitions of labor market entry is reported in Appendix Figures C.3 and C.4.

17 See Appendix Table C.5.

For female migrants, the difference is smaller: 27 percent of single migrants and 23 percent of family migrants had at least one interrupted employment period of more than three months after 12 months since labor market entry.

Figure 4.5: Employment stability, by different types of family migrants and gender (Kaplan-Meier estimates, smoothed)



Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB, own computations.

Again, distinguishing between the different types of family migrants reveals differences between the four family categories (Figure 4.5). Especially after the first six months, the differences become apparent. Female family migrants who migrated at the same time as their partners and those who migrated first show more stable employment patterns than those female migrants who migrated as single migrants, second movers and with a German partner. These mixed results for family female migrants explain the smaller differences obtained in Figure 4.4 for the female sample: family female migrants differ among the different family categories. This is not the case for male migrants. The picture on the right of Figure 4.4 clearly illustrates large differences among family and single male migrants but little difference among the different family categories (see Figure 4.5).[18]

18 See Appendix Table C.6 for the Log-Rank and Wilcoxon test statistics.

4.4.3 Wages

Figure 4.6 and Figure 4.7 present the average daily wages of migrants according to their actual labor market experience in Germany differentiated by gender and by family status. According to the descriptive results illustrated in Figure 4.6, it seems that moving as a family migrant affects women negatively but not men. Female family migrants start with equal wages as female single migrants, but with actual labor market experience, wages diverge strongly. A quite different picture occurs for male migrants. Male single migrants start with lower entry wages, but after two years of actual labor market experience, wages of male single migrants converge and reach those of their counterparts.

Again, distinguishing between the different types of family migrants shows that mainly female family migrants who migrated together with their partner and those who migrated as second movers have low wages, whereas the other two categories of family migrants seem to have more or less the same wages as female single migrants (Figure 4.7). Especially for those women who migrated at the same time as their partner, no wage growth according to actual labor market experience is observable. The higher average daily wage of male family migrants seems to be triggered by first movers. According to Figure 4.7, male family migrants who migrated before their partner have higher wages than single migrants and all other categories of family migrants. Only second movers and those who migrated at the same time seems to have lower wages than single migrants.

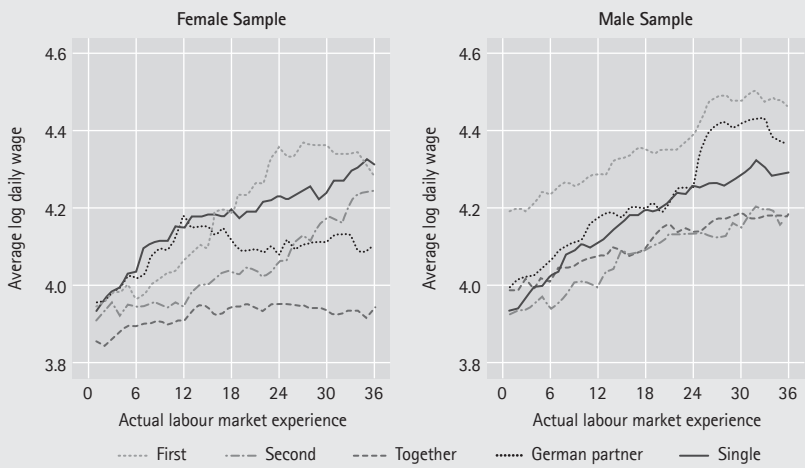
Figure 4.6: Average log daily wage according to actual labor market experience, by family status and gender

Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB, own computations.

To summarize the descriptive findings, first, *H1* can be confirmed. Single and family migrants differ in their labor market integration. In particular, in terms of employment stability, family migrants show longer transition rates. Regarding labor market entry, only significant differences are observable for the female sample. Entry wages seem to be similar for female migrants but not for male migrants. Regarding wage trajectories, differences occur especially for female migrants. Concerning *H2a*, the empirical results show exactly the opposite labor market behavior: female family migrants who moved at the same time as their partners show slower job entry and higher employment stability patterns than single female migrants. *H2b* can only partially confirmed. The descriptive results confirm that especially female second movers have slower entry rates than singles, however, their employment stability is higher than for single movers.

The descriptive results thus show no uniform picture regarding the behavior of family and single migrants. However, the results clearly show the importance of the distinction between different types of family migrants. Moreover, the descriptive findings demonstrates that focusing on labor market entry only is not enough. In particular, employment stability seems to be an important factor when analyzing the labor market integration processes of family and single movers. However, since family migrants might differ strongly in terms of family composition and, thus, in fertility behavior, these patterns might result from a composition effect. These confounding effects can be accounted for by using multivariate analyses, which is performed in the next chapter.

Figure 4.7: Average log daily wage according to actual labor market experience, by different types of family migrants and gender



Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB, own computations.

4.5 Multivariate results

4.5.1 Transition into first employment

To identify drawbacks in terms of labor market outcomes when moving as a family migrant, different specifications are estimated. Drawing on a piece-wise constant exponential regression technique, the relationship between family status and the transition into the first job is analyzed. Model 1 in Table 4.2 provides estimation results of the piece-wise constant exponential regressions with four different time intervals, differentiating family vs. single migrants. The time intervals display the time-dependence of the process.

According to the assumption that the effect of family status varies over the analyzed time period, time-dependent effects of the family status are taken into account and mapped in Table 4.2, Model 2.

Neither males nor females show significant differences between family and single movers in Table 4.2. However, the hazard rates are slightly higher for male than for female family migrants. Since the Kaplan-Meier estimations show that family migrants are not a homogeneous group, meaning that some family migrants might exhibit faster transitions into the labor market than others, the overall effect of being a family mover could be driven by the two divergent effects. For example, assuming that first movers are faster than single migrants but that second movers are slower, the overall effect of being a family mover could be offset. To examine whether this is the case, the different types of family movers are differentiated in Table 4.3 to take into account that the effect of being a family migrant might change over time. In this way, the time dependency of the family coefficients is again estimated.

Differentiating among the four time intervals can reveal significant differences between family and single female migrants within the first half year after migration to Germany. During this time period, female family migrants have – ceteris paribus – a 35 percent lower transition rate than single female migrants. Moreover, the results support the assumption that the effects are strong initially after migration and then decline over time and even reverse to a positive effect. For the male sample, no variation over time occurs.[19] Thus, the multivariate results point in the same direction as the descriptive results. However, significant differences between family and single movers are not observable for either the female or male samples. The only significant difference is found for the female sample within the first time period. Thus, confirmation of *H1*, in terms of the first labor market integration

19 Including interaction terms improves the model fit for the female sample but not for the male sample; see LR test and AIC in Table 4.2.

indicator, is not possible. However, as the descriptive findings showed, family migrants differ along their family category, and therefore, non-significant effects between single and family migrants might be driven by counteractive effects. Therefore, the identical models are replicated while accounting for the different types of family migrants.

Table 4.2: Piece-wise constant exponential model with time-period interaction terms on labor market entry: Family vs. single status

	Female Sample		Male Sample	
	Model 1	Model 2	Model 1	Model 2
Time periods				
1 to 6 months	0.049** (0.065)	0.066** (0.086)	0.033*** (0.015)	0.038*** (0.017)
6 to 12 months	0.052** (0.070)	0.045** (0.059)	0.029*** (0.013)	0.025*** (0.012)
12 to 24 months	0.053** (0.071)	0.049** (0.063)	0.034*** (0.014)	0.034*** (0.015)
24 and more months	0.050** (0.067)	0.045** (0.059)	0.026*** (0.011)	0.024*** (0.010)
Family status: Single mover (ref.)				
Family mover	1.042 (0.143)		1.141 (0.170)	
Period-specific effects				
Family mover x 1 to 6 months		0.644** (0.131)		0.929 (0.177)
Family mover x 6 to 12 months		1.238 (0.324)		1.358 (0.371)
Family mover x 12 to 24 months		1.160 (0.257)		1.111 (0.254)
Family mover x 24 and more months		1.170 (0.219)		1.276 (0.268)
Controls:	Yes	Yes	Yes	Yes
Observations	28729	28729	15315	15315
AIC	2075	2073	1752	1756
LR chi2	7.37		2.31	
Degrees of freedom	3		3	
Prob > chi2	0.0610		0.5107	

Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Standard errors in parentheses.
Controls: Human-capital variables: highest education abroad and in Germany, labor arket experience before migration measured in years and dummy for employed the year before migration, language proficiency (German) at migration. Socio-demographic variables: age at migration, country of birth, partnership, partner living in household, children under 3 in household, children under 16 in household, German citizenship. Entryway: ethnic German, asylum seeker, job offer, partner with job offer. Other controls: education spells, first job: self-employed, arrival cohort, year dummies.

In Table 4.3, a categorical variable of the different types of family migrants is used instead of a simple dummy variable to detect differences among family migrants. Again, interaction with the period effects allows one to study whether the effect changes over time.

Table 4.3: Piece-wise constant exponential model with time-period interaction terms for labor market entry: Different types of family migrants

	Female Sample		Male Sample	
	Model 1	Model 2	Model 1	Model 2
Time periods				
1 to 6 months	0.043**	0.058**	0.033***	0.041***
	(0.057)	(0.076)	(0.014)	(0.018)
6 to 12 months	0.046**	0.040**	0.029***	0.027***
	(0.062)	(0.053)	0.013)	(0.012)
12 to 24 months	0.048**	0.043**	0.034***	0.036***
	(0.064)	(0.056)	(0.014)	(0.016)
24 and more months	0.045**	0.040**	0.026***	0.025***
	(0.061)	(0.052)	(0.011)	(0.011)
Different types of family migrants: Single mover (ref.)				
First mover	0.933		1.073	
	(0.200)		(0.193)	
Second mover	0.986		1.020	
	(0.156)		(0.188)	
Moved together	0.877		1.260	
	(0.153)		(0.222)	
German partner	1.603***		1.242	
	(0.286)		(0.247)	
Period-specific effects				
First mover x 1 to 6 months		1.431		1.589**
		(0.424)		(0.321)
First mover x 6 to 12 months		0.190		0.899
		(0.195)		(0.366)
First mover x 12 to 24 months		1.014		0.607
		(0.350)		(0.209)
First mover x 24 and more months		0.879		0.835
		(0.269)		(0.210)
Second mover x 1 to 6 months		0.440***		0.740
		(0.124)		(0.214)
Second mover x 6 to 12 months		1.398		1.540
		(0.421)		(0.549)
Second mover x 12 to 24 months		0.851		0.832
		(0.236)		(0.275)
Second mover x 24 and more months		1.298		1.239
		(0.267)		(0.379)
Moved together x 1 to 6 months		0.382***		0.469**
		(0.132)		(0.142)
Moved together x 6 to 12 months		0.879		1.264
		(0.310)		(0.410)
Moved together x 12 to 24 months		1.157		1.544*
		(0.319)		(0.397)
Moved together x 24 and more months		0.993		1.907***
		(0.226)		(0.473)

Table 4.3 (continued)

	Female Sample		Male Sample	
	Model 1	Model 2	Model 1	Model 2
German partner x 1 to 6 months		1.075		0.882
		(0.274)		(0.249)
German partner x 6 to 12 months		2.114**		2.011**
		(0.730)		(0.686)
German partner x 12 to 24 months		2.202***		1.179
		(0.624)		(0.497)
German partner x 24 and more months		1.418		1.423
		(0.446)		(0.653)
Controls:	Yes	Yes	Yes	Yes
Observations	28729	28729	15315	15315
AIC	2067	2055	1756	1727
LR Chi2	35.74		52.48	
Degrees of freedom	12		12	
Prob > chi2	0.0004		0.0000	

Source: IAB-SOEP Migration Sample, wave I–III linked with the IEB. *** p < 0.01, ** p < 0.05, * p < 0.1.
Standard errors in parentheses.
Controls: Human-capital variables: highest education abroad and in Germany, labor market experience before migration measured in years and dummy for employed the year before migration, language proficiency (German) at migration. Socio-demographic variables: age at migration, country of birth, partnership, partner living in household, children under 3 in household, children under 16 in household, German citizenship. Entryway: ethnic German, asylum seeker, job offer, partner with job offer. Other controls: education spells, first job: self-employed, arrival cohort, year dummies.

In line with the expectations, first female movers do not differ from single movers in a statistically significant way *(H3)*. The same is true for second movers and those who moved together. However, significant differences are observable for those female family migrants who had a German partner at the time of migration (Table 4.3, Model 1). Such family migrants transition into employment most rapidly. This result contradicts the assumption made in subsection 4.2.3. Interestingly, it seems that the supporting network effects prevail over the local employment opportunity constraints. Female migrants can thus benefit from their native spouse, whereas male migrants, as compared to single male movers, cannot.

Again, assuming that the effects of the different types of family movers change across the time periods, additional time-specific interactions are modeled (Table 4.3, Model 2). Regarding the first six months, migrating second or together decreases the transition rates for female family migrants. Analogously to the effects obtained for the family coefficients, the negative effect declines in importance across later periods and changes to a slightly positive, albeit non-significant, effect. A reverse story emerges for women with a German partner at the time of migration. For female family migrants with a German partner, the positive effect increases in magnitude as well as in importance across the first three time periods. Male family migrants with a German partner show differences only in comparison with single male migrants within the second half of the first year.

To summarize, there is no clear evidence for *H2a* and *H2b* thus far. However, the results are more in favor of *H2b*. Specifically, shortly after migration, negative effects for female family migrants who moved together with their partner or second are observed, whereas first family movers do not significantly differ from single female migrants, which is in line with *H3*. Thus, *H1*, *H2b* and *H3* can be confirmed for the female sample if time-dependent effects are considered, except for migrants with German partners. Furthermore, male family migrants who migrated at the same time as their spouses have faster transition rates over time (except within the first half year), which might be due to their financial responsibility.

The results also show that only distinguishing between single and family migrants is short-sighted and might lead to biased conclusions. Otherwise, nonsignificant effects may result from countervailing effects rather than from a lack of differences between the two different groups. These countervailing effects are, e.g., the timing of moving within the family that leads to differences from single movers rather than family status itself. Moreover, the results show gender-specific differences.

4.5.2 Employment stability

In addition to the duration until a first job is found, it is also interesting to examine how long someone stays in employment afterwards, which indirectly measures the quality of the integration process and hence indicates the validity of the family investment theory. Additionally, it provides a more comprehensive picture of the integration success of migrants, which is often neglected in other empirical studies concerning the labor market integration of migrants. Following *H2a* and, thus, the family investment theory, family migrants – especially female family migrants – should leave the labor market much faster than single migrants, because after financing their spouses' career and supporting them in finding a job, they withdraw from the labor market. Tables 4.4 and 4.5 model the hazard ratios of the piece-wise constant exponential model for exiting employment in the months after first employment. Table 4.4 again distinguishes only between family and single movers. Table 4.5 shows the results for the different types of family movers.

The results for the female sample contradict *H2a*. According to the estimation results, being a female family migrant reduces the hazard of dropping out of employment more than being a female single migrant (Table 4.4, Model 1). Combining this result with the previous findings on labor market entry, it seems that female family migrants need longer to enter the labor market, but once they have entered, the stability is higher for them than for single migrants.

In fact, the same is true for male family migrants. According to Table 4.4, Model 1, a male family migrant's hazard ratio of dropping out of employment is almost 50 percent lower than that for those males moving as singles. Thus, male single migrants seem to have less stable labor market participation than family men. This might be explained by their financial responsibility, as was found for the labor market entry.[20]

Table 4.4: Piece-wise constant exponential model with time-period interaction terms for employment stability: Family vs. single status

	Female Sample		Male Sample	
	Model 1	Model 2	Model 1	Model 2
Time periods				
1 to 6 months	0.016*** (0.014)	0.014*** (0.013)	0.022*** (0.021)	0.019*** (0.018)
6 to 12 months	0.017*** (0.016)	0.015*** (0.014)	0.015*** (0.014)	0.021*** (0.020)
12 to 24 months	0.010*** (0.009)	0.009*** (0.009)	0.008*** (0.008)	0.011*** (0.010)
24 and more months	0.006*** (0.005)	0.007*** (0.006)	0.004*** (0.004)	0.002*** (0.002)
Family status: Single mover (ref.)				
Family mover	0.659** (0.124)		0.483*** (0.126)	
Period-specific effects				
Family mover x 1 to 6 months		0.738 (0.202)		0.590 (0.191)
Family mover x 6 to 12 months		0.752 (0.246)		0.193*** (0.088)
Family mover x 12 to 24 months		0.649 (0.231)		0.244*** (0.121)
Family mover x 24 and more months		0.496** (0.151)		1.122 (0.569)
Controls:	Yes	Yes	Yes	Yes
Observations	21313	21313	22843	22843
AIC	1245	1249	905	899
LR chi2	1.42		11.79	
Degrees of freedom	3		3	
Prob > chi2	0.700		0.008	

Source: IAB-SOEP Migration Sample, wave I–III linked with the IEB. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Standard errors in parentheses.
Controls: Human-capital variables: highest education abroad and in Germany, labor market experience before migration measured in years and dummy for employed the year before migration, language proficiency (German) at migration. Socio-demographic variables: age at migration, country of birth, partnership, partner living in household, children under 3 in household, children under 16 in household, German citizenship. Entryway: ethnic German, asylum seeker, job offer, partner with job offer. Other controls: education spells, type of first job, arrival cohort, year dummies, East-Germany dummy.

20 Since employment gaps less than 3 months are not considered as employment interruptions, the lower employment stability cannot be driven by job-to-job transitions with short interruption periods.

Considering a time-dependent effect of the family variable does not change the results (Table 4.4, Model 2). However, the model fit for the male sample significantly increases when time-dependent effects are included, whereas it does not for the female sample. For men, the effect of being a family migrant turns out to be significant for the second and third time period, and the effects significantly differ from each other. This is in line with the expectation that family workers may put up with a bad job longer because they need it to support their family, whereas a single person could quit more easily. In contrast to the male sample, considering time-dependent effects does not improve the model fit for the female sample. Thus, the interaction terms are not statistically significantly different (Table 4.4, Model 2).

In a second step, as done in the previous analysis, the different types of family migrant are distinguished in order to prevent offsetting effects and hence a misleading result for the family variable. The previous results are confirmed by the more differentiated analysis (Table 4.5).

Table 4.5: Piece-wise constant exponential model with time-period interaction terms for employment stability: Different types of family migrants

	Female Sample		Male Sample	
	Model 1	Model 2	Model 1	Model 2
Time periods				
1 to 6 months	0.009***	0.007***	0.020***	0.016***
	(0.008)	(0.007)	(0.019)	(0.016)
6 to 12 months	0.010***	0.009***	0.013***	0.017***
	(0.010)	(0.008)	(0.012)	(0.017)
12 to 24 months	0.006***	0.005***	0.007***	0.009***
	(0.005)	(0.005)	(0.007)	(0.009)
24 and more months	0.004***	0.004***	0.004***	0.002***
	(0.003)	(0.003)	(0.003)	(0.002)
Different types of family migrants: Single mover (ref.)				
First mover	0.346***		0.437***	
	(0.123)		(0.136)	
Second mover	0.858		0.360***	
	(0.196)		(0.143)	
Moved together	0.395***		0.458**	
	(0.104)		(0.170)	
German partner	0.862		0.718	
	(0.203)		(0.232)	
Period-specific effects				
First mover x 1 to 6 months		0.714		0.269**
		(0.311)		(0.149)
First mover x 6 to 12 months		0.141**		0.155**
		(0.140)		(0.122)
First mover x 12 to 24 months		0.254*		0.284*
		(0.188)		(0.191)
First mover x 24 and more months		0.219**		1.467
		(0.141)		(0.848)

Table 4.5 (continued)

	Female Sample		Male Sample	
	Model 1	Model 2	Model 1	Model 2
Second mover x 1 to 6 months		0.878		0.534
		(0.287)		(0.247)
Second mover x 6 to 12 months		0.948		0.131*
		(0.359)		(0.137)
Second mover x 12 to 24 months		0.907		0.370
		(0.378)		(0.313)
Second mover x 24 and more months		0.695		0.241
		(0.246)		(0.254)
Moved together x 1 to 6 months		0.440**		0.809
		(0.166)		(0.335)
Moved together x 6 to 12 months		0.506		0.151***
		(0.236)		(0.105)
Moved together x 12 to 24 months		0.384*		0.150**
		(0.204)		(0.124)
Moved together x 24 and more months		0.279***		0.571
		(0.126)		(0.397)
German partner x 1 to 6 months		0.851		0.556
		(0.327)		(0.313)
German partner x 6 to 12 months		0.991		0.434
		(0.428)		(0.272)
German partner x 12 to 24 months		0.741		0.220
		(0.360)		(0.224)
German partner x 24 and more months		0.810		3.354**
		(0.341)		(1.872)
Controls:	Yes	Yes	Yes	Yes
Observations	28729	28729	15315	15315
AIC	2067	2055	1756	1727
LR Chi2	35.74		52.48	
Degrees of freedom	12		12	
Prob > chi2	0.0004		0.0000	

Source: IAB-SOEP Migration Sample, wave I–III linked with the IEB. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.
Standard errors in parentheses.
Controls: Human-capital variables: highest education abroad and in Germany, labor market experience before migration measured in years and dummy for employed the year before migration, language proficiency (German) at migration. Socio-demographic variables: age at migration, country of birth, partnership, partner living in household, children under 3 in household, children under 16 in household, German citizenship. Entryway: ethnic German, asylum seeker, job offer, partner with job offer. Other controls: education spells, type of first job, arrival cohort, year dummies, East-Germany dummy.

For women, first movers and those who came after their partners seem to drive the significant differences from single migrants, although the longer transition rates are observable for all four family migrant categories (Table 4.5, Model 1). The previous result for the male sample is driven not by one single category but by the first three categories. Only family migrants with German partners do not significantly differ from single migrants (Table 4.5, Model 1).

Considering time-dependent effects for the different types of family migrants improves the model fit for both samples (Table 4.5, Model 2). For female family migrants who migrated as first movers or those who migrated at the same time, the interaction terms with the time periods significantly differ from each other.

The interaction terms of the other two categories of family migrants depict no significant effects, which confirm the result of Model 1. The result obtained for the male sample in Figure 4.5, Model 1, can also be confirmed by the interaction terms. However, the lower but nonsignificant hazard ratio for male family migrants with a German partner seem to be due to countervailing effects over the time periods. For the first three time periods, the hazard ratios are lower, although not significant, but the effect turns out to be significantly higher for male family migrants in the fourth time period in comparison with male single migrants.

Overall, the descriptive results from section 4.4.2 can be confirmed by the multivariate analysis. Especially first movers and those who migrated at the same time significantly differ in a positive way from single migrants, irrespective of gender. This finding contradicts *H2a* and hence the family investment theory which predicts faster withdrawal for female family migrants but not for male family migrants. However, neither effect is observable. Nevertheless, there is strong evidence for an overall difference between single and family migrants, which confirms *H1*.

4.5.3 Wages

Another way to analyze the quality of the first job and labor market success is to model entry wages. Similar to the entry date, specified in the section above, as well as the stability of the employment episode, wages are obtained from the administrative data. While this makes wages highly reliable, it implies some drawbacks. First, wages are right censored because of the social security contribution limit. To overcome this problem, all wages above the censoring limit are imputed separately for each year (Reichelt, 2015). Second, since no exact information on hours worked per day is given, the estimations are restricted to individuals working full time in their first job. Additionally, all wages below the marginal employment limit are excluded, and only employment spells subject to social security contributions are counted. This, of course, reduces the sample size, but it allows unbiased comparisons of entry wages for full-time workers subject to social security contributions.

In a first step, a simple ordinary least squares model (OLS) is estimated. Drawing on a fixed-effects model with interaction terms, long-lasting effects are examined in a second step. For the OLS estimations, no significant differences between family migrants and single migrants are observed (Table 4.6). Even distinguishing the family variable does not reveal significant effects: all four categories of female family migrants display a negative, but non-significant, effect. For the male sample, the opposite is true: all types of family migrants show higher wages than single male migrants. However, the effects are again not statistically significant. Since only full-time employment spells subject to social security contributions are

considered, the effects might be underestimated, and the differences might be even be stronger in size as well as in power for the overall sample. Moreover, the lack of significance of the effects could be due to the small sample size.

Table 4.6: Estimation results of the log daily wage of first employment

	Female Sample		Male Sample	
Dependent variable: Log daily wage	Family vs. single	Family types	Family vs. single	Family types
Family status: Single mover (ref.)				
Family mover	–0.037		0.054	
	(0.065)		(0.062)	
Different types of family migrants: Single mover (ref.)				
First mover		–0.037		0.080
		(0.106)		(0.076)
Second mover		–0.070		0.060
		(0.082)		(0.079)
Moved together		–0.051		0.031
		(0.072)		(0.082)
German partner		0.025		0.018
		(0.090)		(0.097)
Controls:	Yes	Yes	Yes	Yes
Number of subjects	339		460	
Adj. R-squared	0.277	0.273	0.285	0.281

Source: IAB-SOEP Migration Sample, wave I–III linked with the IEB. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Dependent variable: Log daily wages for first employment spell subject to social security contribution and full-time work.
Controls: Highest education obtained in Germany, age at migration, German citizenship, education spells, ethnic German, asylum seeker, children under 3 and under 16 in household, partnership, partner living in household, occupation, time since migration, labor market experience abroad, job offer at the time of migration, arrival cohort, year dummies, east Germany dummy.

As another way to test whether long-lasting negative effects persist over the life course and to control for unobserved individual-specific heterogeneity, a fixed-effects model is applied with interaction terms of actual labor market experience and family status according to the different categories of the family variable. As expected, wages increase over the employment trajectories. Indeed, some significant differences are observable for family male migrants who moved first and for female family migrants with German partners. The result for female family migrants with a German partner at the time of migration indicates a positive effect on wage trajectories. This finding is in line with the one obtained in subsection 4.5.1, but it contradicts *H2b*. In contrast, male first movers' wages seem to increase less strongly than male single movers. However, both effects are only significant on the 10% level (Table 4.7). The descriptive results obtained in section 4.4.3 thus cannot be confirmed by the multivariate analysis. Especially the alleged growing difference between female single and family migrants according to the descriptive results is not observable if composition differences and unobservable person-specific differences are considered. As only those employed full time and employees subject to social security contribution are considered, the obtained results must be treated with caution.

Table 4.7: Wage trajectory

Dependent variable: Log daily wage	Female Sample		Male Sample	
	Family vs. single	Family types	Family vs. single	Family types
Actual labor market experience	0.002**	0.002**	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)
Actual labor market experience (squared)	–0.000	–0.000	–0.000***	–0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Family status: Actual labor market experience x Single mover (ref.)				
Actual labor market experience x Family mover	–0.001		–0.001	
	(0.001)		(0.001)	
Different types of family migrants: Actual labor market experience x Single mover (ref.)				
Actual labor market experience x First mover		0.001		–0.002*
		(0.002)		(0.001)
Actual labor market experience x Second mover		0.001		–0.000
		(0.002)		(0.001)
Actual labor market experience x Moved together		–0.002		–0.001
		(0.001)		(0.001)
Actual labor market experience x German partner		0.003*		0.002
		(0.002)		(0.002)
Controls	Yes	Yes	Yes	Yes
Number of subjects	357		483	
Monthly observations	16,019		38,669	
Adj. R-squared	0.209	0.225	0.127	0.141

Source: IAB-SOEP Migration Sample, wave I–III linked with the IEB. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.
Dependent variable: Log daily wages of employment spell subject to social security contribution and full-time work.
Controls: Highest education obtained in Germany, age at migration, German citizenship, education spells, ethnic German, asylum seeker, children under 3 and under 16 in household, partnership, partner living in household, occupation, time since migration, labor market experience abroad, job offer at the time of migration, arrival cohort, year dummies, east Germany dummy.

4.6 Robustness checks

To test the robustness of the results, alternative analyses are applied. As mentioned in subsection 4.3.2, different concepts of first labor market entry are imaginable, which might drive the estimation results. Re-estimating the models in subsection 4.5.1 and 4.5.2 with the two different versions of labor market entry, however, does not change the results considerably (see Appendix Tables C.7–C.10).

Second, a more restrictive sample selection is considered to ensure that the results are not influenced by individuals who start with an education, which might be due to differences in unobserved characteristics, such as motivation,

intelligence, and role concept in the family. To account for these conceivable differences, the analytical sample is restricted to only those starting with marginal employment or employment subject to social security contribution. Re-estimating the models, presented in Tables 4.2–4.5, does not lead to considerable changes in the results.

Third, to test the family investment theory in a more precise way, a categorical variable that considers the employment trajectory of the partner is included. Unfortunately, capturing the employment trajectory of the partner initially after migration up to the latest monthly observation is possible only for family migrants who are still in the same relationship. To avoid losing single migrants and family migrants who are not in the same relationship anymore, a third category within the employment variable is included. As a result, there are three characteristics: not working, working, and no information because the individual is not in the same relationship as that at the time of migration. Again, reestimating the transition into the first job by controlling for the labor market participation of the partner does not change the effect of the family status variable substantially. However, having a partner participating in the German labor market significantly increases the transition into first employment for women. The effect within the male sample is only weakly positive and significant. According to the family investment theory, female family migrants should reduce their labor market supply or even withdraw from the labor market as soon as their partners have gathered enough host country-specific human capital. Considering this assumption, the variable for the partners' labor market participation is interacted with the family variable to determine whether this is true for family migrants. Again, the results do not support the family investment theory.

4.7 Conclusion

In this paper, the labor market integration process of family and single migrants are analyzed using a unique and novel dataset. Two main theories that predict different labor market behaviors of female migrants initially after migration are used as a benchmark to formulate differences between the two categories of migrants and their expected integration success. The family investment theory predicts high labor market participation soon after migration due to credit constraints. However, with increasing time spent in the host country, female family migrants will reduce their labor supply or even withdraw from the labor market. In contrast, the tied mover theory predicts less favorable economic positions for female migrants after migration than other comparable movers, under the condition that they are tied movers.

Differences between single and family migrants within their labor market integration processes are tested using three different indicators. First, the transition into first employment is investigated as a first proxy for labor market integration. Second and third, two indicators are used to model the quality of the job: labor market stability and wages. Estimating employment stability allows one to test the potentially faster withdrawal of female migrants according to the family investment theory, whereas examining the entry wages for each individual and the wage trajectories enables the investigation of whether the tied mover theory holds. Moreover, employment stability and wage trajectories provide a more complete picture of the integration success, especially in the long run.

The three models are estimated first with the distinction between family and single movers and second with a more detailed variable that divides family movers into first and second movers as well as those migrating at the same time and with German partners at the time of migration. Moreover, the analysis is performed separately by gender.

What do we learn from this paper? First, a distinction between single and family migrants is not sufficient when investigating the labor market integration of these two groups. Family migrants vary greatly in their integration processes and hence offset the overall family effect, which can lead to misinterpretation when analyzing differences between family and single migrants. Considering the different categories of family migrants, several findings are identifiable: First movers show a similar pattern to single movers regarding the time until labor market entry. Second movers and those migrating at the same time as their partners show significantly slower transition rates than single migrants; however, the differences are only significant within the first six months. By comparison, female family migrants with a German partner enter employment faster than singles migrants and other family migrants. This variation within family migrants emphasizes the importance of a detailed distinction.

Surprisingly, and contradictory to the investment theory, family migrants show higher employment stability than single migrants. Moreover, variation within the family variable is less pronounced, especially for male family migrants. All types of male family migrants have higher employment stability than male single migrants. Female family migrants also show higher employment stability, but the result is mainly driven by first movers and those who migrated at the same time as their partners.

Embedding the empirical findings into the main theories of labor market integration of family migrants, one can conclude that the findings support the tied mover theory rather than the family investment theory. Especially for female migrants it seems that entering the labor market is questionable, but once

this hurdle is overcome, family migrants display even more stable employment trajectories than single migrants. Therefore, the negative effect of being a family migrant, especially for female migrants, is not as high as often presumed and claimed by economic theory and in public debates. However, it strongly depends on the type of family migrant one belongs to.

In summary, this article aims to contribute to the empirical debate concerning the labor market integration of family migrants, and especially female family migrants. The underlying analyses strongly differ from those in previous research because migrants are compared with migrants instead of native counterparts. Moreover, comparing family migrants with other migrants is a new method to test whether the tied mover theory or the family investment theory explains the integration process of female migrants. Furthermore, differentiating among the various categories of family migrants furthers the understanding of family migrants and emphasizes their diversity. This should be kept in mind when discussing the difficulties of family migrants and their labor market integration process. Neglecting the differences between family migrants might lead to misinterpretation and wrong conclusions.

5 Conclusion and Outlook

This thesis discusses the economic integration of migrants in Germany, reveals new insights about the wage differentials between migrants and natives, and examines the labor market performance in the partnership and family context. The thesis does not only foster the understanding of wage differentials by offering additional explanation attempts, but also broadens the current understanding of labor market integration of often neglected groups by bringing them to the fore. Section 5.1 summarizes the main findings of Chapters 2–4. Limitations and further research possibilities are raised in section 5.2. With section 5.3, the thesis ends by drawing some policy implications.

5.1 Main findings

Based on job mobility as well as on signaling theory, the thesis shows that traditional theories which have generally explained wage dispersion over the life-course can also contribute to the explanation of wage gaps between natives and migrants. The thesis offers a new perspective on diverging wages and emphasizes the multidimensional process of labor market integration. Further, the analysis helps to understand why no typical assimilation patterns – as found for the U.S. or Canada – are observed for Germany. While most of the empirical work on wage inequality between migrants and natives approach the topic from a cross-sectional view, the study in Chapter 2 investigates the question on wage differentials from a longitudinal perspective. By applying this approach, the chapter shows that migrants and natives exhibit differences in their numbers of job transitions over their entire employment career. But not only the quantity of job transitions matters, moreover, the quality of the transition plays a crucial role. On average, migrants appear to have lower probabilities for voluntary and internal changes, whereas the probability of having a second involuntary change is higher for migrants than for natives. Due to the different effects caused by the quality of the job changes, fixed-effects estimates show that the differences in migrants' mobility patterns influence future earnings and thus explain wage differences between migrants and natives.

Chapter 3 approaches the immigrant-native wage gap from a different perspective. The empirical study in this chapter links the question of wage differentials to a behavioral model of earnings, proposed by Bowles et al. (2001a, b). The results show that migrants and natives – as do men and women – differ in their average personality traits, measured by the Big Five personality dimensions. Furthermore the study confirms a meaningful contribution of personality traits to

explaining variance in wages. But not only wages are affected by the traits: the results also provide evidence for heterogeneous effects for migrants and natives, meaning that different traits seem to be important. To put it differently, the empirical findings suggest that, as an example, openness to experience influences migrants' wages positively, while this is not the case for natives. This finding indicates that migrants and natives not only differ in their average personality traits, but that heterogeneous effects on wages exist and influence differences in wages. Moreover, using unconditional quantile regression, Chapter 3 pursues whether the Big Five's influence varies across the wage distribution. However, the empirical findings do not confirm this assumption. Adding to the existing immigrant-native wage gap literature, the results of an Oaxaca-Blinder decomposition reveal insights into what extent non-cognitive skills contribute to the remaining "unexplained" portion of wage differentials. After controlling for endowment differences, including the Big Five decreases the unexplained wage gap by 5 percentage points.

Turning the focus of investigation from a specific indicator of labor market performance to differences among specific groups of migrants, Chapter 4 put the integration process of migrants in a family context. The study in this chapter analyzes the impact of migrating as a family migrant on the integration process and labor market performance. The analysis is based on two strands of theory – the tied mover and family investment theory – which make predictions about the labor market integration of family migrants. Both theories argue worse labor market performance, but differ in their reasoning. The family investment theory predicts high employment probabilities for female family migrants initially after migration but decreasing with time spent in the host country. In contrast, the tied mover theory predicts low labor market participation and high risk of over-qualification for family migrants in the first years after migration. Against this backdrop, the findings of Chapter 4 reinforce the importance of a detailed distinction of the family status at the time of migration. It can be shown that there are major differences between the family categories in terms of their labor market performance. Especially for family migrants who moved after or at the same time as their partners, longer entry rates are observed. This finding points in the direction of the tied mover theory.

Since labor market integration of migrants can be measured through a variety of different indicators, the study examines not only the transition into first employment, it also pursues the employment stability as well as the initial earnings and the wage trajectories. Concerning the employment stability, the findings contradict the family investment theory and show significantly higher employment stability of family migrants compared to single migrants. No differences between single and family migrants are observed for entry wages and wage trajectories,

controlling for composition effects. Therefore, the negative effect of being a family migrant, which is especially pronounced for female migrants, is not as high as often presumed and claimed by economic theory and in public debates. However, it strongly depends which type of family migrant one belongs to.

5.2 Limitations and further research

The studies in Chapters 2, 3, and 4 improve the understanding of wage differentials between migrants and natives and highlight the variation of the labor market performance among family and single migrants. However, along with the new insights gathered from these studies, open questions remain which lead to further research potential.

Chapter 2 identifies differences in job mobility patterns for migrants and natives but what drives these differences remains in question. Therefore, further research should attempt to assess this issue. Several factors potentially determine the different numbers of voluntary and involuntary job changes. One possible explanation for differences in voluntary job changes can be found in the amount of search costs, as addressed and argued in Chapter 2. However, further research is needed to analyze to what extent search costs determine the differences. The ability to quantify this issue could result in a more holistic picture and allow more specific policy advice. Moreover, the impact of discrimination must be explored, especially in terms of involuntary job changes. Existing discrimination may lead to higher dismissal rates for migrants and hence – due to a much stronger negative signal of discharges – to a stronger negative effect on migrants than on natives. One straightforward approach would be to distinguish discharges and terminations from layoffs. Unfortunately, with the available data at hand, this was not possible in the current study. Based on the discrimination assumption, differences in returns must be examined in greater detail too.

As shown in Chapter 3, personality traits vary across migrants and natives and these traits influence the wage differentials between these groups. However, as in many other empirical studies, the findings cannot claim causality. Either applying panel data or relying on an instrumental variable design would be one possibility to tackle the causality issue. Unfortunately, at the time of writing Chapter 3, panel data analysis was not possible because only one wave of the LPP data set, on which the study is based on, was available. Further research should thus re-estimate the models in a panel framework to mitigate unobserved heterogeneity problems and strengthen the findings. Regarding an instrumental variable design, one idea is to overcome the causality issue by utilizing the average personality traits of migrants in their home country instead of using the individual personality traits. Yet, even

this approach is not without its flaws. One argument in the empirical study was that individuals who are willing to migrate are possibly self-selected and hence differ in their risk behavior and personality traits compared to people who stay in their home country. Using the "stayers" average personality traits might thus not reflect the personality traits of the observed migrants. Based on the idea that stereotypes are specific to the country of origin, future research which employs a classification of migrants along their nationality should contribute to already existing findings that confirm considerable variation of wage differentials according to the country of origin.

Regarding Chapter 4, a potential drawback can be seen in the indirect identification of the tied movers. Applying the sequential immigration history of family migrants as the identification strategy of being a tied mover does not necessarily determine the driving force within the household. Unfortunately, a more detailed question addressing this issue was only implemented in the second and third wave of the IAB-SOEP Migration Sample. Drawing on this question would, however, mean a crucial downsizing of the sample size. Nevertheless, as soon as the entire third wave is linked to the administrative data, a re-estimation of the study, by using this specific question, will be performed to validate the findings. However, the applied identification strategy in Chapter 4, which is to distinguish migrants by the individual timing of migration, also contains essential advantages. Utilizing this approach allows one to specifically investigate the impact of sequential migration of family members. This is rather important since this topic has acquired increased relevance in the emergence of the refugee crisis and associated family reunifications. Moreover, the empirical findings derived in Chapter 4 hint to further research potential for explaining the differences of family and single migrants by designing a theoretical framework which includes the loss of bargaining power due to migration as one major mechanism. In this specific context, a distinction among the sequences of migration is crucial to identify differences in bargaining power dependent on the migration time. Additionally, further research should delve deeper into the understanding of differences in employment stability and into the mechanisms behind this difference, which are evident between single and family migrants.

5.3 Policy implications

The present thesis provides new insights about key aspects of integration: the findings strengthen and enrich the ongoing academic and political debate about the integration of migrants and different subgroups. Moreover, the thesis helps to define and create targeted funding instruments for migrants in order not only to

speed up the labor market integration but rather to make it more sustainable over the life-course. There are at least three main political implications which can be directly drawn from the papers of this thesis:

First, the thesis showed that differences in job mobility influence wage trajectories of migrants and natives that contribute to wage differentials. A straightforward policy implication would be thus to reduce barriers to favorable job changes by minimizing search costs. This can be done by informational seminars or other types of active search assistance provided by the Federal Employment Agency. Similarly, awareness of the positive effects of job change on wages should be increased, and migrants should be especially sensitized to the importance of job searching in terms of wage growth. If voluntary job changes of migrants can be increased at least to the level of natives, wage differentials over the life-course should be reduced.

Second, the thesis showed that the gender wage gap and the immigrant-native wage gap are influenced by different rewards and punishments of personality traits. These rewards and punishments can be explained by the influence of asymmetric information in terms of the wage determination of migrants as well as by employer stereotyping. Knowing which personality traits are favorable and which are unfavorable helps one understand and describe wage differentials more accurately. Moreover, knowing that personality traits are associated with wages, it can be inferred that improving only cognitive skills is not sufficient to overcome wage disparities. Therefore, training programs begin to emphasize non-cognitive skills, in addition to investing in qualification and cognitive skills. Despite the literature being ambiguous concerning the malleability of personality traits, especially in individuals of more advanced age, it is worthwhile to train individuals in their social and personal behavior. This is even more important since personality tests and tests of behavioral patterns according to specific situations are more and more common in the recruitment process. Even though a complete change in personality traits is not possible, at least an increased awareness of the importance of favorable labor market-related personality characteristics should be possible and achievable.

Third, the thesis showed that differences exists between single and family migrants in their labor market integration process. Even more important, however, is the diverse effect stemming from the different categories of family migrants: the sequence of migration is the most important factor when talking about family migrants. This finding demands a careful approach when analyzing the potential drawbacks of family migrants. Besides the importance of the different types of family migrants, the thesis also showed that taking different dimensions of labor market integration into account also significantly contributes to the public debate on family migration and integration into the host country labor market. Therefore,

active labor market programs developed for family migrants must consider the type of family migrant as well as the stage of integration. For example, the findings showed that especially female family migrants who moved after their partner or simultaneously face difficulties entering the labor market. This group comprises mostly female migrants coming for family reunification. Therefore, specific support is needed to gain them as employees and help them find suitable jobs. These efforts are necessary if migration shall be used as a tool to counteract the impact of the demographic change and the impeding labor shortage. Once almost all family migrants, irrespective of gender, entered the labor market, they acquired greater employment stability than other migrants.

Therefore, an additional focus of active labor market programs should be on increasing employment stability, especially for those migrants who came as singles to Germany.

Bibliography

Adserà, A. and Ferrer, A. (2014). Labour market progression of Canadian immigrants women. *IZA DP No. 8407*.

Agrawal, T. (2013). Gender and caste-based wage discrimination in India: Some recent evidence. *Journal for Labour Market Research*, 47(4): 329–340.

Aldashev, A., Almaty, J. G., and Thomsen, S. L. (2012). The immigrant-native wage gap in Germany. *Jahrbücher für Nationalökonomie und Statistik*, 232(5): 490–517.

Algan, Y., Dustmann, C., Glitz, A., and Manning, A. (2010). The economic situation of first and second-generation immigrants in France, Germany and the United Kingdom. *The Economic Journal*, 120: 1–30.

Allik, J. and McCrae, R. R. (2004). Toward a geography of personality traits: Patterns of profiles across 36 cultures. *Journal of Cross-Cultural Psychology*, 35(1): 13–28.

Anger, C. and Schmidt, J. (2010). Gender Pay Gap: Gesamtwirtschaftliche Evidenz und regionale Unterschiede. *IW Trends 4*.

Anger, S., Camehl, G., and Peter, F. (2017). Involuntary job loss and changes in personality traits. *Journal of Economic Psychology*, 60: 71–91.

Antoni, M., Drasch, K., Kleinert, C., Matthes, B., Ruland, M., and Trahms, A. (2010). Working and learning in a changing world. *FDZ-Methodenbericht*, 05/2010.

Antoni, M., Jacobebbinghaus, P., and Seth, S. (2011). ALWA-Befragungsdaten verknüpft mit administrativen Daten des IAB (ALWA-ADIAB) 1975–2009. *FDZ-Datenreport*, 05/2011.

Antoni, M. and Seth, S. (2012). ALWA-ADIAB – linked individual survey and administrative data for substantive and methodological research. *Schmollers Jahrbuch. Zeitschrift für Wirtschafts- und Sozialwissenschaften*, 132(1): 141–146.

Arrow, K. (1973). *The Theory of Discrimination*. Discrimination in Labor Markets. Princeton University Press, Princeton, NJ.

Arulampalam, W., Booth, A. L., and Bryan, M. L. (2007). Is there a glass ceiling over Europe? Exploring the gender pay gap across the wage distribution. *Industrial and Labor Relations Review*, 60(2): 163–186.

Baker, M. and Benjamin, D. (1997). The role of the family in immigrants' labor-market acitivity: An evaluation of alternative explanations. *The American Economic Review*, 87(4): 705–727.

Banerjee, R. and Phan, M. B. (2014). Do tied movers get tied down? The occupational displacement of dependent applicant immigrants in Canada. *Journal of International Migration and Integration*, 16(2): 333–353.

Barrett, A., McGuinness, S., and O'Brien, M. (2012). The immigrant earnings disadvantage across the earnings and skills distributions: The case of immigrants from the EU's New Member States. *British Journal of Industrial Relations*, 50(3): 457–481.

Barrick, M. R. and Mount, M. K. (1991). The Big Five personality dimensions and job performance: A meta-analysis. *Personnel Psychology*, 44(1): 1–26.

Barth, E., Bratsberg, B., and Raaum, O. (2012). Immigrant wage profiles within and between establishments. *Labour Economics*, 19(4): 541–556.

Basilio, L., Bauer, T. K., and Kramer, A. (2014). Transferability of human capital and immigrant assimilation: An analysis for Germany. *SOEPpaper No. 671*.

Basilio, L., Bauer, T. K., and Sinning, M. (2009). Analyzing the labor market activity of immigrant families in Germany. *Labour Economics*, 16(5): 510–520.

Battu, H., Ma, A., and Phimister, E. (2009). Family migration and labour market outcomes: A panel investigation. *Homeownership and the Labour Market in Europe*, page 225.

Bauer, T. K., Dietz, B., Zimmermann, K. F., and Zwintz, E. (2005). *European Migration. What do we know?* Oxford University Press Inc., New York.

Becker, G. S. (1957). *The Economics of Discrimination*. Univ. Chicago Press, Chicago.

Becker, G. S. (1964). *Human Capital*. Columbia University Press, New York.

Bellmann, L., Bender, S., Bossler, M., Broszeit, S., Dickmann, C., Gensicke, M., Gilberg, R., Grunau, P., Kampkötter, P., Laske, K., Mohrenweiser, J., Schröder, H., Schütz, H., Sliwka, D., Steffes, S., Stephani, J., Tschersich, N., and Wolter, S. (2015). LPP – Linked Personnel Panel; Quality of work and economic success: Longitudinal study in German establishments (data collection on the first wave). *FDZ-Methodenreport 05/2015 (en), Nürnberg.*

Bertoli, S., Brücker, H., and Moraga, J. F.-H. (2013). The European crisis and migration to Germany: Expectations and the diversion of migration flows. *IZA Discussion Paper*, 7170.

Bertrand, M. (2011). *New Perspectives on Gender*, volume 4b of *Handbook of Labor Economics*. Elsevier, Ltd., Amsterdam.

Blau, F. D. and Kahn, L. M. (2016). The gender wage gap: Extent, trends and explanations. *IZA Discussion Paper*, No. 9656.

Blau, F. D., Kahn, L. M., Moriarty, J. Y., and Souza, A. P. (2003). The role of the family in immigrants' labor-market activity: An evaluation of alternative explanations: Comment. *The American Economic Review*, 93(1): 429–447.

Blinder, A. S. (1973). Wage discrimination: Reduced form and structural estimates. *The Journal of Human Resources*, 8(4): 436–455.

Blossfeld, Hans-Peter Glosch, K. R. G. (2007). *Event History Analysis with Stata*. Lawrence Erlbaum Associates.

Boneva, B., Frieze, I. H., Ferligoj, A., Jarosova, E., Pauknerova, D., and Orgocka, A. (1998). Achievement, power, and affiliation motives as clues to (e)migration desires. *European Psychologist*, 3(4): 247–254.

Boneva, B. S. and Frieze, I. H. (2001). Toward a concept of a migrant personality. *Journal of Social Issues*, 57(3): 477–491.

Bonin, H., Raffelhüschen, B., and Walliser, J. (2000). Can immigration alleviate the demographic burden? *FinanzArchiv: Public Finance Analysis*, 57: 1–21.

Borjas, G. J. (1985). Assimilation, changes in cohort quality, and the earnings of immigrants. *Journal of Labor Economics*, pages 463–489.

Borjas, G. J. (1987). Self-selection and the earnings of immigrants. *The American Economic Review*, 77: 531–553.

Borjas, G. J. (1994). The economics of immigration. *Journal of Economic Literature*, 32(4): 1677–1717.

Bouchard, T. J. and Loehlin, J. C. (2001). Genes, evolution, and personality. *Behavior Genetics*, 31(3): 243–273.

Boudarbat, B. and Lemieux, T. (2014). Why are the relative wages of immigrants declining? A distributional approach. *Industrial and Labor Relations Review*, 67(4): 1127– 1165.

Bowles, S., Gintis, H., and Osborne, M. (2001a). The determinants of earnings: A behavioral approach. *Journal of Economic Literature*, 39(4): 1137–1176.

Bowles, S., Gintis, H., and Osborne, M. (2001b). Incentive-enhancing preferences: Personality, behavior, and earnings. *The American Economic Review*, 91(2): 155–158.

Braakmann, N. (2009). The role of psychological traits for the gender gap in full-time employment and wages: Evidence from Germany. *University of Lüneburg Working Paper Series in Economics*, No. 112.

Brenzel, H. and Laible, M.-C. (2016). Does personality matter? The impact of the Big Five on the migrant and gender wage gaps. *IAB-Discusson Paper* 26/2016.

Brenzel, H. and Reichelt, M. (2017). Job mobility as a new explanation for the immigrant-native wage gap: A longitudinal analysis of the German labor market. *International Migration Review (online first)*, pages 1–26.

Broszeit, S. and Wolter, S. (2015). LPP – Linked Personnel Panel. Arbeitsqualität und wirtschaftlicher Erfolg: Längsschnittstudie in deutschen Betrieben (Datendokumentation der ersten Welle). *FDZ Datenreport*, 01/2015.

Brücker, H. (2015). Migration und Finanzkrise: Eine quantitative und strukturelle Analyse der Umlenkung von Wanderungsströmen. *Kölner Zeitschrift für Soziologie und Sozialpsychologie (forthcoming)*.

Brücker, H., Kroh, M., Bartsch, S., Goebel, J., Kühne, S., Liebau, E., Trübswetter, P., Tucci, I., and Schupp, J. (2014). The new IAB-SOEP Migration Sample. An introduction into the methodology and the contents. *SOEP Survey Papers. Series C, 216*.

Brunow, S. and Brenzel, H. (2012). The effect of a culturally diverse labour supply on regional income in the EU. *Empirica*, 39: 461–485.

Büchel, F. (2000). *Tied movers, tied stayers: The higher risk of overeducation among married women in West Germany*, pages 133–146. Macmillan Publishers Ltd.

Büchel, F. and van Ham, M. (2003). Overeducation, regional labor markets, and spatial flexibility. *Journal of Urban Economics*, 53(3): 482–493.

Bütikofer, A. and Peri, G. (2016). The role of cognitive and noncognitive skills in selecting into migration. *Working Paper, SOLE Conference. Work in progress, April 27*.

Büttner, T. and Stichs, A. (2014). Die Integration von zugewanderten Ehegattinnen und Ehegatten in Deutschland. Forschungsbericht 22, Bundesamt für Migration und Flüchtlinge.

Bundesamtes für Migration und Flüchtlinge (2015). Migrationsbericht.

Burdett, K. (1978). A theory of employee job search and quit rates. *The American Economic Review*, 68(1): 212–220.

Cahuc, P. and Zylberberg, A. (2004). *Labor Economics*. MIT Press.

Cameron, A. C. and Trivedi, P. K. (2010). *Microeconometrics using stata*. Stata Press, College Station, Texas, 2 edition.

Chiswick, B. R. (1978). The effect of Americanization on the earnings of foreign-born men. *Journal of Political Economy*, 86(5): 897–921.

Chiswick, B. R. and Miller, P. W. (2009). The international transferability of immigrants' human capital. *Economics of Education Review*, 28(2): 162–169.

Cobb-Clark, D. and Crossley, T. F. (2004). Revisiting the family investment hypothesis.*Labour Economics*, 11(3): 373–393.

Cobb-Clark, D. and Schurer, S. (2011). Two economists' musings on the stability of locus of control. *IZA Discussion Paper*, No. 5630.

Cobb-Clark, D. A. (2001). Getting ahead: The determinants of and payoffs to internal promotion for young U.S. men and women. *IZA Discussion Paper No. 288*.

Cobb-Clark, D. A. and Schurer, S. (2012). The stability of Big Five personality traits. *Economics Letters*, 115(1): 11–15.

Cobb-Clark, D. A. and Tan, M. (2011). Noncognitive skills, occupational attainment, and relative wages. *Labour Economics*, 18: 1–13.

Coleman, D. (2008). The demographic effects of international migration in Europe. *Oxford Review of Economic Policy*, 24: 452–476.

Constant, A. and Massey, D. S. (2005). Labor market segmentation and the earnings of German guestworkers. *Population Research and Policy Review*, 24(5): 489–512.

Cornell, B. and Welch, I. (1996). Culture, information, and screening discrimination. *The Journal of Political Economy*, 104(3): 542–571.

Costa, P. T., Herbst, J. H., McCrae, R. R., and Siegler, I. C. (2000). Personality at midlife: Stability, intrinsic maturation, and response to life events. *Assessment*, 7(4): 365–378.

Costa Jr, P., Terracciano, A., and McCrae, R. R. (2001). Gender differences in personality traits across cultures: Robust and surprising findings. *Journal of Personality and Social Psychology*, 81(2): 322.

Croson, R. and Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, 47(2): 448–474.

Drasch, K. and Matthes, B. (2013). Improving retrospective life course data by combining modularized self-reports and event history calendars. Quality and quantity. *International Journal of Methodology*, 47: 817–838.

Duleep, H. O. and Sanders, S. (1993). The decision to work by married immigrant women. *Industrial and Labor Relations Review*, 46(4): 677–690.

Dustmann, C. (1993). Earnings adjustment of temporary migrants. *Journal of Population Economics*, 6: 153–168.

Dustmann, C. and Pereira, S. C. (2008). Wage growth and job mobility in the United Kingdom and Germany. *Industrial and Labor Relations Review*, 61(3): 374–393.

Eagly, A. H. (1987). *Sex Differences in Social Behavior: A Social Interpretation*. Erlbaum, Hillsdale, NJ.

Firpo, S., Fortin, N. M., and Lemieux, T. (2009). Unconditional quantile regressions. *Econometrica*, 77(3): 953–973.

Fischer, G., Janik, F., Müller, D., and Schmucker, A. (2009). The IAB Establishment Panel. Things users should know. *Schmollers Jahrbuch*, 129: 133–148.

Fortin, N. M. (2008). The gender wage gap among young adults in the United States. The importance of money versus people. *The Journal of Human Resources*, 43(4): 884–918.

Fortin, N. M., Lemieux, T., and Firpo, S. (2010). Decomposition methods in economics.*NBER Working Paper*, No. 16045.

Frank, R. H. (1978). Why women earn less: The theory and estimation of differential overqualification. *American Economic Review*, 68: 360–373.

Friedberg, R. M. (2000). You can't take it with you? Immigrant assimilation and the portability of human capital. *Journal of Labor Economics*, 18(2): 221–251.

Fuchs, J., Kubis, A., and Schneider, L. (2015). Zuwanderungsbedarf aus Drittstaaten in Deutschland bis 2050. Szenarien für ein konstantes Erwerbspersonenpotenzial – unter Berücksichtigung der zukünftigen inländischen Erwerbsbeteiligung und der EU-Binnenmobilität. Technical report, Bertelmann Stiftung.

Fuller, S. (2008). Job mobility and wage trajectories for men and women in the United States. *American Sociological Review*, 73(1): 158–183.

Fuller, S. (2015). Do pathways matter? Linking early immigrant employment sequences and later economic outcomes: Evidence from Canada. *International Migration Review*, 49(2): 355–405.

Fuller, S. and Martin, T. F. (2012). Predicting immigrant employment sequences in the first years of settlement. *International Migration Review*, 46(1): 138–190.

García Pérez, J. I. and Rebollo Sanz, Y. (2005). Wage changes through job mobility in Europe: A multinomial endogenous switching approach. *Labour Economics*, 12(4): 531– 555.

Gartner, H. and Hinz, T. (2009). Geschlechtsspezifische Lohnungleichheit in Betrieben, Berufen und Jobzellen (1993–2006). *Berliner Journal für Soziologie*, 19: 557–575.

Gibbons, R. and Katz, L. F. (1991). Layoffs and lemons. *Journal of Labor Economics*, 9(4): 351–380.

Gius, M. (2014). The impact of job mobility on earnings: Using occupational and industrial classifications to identify job changes. *International Review of Applied Economics*, 28(2): 181–190.

González-Ferrer, A. (2007). The process of family reunification among original guestworkers in Germany. *Zeitschrift für Familienforschung*, 19: 10–33.

Gosling, S. D., Rentfrow, P. J., and Swann, W. B. (2003). A very brief measure of the Big Five personality domains. *Journal of Research in Personality*, 37(6): 504–528.

Granato, N. and Kalter, F. (2001). Die Persistenz ethnischer Ungleichheit auf dem deutschen Arbeitsmarkt: Diskriminierung oder Unterinvestition in Humankapital? *Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 53(3): 497–520.

Heckman, J. J., Stixrud, J., and Urzua, S. (2006). The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior. *Journal of Labor Economics*, 24(3): 411–482.

Heineck, G. (2011). Does it pay to be nice? Personality and earnings in the United Kingdom. *Industrial and Labor Relations Review*, 64(5): 1020–1038.

Heineck, G. and Anger, S. (2010). The returns to cognitive abilities and personality traits in Germany. *Labour Economics*, 17(3): 535–546.

Huffman, M., King, J., and Reichelt, M. (2016). Equality for whom? Organizational policies and the gender gap across the German earnings distribution. *Industrial and Labor Relations Review*, 70(1): 16–41.

Jaeger, D. A., Dohmen, T., Falk, A., Huffman, D., Sunde, U., and Bonin, H. (2010). Direct evidence in risk attituteds and migration. *The Review of Economics and Statistics*, 92: 684–689.

Jang, K. L., Llvesley, W. J., and Vemon, P. A. (1996). Heritability of the Big Five personality dimensions and their facets: A twin study. *Journal of Personality*, 64(3): 577–591.

Jokela, M. (2009). Personality predicts migration within and between US States. *Journal of Research in Personality*, 43(1): 79–83.

Jovanovic, B. (1979a). Firm-specific capital and turnover. *Journal of Political Economy*, 87(6): 1246–1260.

Jovanovic, B. (1979b). Job matching and the theory of turnover. *Journal of Political Economy*, 87(5): 972–990.

Kampkötter, P., Mohrenweiser, J., Sliwka, D., Steffes, S., and Wolter, S. (2015). Measuring the use of human resources practices and employee attitudes: The Linked Personnel Panel. *IAB-Discussion Paper 35/2015*.

Kandler, C., Riemann, R., Spinath, F. M., and Angleitner, A. (2010). Sources of variance in personality facets: A multiple-rater twin study of self-peer, peer-peer, and self-self (dis)agreement. *Journal of Personality*, 78(5): 1565–94.

Keith, K. and McWilliams, A. (1999). The returns to mobility and job search by gender. *Industrial and Labor Relations Review*, 52(3): 460–477.

Kleinert, C., Matthes, B., Antoni, M., Drasch, K., Ruland, M., and Trahms, A. (2011). ALWA – New life course data for Germany. *Schmollers Jahrbuch. Zeitschrift für Wirtschafts- und Sozialwissenschaften*, 131(4): 625–634.

Koenig, A. M., Eagly, A. H., Mitchell, A. A., and Ristikari, T. (2011). Are leader stereotypes masculine? A meta-analysis of three research paradigms. *Psychological Bulletin*, 137(4): 616–642.

Le, A. T. (2005). Female migrants' participation in the Australian labour market. *Public policy and immigration settlement. Edward Elgar, Cheltenham, UK*, pages 89–119.

LeClere, F. and McLaughlin, D. K. (1997). Family migration and changes in women's earnings: A decomposition analysis. *Population Research and Policy Review*, 16: 315– 335.

Lehmer, F. and Ludsteck, J. (2011). The immigrant wage gap in Germany: Are East Europeans worse off? *International Migration Review*, 45(4): 872–906.

Lehmer, F. and Ludsteck, J. (2015). Wage assimilation of foreigners: Which factors close the gap? Evidence from Germany. *Review of Income and Wealth*, 61(4): 677–701.

Licht, G. and Steiner, V. (1994). Assimilation, labour market experience and earnings profiles of temporary and permanent immigrant workers in Germany. *International Review of Applied Economics*, 8(2): 130–156.

Lichter, D. T. (1980). Household migration and the labor market position of married women. *Social Science Research*, 9: 83–97.

Long, J. E. (1980). The effect of Americanization on earnings: Some evidence for women. *The Journal of Political Economy*, 88(3): 620–629.

Lundberg, S. J. (2013). The college type: Personality and educational inequality. *Journal of Labor Economics*, 31: 421–441.

Matthes, B., Meinken, H., and Neuhauser, P. (2015). Berufssektoren und Berufssegmente auf Grundlage der KldB 2010. *Methodenbericht der Statistik der BA*, pages 1–19.

McCrae, R. R., Costa, P. T., Pedroso de Lima, M., Simoes, A., Angleitner, A., Ostendorf, F., Marusic, I., Bratko, D., Caprara, G. V., Barbaranelli, C., Chae, J.-H., and Pedmont, R. L. (1999). Age differences in personality across the adult life span: Parallels in five cultures. *Developmental Psychology*, 35(2): 466–477.

McCrae, R. R. and Terracciano, A. (2005). Personality profiles of cultures: Aggregate personality traits. *Journal of Personality and Social Psychology*, 89(3): 407–425.

Mincer, J. (1974). *Schooling, Experience, and Earnings*. National Bureau of Economic Research, Inc.

Mincer, J. (1978). Family migration decision. *Journal of Political Economy*, 86(5): 749–773.

Mortensen, D. T. (1988). Wages, separations, and job tenure: On-the-job specific training or matching? *Journal of Labor Economics*, 6(4): 445–471.

Mueller, G. and Plug, E. (2006). Estimating the effect of personality on male and female earnings. *Industrial and Labor Relations Review*, 60(1): 3–22.

Nielsen, H. S., Rosholm, M., Smith, N., and Husted, L. (2004). Qualifications, discrimination, or assimilation? An extended framework for analysing immigrant wage gaps. *Empirical Economics*, 29(4): 855–883.

Nyhus, E. K. and Pons, E. (2005). The effects of personality on earnings. *Journal of Economic Psychology*, 26(3): 363–384.

Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International Economic Review*, 14(3): 693–709.

OECD (2014). Is migration really increasing. *Migration Policy Debates*.

Ottaviano, G. I. and Peri, G. (2005). Cities and cultures. *Journal of Urban Economics*, 58: 304–337.

Peter, F. H. and Storck, J. (2015). Personality traits affect young people's intention to study. *DIW Economic Bulletin*, 1/2/2015.

Peters, H. (2008). Development of wage inequality for natives and immigrants in Germany – evidence from quantile regression and decomposition. *SOEP Paper*, No. 113.

Petre, M. C. A. (2014). *Essays on the Impact of Cognitive and Noncognitive Skills on Labor Market Outcomes*. Thesis.

Phelps, E. S. (1972). The statistical theory of racism and sexism. *The American Economic Review*, 62(4): 659–661.

Quinn, M. A. and Rubb, S. (2011). Spouse overeducation and family migration: Evidence from the US. *Journal of Family Economic Issues*, 32: 36–45.

Reichelt, M. (2015). Using longitudinal wage information in linked data sets. *FDZ-Methodenbericht*, 01/2015.

Riphahn, R. (2004). Immigrant participation in social assistance programs: Evidence from German guest workers. *Applied Economics Quarterly*, 50: 329–362.

Riphahn, R. T., Sander, M., and Wunder, C. (2013). The welfare use of immigrants and natives in Germany: The case of Turkish immigrants. *International Journal of Manpower*, 34: 70–82.

Roberts, B. W. and DelVeccio, W. F. (2000). The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychological Bulletin*, 126(1): 3–25.

Rowthorn, R. (2008). The fiscal impact of immigration on the advanced economies. *Oxford Review of Economic Policy*, 24: 560–580.

Roy, A. D. (1951). Some thoughts on the distribution of earnings. *Oxford Economic Papers*, 3: 135–146.

Salgado, J. F. (1997). The Five Factor Model of personality and job performance in the European community. *Journal of Applied Psychology*, 82(1): 30.

Sandell, S. H. (1977). Women and the economics of family migration. *The Review of Economics and Statistics*, 59(4): 406–414.

Schmelzer, P. (2011). Consequences of job mobility for the subsequent earnings at the beginning of the employment career in Germany and the UK. *Schmollers Jahrburch*, 131: 327–337.

Schmelzer, P. (2012). The consequences of job mobility for future earnings in early working life in Germany – placing indirect and direct job mobility into institutional context. *European Sociological Review*, 28(1): 82–95.

Schmidt, C. M. (1997). Immigrant performance in Germany: Labor earnings of Ethnic German migrants and foreign guest-workers. *The Quarterly Review of Economics and Finance*, 37: 379–397.

Seifert, W. (1997). Occupational and economic mobility and social integration of mediterranean migrants in Germany. *European Journal of Population*, 13: 1–16.

Silventoinen, K., Hammar, N., Hedlund, E., Koskenvuo, M., Rönnemaa, T., and Kaprio, J. (2008). Selective international migration by social position, health behaviour and personality. *The European Journal of Public Health*, 18(2): 150–155.

Specht, J., Egloff, B., and Schmukle, S. (2011). Stability and change of personality across the life course: The impact of age and major life events on mean-level and rank-order stability of the Big Five. *Journal of Personality and Social Psychology*, 101(4): 862–882.

Srivastava, S., John, O. P., Gosling, S. D., and Potter, J. (2003). Development of personality in early and middle adulthood: Set like plaster or persistent change? *Journal of Personality and Social Psychology*, 84(5): 1041–1053.

Statistik der Bundesagentur für Arbeit (2017). Berichte: Analyse Arbeitsmarkt, Arbeitsmarkt für Ausländer, Mai. Technical report.

Statistisches Bundesamt (2015). Verdienstunterschied zwischen Frauen und Männern in Deutschland weiterhin bei 22 %. Pressemitteilung vom 16. März 2015-99/15.

Taylor, M. P. (2007). Tied migration and subsequent employment: Evidence from couples in Britain. *Oxford Bulletin of Economics and Statistics*, 69(6): 795–818.

Topel, R. H. and Ward, M. P. (1992). Job mobility and the careers of young men. *The Quarterly Journal of Economics*, 107(2): 439–479.

Trübswetter, P. and Fendel, T. (2016). IAB-SOEP Migrationsstichprobe verknüpft mit administrativen Daten des IAB. Report, Forschungsdatenzentrum der Bundesagentur für Arbeit im Institut für Arbeitsmarkt- und Berufsforschung.

United Nations (2016). International migration report 2015. Technical report, Department of Economic and Social Affairs, Population Division.

Velling, J. (1995). Wage discrimination and occupational segregation of foreign male workers in Germany. *ZEW Discussion Paper*, 95-04.

Wegener, B. (1991). Job Mobility and Social Ties: Social Resources, Prior Job, and Status Attainment. *American Sociological Review* 56: 60–71.

A Supplements: Job mobility

Imputation method

Due to the social security system, wages are right censored and therefore imputed in our analysis. Wages below the limit for marginal employment and wages above the right-censoring limit are set to missing because they do not reflect regular wages and are therefore not reliable. The imputation method follows Reichelt (2015) and calculates the expected value of the logarithm of the daily wage by separate interval regression for each year. We use standard sociodemographic variables, such as schooling, qualifications, age and sex, as covariates. We include job-specific indicators, such as the 3-digit occupation code, if the employee is working full- or part-time. We also include the size of the firm. As large wage differences still exist between East and West Germany, we also include a region dummy. We first calculate an estimation of the right-censored wages and include a randomly drawn error term

$$E(ln(w_i) = x_i' \hat{\beta}_i + \varepsilon_{it}$$

with

$$\varepsilon = \Phi^{-1} \ (Y \ (1 - \Phi \ (\alpha))).$$

Figure A.1 describes the wage distribution before and after imputation and shows that it approximately results in a normal distribution. For a more detailed description, see Reichelt (2015).

Table A.1: Descriptive statistics by natives and migrants

	Natives		Migrants	
Variable	Mean/Proportion	Std.Dev	Mean/Proportion	Std.Dev
Log hourly wage	2.635	0.489	2.546	0.408
Labor market experience	12.427	7.129	11.374	7.256
Voluntary change (first)	0.483	0.500	0.332	0.471
Voluntary change (second)	0.211	0.408	0.091	0.287
Involuntary change (first)	0.192	0.394	0.187	0.390
Involuntary change (second)	0.051	0.221	0.057	0.231
Internal change (first)	0.152	0.359	0.079	0.270
Internal change (second)	0.042	0.200	0.024	0.154
Other change (first)	0.208	0.406	0.145	0.352
Other change (second)	0.053	0.224	0.017	0.131
Employment gaps	13.086	28.493	6.288	18.880
Unemployment gaps	3.860	12.801	3.169	8.080
Company Size (ref: 2000+ employees)				
1–4	0.053	0.223	0.052	0.222
5–9	0.098	0.298	0.081	0.272
10–19	0.102	0.303	0.117	0.321
20–99	0.207	0.405	0.207	0.406
100–199	0.112	0.315	0.172	0.377
200–1999	0.267	0.442	0.248	0.432
2000+	0.161	0.368	0.123	0.328
Economic sector (ref: manufacturing and agricultural)				
Manufacturing and agricultural	0.302	0.459	0.370	0.483
Public service	0.076	0.265	0.034	0.181
Construction	0.072	0.258	0.121	0.327
Trade	0.107	0.309	0.121	0.326
Transport	0.037	0.190	0.057	0.232
Financial Intermediation and real estate	0.072	0.258	0.009	0.094
Education, health and other services	0.334	0.472	0.288	0.453
Employment abroad in months	0.576	6.569	32.363	52.709
Transition from previous unemployment	0.158	0.365	0.236	0.425
Subsequently attained education	0.063	0.242	0.093	0.290
Overqualification	0.081	0.273	0.165	0.371
Female	0.474	0.499	0.447	0.497
Partner in household				
Single	0.281	0.450	0.180	0.384
Unmarried	0.137	0.344	0.074	0.262
Married	0.582	0.493	0.746	0.435
Age of child in household				
Under 3	0.121	0.326	0.141	0.349
3–5	0.141	0.348	0.160	0.366
6+	0.401	0.490	0.528	0.499
East Germany	0.174	0.379	0.021	0.143
Number of observations	5,436		386	

Source: ALWA-ADIAB, own calculations. Case selection is dependent on regression models. Only cases that are relevant to the multivariate analysis are considered. Standard deviations are not adjusted for clustering.

Figure A.1: Wage distribution before and after imputation

Source: ALWA-ADIAB, own calculations.

Table A.2: Cox regression model

Transition type	Odds ratio
	Migrants (ref: Natives)
Voluntary change (first)	1.107
Voluntary change (second)	0.693*
Involuntary change (first)	1.194
Involuntary change (second)	2.471***
Internal change (first)	0.646
Internal change (second)	0.550
Other change (first)	0.979
Other change (second)	0.185**
Controls	Yes

Source: ALWA-ADIAB, own calculations. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Controls are the same as in FE model 2.

Table A.3: Robustness checks: Separate regressions for the different job changes

Explanatory Variables	Fixed Effects Regressions: Log hourly wage							
	Model 1 Controls	Model 2 Voluntary	Model 3 Involuntary	Model 4 Internal changes	Model 5 Other changes	Model 6 Voluntary & Involuntary	Model 7 Voluntary, Involuntary & Other changes	Model 8 Full Model
Labor market experience (years)								
Natives (ref)	0.047***	0.044***	0.047***	0.045***	0.046***	0.045***	0.043***	0.042***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Migrants	−0.012**	−0.011**	−0.011**	−0.011**	−0.011**	−0.011**	−0.010**	−0.010**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Labor market experience^2								
Natives (ref)	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Migrants	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Type of changes								
Voluntary change (first)		0.070***				0.071***	0.073***	0.073***
		(0.014)				(0.014)	(0.014)	(0.014)
Voluntary change (second)		0.022				0.023*	0.025*	0.025*
		(0.014)				(0.014)	(0.014)	(0.145)
Involuntary change (first)			−0.021			−0.026*	−0.025*	−0.025
			(0.014)			(0.014)	(0.014)	(0.014)
Involuntary change (second)			−0.050***			−0.048***	−0.045**	−0.045**
			(0.018)			(0.018)	(0.018)	(0.018)

Table A.3 (continued)

Explanatory Variables	Fixed Effects Regressions: Log hourly wage							
	Model 1 Controls	Model 2 Voluntary	Model 3 Involuntary	Model 4 Internal changes	Model 5 Other changes	Model 6 Voluntary & Involuntary	Model 7 Voluntary, Involuntary & Other changes	Model 8 Full Model
Type of changes								
Internal change (first)				0.099***			0.101***	0.102***
				(0.014)			(0.014)	(0.014)
Internal change (second)				0.041			0.044*	0.045*
				(0.025)			(0.025)	(0.025)
Other change (first)					0.044**			0.045**
					(0.019)			(0.019)
Other change (second)					0.025			0.025
					(0.031)			(0.031)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average wage gap in percent (1 year)	1.12**	1.08**	1.09**	1.04**	1.11**	1.04**	0.95**	0.94*
Average wage gap in percent (5 years)	4.90**	4.67**	4.76**	4.53**	4.83**	4.52**	4.13**	4.05*
Average wage gap in percent (10 years)	8.16**	7.72**	7.93**	7.50**	8.01**	7.47**	6.78**	6.63*
N Persons	5,822 (natives: 5,436; migrants: 386)							
N Person periods	686,045 (natives: 647,609; migrants: 38,436)							
R-squared within	0.165	0.169	0.166	0.170	0.166	0.170	0.175	0.176
R-squared between	0.128	0.125	0.133	0.138	0.129	0.130	0.140	0.140

Source: ALWA-ADIAB, own calculations. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Robust standard errors in parentheses.

B Supplements: Does personality matter?

Table B.1: Sample summary statistics

	Migrant sample				Gender sample			
	Migrants[a]		Natives		Women		Men	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Individual Characteristics								
Tenure (in months)	133.20	99.73	171.66	126.34	137.69	104.96	161.28	121.01
Unemployment (in months)	11.82	16.92	6.18	13.33	12.03	22.41	7.84	15.63
Hours worked (per week)	37.72	4.07	38.09	4.26	34.13	7.53	38.48	4.35
Blue-collar worker	0.66	0.48	0.41	0.49	0.24	0.43	0.45	0.50
Establishment Characteristics								
Collective bargaining	0.65	0.48	0.66	0.47	0.59	0.49	0.64	0.48
Log size	5.17	0.98	5.35	0.97	5.24	0.92	5.29	0.96
Industry								
Manufacturing	0.25	0.43	0.27	0.45	0.20	0.40	0.29	0.45
Metal, electronics, automotive	0.39	0.49	0.33	0.47	0.17	0.37	0.32	0.47
Trade, traffic, news	0.21	0.41	0.19	0.39	0.22	0.42	0.19	0.39
Business and financial services	0.11	0.31	0.14	0.34	0.27	0.45	0.15	0.36
Information, communication, other services	0.05	0.21	0.06	0.24	0.14	0.34	0.06	0.23
Works council	0.71	0.45	0.74	0.44	0.65	0.48	0.70	0.46
Exports	0.70	0.46	0.63	0.48	0.47	0.50	0.59	0.49
Share of females	0.21	0.16	0.22	0.17	0.48	0.25	0.22	0.18
Region								
North	0.10	0.30	0.17	0.38	0.17	0.37	0.14	0.35
East	0.00	0.00	0.00	0.00	0.23	0.42	0.16	0.37
South	0.37	0.48	0.39	0.49	0.28	0.45	0.32	0.47
West	0.53	0.50	0.44	0.50	0.32	0.47	0.37	0.48
Number of observations	349		2,705		1,252		3,596	

Source: LPP, BHP, IEB, own computations. Results are weighted.

[a] Only male migrants living in West Germany are regarded for the migration sample. No migrants are included in the gender sample.

Table B.2: Big Five questionnaire items

I am ...
A: a thorough worker
B: communicative, talkative
C: sometimes a bit rude to others
D: original, someone who comes up with new ideas
E: a worrier
F: forgiving
G: somewhat lazy
H: outgoing, sociable
I: someone who values artistic, aesthetic experiences
J: somewhat nervous
K: effective and efficient in completing tasks
L: reserved
M: considerate and kind to others
N: imaginative
O: relaxed, able to deal with stress
P: eager for knowledge
Scale
1: Fully applies
2: Largely applies
3: Neutral
4: Does rather not apply
5: Does not apply at all
7: Refuse
8: Do not know
Source: LPP Questionnaire.

Table B.3: T-test of the Big Five: Migrants and natives

Extroversion						
Group	Observation	Mean	Std. Error	Std. Deviation	[95% Conf. Interval]	
Natives	2705	-0.0146	0.0189	0.9819	-0.0516	0.0224
Migrants	349	-0.1741	0.0536	1.0008	-0.2794	-0.0687
Combined	3054	-0.0328	0.0178	0.9852	-0.0678	0.0021
diff	0.1594	0.0560	0.0497	0.2692		
diff = mean(0)-mean(1)						t = 0.9033
Ho: dif f = 0					degrees of freedom = 56033	
Ha: diff < 0			Ha: diff != 0			Ha: diff > 0
Pr(T < t) = 0.998			Pr(T < t) = 0.004			Pr(T < t) = 0.002
Neuroticism						
Group	Observation	Mean	Std. Error	Std. Deviation	[95% Conf. Interval]	
Natives	2705	-0.1278	0.0182	0.9483	-0.1635	-0.0920
Migrants	349	0.0962	0.0540	1.0086	-0.0099	0.2024
Combined	3054	-0.1022	0.0173	0.9579	-0.1362	-0.0682
diff	-0.2240	0.0543	-0.3306	-0.1175		
diff = mean(0)-mean(1)						t = 0.9033
Ho: dif f = 0					degrees of freedom = 56033	
Ha: diff < 0			Ha: diff != 0			Ha: diff > 0
Pr(T < t) = 0.000			Pr(T < t) = 0.000			Pr(T < t) = 1.000
Conscientiousness						
Group	Observation	Mean	Std. Error	Std. Deviation	[95% Conf. Interval]	
Natives	2705	-0.0838	0.0193	1.0046	-0.1217	-0.0459
Migrants	349	-0.1321	0.0625	1.1675	-0.2550	-0.0091
Combined	3054	-0.0893	0.0185	1.0244	-0.1257	-0.0530
diff	0.0483	0.0583	-0.0660	0.1625		
diff = mean(0)-mean(1)						t = 0.9033
Ho: dif f = 0					degrees of freedom = 56033	
Ha: diff < 0			Ha: diff != 0			Ha: diff > 0
Pr(T < t) = 0.796			Pr(T < t) = 0.407			Pr(T < t) = 0.204
Agreeableness						
Group	Observation	Mean	Std. Error	Std. Deviation	[95% Conf. Interval]	
Natives	2705	-0.0631	0.0186	0.9697	-0.0997	-0.0265
Migrants	349	-0.0186	0.0597	1.1146	-0.1360	0.0987
Combined	3054	-0.0580	0.0179	0.9873	-0.0931	-0.0230
diff	-0.0445	0.0562	-0.1546	0.0656		
diff = mean(0)-mean(1)						t = 0.9033
Ho: dif f = 0					degrees of freedom = 56033	
Ha: diff < 0			Ha: diff != 0			Ha: diff > 0
Pr(T < t) = 0.214			Pr(T < t) = 0.428			Pr(T < t) = 0.786
Openness						
Group	Observation	Mean	Std. Error	Std. Deviation	[95% Conf. Interval]	
Natives	2705	-0.0122	0.0185	0.9603	-0.0484	0.0240
Migrants	349	-0.0719	0.0580	1.0837	-0.1860	0.0422
Combined	3054	-0.0190	0.0176	0.9752	-0.0536	0.0156
diff	0.0597	0.0555	-0.0491	0.1684		
diff = mean(0)-mean(1)						t = 0.9033
Ho: dif f = 0					degrees of freedom = 56033	
Ha: diff < 0			Ha: diff != 0			Ha: diff > 0
Pr(T < t) = 0.859			Pr(T < t) = 0.282			Pr(T < t) = 0.141

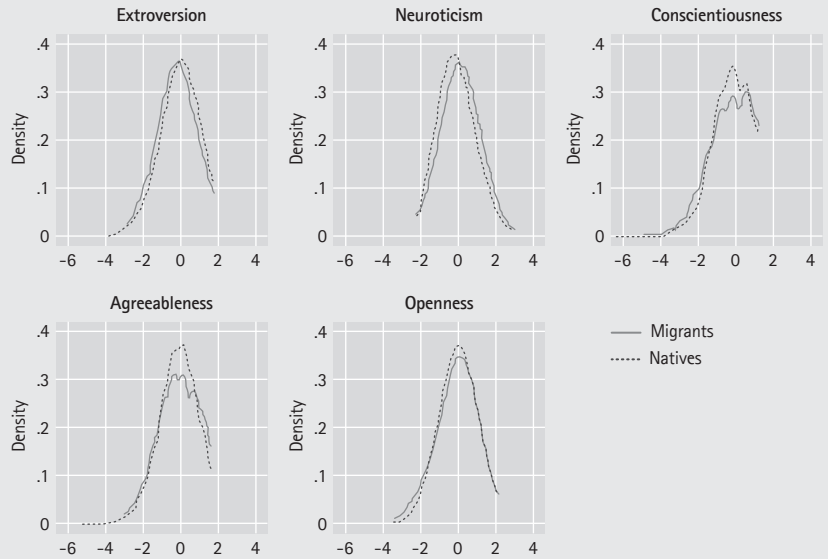
Source: LPP, BHP, IEB, own computations. *** p < 0.01, ** p < 0.05, * p < 0.1. Clustered robust standard errors in parentheses.

Table B.4: T-test of the Big Five: Men and women

Extroversion						
Group	Observation	Mean	Std. Error	Std. Deviation	[95% Conf.	Interval]
Men	3596	-0.0011	0.0164	0.9814	-0.0332	0.0310
Women	1252	0.0925	0.0286	1.0103	0.0365	0.1485
Combined	4848	0.0231	0.0142	0.9897	-0.0048	0.0510
diff	-0.0936	0.0325	-0.1572	-0.0300		
diff = mean(0)-mean(1)						t = 0.9033
Ho: dif f = 0					degrees of freedom = 56033	
Ha: diff < 0			Ha: diff != 0			Ha: diff > 0
Pr(T < t) = 0.002			Pr(T < t) = 0.0039			Pr(T < t) = 0.998
Neuroticism						
Group	Observation	Mean	Std. Error	Std. Deviation	[95% Conf.	Interval]
Men	3596	-0.1036	0.0159	0.9524	-0.1348	-0.0725
Women	1252	0.1441	0.0296	1.0468	0.0861	0.2022
Combined	4848	-0.0396	0.0141	0.9835	-0.0673	-0.0119
diff	-0.2477	0.0321	-0.3106	-0.1848		
diff = mean(0)-mean(1)						t = 0.9033
Ho: dif f = 0					degrees of freedom = 56033	
Ha: diff < 0			Ha: diff != 0			Ha: diff > 0
Pr(T < t) = 0.000			Pr(T < t) = 0.000			Pr(T < t) = 1.000
Conscientiousness						
Group	Observation	Mean	Std. Error	Std. Deviation	[95% Conf.	Interval]
Men	3596	-0.0462	0.0166	0.9935	-0.0787	-0.0137
Women	1252	0.1754	0.0253	0.8959	0.1257	0.2250
Combined	4848	0.0110	0.0140	0.9740	-0.0164	0.0384
diff	-0.2215	0.0318	-0.2839	-0.1592		
diff = mean(0)-mean(1)						t = 0.9033
Ho: dif f = 0					degrees of freedom = 56033	
Ha: diff < 0			Ha: diff != 0			Ha: diff > 0
Pr(T < t) = 0.000			Pr(T < t) = 0.000			Pr(T < t) = 1.000
Agreeableness						
Group	Observation	Mean	Std. Error	Std. Deviation	[95% Conf.	Interval]
Men	3596	-0.0586	0.0163	0.9786	-0.0906	-0.0266
Women	1252	0.1435	0.0286	1.0118	0.0874	0.1996
Combined	4848	-0.0064	0.0142	0.9912	-0.0343	0.0215
diff	-0.2022	0.0324	-0.2657	-0.1387		
diff = mean(0)-mean(1)						t = 0.9033
Ho: dif f = 0					degrees of freedom = 56033	
Ha: diff < 0			Ha: diff != 0			Ha: diff > 0
Pr(T < t) = 0.000			Pr(T < t) = 0.000			Pr(T < t) = 1.000
Openness						
Group	Observation	Mean	Std. Error	Std. Deviation	[95% Conf.	Interval]
Men	3596	0.0095	0.0160	0.9576	-0.0218	0.0408
Women	1252	0.0129	0.0293	1.0364	-0.0445	0.0704
Combined	4848	0.0104	0.0141	0.9784	-0.0172	0.0379
diff	-0.0035	0.0321	-0.0664	0.0595		
diff = mean(0)-mean(1)						t = 0.9033
Ho: dif f = 0					degrees of freedom = 56033	
Ha: diff < 0			Ha: diff != 0			Ha: diff > 0
Pr(T < t) = 0.457			Pr(T < t) = 0.914			Pr(T < t) = 0.543

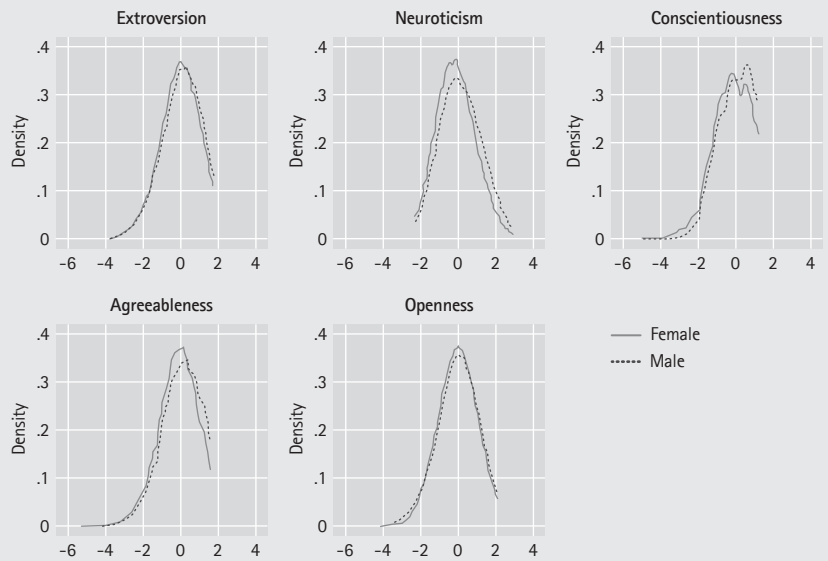
Source: LPP, BHP, IEB, own computations. *** p < 0.01, ** p < 0.05, * p < 0.1. Clustered robust standard errors in parentheses.

Figure B.1: Personality Traits by migratory status



Source: LPP, BHP, IEB, own computations.

Figure B.2: Personality Traits by gender



Source: LPP, BHP, IEB, own computations.

Table B.5: OLS results for the subsamples

	Migration		Gender	
	Migrants	Natives	Female	Male
Extroversion	−0.004	0.025***	0.016*	0.017***
	(0.016)	(0.007)	(0.009)	(0.006)
Neuroticism	−0.048***	−0.037***	−0.018**	−0.035***
	(0.016)	(0.007)	(0.008)	(0.006)
Conscientiousness	−0.004	−0.009	−0.016	−0.008
	(0.017)	(0.007)	(0.011)	(0.006)
Agreeableness	−0.024	−0.027***	−0.005	−0.026***
	(0.017)	(0.007)	(0.009)	(0.006)
Openness	0.026*	0.009	0.003	0.012*
	(0.015)	(0.008)	(0.008)	(0.006)
Controls	Yes	Yes	Yes	Yes
Observations	349	2,705	1,252	3,596
R-squared	0.504	0.493	0.546	0.588
Adjusted R-squared	0.451	0.488	0.537	0.585

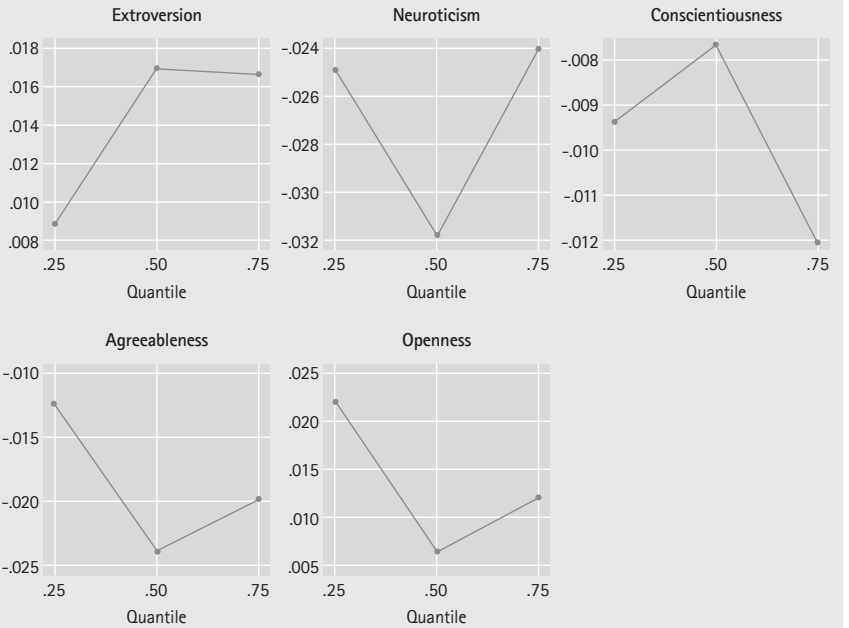
Source: LPP, BHP, IEB, own computations. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Clustered robust standard errors in parentheses.
In the gender sample, the coefficients for neuroticism and agreeableness are significantly different from each other on the 10% level. In the migration sample, the coefficients for extroversion are significantly different from each other on the 10% level.
Controls: age, age squared, education, hours worked, blue-collar worker, collective agreement, works council, log size of establishment, exports, share of female employees, tenure, unemployment, regions, sectors. Further controls for the migration sample are years since migration and country of origin.

Table B.6: Unconditional quantile regression for the overall sample

Quantiles	25	50	75
Migrant	0.006	–0.050	–0.128***
	(0.030)	(0.029)	(0.031)
Female	–0.208***	–0.232***	–0.278***
	(0.022)	(0.018)	(0.020)
Big Five			
Extroversion	0.009	0.017**	0.017**
	(0.008)	(0.007)	(0.008)
Neuroticism	–0.025***	–0.032***	–0.024***
	(0.008)	(0.007)	(0.008)
Conscientiousness	–0.009	–0.008	–0.012
	(0.008)	(0.007)	(0.008)
Agreeableness	–0.012	–0.024***	–0.020**
	(0.008)	(0.007)	(0.008)
Openness	0.022***	0.006	0.012
	(0.008)	(0.007)	0.008)
Controls	Yes	Yes	Yes
Observations	5,248	5,248	5,248
R-squared	0.409	0.427	0.342
Adjusted R-squared	0.406	0.424	0.339

Source: LPP, BHP, IEB, own computations. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Robust standard errors in parentheses. Controls: age, age squared, education, hours worked, blue-collar worker, collective agreement, works council, log size of establishment, exports, share of female employees, tenure, unemployment, regions, sectors.

Figure B.3: Quantile plots for the Big Five in the overall sample



Source: LPP, BHP, IEB, own computations.

Table B.7: Full Oaxaca-Blinder decomposition for the migrant sample

Native		3.168***	(0.015)	
Migrant		2.974***	(0.027)	
Difference		0.194***	(0.026)	
Explained		0.146***	(0.021)	
Unexplained		0.048**	(0.022)	
Big Five	**Explained**		**Unexplained**	
Extroversion	0.004**	(0.002)	−0.003	(0.003)
Neuroticism	0.008***	(0.003)	0.001	(0.002)
Conscientiousness	−0.000	(0.001)	0.001	(0.002)
Agreeableness	0.001	(0.002)	0.000	(0.000)
Openness	0.000	(0.001)	0.001	(0.002)
Controls				
Age	0.194***	(0.036)	1.071**	(0.510)
Age squared	−0.149***	(0.030)	−0.435	(0.273)
Education				
Lower Secondary	0.004	(0.004)	0.040	(0.048)
Secondary School	−0.015*	(0.008)	0.108*	(0.061)
Higher education	0.029***	(0.011)	0.081**	(0.039)
Other	−0.007	(0.009)	0.014	(0.012)
Hours worked (per week)	−0.000	(0.002)	0.516**	(0.213)
Blue-collar worker	0.056***	(0.008)	0.005	(0.025)
Collective bargaining	0.001	(0.001)	0.004	(0.034)
Works council	0.003	(0.003)	0.033	(0.047)
Log establishment size	0.002	(0.004)	0.039	(0.104)
Industry sectors				
Metall, electronics, automotive	−0.004	(0.003)	−0.035*	(0.021)
Trade, traffic, news	−0.003	(0.003)	−0.012*	(0.007)
Business and financial services	−0.003	(0.003)	0.001	(0.007)
Information, communication, other services	0.000	(0.001)	−0.004	(0.002)
Regions				
North	−0.007**	(0.003)	−0.019**	(0.009)
West	0.006**	(0.003)	−0.085***	(0.025)
Exports	−0.002	(0.002)	−0.036	(0.041)
Tenure (in months)	0.004	(0.003)	−0.012	(0.026)
Unemplomen (in months)	0.030***	(0.006)	−0.033***	(0.012)
Share of females	−0.005**	(0.003)	0.058**	(0.029)
Observations		3,057		

Source: LPP, BHP, IEB, own computations. *** p<0.01, ** p<0.05, * p<0.1. Clustered robust standard errors in parentheses.
Reference group is "Natives". When "Migrant" is the reference group, the main results shown here do not change substantially.

Table B.8: Full Oaxaca–Blinder decomposition for the gender sample

Men		3.040***	(0.017)	
Women		2.751***	(0.020)	
Difference		0.289***	(0.021)	
Explained		0.043	(0.026)	
Unexplained		0.246***	(0.020)	
Big Five	**Explained**		**Unexplained**	
Extroversion	−0.002**	(0.001)	0.000	(0.001)
Neuroticism	0.009***	(0.002)	−0.002*	(0.002)
Conscientiousness	0.002	(0.001)	0.002	(0.002)
Agreeableness	0.005***	(0.001)	−0.003*	(0.002)
Openness	−0.000	(0.000)	0.000	(0.000)
Controls				
Age	0.009	(0.021)	1.221***	(0.351)
Age squared	−0.009	(0.017)	−0.588***	(0.192)
Education				
Secondary School	−0.013***	(0.003)	0.029*	(0.015)
Higher education	−0.004	(0.005)	0.012	(0.010)
Hours worked (per week)	−0.051***	(0.013)	−0.194**	(0.099)
Blue-collar worker	−0.047***	(0.005)	0.007	(0.007)
Collective bargaining	0.004**	(0.002)	−0.012	(0.018)
Works council	0.007**	(0.003)	−0.041*	(0.023)
Log establishment size	0.005*	(0.003)	0.024	(0.066)
Industry sectors				
Metall, electronics, automotive	0.007*	(0.003)	0.011	(0.007)
Trade, traffic, news	0.005*	(0.003)	−0.012*	(0.006)
Business and financial services	0.012**	(0.005)	−0.014	(0.011)
Information, communication, other services	−0.002	(0.002)	0.003	(0.006)
Regions				
North	0.002	(0.002)	−0.010	(0.007)
East	0.027***	(0.009)	−0.062***	(0.013)
West	−0.003*	(0.002)	−0.015*	(0.008)
Exports	0.003	(0.003)	−0.011	(0.020)
Tenure (in months)	0.004**	(0.002)	−0.044***	(0.016)
Unemploment (in months)	0.029***	(0.005)	−0.038***	(0.009)
Share of females	0.045***	(0.012)	0.001	(0.030)
Observations		4,848		

Source: LPP, BHP, IEB, own computations. *** p<0.01, ** p<0.05, * p<0.1. Clustered robust standard errors in parentheses.
Reference group is "Natives". When "Migrant" is the reference group, the main results shown here do not change substantially.

C Supplements: Are family migrants worse off?

Table C.1: Weighted means of control variables by family status: Female sample

	Single mover	Family mover	Total	t-Test	Time varying variable
Age at migration	26.39	29.99	28.66	***	No
Highest education abroad					
No education	0.36	0.40	0.39		No
Apprenticeship	0.02	0.03	0.03		No
Vocational	0.07	0.05	0.06		No
Tech./prof. -oriented college	0.11	0.17	0.15		No
University	0.20	0.08	0.12		No
Highest education in Germany[a]					
No education	0.86	0.88	0.87		Yes
Apprenticeship	0.00	0.00	0.00		Yes
Vocational	0.00	0.00	0.00		Yes
Tech./prof. -oriented college	0.01	0.02	0.02		Yes
University	0.06	0.03	0.04		Yes
Country of birth					
West Europe	0.16	0.05	0.09	***	No
Turkey	0.21	0.12	0.15	***	No
East Europe	0.06	0.04	0.05		No
South East Europe	0.10	0.17	0.14	*	No
UDSSR	0.29	0.34	0.32	**	No
Asia & Middle East	0.09	0.15	0.13	**	No
Africa	0.06	0.08	0.07		
Central-South America	0.02	0.04	0.03		No
German nationality[a]	0.13	0.25	0.21	***	Yes
Language proficiency before migration					
Bad	0.82	0.86	0.85	***	No
Good	0.17	0.13	0.15	***	No
Native speaker	0.01	0.00	0.01		No
Family situation[a]					
Child under 3 years in household	0.08	0.17	0.14	***	Yes
Child under 16 years in household	0.19	0.41	0.33	***	Yes
In a relationship	0.42	0.85	0.69	***	Yes
Partner is living in household	0.31	0.76	0.59	***	Yes
Labor market experience abroad					
Labor market experience abroad (years)	3.92	7.06	5.90	***	No
Employed before migration	0.59	0.68	0.65	**	No

Table C.1 (continued)

	Single mover	Family mover	Total	t-Test	Time varying variable
Way of migration					
Ethnic German	0.09	0.18	0.15	***	No
Asylum seeker	0.04	0.07	0.06	**	No
Job offer at the time of migration	0.25	0.07	0.13	***	No
Partner had a job offer at the time of migration	0.00	0.09	0.06	***	No
First job					
Self employed	0.01	0.01	0.01		No
Education	0.09	0.03	0.05	***	No
Low-paid job	0.33	0.40	0.37	**	No
Employed subject to social security constribution	0.52	0.45	0.47		No
Cohort of arrival					
1945–1990	0.04	0.03	0.03		No
1991–1995	0.08	0.09	0.09		No
1996–2000	0.17	0.20	0.19		No
2001–2005	0.23	0.22	0.22		No
2006–2008	0.09	0.12	0.11	**	No
2009–2015	0.39	0.33	0.35	***	No
N		702			

Source: IAB-SOEP-Migration Sample, wave I-III linked with the IEB. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Means are weighted, t-Test not weighted.
[a] Mean estimated at labor market entry time.

Table C.2: Weighted means of control variables by family status: Male sample

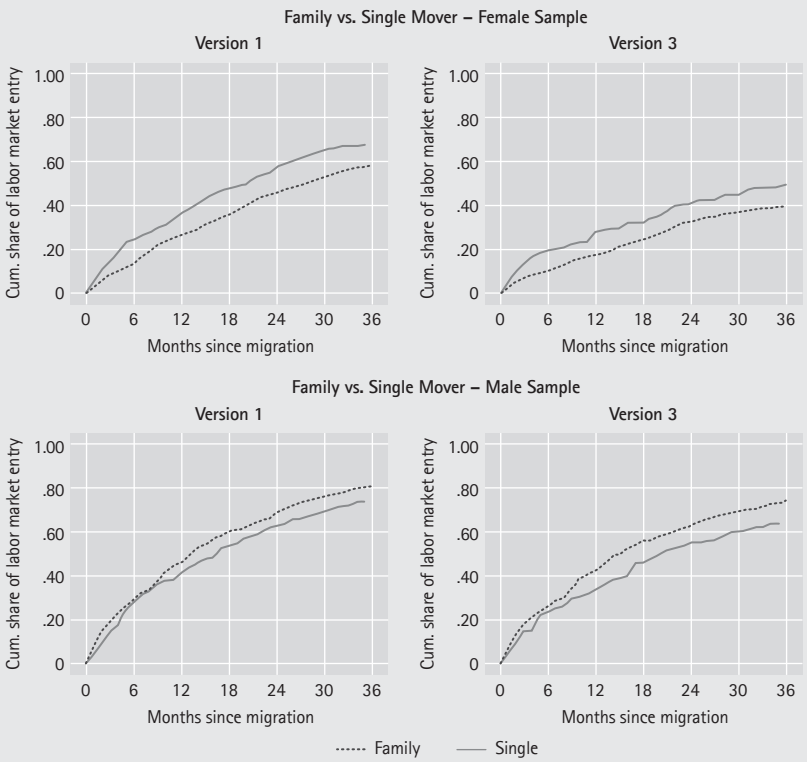
	Single mover	Family mover	Total	t-Test	Time varying variable
Age at migration	25.51	31.66	28.90	***	
Highest education abroad					
No education	0.52	0.40	0.45	***	No
Apprenticeship	0.02	0.05	0.04		No
Vocational	0.08	0.10	0.09	**	No
Tech./prof. -oriented college	0.06	0.17	0.12	**	No
University	0.11	0.12	0.12		No
Highest education in Germany[a]					46
No education	0.87	0.90	0.89		Yes
Apprenticeship	0.00	0.01	0.01		Yes
Vocational	0.01	0.02	0.02		Yes
Tech./prof. -oriented college	0.02	0.02	0.02		Yes
University	0.00	0.02	0.01	**	Yes
Country of birth					
West Europe	0.17	0.11	0.14		No
Turkey	0.11	0.08	0.10		No
East Europe	0.04	0.10	0.07		No
South East Europe	0.14	0.15	0.15		No
UDSSR	0.14	0.33	0.24	***	No
Asia & Middle East	0.24	0.13	0.18	***	No
Africa	0.14	0.05	0.09	***	No
Central-South America	0.01	0.04	0.03		No
German nationality[a]	0.10	0.20	0.16	*	Yes
Language proficiency					
Bad	0.90	0.85	0.87		No
Good	0.09	0.14	0.12		No
Native speaker	0.01	0.00	0.01		No
Family situation[a]					
Child under 3 years in household	0.08	0.18	0.13	***	Yes
Child under 16 years in household	0.13	0.44	0.30	***	Yes
In a relationship	0.39	0.81	0.62	***	Yes
Partner is living in household	0.22	0.67	0.47	***	Yes
Labor market experience abroad					
Labor market experience abroad (years)	3.67	9.79	7.04	***	No
Employed before migration	0.54	0.82	0.69	***	No

Table C.2 (continued)

	Single mover	Family mover	Total	t-Test	Time varying variable
Way of migration					
Ethnic German	0.06	0.17	0.12	***	No
Asylum seeker	0.20	0.15	0.17	*	No
Job offer at the time of migration	0.20	0.25	0.23		No
Partner had a job offer at the time of migration	0.00	0.05	0.02	***	No
First job					
Self employed	0.03	0.01	0.01		No
Education	0.08	0.01	0.04	***	No
Low-paid job	0.27	0.15	0.20	**	No
Employed subject to social security constribution	0.60	0.80	0.71	***	No
Cohort of arrival					
1945–1990	0.09	0.09	0.09		No
1991–1995	0.06	0.12	0.09		No
1996–2000	0.14	0.18	0.16	*	No
2001–2005	0.19	0.20	0.20		No
2006–2008	0.10	0.05	0.07		No
2009–2015	0.42	0.36	0.39	*	No
N		571			

Source: IAB-SOEP-Migration Sample, wave I-III linked with the IEB. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Means are weighted, t-Test not weighted.
[a] Mean estimated at labor market entry time.

Figure C.1: Transition rate to first employment, by family status and gender (inverted Kaplan-Meier estimates, smoothed)



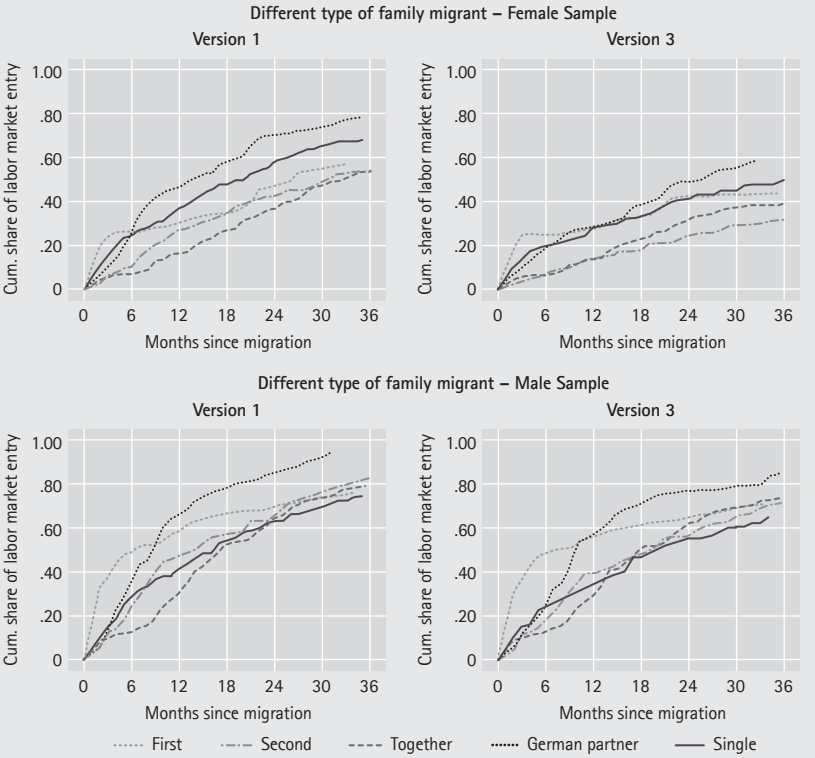
Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB, own computations.

Table C.3: Test statistic to compare survivor functions (family vs. single status): First employment

	Female Sample			Male Sample		
	Log-rank test for equality of survivor functions					
Family status	*Events observed*	*Events expected*		*Events observed*	*Events expected*	
No	177	157.50		168	190.82	
Yes	432	451.50		373	350.18	
Total	609	609.00		541	541.00	
Chi2	3.35			4.48		
Pr>chi2	0.0672			0.0343		
	Wilcoxon (Breslow) test for equality of survivor functions					
Family status	*Events observed*	*Events expected*	*Sum of ranks*	*Events observed*	*Events expected*	*Sum of ranks*
No	177	157.50	11165	168	190.82	-6690
Yes	432	451.50	-11165	373	350.18	6690
Total	609	609.00	0	541	541.00	0
Chi2		5.70			3.30	
Pr>chi2		0.0169			0.0693	

Source: IAB-SOEP-Migration Sample, wave I-III linked with the IEB. Test statistic of Figure 4.2.

Figure C.2: Transition rate to first employment, by different types of family migrants and gender (inverted Kaplan-Meier estimates, smoothed)



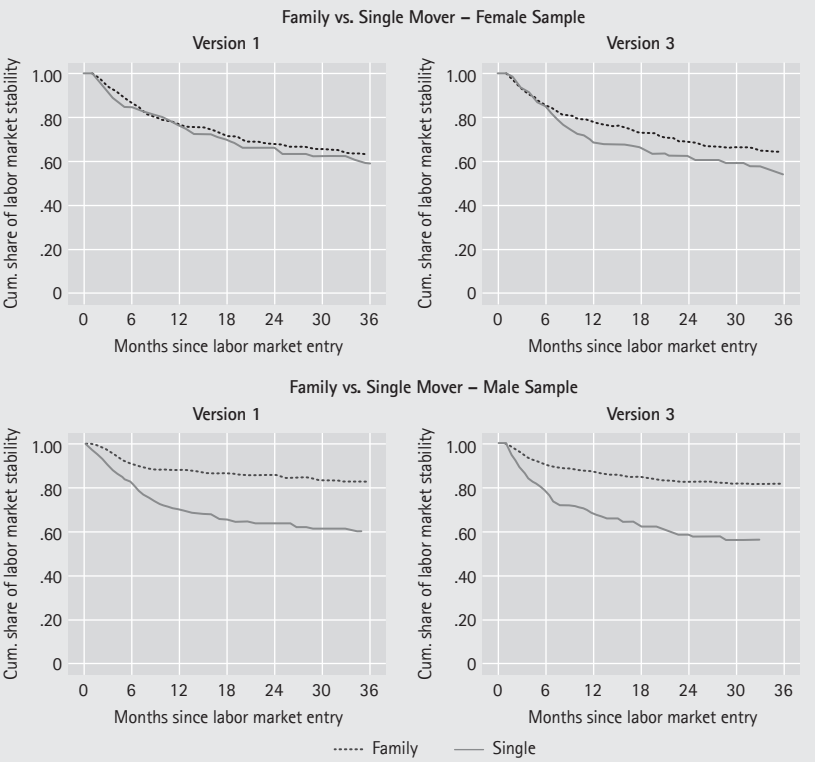
Source: IAB-SOEP-Migration Sample, wave I-III linked with the IEB, own computations.

Table C.4: Test statistic to compare survivor functions (different types of family migrants): First employment

	Female Sample			Male Sample		
	Log-rank test for equality of survivor functions					
Family categories	*Events observed*	*Events expected*		*Events observed*	*Events expected*	
First mover	48	44.55		114	101.81	
Second mover	165	182.07		67	65.53	
Moved together	138	172.62		141	150.04	
German partner	81	52.27		51	32.81	
Single	177	157.50		168	190.82	
Total	609	609.00		541	541.00	
Chi2	28.05			15.93		
Pr>chi2	0.0000			0.0031		
	Wilcoxon (Breslow) test for equality of survivor functions					
Family categories	*Events observed*	*Events expected*	*Sum of ranks*	*Events observed*	*Events expected*	*Sum of ranks*
First mover	48	44.55	1840	114	101.81	11230
Second mover	165	182.07	-11081	67	65.53	-523
Moved together	138	172.62	-16409	141	150.04	-10098
German partner	81	52.27	14485	51	32.81	6081
Single	177	157.50	11165	168	190.82	-6690
Total	609	609.00	0	541	541.00	0
Chi2		36.28			27.16	
Pr>chi2		0.0000			0.0000	

Source: IAB-SOEP-Migration Sample, wave I-III linked with the IEB. Test statistic of Figure 4.3.

Figure C.3: Employment stability, by family status and gender (Kaplan-Meier estimates, smoothed)



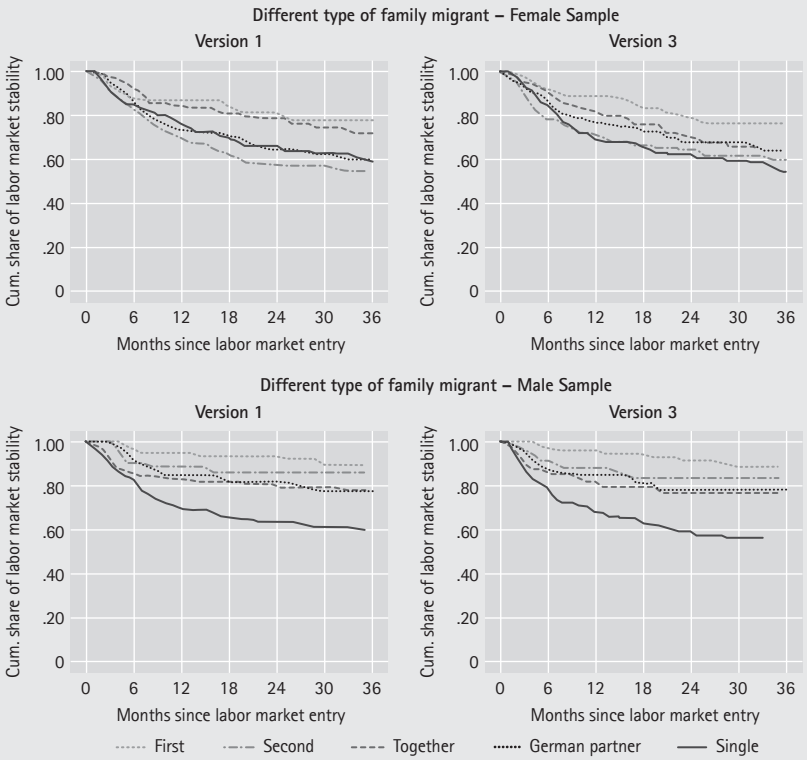
Source: IAB-SOEP-Migration Sample, wave I-III linked with the IEB, own computations.

Table C.5: Test statistic to compare survivor functions (family vs. single status): Employment stability

	Female Sample			Male Sample		
	Log-rank test for equality of survivor functions					
Family status	*Events observed*	*Events expected*		*Events observed*	*Events expected*	
No	79	63.36		65	39.88	
Yes	161	176.64		77	102.12	
Total	240	240.00		142	142.00	
Chi2	5.38			22.91		
Pr>chi2	0.0204			0.0000		
	Wilcoxon (Breslow) test for equality of survivor functions					
Family status	*Events observed*	*Events expected*	*Sum of ranks*	*Events observed*	*Events expected*	*Sum of ranks*
No	79	63.36	4768	65	39.88	11333
Yes	161	176.64	-4768	77	102.12	-11333
Total	240	240.00	0	142	142.00	0
Chi2	2.86			28.77		
Pr>chi2	0.0908			0.0000		

Source: IAB-SOEP-Migration Sample, wave I-III linked with the IEB. Test statistic of Figure 4.4.

Figure C.4: Employment stability, by different types of family migrants and gender (Kaplan-Meier estimates, smoothed)



Source: IAB-SOEP-Migration Sample, wave I-III linked with the IEB, own computations.

Table C.6: Test statistic to compare survivor functions (different types of family migrants): Employment stability

	Female Sample			Male Sample		
	Log-rank test for equality of survivor functions					
Family categories	*Events observed*	*Events expected*		*Events observed*	*Events expected*	
First mover	14	20.63		21	33.75	
Second mover	77	62.25		10	17.06	
Moved together	35	62.24		31	38.37	
German partner	35	31.53		15	12.93	
Single	79	63.36		65	39.88	
Total	240	240.00		142	142.00	
Chi2	22.52			26.28		
Pr>chi2	0.0002			0.0000		
	Wilcoxon (Breslow) test for equality of survivor functions					
Family categories	*Events observed*	*Events expected*	*Sum of ranks*	*Events observed*	*Events expected*	*Sum of ranks*
First mover	14	20.63	-2099	21	33.75	-7253
Second mover	77	62.25	5648	10	17.06	-2458
Moved together	35	62.24	-8783	31	8.37	-1106
German partner	35	31.53	466	15	12.93	-516
Single	79	63.36	4768	65	39.88	11333
Total	240	240.00	0	142	142.00	0
Chi2		14.83			33.67	
Pr>chi2		0.0051			0.0000	

Source: IAB-SOEP-Migration Sample, wave I-III linked with the IEB. Test statistic of Figure 4.5.

Table C.7: Estimation results of different versions of labor market entry: Transition into first employment, by family status and gender

	Female Sample				Male Sample			
	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3
	Model 1		Model 2		Model 1		Model 2	
Time periods								
1 to 6 months	0.047**	0.071**	0.061**	0.087*	0.034***	0.033***	0.038***	0.040***
	(0.063)	(0.093)	(0.080)	(0.111)	(0.015)	(0.016)	(0.017)	(0.019)
6 to 12 months	0.052**	0.057**	0.047**	0.054**	0.031***	0.028***	0.028***	0.022***
	(0.069)	(0.074)	(0.061)	(0.068)	(0.013)	(0.014)	(0.013)	(0.011)
12 to 24 months	0.055**	0.063**	0.057**	0.049**	0.035***	0.032***	0.034***	0.034***
	(0.073)	(0.081)	(0.075)	(0.062)	(0.015)	(0.015)	(0.015)	(0.016)
24 and more months	0.049**	0.048**	0.041**	0.047**	0.027***	0.022***	0.025***	0.021***
	(0.065)	(0.062)	(0.054)	(0.059)	(0.011)	(0.011)	(0.011)	(0.010)
Family status: Single mover (ref.)								
Family mover	1.009	0.917			1.170	1.065		
	(0.138)	(0.133)			(0.177)	(0.161)		
Period-specific effects								
Family mover x 1 to 6 months			0.658**	0.641*			0.970	0.834
			(0.131)	(0.146)			(0.186)	(0.173)
Family mover x 6 to 12 months			1.149	0.968			1.341	1.454
			(0.290)	(0.298)			(0.361)	(0.429)
Family mover x 12 to 24 months			0.930	1.266			1.198	0.961
			(0.192)	(0.323)			(0.282)	(0.220)
Family mover x 24 and more months			1.250	0.912			1.269	1.195
			(0.245)	(0.161)			(0.267)	(0.244)
Controls:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27890	41793	27890	41793	14925	17837	14925	17837
AIC	2079	2019	2077	2021	1757	1758	1761	1760

Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB. *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Controls: Human-capital variables: highest education abroad and in Germany, labor market experience before migration measured in years and dummy for employed the year before migration, language proficiency (German) at migration. Socio-demographic variables: age at migration, country of birth, partnership, partner living in household, children under 3 in household, children under 16 in household, German citizenship. Entryway: ethnic German, asylum seeker, job offer, partner with job offer. Other controls: education spells, first job: self-employed, arrival cohort, year dummies. In Version 1 all types of employment which follow the immigration are counted. In Version 3 only employment spells which are subject to social security contributions are considered as follow-up episodes.

Table C.8: Estimation results of different versions of labor market entry: Transition into first employment, by different types of family migrants and gender

	Female Sample				Male Sample			
	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3
	Model 1		Model 2		Model 1		Model 2	
Time periods								
1 to 6 months	0.041**	0.065**	0.054**	0.086*	0.034***	0.033***	0.041***	0.042***
	(0.055)	(0.084)	(0.071)	(0.108)	(0.015)	(0.016)	(0.018)	(0.020)
6 to 12 months	0.046**	0.052**	0.041**	0.053**	0.031***	0.028***	0.030***	0.023***
	(0.061)	(0.067)	(0.054)	(0.067)	(0.013)	(0.013)	(0.014)	(0.012)
12 to 24 months	0.050**	0.058**	0.051**	0.049**	0.035***	0.031***	0.037***	0.035***
	(0.066)	(0.075)	(0.066)	(0.061)	(0.015)	(0.015)	(0.016)	(0.017)
24 and more months	0.045**	0.044**	0.036**	0.046**	0.027***	0.022***	0.027***	0.022***
	(0.060)	(0.057)	(0.047)	(0.058)	(0.012)	(0.011)	(0.012)	(0.010)
Different types of family migrant: Single mover (ref.)								
First mover	0.838	0.969			1.113	1.035		
	(0.180)	(0.217)			(0.202)	(0.195)		
Second mover	0.974	0.796			1.040	0.934		
	(0.154)	(0.137)			(0.195)	(0.171)		
Moved together	0.857	0.835			1.317	1.159		
	(0.149)	(0.150)			(0.235)	(0.209)		
German partner	1.554**	1.270			1.237	1.107		
	(0.276)	(0.240)			(0.249)	(0.210)		
Period-specific effects								
First mover x 1 to 6 months			1.371	1.586			1.656**	1.577**
			(0.405)	(0.511)			(0.336)	(0.345)
First mover x 6 to 12 months			0.161*	0.237			0.949	0.829
			(0.166)	(0.247)			(0.375)	(0.374)
First mover x 12 to 24 months			0.717	1.164			0.705	0.521*
			(0.243)	(0.456)			(0.239)	(0.181)
First mover x 24 and more months			0.880	0.842			0.817	0.900
			(0.278)	(0.246)			(0.206)	(0.235)

Table C.8 (continued)

	Female Sample				Male Sample			
	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3
	Model 1		Model 2		Model 1		Model 2	
Second mover x 1 to 6 months			0.457***	0.339***			0.776	0.539*
			(0.126)	(0.120)			(0.226)	(0.172)
Second mover x 6 to 12 months			1.333	0.992			1.485	1.581
			(0.389)	(0.367)			(0.525)	(0.593)
Second mover x 12 to 24 months			0.731	0.728			0.883	0.623
			(0.194)	(0.241)			(0.296)	(0.215)
Second mover x 24 and more months			1.385	0.998			1.247	1.425
			(0.296)	(0.207)			(0.377)	(0.396)
Moved together x 1 to 6 months			0.386***	0.445**			0.507**	0.460**
			(0.132)	(0.161)			(0.153)	(0.145)
Moved together x 6 to 12 months			0.798	0.988			1.308	1.397
			(0.276)	(0.392)			(0.416)	(0.482)
Moved together x 12 to 24 months			0.912	1.537			1.709**	1.510
			(0.239)	(0.477)			(0.448)	(0.391)
Moved together x 24 and more months			1.086	0.768			1.896**	1.481
			(0.257)	(0.166)			(0.472)	(0.365)
German partner x 1 to 6 months			1.104	1.049			0.898	0.633
			(0.276)	(0.301)			(0.257)	(0.207)
German partner x 6 to 12 months			1.952**	1.282			1.847*	2.328**
			(0.663)	(0.566)			(0.627)	(0.842)
German partner x 12 to 24 months			1.674*	2.168**			1.189	0.919
			(0.456)	(0.710)			(0.502)	(0.366)
German partner x 24 and more months			1.562	1.034			1.601	1.273
			(0.504)	(0.316)			(0.729)	(0.388)
Controls:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	27890	41793	27890	41793	14925	17837	14925	17837
AIC	2070	2017	2060	2009	1760	1762	1735	1726

Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB. *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Controls: Human-capital variables: highest education abroad and in Germany, labor market experience before migration measured in years and dummy for employed the year before migration, language proficiency (German) at migration. Socio-demographic variables: age at migration, country of birth, partnership, partner living in household, children under 3 in household, children under 16 in household, German citizenship. Entryway: ethnic German, asylum seeker, job offer, partner with job offer. Other controls: education spells, first job: self-employed, arrival cohort, year dummies. In Version 1 all types of employment which follow the immigration are counted. In Version 3 only employment spells which are subject to social security contributions are considered as follow-up episodes.

Table C.9: Estimation results of different versions of labor market entry: Employment stability, by family status and gender

	Female Sample				Male Sample			
	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3
	Model 1		Model 2		Model 1		Model 2	
Time periods								
1 to 6 months	0.025***	0.024***	0.028***	0.018***	0.073***	0.024***	0.069***	0.021***
	(0.021)	(0.020)	(0.024)	(0.016)	(0.072)	(0.023)	(0.068)	(0.020)
6 to 12 months	0.023***	0.022***	0.020***	0.029***	0.050***	0.015***	0.075**	0.021***
	(0.019)	(0.019)	(0.017)	(0.025)	(0.051)	(0.015)	(0.077)	(0.021)
12 to 24 months	0.014***	0.012***	0.014***	0.0083***	0.018***	0.011***	0.028***	0.013***
	(0.012)	(0.010)	(0.013)	(0.007)	(0.018)	(0.011)	(0.029)	(0.013)
24 and more months	0.007***	0.009***	0.007***	0.010***	0.013***	0.004***	0.008***	0.002***
	(0.006)	(0.008)	(0.006)	(0.008)	(0.014)	(0.004)	(0.008)	(0.002)
Family status: Single mover (ref.)								
Family mover	0.713*	0.739			0.457***	0.526**		
	(0.139)	(0.159)			(0.128)	(0.133)		
Period-specific effects								
Family mover x 1 to 6 months			0.612*	0.965			0.538*	0.568*
			(0.168)	(0.294)			(0.187)	(0.165)
Family mover x 6 to 12 months			0.885	0.415**			0.200***	0.224***
			(0.318)	(0.148)			(0.091)	(0.106)
Family mover x 12 to 24 months			0.732	1.173			0.199***	0.335**
			(0.255)	(0.507)			(0.120)	(0.156)
Family mover x 24 and more months			0.731	0.628			1.005	1.203
			(0.234)	(0.208)			(0.489)	(0.603)
Controls:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22656	16925	22656	16925	23465	21952	23465	21952
AIC	1265	1065	1270	1065	888	902	883	899

Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB. *** p<0.01, ** p<0.05, * p<0.1. Standard errors in parentheses. Controls: Human-capital variables: highest education abroad and in Germany, labor market experience before migration measured in years and dummy for employed the year before migration, language proficiency (German) at migration. Socio-demographic variables: age at migration, country of birth, partnership, partner living in household, children under 3 in household, children under 16 in household, German citizenship. Entryway: ethnic German, asylum seeker, job offer, partner with job offer. Other controls: education spells, first job: self-employed, arrival cohort, year dummies.In Version 1 all types of employment which follow the immigration are counted. In Version 3 only employment spells which are subject to social security contributions are considered as follow-up episodes. In all versions, only gaps which last longer than three months are considered as an employment drop out.

Table C.10: Estimation results of different versions of labor market entry: Employment stability, by different types of family migrants and gender

	Female Sample				Male Sample			
	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3
	Model 1		Model 2		Model 1		Model 2	
Time periods								
1 to 6 months	0.018***	0.018***	0.020***	0.014***	0.064***	0.025***	0.055***	0.019***
	(0.016)	(0.016)	(0.018)	(0.013)	(0.063)	(0.024)	(0.056)	(0.018)
6 to 12 months	0.017***	0.017***	0.014***	0.023***	0.044***	0.016***	0.061***	0.019***
	(0.015)	(0.015)	(0.013)	(0.021)	(0.044)	(0.015)	(0.065)	(0.020)
12 to 24 months	0.011***	0.010***	0.011***	0.007***	0.016***	0.011***	0.022***	0.012***
	(0.009)	(0.009)	(0.009)	(0.006)	(0.016)	(0.011)	(0.024)	(0.012)
24 and more months	0.006***	0.008***	0.005***	0.008***	0.012***	0.004***	0.006***	0.002***
	(0.005)	(0.007)	(0.005)	(0.007)	(0.012)	(0.004)	(0.007)	(0.002)
Different types of family migrant: Single mover (ref.)								
First mover	0.481**	0.479**			0.433***	0.510**		
	(0.172)	(0.176)			(0.139)	(0.152)		
Second mover	0.826	0.913			0.369**	0.363**		
	(0.186)	(0.232)			(0.154)	(0.155)		
Moved together	0.491***	0.614*			0.406**	0.564*		
	(0.133)	(0.179)			(0.161)	(0.193)		
German partner	0.874	0.817			0.662	0.647		
	(0.213)	(0.244)			(0.233)	(0.223)		
Period-specific effects								
First mover x 1 to 6 months			0.697	0.543			0.207**	0.190***
			(0.310)	(0.344)			(0.131)	(0.118)
First mover x 6 to 12 months			0.000***	0.242*			0.226**	0.076**
			(0.000)	(0.194)			(0.152)	(0.080)
First mover x 12 to 24 months			0.365	0.861			0.129*	0.327*
			(0.276)	(0.574)			(0.139)	(0.197)
First mover x 24 and more months			0.600	0.425			1.393	2.188
			(0.347)	(0.258)			(0.754)	(1.233)

Table C.10 (continued)

	Female Sample				Male Sample			
	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3	Version 1	Version 3
	Model 1		Model 2		Model 1		Model 2	
Second mover x 1 to 6 months			0.659	1.250			0.499	0.444
			(0.209)	(0.445)			(0.234)	(0.222)
Second mover x 6 to 12 months			1.022	0.337**			0.126**	0.239*
			(0.415)	(0.157)			(0.132)	(0.203)
Second mover x 12 to 24 months			1.005	1.063			0.240	0.296
			(0.395)	(0.584)			(0.268)	(0.237)
Second mover x 24 and more months			0.838	1.094			0.462	0.467
			(0.313)	(0.418)			(0.401)	(0.421)
Moved together x 1 to 6 months			0.428**	0.646			0.708	0.884
			(0.170)	(0.273)			(0.310)	(0.330)
Moved together x 6 to 12 months			0.724	0.494			0.122***	0.373*
			(0.350)	(0.230)			(0.085)	(0.209)
Moved together x 12 to 24 months			0.458	1.457			0.169**	0.364
			(0.241)	(0.751)			(0.146)	(0.246)
Moved together x 24 and more months			0.452*	0.321**			0.361	0.351
			(0.208)	(0.170)			(0.260)	(0.263)
German partner x 1 to 6 months			0.675	1.058			0.429	0.773
			(0.253)	(0.470)			(0.264)	(0.363)
German partner x 6 to 12 months			1.192	0.520			0.411	0.170
			(0.553)	(0.294)			(0.277)	(0.189)
German partner x 12 to 24 months			0.714	1.044			0.278	0.387
			(0.345)	(0.585)			(0.287)	(0.277)
German partner x 24 and more months			1.081	0.741			2.642*	1.872
			(0.485)	(0.351)			(1.459)	(1.109)
Controls:	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	22656	16925	22656	16925	14925	23465	14925	23465
AIC	1265	1067	1279	1077	892	906	888	897

Source: IAB-SOEP Migration Sample, wave I-III linked with the IEB. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. Standard errors in parentheses. Controls: Human-capital variables: highest education abroad and in Germany, labor market experience before migration measured in years and dummy for employed the year before migration, language proficiency (German) at migration. Socio-demographic variables: age at migration, country of birth, partnership, partner living in household, children under 3 in household, children under 16 in household, German citizenship. Entryway: ethnic German, asylum seeker, job offer, partner with job offer. Other controls: education spells, first job: self-employed, arrival cohort, year dummies. In Version 1 all types of employment which follow the immigration are counted. In Version 3 only employment spells which are subject to social security contributions are considered as follow-up episodes.

Abstract

This thesis raises the economic integration of migrants from various perspectives and contributes to the existing literature by offering new explanations for the immigrant-native wage gap and the labor market performance of single and family migrants. The thesis contains three self-sufficient essays embedded in Chapters 2, 3 and 4 which are linked by the theme of labor market performance. The first chapter includes a brief overview of the German migration history, a short summary of the empirical and theoretical motivation as well as of the utilized datasets within the three essays.

Chapter 2 draws on the job mobility and the signaling theory to explain remaining wage gaps and even diverging wages between migrants and natives. Utilizing longitudinal data for Germany, the job mobility of migrants and natives is analyzed by distinguishing among voluntary, involuntary, and internal job changes. Evidence for differences in transition patterns is found and the results of several fixed-effects regressions explain a substantial part of the gap in hourly wages.

Chapter 3 contributes to the rather small body of economic literature dealing with personality traits and reveals first results regarding the relationship between personality traits and the labor market outcomes of migrants in Germany. By drawing on a linked employer-employee dataset (LPP), not only individual-level information is taken into consideration, but establishment-level information can also be included in the analyses which has previously not been done to this extent. The results show that migrants and natives – as do men and women – differ in their average personality traits, measured by the Big Five personality dimensions. Furthermore the study confirms a meaningful contribution of personality traits to explaining variance in wages. But not only wages are affected by the traits: the results also provide evidence for heterogeneous effects for migrants and natives, meaning that different traits seem to be important.

Based on the tied mover theory and the family investment theory, the labor market participation of family migrants – measured by three different indicators – is analyzed in Chapter 4. Drawing on the new IAB-SOEP Migration Sample, not only a distinction of family and single migrants is feasible, but it is also possible to distinguish between different types of family migrants, allowing to depict a more precise picture of the integration process of family migrants. Additionally, and unlike previous research, the subdivision into different family types facilitates a comparison of migrants among each other. The empirical results confirm not just differences between family and single migrants, but also variation among the different types. The findings of Chapter 4 reinforce the importance of a detailed

distinction of the family status at the time of migration and show that there are major differences between the family categories in terms of their labor market performance. Moreover, the analysis emphasises the need of further theoretical developments in the field of migration research within a partnership and family context.

Kurzfassung

Die Dissertation beleuchtet die Arbeitsmarktintegration von Migrantinnen/Migranten aus unterschiedlichen Perspektiven und bereichert die bestehende Integrationsliteratur anhand neuer Erklärungsansätze für Lohnunterschiede zwischen Migrantinnen/Migranten und Einheimischen. Darüber hinaus verweist die Dissertation auf die Bedeutung des Familienkontexts zum Zeitpunkt der Migration im Zusammenhang mit der Arbeitsmarktperformance im Zielland. Zunächst wird in Kapitel 1 ein kurzer Überblick über die Immigrationsgeschichte Deutschlands gegeben und die empirische und theoretische Motivation der inhaltlichen Kapitel sowie die Datenbasis der empirischen Analysen vorgestellt. Sowohl Kapitel 2 als auch Kapitel 3 befassen sich mit der Lohnlücke zwischen Einheimischen und Migrantinnen/Migranten. Häufig wird die Humankapitaltheorie als Erklärungsansatz für diese Lohnunterschiede herangezogen, wobei jedoch Unterschiede in der Humankapitalausstattung oder die Entwertung von länderspezifischem Humankapital durch Migration nur bedingt die Lohnunterschiede erklären kann. Aus diesem Grund werden in den ersten beiden Artikeln der Dissertation ergänzende Erklärungskonzepte zu den bestehenden und traditionellen Ansätzen angeführt. Der erste Ansatz stützt sich auf die Job-Search- und Matching-Theorien des Arbeitsmarkts. Hierbei wird in Kapitel 2 untersucht, inwieweit unterschiedliche Muster von Jobwechseln einen Beitrag zur Erklärung der Lohnlücke zwischen Migrantinnen/Migranten und Einheimischen leisten können. Unter Verwendung von Längsschnittdaten für Deutschland lassen sich drei Arten von Jobwechsel identifizieren: freiwillige externe Wechsel, interne Wechsel sowie unfreiwillige externe Wechsel. Die empirische Analyse bestätigt ein signifikantes unterschiedliches Mobilitätsverhalten zwischen Migrantinnen/Migranten und Einheimischen, welches unter Verwendung von fixed-effects-Regressionen, einen substanziellen Teil der Lohnlücke erklärt.

Kapitel 3 hat ebenfalls die Lohnlücke zwischen Migranten und Einheimischen im Fokus, verwendet jedoch einen behaviouristischen Erklärungsansatz. Dieser jüngere Zweig der Arbeitsmarktforschung findet im Bereich der Gender-Wage-Gap-Forschung bereits häufiger Anwendung, jedoch ist er in der Migrations- und Integrationsforschung bisher weitestgehend unbeachtet geblieben. In diesem Kapitel werden daher die Auswirkungen von nicht kognitiven Fähigkeiten – gemessen anhand des Big-Five-Konzepts – auf die Arbeitsmarktperformance von bestimmten Gruppen untersucht. Die Ergebnisse zeigen, dass Migranten und Einheimische – sowie Frauen und Männer – sich in ihren durchschnittlichen Persönlichkeitsmerkmalen signifikant unterscheiden und dass diese einen signifikanten Einfluss auf die Löhne haben. Eine Berücksichtigung nicht kognitiver Fähigkeiten trägt demnach zur Erklärung und Beschreibung der Lohnlücke

zwischen Migranten und Einheimischen bei, da sowohl Gruppenunterschiede als auch variierende Lohneffekte festzustellen sind. In Kapitel 4 werden die Arbeitsmarktauswirkungen von Migration in einem Partnerschafts- und Familienkontext betrachtet und analysiert, ob es systematische Unterschiede in der Arbeitsmarktperformance von Single- und Familienmigrantinnen/migranten gibt. Unter Verwendung der IAB-SOEP-Migrationsstichprobe ist es möglich, nicht nur zwischen Single- und Familienmigrantinnen/migranten zu differenzieren, sondern darüber hinaus verschiedene Typen von Familienmigrantinnen/migranten zu identifizieren, wodurch ein präziseres Bild der Arbeitsmarktperformance von Familienmigrantinnen/migranten abgebildet werden kann. Zusätzlich und im Unterschied zu bisherigen Studien ermöglicht die Differenzierung einen Vergleich verschiedener Typen von Migrantinnen/Migranten untereinander. Die empirischen Ergebnisse bestätigen nicht nur Unterschiede zwischen Single- und Familienmigrantinnen/migranten, sondern ebenso eine Variation zwischen den verschiedenen Typen von Familienmigrantinnen/migranten. Kapitel 4 verweist somit auf die Bedeutung des Familienkontexts im Zusammenhang mit der Migration. So erfordern Analysen zu potenziellen Nachteilen von Familienmigrantinnen/migranten im Bereich der ökonomischen Integration einen sorgfältig gewählten Ansatz, da nicht nur die Tatsache, ob jemand im Familienkontext oder allein nach Deutschland migriert, einen wesentlichen Einfluss auf die Arbeitsmarktintegration hat. Vielmehr erweisen sich die verschiedenen Familienkonstellationen zum Zeitpunkt des Zuzugs als wesentliche Determinanten. Zusätzlich heben die Analysen die Notwendigkeit der Weiterentwicklung bestehender Theorien im Bereich der Migrationsforschung im Familienkontext hervor.

The economic integration of migrants is a key concern, especially in attempting to counteract the impact of demographic change and the impending labor shortage by migration. Moreover, a successful labor market integration acts as one of the most important integration mechanism in modern labor market societies. In this context, the dissertation evaluates economic integration of migrants in Germany from various perspectives. First, Hanna Brenzel shows that differences in job mobility influence wage trajectories of migrants and natives which, in turn, contribute to wage differentials. Next, she documents the fact that the immigrant-native wage gap is influenced by different personality traits. Last, her work demonstrates that there are differences exists between single and family migrants concerning their respective labor market integration processes. Building on these three main findings, Brenzel not only fosters the understanding of wage differentials, but also broadens the current knowledge about the labor market integration of often neglected groups by bringing them to the fore.

wbv Publikation

ISBN 978-3-7639-4124-7

Institut für Arbeitsmarkt- und Berufsforschung der Bundesagentur für Arbeit
Regensburger Str. 100 ▪ 90478 Nürnberg ▪ www.iab.de