

UNIVERSITÄT MANNHEIM
FAKULTÄT FÜR SOZIALWISSENSCHAFTEN

Ethnic Inequality in Vocational Education in Germany

An Analysis of the Impact of Spatial and Historical Context

Inauguraldissertation zur Erlangung des akademischen Grades einer Doktorin der
Sozialwissenschaften der Universität Mannheim

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Tag der Disputation: 7. Oktober 2016

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Acknowledgment

I would like to thank all persons who supported me during the time I worked on my dissertation. First of all, thank you Christof Wolf for the support, the advice and helpful discussions during our constant meetings. Thank you also for the patience and the encouragement which made it possible for me to finish this project. I would also like to thank Oshrat Hochman for her willingness to co-review my dissertation and for her precise and constructive feedback in the end of the dissertation process which helped me to finalize the project.

I am also grateful for the support I received from colleagues of my team German Microdata Lab. First, thanks to Bernhard Schimpl-Neimanns for many constructive discussions on methodological problems, thank you Felix Weiss and Heike Wirth for the feedback on my manuscripts and thank you Andreas Herwig for the frequent discussions and for being such a pleasant office mate.

My thesis was written during my employment at GESIS, which offered me many possibilities to improve my skills and to broaden my horizon. In this context I want to mention the possibility to visit the SOFI at University Stockholm. Being part of the “Netzwerk Bildungsforschung” of the “Baden Württemberg Stiftung” helped me to find researchers who are interested in similar research topics. Thank you for the many helpful comments from this network, especially from Tobias Roth.

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1 General Introduction

In educational participation and attainment in Germany, a persisting inequality exists between groups with and without a migrant background. More children with a migrant background leave school without any general secondary school degree compared to native German children (13 % vs. 2 %) and people with a migrant background less often attain a high school degree (Abitur) (37 % vs. 45 % of people 30–35 years of age). Consequently, young people with a migrant background less often participate in full qualifying vocational education (54 % non-nationals vs. 76 % Germans) but more often in pre-vocational qualification courses (47 % non-nationals vs. 24 % Germans). This situation leads to a large gap between the population with and without a migrant background with respect to the achievement of vocational degrees. 38 % of the population with a migrant background do not attain any vocational degree compared to only 11 % of the population without a migrant background (Autorengruppe Bildungsberichterstattung, 2014).

Low educational achievement has a long-term impact, both on the individual and the economy. For the individual, education is a key factor for participation in the labour market and in society. For the economy, low educational achievement becomes more and more problematic as higher skill levels increasingly are required and skill shortages become imminent. Consequently, research on educational inequality has a long tradition in the sociological discourse of social stratification (Blau & Duncan, 1967; Schimpl-Neimanns, 2000; Shavit & Blossfeld, 1993). Compared to the research on educational inequality, questions concerning migration and integration are rather new in Germany, emerging especially since the early 1980s with a growing social relevance (Kalter, 2008).

Current research has analyzed ethnic inequality at different steps within the life course, and the reasons why it emerges. Results have shown that much of ethnic inequality in education is due to social class and family background (Helland & Støren, 2006; Kalter, Granato, & Kristen, 2007). Some researchers have argued that also certain characteristics of our schools play a large role in the low achievement of migrant children (Dronkers, van der Velden, & Dunne, 2012; Pfeffer, 2008).

Much of the research on ethnic inequality in education has focused on the transitions into the sector of general secondary schools within the educational career since they are the starting point for all further educational steps (Alba, Handl, & Müller, 1994; Diefenbach, 2010; Kristen, 2002). In contrast, studies on ethnic inequality in the vocational educa-

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tion system are rare at present. Not having a vocational degree has consequences. Since Germany's educational system is highly standardized (Allmendinger, 1989), a vocational degree in addition to a general secondary school leaving degree is crucial for a successful entry into the labour market. Therefore, we need further research on the amount and the causes of ethnic inequality at this stage of a student's educational career.

Research focusing on the vocational education sector has shown that inequality exists between natives and immigrants with respect to participation in vocational education and in the attainment of vocational degrees. The causes mostly are seen to be a lack of individual resources, such as a low level of general secondary education (Hunkler, 2010) or insufficient social networks (Beicht & Granato, 2010). Social origin also has an impact, but it is rather small in comparison to the impact of social origin on the transitions into higher general secondary education (Urban, 2012). However, even when these differences are taken into account in multivariate analyses, often the negative effect of having a migrant background persists, and we still do not fully understand the disadvantage of people with a migrant background in the transition into the vocational education system.

Recent research has argued that the disadvantage of people with a migrant background is not only caused by a lack of individual resources. The disadvantage also may depend on context characteristics, i.e., the way in which the transition to tertiary or vocational education is organized (Ulrich, 2013). This idea is based on a research tradition that also pays attention to context characteristics when analyzing the developments of a society (Coleman, 1990). Research based on this tradition argues that an individual's decisions, and therefore his/her educational attainment, is dependent on the opportunity structures the environment offers. Therefore not paying attention to context characteristics might distort the results (Allmendinger, 1989). A number of research examples have shown that educational systems have an impact on educational outcomes (Ammermüller, 2005; Dronkers et al., 2012) and on labour market success (Allmendinger, 1989; Pfeffer, 2008). However, we know little about whether a successful transition into the tertiary and vocational education system depends on the context in which an individual is living. However, it is important to analyze the impact of context on ethnic inequality in vocational education, since the remaining effect of ethnic inequality—after taking into account insufficient individual resources—may be explained by the way the vocational education system is organized.

Context can be described in different spatial units: schools, neighbourhoods, cities, regions within a country, countries, and so on. Within these units, a large variety of characteristics are usually of interest, for example, the organization of educational institutions. So far, usually countries are compared with each other. However, Germany has a very special way to organize its vocational education system with its dual system (for an overview of the German tertiary and vocational education system, see Section 2 in

Article I). Therefore, in this aspect, Germany is not comparable to many other countries. In addition, Germany is a good example of a country for which analyses on a sub-national level might suit better than analyses on a state level. Due to federalism, educational policy varies widely between German federal states. This variation influences the educational structure in the federal states, and thus the opportunity structures for individuals. Thränhardt (2004) has argued, that by analyzing ethnic disadvantages in Germany without a comparison of the different federal states, the variations and causes of inequality cannot be seen. So far we do not know if differences exist in the level of ethnic inequality in the sub-national units of Germany or how the organization of the vocational education system in different federal states within Germany influences the level of ethnic inequality. Knowing more about these processes may help to increase our understanding of ethnic inequality in vocational education.

When it comes to the analysis of the vocational education system as a relevant moderator of individual resources and the attainment of vocational education, not only differences in spatial units but also the historical time period play a crucial role. Within the sociological discourse of inequality, questions about the development of inequality in different historical contexts have a long tradition (Beck, 1986; Hradil, 1987). Much of the existing research has shown the amount and causes of ethnic inequality at a specific point in time. However, by focusing on one time period, specific historical, political, and economic background factors that play a crucial role in the opportunity structure for individuals will not be seen. By comparing results of different historical time context, ethnic inequality in the attainment of vocational education can be understood to a larger extent.

With this thesis, I contribute to the current research by investigating questions about the impact of context as a moderator between individual resources and educational achievement. I analyze questions concerning three characteristics of the vocational education system of different federal states, as well as on the characteristics of historical time as context. Thus, this thesis focuses on the following research questions:

- How large are the differences in ethnic inequality in vocational education in the different federal states within Germany, and what role do individual resources play in explaining the inequality in the different federal states?
- Can the characteristics of the different vocational education systems within Germany explain the differences in the level of ethnic inequality in vocational education between the federal states?
- How does the level of ethnic inequality and the role of individual resources develop in different immigration cohorts and different migrant groups?

This introductory chapter provides a general overview of the theory and empirical results on ethnic inequality in the vocational education system. Thereby, a research programme for the research of the impact of context factors on the level of ethnic inequality in vocational education is elaborated. The third section is a description of the data used to analyze the research question. It also presents and discusses the methods used in this thesis. The fourth section provides an extended summary of the articles and results of additional analyses. The final section concludes the findings, discusses the impact of the results, and offers ideas for further research.

1.1 Theoretical Considerations and Empirical Research on Ethnic Inequality in Vocational Education

This thesis is embedded in the general research on ethnic educational inequality and its causes. Therefore, this section, discusses theoretical considerations and empirical studies regarding ethnic educational inequality.

For the analysis of ethnic inequality in vocational education, three different perspectives were taken into account. First, the individual and her/his decisions concerning educational paths, bearing in mind the skills and educational preconditions he or she is bringing to the transition process. Second, since part of the vocational education sector is located in the labour market, the perspective of the employer who wants to hire the best candidate for an apprenticeship also is considered. Third, different vocational schools and universities, have different entrance requirements. The following section focuses on how an individual's resources and decisions on the one hand, and employers hiring methods on the other, impact the transition into vocational education. Then, the role of context is discussed.

1.1.1 Individual Resources

The next section describes the diverse individual resources that have been proven to play a role in educational attainment. I start with an overview of the impact of social origin, since social origin is the starting point for the achievement of prerequisites—for example, general secondary school certificates or the availability of social network—which are needed in the transition to the vocational education system. In the following section, I continue to describe the impact of other individual resources like human, cultural, or social capital, which are based on social origin.

1.1.1.1 Social Origin

Social stratification theories show that social origin is a strong determinant for educational success (Breen & Luijkx, 2004). Social origin is mostly operationalized as education or the social status of parents. In Germany, a large group of people with a migrant background are former guestworkers or their descendants, who were recruited for low status work, and

therefore often, originate from a lower social origin. Hence, a strong correlation exists between having a migrant background and a low social origin (Kalter et al., 2007).

Research has shown that social origin can in fact explain part of the lower chances of migrants to secure a place in the vocational education sector (Beicht & Granato, 2011; Laganà, Chevillard, & Gauthier, 2014; Urban, 2012). However, the effect of social origin is rather small with respect to the transition into the vocational education system compared to transitions into higher secondary school education (Kalter et al., 2007). Therefore, the effect of social origin matters for a successful transition into the vocational education system, although it is rather an indirect effect: social origin is directly connected with the resources that are available for families to promote their children and for achievements in the early educational steps. Thus, these achievements that children attain based on their social origin are very important to the attainment of vocational education.

An example of an achievement based on social origin is the level of general secondary school education achieved. In other words, social origin is correlated with the level of the school leaving certificate attained. The level of general secondary school education determines the possibilities for accessing different paths within the vocational education system. Usually a higher level of secondary school certificates is needed to enter full-time vocational schools. Therefore, students who come from a lower social origin, and who less often achieve higher secondary school certificates, have a smaller chance of gaining access to full-time vocational schools. This same scenario applies to their chances of gaining access to an institution in the tertiary sector. Thus, for graduates with a low level of general school education, often the only option to achieve a vocational education is to complete an apprenticeship. However, gaining access to an apprenticeship program is highly dependent on supply and demand conditions. In summary, the resource of a higher social origin will increase students potential to achieve higher levels of general school education, which will then increase their potential to gain access to the vocational education system and to achieve a vocational education.

In the literature, these resources and achievements based on social origin often are called capital and are distinguished by different forms: economic capital, cultural capital, social capital (Bourdieu, 1986), and human capital (Becker, 1993). The next section explores these four forms of capital in more detail with regard to their meaning and impact.

1.1.1.2 Economic Capital

Economic capital is capital in terms of material wealth. It is the source for many other forms of capital (Bourdieu, 1986). Economic capital plays a role in students' transition to vocational education in the sense that their parents or the individual themselves have the

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economic resources to support their educational endeavors. For example, if the supply of apprenticeships is small in their home town, the children of parents with economic capital can afford to move to another region to find an apprenticeship, since their parents can provide financing for an apartment. Similar to this argument, Beicht and Granato (2011) point out that young people with a migrant background have less mobility when applying for apprenticeships more than 100 kilometers from their home town. This difference may partly explain some ethnic disadvantages in the participation in vocational education.

Another example of the impact of economic capital is related to the financial limitations on students' choices between different alternatives in vocational education. Access to apprenticeships depends mostly on market conditions, whereas access to full-time vocational schools or institutions in the tertiary system does not. However, full-time vocational schools and institutions in the tertiary system do not offer financial support in the form of a basic income, and often require students to pay school fees. For children from families with low economic capital, apprenticeships are an important means for obtaining vocational degrees, since these students depend on the basic income paid to them during their training. In contrast, children from families with economic capital can afford to pay for their children to participate in full-time vocational schools or university. Thus, families with economic capital are less dependent on the labour market conditions of a specific time, and so have increased possibilities to achieve a vocational education and to attain a vocational degree.

1.1.1.3 Human/Cultural Capital

Another important aspect of the transition into vocational education is the availability of human and cultural capital. *Human capital* is defined as the accumulation of previous education and training (Becker, 1993). Similar to Becker's concept of human capital, Bourdieu (1986) introduced the concept of *cultural capital*. Whereas human capital defines education as the number of years spent in getting an education, cultural capital defines education in a much more vague and diverse way, and it remains unclear what kind of education is considered to be cultural capital. *Cultural capital* means to have an "elite status" of cultural competence, taste, knowledge and beliefs or language (Bourdieu, 1986). For Bourdieu (1986) the "institutionalized state" is one of the forms of cultural capital that is the most objective and very similar to the idea of human capital—it is the objectification of cultural capital in the form of school certificates.

While the definitions of human and cultural capital differ, meaning education is operationalized differently, both concepts posit the same mechanism. Children from a lower social class accumulate less human or cultural capital than their peer group from a higher social class because the parents of children from a lower social class have less resources to foster the acquisition of human or cultural capital. This difference explains the inequality

between people of different social origins in many dimensions of life: educational achievement, participation in the labour market, and level of income (Becker, 1993).

A migration process adds to the disadvantages and negative impacts of a low social origin. Some aspects of human or cultural capital are country- or culture-specific and therefore cannot be transferred to another context. Hence, part of a migrant's endowment of human and cultural capital is lost or becomes irrelevant with the migration process (Borjas, 1994; Chiswick, 1991). Language skills, which play a crucial role in the transition process to vocational education (Diehl, Friedrich, & Hall, 2009), are an example of country specific cultural or human capital. When an individual does not speak the language of the receiving country, her/his available human or cultural capital is of no use, since it cannot be communicated. Furthermore, the language used in vocational schools is German. Therefore, the learning of new skills will be hindered by poor language skills (Hunkler, 2014). Another example of cultural or human capital that may be lost after migration is the school degree that has been achieved in the country of origin, and which may not be valid in other countries.

The secondary school leaving certificate is the indicator of human and cultural capital that is used most often in empirical studies and that has proved to be the most important factor for explaining the differences in students' chances of achieving a vocational education. Signaling theory argues that employers focus on "signals" of their applicants to evaluate their productivity and fit for the company (Spence, 1974; Stiglitz, 1975). Therefore, an individual's educational certificates are a signal to the employer. A higher level of secondary school education signals higher productivity to the employer. Therefore, although no formal entry requirements exist for apprenticeships, employers tend to prefer graduates with higher school leaving certificates, especially if the supply of graduates is large. For full-time vocational schools, the minimum requirement is a *Hauptschule* leaving certificate, and some training programmes require a *Mittlere Reife* leaving certificate. For the tertiary sector, a high school leaving certificate is required. Thus, higher school leaving certificates increase students' possibilities of participating in the different paths of the vocational education sector, and therefore, his/her chances of obtaining a vocational education degree. A number of studies have shown that migrants, on average, have lower school leaving certificates than their native German peers. These differences in the level of secondary school education achieved are the most important factor in the explanation of ethnic inequality in the vocational education sector (Beicht & Granato, 2011; Hunkler, 2010).

As cultural capital is lost or becomes irrelevant when migrating to another country, children with a migrant background have been accused of having deficits in the behaviours or skills needed in educational institutions in Germany (Diefenbach, 2010). This idea is derived from Claessens (1962) theory of sociology, which claims that every culture has

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its own value system that hinders the exchange between different cultures. Socialization happens in early childhood and may be difficult to change at an older age. Therefore, children with a migrant background who were born in Germany are better off than children who migrated to Germany when they were older (Schrader, Nikles, & Griese, 1976). Not being socialized in the culture of the receiving country means not to know what behaviour is important in school or during an application meeting for an apprenticeship.

However, with respect to the application process for an apprenticeship, it is not only that applicants who are migrants may not know the culture of the receiving country, but also that employers may read certain cultural-specific “signals” as indicators for their productivity “beliefs”. Arrow (1973) argues that this “statistical discrimination” occurs because of information deficits. Employers want to employ individuals with high productivity. Since employers do not have full information about their applicants, they trust their experiences about the productivity of different groups. This is a rational, pragmatic decision to save time and costs, rather than a prejudice against a particular group. Different signals give employers information about probable productivity. For example, these signals can be the membership in an ethnic group. In this context, one can think of many signals that ethnic groups might send that will lower the “beliefs” about their productivity. One example might be language skills or an accent. Another example might be the way migrants apply for a position in the vocational education system. As they stem from another culture they may differ in their application procedure. This may “signal” a lower productivity.

An indicator for these cultural deficits that often is used in empirical studies is the motivation and ambition to achieve a vocational education. However, so far, no empirical evidence exists to support an assumption that migrants and natives differ in their motivation and ambition to achieve a vocational education. Diehl et al. (2009) and Beicht and Granato (2011) did not find any differences between natives and migrants with respect to their search for apprenticeships or in the number of applications for apprenticeships. Furthermore, with respect to their ability and skills, the majority of people with a migrant background would consider themselves to be prepared for an apprenticeship (Ulrich, 2006). Reißig and Gaupp (2006) have shown that above all others groups young people with a migrant background have a positive attitude towards school and want to integrate into the vocational education system.

1.1.1.4 Social Capital

In addition to human and cultural capital, several scholars point to the importance of social capital (Bourdieu, 1986; Coleman, 1990; Granovetter, 1973; Lin, 2001). In contrast to human or cultural capital, the profits of social capital are gained through the structure of relations between persons and among persons (Coleman, 1990). According to Bourdieu (1986):

“Social capital is the aggregate of the actual or potential resources which are linked to possession of a durable network of more or less institutionalized relationships (...) which provides each of its members with the backing of the collectivity-owned capital” (p. 248–249).

Hence, the resource of social capital is gained through membership in a certain group. Networking with this group facilitates certain actions that could not be achieved without the network, or could be achieved only at a higher cost (Coleman, 1990).

The literature provides four explanations about how social capital leads to a preferred position (Lin, 2001, 19–21):

First, an individual who is part of a social network, consisting of people located in strategic positions, will find it is easier to gain information about opportunities and choices that otherwise are not available or only available at high costs. For example, the probability of finding an apprenticeship is increased not only by information on which positions are available but also by information about the recruitment process.

Second, a social network can influence the recruiters or supervisors who are involved in the decision-making processes.

Third, the acknowledged relationship between an individual and her/his social ties to an organization can be seen as a certification of that individual’s suitability, productivity, or motivation. At least the organization knows that the individual has access to important social capital.

Fourth, a social network assures that an individual is worthy of being part of a certain social group that shares similar interests, which reinforces identity and recognition.

Thereby, theorists have categorized social capital into different types and dimensions. Granovetter (1973) makes a distinction between “strong-ties” and “weak-ties”, which are defined by the amount of time people spend in the group, their degree of intimacy, and the form of inverse assistance. Putnam (2000) makes a similar distinction when he differentiates between “bridging” and “bonding” social networks. A bonding-network includes similar people regarding age, ethnicity, or social class, for example. In contrast, bridging-networks include people who are unlike. Both types are important and have positive effects for different dimensions of life. “Strong-ties” or a bonding-network—like for example the family—are important in terms of social support and above all for the socialization of an individual that builds human or cultural capital. Therefore, social capital is a mediator between the human capital of parents and the educational success of their children (Bourdieu, 1986). However, Granovetter (1973) claims that “weak-ties” are more helpful than “strong-ties” when it comes to searching for a job. While “strong-ties” are more likely to know the same people, people with “weak-ties” are more likely to get to know new people and thereby to be informed about unknown opportunities. A bridging-network refers, like Granovetter’s “weak-ties”, to a wider social network that enables the spreading of infor-

mation between a larger number of people and groups.

Which kind of network—bridging or bonding—is more important, especially to immigrants in the search for a job, is an ongoing debate. Some argue that especially for immigrants, a bridging-network or “weak-ties” are important in terms of receiving information about vocational schools or available apprenticeship positions. The bonding-networks of immigrants may predominantly consist of immigrants, who may not have as much information on the vocational education system in Germany as do natives. To be part of an ethnic network can have negative consequences, for example, through the social commitment to the network and the pressure of conformity with its “downward leveling norms” (Portes, 1998, 15). The concentration on an ethnic network regarding labour market activities may lead to “ethnic segmentation”, which may prevent migrants from integrating into the receiving country society (Esser, 2001). In contrast, other researchers have found that—especially for newly arrived migrants and those with few skills—ethnic networks eases the transition into the labour market, since the hiring process happens within ethnic niches (Drever & Hoffmeister, 2008; Thränhardt, 2000).

Roth (2014) has shown that a social network has a positive effect on the probability to finding an apprenticeship. However, in this respect, a mothers’ network plays a more crucial role than an adolescents’ network. Fick (2011) has shown that when a person with a migrant background has German friends, this friendship has a positive effect on the probability of the person with a migrant background participating in vocational education. In addition Beicht and Granato (2011) have demonstrated the positive effect of participating in voluntary projects, for example, a voluntary fire brigade. However, research has shown that young people with a migrant background can less often rely on family members or friends in their search for an apprenticeship than individuals in the same age group without a migrant background. Hence, this difference is an additional explanation for the ethnic inequality in the transition to vocational education (Beicht & Granato, 2010).

1.1.2 Analysis of the Impact of Context Factors: A Research Programme

The previous sections described the impact of social origin, and economic, human, cultural, and social capital on the attainment of vocational education. Human capital, in terms of general secondary school education, and social capital proved to be the most important determinants for a successful transition to the vocational education system. However, even after holding constant many of these individual resources in multivariate analyses, the negative effect of having a migrant background often persists. In recent research, the idea that differences in context characteristics might help to explain microeconomic processes is receiving more and more attention. *Context* characteristics, in contrast to individual resources, are all the conditions an individual is exposed to in a specific spatial

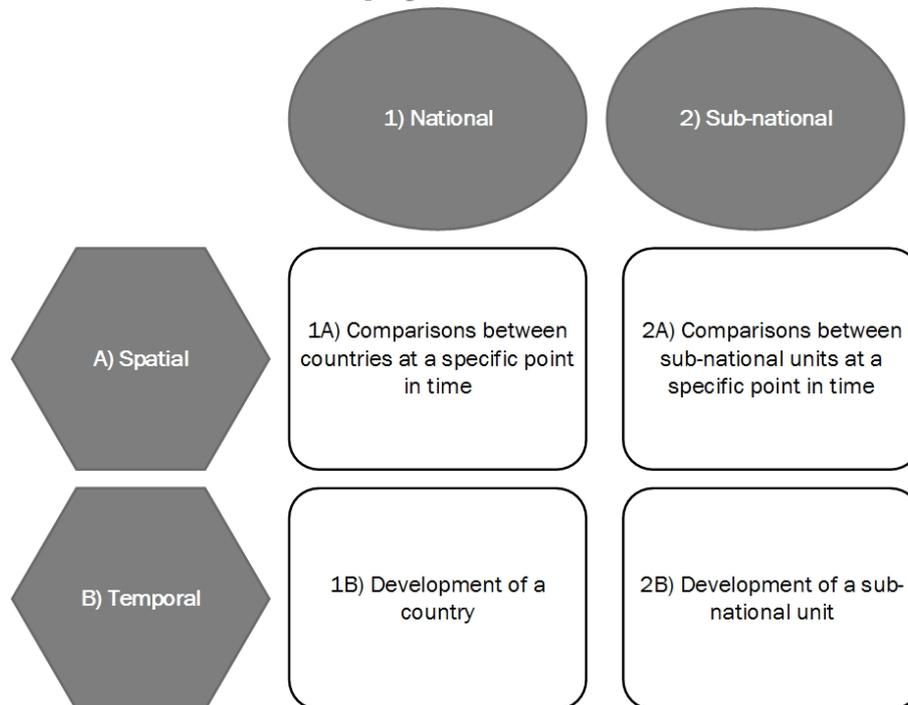
or historical context. However, research on the impact of context factors on the degree of ethnic inequality with respect to participation in vocational education is rare at the moment. Therefore, this section provides an overview of a research programme that focuses on the question of how context influences ethnic inequality with respect to participation in tertiary and vocational education and the attainment of vocational degrees. Within the territory of this research programme, the present study tackles some of the questions it has raised.

The analysis of the impact of context factors as a research programme is based on the ideas of Coleman (1990) who claims that an individual's educational achievement depends on the opportunity structures to which she/he is exposed. He explains social phenomena as the interdependency of macro and micro level factors. A phenomenon at the macro level has an impact on individuals at the micro level, which in turn has an impact on phenomena at the macro level. Walther (2006) also claims that any transition process is embedded in the specific structural, cultural, and institutional context of different states. Therefore, the differences in institutional arrangements have an impact on the choices and decisions of individuals, and thus on the transition process itself (Heinz, 2009; Raffe, 2008).

However, context does not influence everybody in the same way. The impact of different context structures is expected to vary depending on individual resources (De Graaf & van Zenderen, 2013). Hence, the interplay between individual resources and context factors plays a crucial role. For example, the organization of the vocational educational system in a country or in a sub-national entity at a specific point in time determines the required individual resources for the transition process. If the tertiary sector is present or the number of full-time vocational schools is high, the level of general secondary school degrees will play a much larger role than in systems with a large number of apprenticeships. A social network is more important if the supply of apprenticeships is low, and information about where apprenticeships are available is crucial. Also, economic capital will be more important if the supply of apprenticeships is low, because, especially in this case, it is an advantage to be able to afford alternatives like moving to another city or participating in full-time vocational schools. These examples highlight that the interaction between individual resources and context factors are of special interest when analyzing the impact of context.

While the impact of context varies depending on individual resources, it also may vary between groups of people with different characteristics, for example, people with and without a migrant background. Related to this argument, Crul et al. (2012) have shown that different educational outcomes are a result of the interaction between varying school system characteristics and the attributes typical of Turkish parents with low levels of education. The fact that educational policy varies between federal states, and the assumption that context impacts groups of migrants and natives in different ways, lead to the main

FIGURE 1.1: Overview of the research programme context factors



hypothesis of this present study—that the level of ethnic inequality varies between different context units.

Context can be described in spatial or historical dimensions. Thereby, a spatial context can be understood in different ways: it includes comparisons of countries or groups of countries, and also regional entities within a country, i.e., the federal state, and the community or district down to the level of the neighbourhood. The historical context describes characteristics that evolve over historical time periods. Figure 1.1 provides an overview of the categorization of context into four research fields. The following two sections examine these fields of research in more detail.

1.1.2.1 Spatial Comparisons

Research field 1A analyzes questions about the impact of country-specific regulations on the degree of ethnic inequality. Therefore the political, economic, or cultural structure of a state may play a role in perpetuating this inequality. An example of a cultural characteristic is the language that is spoken in a country. From Adsera and Pytlikova (2015) we know that linguistic proximity determines migration rates, which increase with linguistic proximity or if the language spoken is English. The proximity of a language may ease or hinder integration processes, for example, integration into the vocational education system. The economic system of a country also will have an impact on how the vocational education system is organized. Political orientation has an impact on legal regulations,

1.1 Theoretical Considerations and Empirical Research on Ethnic Inequality in Vocational Education

which determine, for example, immigration policies that dictate the history of migration of a country. In Germany, for example, we experienced a large immigration flow of guest-workers, which has shaped the country to this day. Politics also dictate the structure of the educational system, and determine how it is characterized with respect to its standardization or stratification. For example, the vocational education system can be categorized by its level of specialization or generalization, which in turn structures the possibilities of transition into the labour market. So far, a number of studies have shown that national educational systems can influence educational outcomes (Alba, Sloan, & Sperling, 2011; Alegre & Benito, 2014; Dronkers et al., 2012). However, little is known about how the organization of the vocational education system of a country impacts the level of ethnic inequality in the participation in, and attainment of, vocational education. Thus, learning more about this issue is the aim of research field 1A.

Recent research also has shown that differences in the sub-national units of a country can affect educational inequality (Ainsworth & Roscigno, 2005; Freitag & Schlicht, 2009; Dollmann, 2011; Stadelmann-Steffen, 2011). One example is the case of Germany. Under German federalism, each state enjoys educational autonomy. As a result, educational policy varies widely within Germany, which influences the educational structure in every federal state. One of the impacts of the variation in educational structure is the variation in the composition of the main sectors within the vocational and tertiary educational system. Research on which context effects have an impact on a successful transition into vocational education are rather scarce so far. Eberhard and Ulrich (2011) analyzed the impact of the size of the transition system in the different regions of Germany and found that the availability of a large number of these programs reduced the chances of the graduates of general secondary schools to gain access to vocational education. But what is the impact on the gap between natives and migrants with respect to participation in vocational education? Seibert, Hupka-Brunner, and Imdorf (2009) have found that men with a Turkish, or a former Yugoslavian nationality, living in Germany have a lower chance of gaining entry into full-time vocational schools, even when holding constant general secondary education. Another factor that reduces the chances of migrants is the economic situation or the prevalent economic sector of a sub-national spatial unit. Both dimensions are a determinant of the organization of the vocational education system or the overall chances to gain access to the vocational education system. From current research, we know that the higher the percentage of unemployed persons in a region, the lower are the chances of participating in vocational education (Diehl et al., 2009). Thus, the aim of research field 2A is to examine how the organization of the vocational education system in sub-national spatial units within a country impacts the level of ethnic inequality with respect to participation in, and achievement of, vocational education.

1.1.2.2 Temporal Comparisons

Research fields 1B and 2B are interested in changes in the degree of ethnic inequality over historical periods. Empirical studies have shown that the overall chances of foreigners obtaining a vocational degree in Germany increases within the cohorts from 1960 to 1971 (Seibert, 2005). However, this result seems to vary within migrant groups. Siegert (2009), examining the period 2000 to 2006, found that participation in vocational education and training had decreased especially for young people with a Serbia and Montenegro or a Turkish nationality. In contrast, during this period, young people from Russia more often participated in vocational education. However, when these participation rates are compared to the participation rates of native Germans, the gap remains wide. Wagner (2005) has analyzed the composition of the population without a vocational degree within the immigration cohorts of 1959–1975 and found an increasing number of young individuals from migrant families without a vocational degree within this group.

Context characteristics can develop or change over time. As we experience economic recessions and booms, they in turn impact other developments. Cebolla-Boado, Miyar-Busto, and Munoz-Comet (2015) have shown that inequality in the attainment of educational credentials for the labour market has increased with the recent economic crisis. According to Turner and Cross (2015), the economic crisis also has had an effect of decreasing the positive attitudes towards immigrants. If this is true for Germany as well, this trend may have an impact on the chances of migrants to secure an apprenticeship. Another development that may be of interest is the reform of the citizenship law in 2000, which simplified naturalizations for foreigners and may have an impact on integration processes.

Furthermore, with the beginning of deindustrialization in the late 20th century, employment is being restructured by a trend towards the extension of the service sector and globalized information technologies. As a consequence, a significant number of jobs for unskilled or lower skilled workers has diminished, while the demand for highly qualified employees has increased (Baethge, 2005, 2006). These developments in the labour market also have had an impact on the organization of the vocational education system. Thus, the German vocational system has been confronted by significant developments in the last decades (Baethge, 2005, 2006). Traditionally, the industrial sector has offered the largest share of apprenticeships in the dual system, taking the majority of graduates from lower secondary school. With the decline of this sector, this group of graduates has a lower chance of securing a place in the vocational education system. Therefore, the current literature discusses the “crisis” in the German vocational and academic educational system and asks to what extent is it still able to integrate all levels of graduates from secondary general education (Kupfer, 2010). Over the last several decades, more and more full-time vocational schools have evolved, both in response to the changing needs of the economy and in an effort to create additional opportunities for young people who did not find

an apprenticeship (Baethge, Solga, & Wieck, 2007). Another reaction to the decline of apprenticeship positions was the organization of a “transition system” (Baethge, 2008). Moreover, due to educational expansion, the secondary school leaving certificate is said to have become more and more important during the last decades, leaving especially young people with lower secondary school leaving degrees or with no school leaving certificates at all in a weaker competitive position (Solga, 2005).

Among the diverse number of potential context characteristics that may play a role in the development of ethnic inequality is the fact that migration flows have changed over time with respect to the diversity of their ethnic groups, the causes of the migrations, and the development of the attitudes towards immigrants.

1.1.3 Contribution of the Present Study

This present study analyzes some of the questions raised in the research programme regarding the impact of context on the degree of ethnic inequality in vocational education. The research questions for the present study were thereby derived from the research fields 2A and 1B. I analyzed the impact of the organization of the vocational education system in different federal states on the amount of ethnic inequality with respect to participation in vocational education (2A). I thereby focused on how the composition of the main parts of the vocational education sector, the number of apprenticeships, the number of full-time vocational schools, and the presence of a transition system influence inequality between native Germans and migrants with respect to participation in vocational education.

The second part of this study focuses on the impact of the development or the change of context characteristics on the degree of ethnic inequality with respect to the achievement of vocational education (1B). I am especially interested in how the change in the composition of ethnic groups immigrating to Germany and the changes in the structural conditions of the society of the receiving country impact integration processes.

Thereby, the interaction between individual resources and context factors are of special interest. Not only the interaction between having a migrant background and being exposed to certain context factors are taken into account, but also other individual resources such as the differences in the endowments of general secondary school education, social integration, socio-economic background, and language skills.

1.2 Data

The analyses in the three papers of this study are based on German microcensus data and context data collected from different federal offices. Moreover, I calculated additional analyses based on the socio-economic panel (SOEP), which offers some information that

is not available in the microcensus data, such as socio-economic background and language skills. In the next three sections, I describe the data sets and discuss the advantages and disadvantages regarding the analyses of ethnic educational inequality in different spatial and temporal contexts.

1.2.1 German Microcensus Data

The German microcensus is the official representative survey of the population and the labour market in which 1 % of all households in Germany are surveyed annually. De facto anonymized scientific use files (SUFs) are available for research purposes. SUF data are a 70 % sample of the original data. Data has been collected in the western federal states of Germany since 1957. Since 1991 German microcensus data also contain information about the eastern federal states. The European Union Labour Force Survey (EU-LFS) is integrated into the microcensus. The sampling method is a single-stage cluster sampling. The sampling frame consists of all persons in Germany who have right of residence. The sampling districts are artificially delimited areas (clusters) comprising, as a rule, neighbouring buildings. Within the sampling districts, all persons within households and dwellings are interviewed. Each sampling district remains in the sample for four years. Each year, a quarter of the sampling districts is replaced by new sampling districts. Households and persons who move away from the sampling district are not followed; rather they are replaced by households and persons who have moved into the sampling district. Therefore, the microcensus is a repeated survey with a partial overlapping of sampling units. However, the rotation quarter to which a respondent belongs is not identifiable in the SUFs (Statistisches Bundesamt, 2011).

The use of official microdata has many advantages (Alba, Müller, & Schimpl-Neimanns, 1994). The size of the sample enables the analysis of different ethnic groups, and a comparison of the federal states within Germany. Sampled households and their members are obliged by law to provide information for the microcensus, which encourages a low non-response (2.4 % in 2011) (Statistisches Bundesamt, 2011) and a good coverage of the German population. The question of whether missing data might be non-random (Allison, 2002) is less of a problem with a microcensus than with survey data. Moreover, since SUFs are available beginning with 1973, this data makes it possible to analyze patterns of ethnic inequality in a trend design.

Since the German microcensus is a household survey, information about other household members are available. It also is possible to analyze the characteristics of other persons living in the same dwelling or neighbourhood. However, when it comes to social background information, the parents' employment status or education level is only available, if the person is living in the same household as their parents and is non-married. Since most young people move out of their parents' household after graduation from a general

secondary school, the impact of social background can only be analyzed for a highly selective group of individuals over 19 years of age (Schimpl-Neimanns, 2008).

Regarding the differentiation of migrant groups, the data contains important information about the year of migration, nationality, naturalization, country of birth (Germany or not), and immigration as a German ethnic repatriate including information on the migrant status of the parents in the context of the household. Data for the survey year 2005 and 2009 also contain information about the migrant status of parents not living in the same household (Jäger & Schimpl-Neimanns, 2012).

Data about participation in education and achieved educational degrees has been available since 1976. However, until the survey year 2005, questions about the achievement of educational certificates were voluntary for people aged 51 and older. The comparison over time regarding participation in or attainment of vocational education is a challenge (Spieß, Kreyenfeld, & Lohmann, 2013). Moreover, in this regard, Schimpl-Neimanns (2013) has pointed to inconsistencies in the data compared to official school statistics, which might be due to the way in which the different types of vocational education are surveyed. The differentiation between general secondary school and vocational and tertiary education works well, but when differentiating between different school types inconsistencies compared to official school statistics have arisen.

German microcensus data is very compelling for a large number of cases, which is especially appreciated when analyzing spatial contexts within Germany. Moreover, the long period over which the data is available enables analyses of the historical context. The most important limitation of the official data, which applies more or less to every secondary analysis, is that the data may not match the requirements of a research question. This limitation is especially true, since the microcensus data is collected for administrative purposes and thus is constrained by considerations of cost efficiency. Therefore, some characteristics that play a role in the theoretical discussions about ethnic inequality—e.g., language skills, social network, and attitudes—are not available in this data. Also, information on social background is only available if the person of interest lives with their parents.

1.2.2 German Socio-Economic Panel (SOEP)

The SOEP is a longitudinal survey in which private households and individuals in Germany have been annually surveyed since 1984. Since 1990, the sample also had included Eastern Germany. A central aim of the study is to measure the stability and change of living conditions. The SOEP is available in a cross-sectional or longitudinal form. The samples of the SOEP are multi-stage random, which are regionally clustered. The households are selected by random-walk. The interviews are obtained mostly in face-to-face

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interviews with all members of a household who are aged 16 years and older. Additionally, the head of the household is asked to give household-related information on such things as housing, housing costs, income, and persons who are younger than 16 years. Every year, about 20,000 persons in 11,000 households are interviewed. Participation is voluntary in contrast to the mandatory participation of the microcensus. Persons who move will nonetheless be interviewed. SOEP data on income, employment, health, education, and other characteristics is available (Haisken-DeNew & Frick, 2005).

Migrant groups from former recruitment countries are oversampled in SOEP to make sure that the number of cases in the sample is large enough for analysis (Haisken-DeNew & Frick, 2005). Moreover, a new sample has been added recently to account for newer migration flows into Germany—the “IAB-SOEP Migration Sample”. This sample includes 4,964 migrants in 2,723 households who have immigrated to Germany since 1995, as well as the descendants of immigrants that have entered the German labor market since 1995. The focus is on migrants from Poland; Rumania; GUS; Turkey; the former Yugoslavia; southern european countries like Italy, Spain and Greece and Arabic and Muslim countries (Brücker et al., 2014). The SOEP offers information about migrants’ backgrounds, which can be differentiated by generation and nationality. Additionally, information is available on the causes of migration, residence of family members, year of immigration, country where educational certificates were attained, and subjective language skills (Spieß et al., 2013).

Since the SOEP has a longitudinal design that has existed since 1984, individual educational paths can be analyzed from the very beginning until adulthood. Information is available on participation in educational programmes, and the attainment and specialization of educational certificates. Moreover, the SOEP also contains information about participation in the non-formal educational sector, and measures the non-cognitive skills and characteristics of the personality. However, the number of cases can be quite small when individuals are analyzed over a very long time period (Spieß et al., 2013).

Regarding the analyses of context information is available on the household, family, social networks, peers and educational institutions in which the individual participates. In contrast to the microcensus data, SOEP data is available on the family background—e.g., the employment and education of parents—also for individuals who are not living with their parents. For the analyses of spatial context, the following units can be considered under different data access conditions: federal state, region, district, community and postal code (Spieß et al., 2013).

The potential of SOEP data is the large amount of information available on household and family background. However, for specific analysis—for example, for the differentiation

by federal state—the number of cases gets very small, above all when the population of people with a migrant background are to be differentiated by generation and nationality.

1.2.3 Context Data

Even though microcensus data and SOEP data provide information about the federal state level, information is not available on an aggregated federal state level with respect to the supply of apprenticeships. Therefore, aggregated data at the federal state level regarding the supply of apprenticeships, the presence of full-time vocational schools, the number of programmes in the transition system, and the proportion of students in the tertiary system must be gained from the federal statistical office and the federal institute for vocational education and training. The federal statistical office (Statistisches Bundesamt, 2013a) provides information about the number of school-leavers (students who have graduated from general secondary school) who started in the tertiary sector, full-time vocational schools, and the transition system in each federal state. Based on this information, I calculated the following indicators:

- The size of the tertiary sector: the percentage of school-leavers who start in the tertiary sector in comparison to all possible transitions after general secondary school (tertiary sector, apprenticeships, full-time vocational schools, transition system)
- The presence of full-time vocational schools: the percentage of school-leavers starting in full-time vocational schools compared to all possible transitions in the vocational education sector (apprenticeships, full-time vocational schools, transition system)
- The presence of a transition system: the percentage of school-leavers starting in the transition system compared to all possible transitions in the vocational education sector (apprenticeships, full-time vocational schools, transition system)

Furthermore, the federal institute for vocational education and training (Bundesinstitut für Berufsbildung, 2010, 2011) provides information about the supply of apprenticeships. The advantage of this data is the comparison of supply and demand:

- The supply of apprenticeships: the relation between the supply and demand of apprenticeships. This relation shows how many apprenticeship positions can be offered to each 100 applicants. Thus, the higher the number, the better the supply of apprenticeship positions.

Since pooled microcensus data from 2008 to 2010 was used at the microlevel, I also calculated the averages of the aggregated data for the federal state level from 2008 to 2010.

1.3 Methods

To answer the research questions of this present study, I used different methodological approaches. To analyze the level of ethnic inequality in different federal states (paper 1 and 2) or among different cohorts (paper 3) I used quantitative statistical analyses at the individual level. To avoid an over- or under-estimation of correlations, I used multivariate regression models to measure the effects of certain characteristics of the inclusion in vocational education while holding other characteristics constant. The dependent variable was the participation in vocational education (paper 1 and 2) or the achievement of vocational education degrees (paper 3). The key independent variables were migrant background and the general school leaving certificate. Depending on the dataset, I also included information about the education of the parents, language skills, and social integration (ethnic composition in the household or neighbourhood). Variables that were likely to be correlated with both the dependent and independent variables were held constant. On the one hand, age and sex have been found to have an impact on the chances of participating in vocational education (Beicht & Granato, 2011; Diehl et al., 2009). On the other hand, the population of people with and without a migrant background differs in these demographic characteristics.

In addition to analyzing the level of ethnic inequality of different federal states and cohorts, the present study also analyzed the impact of the main characteristics of the vocational education system on the degree of ethnic inequality. Two dominant positions in social science are available for doing this type of macro analysis: the macro-quantitative variable approach versus the macro-qualitative small N case approach (Berg-Schlusser & Cronqvist, 2005). While the case approach camp highlights the advantage of the possibility of examining complex empirical processes, rather than reducing cases to variables, critics have claimed that this approach does not offer tools for constructing generalizations or testing the theory, which can be accomplished by using the variable approach (Ragin, Shulman, Weinberg, & Gran, 2003). In recent years, multilevel regression techniques increasingly have been used. However, a common critique is that with a small N approach, at the upper level, the estimated models have a low number of degrees of freedom. Therefore, only a small number of country-level predictors can be controlled for, which may lead to an omitted variables bias (Hox, 2010). Furthermore, the country slope estimators are likely to be unreliable due to the influential cases of small sample sizes. Maas and Hox (2005) have concluded that only samples with more than 50 macro units produce unbiased multilevel estimators.

With the Qualitative Comparative Analysis (QCA) method, Ragin (1987) introduced another approach for macro analyses. Ragin et al. (2003) have claimed that QCA combines the best features of both case-oriented and variable-oriented approaches. Moreover, this method can handle the number of cases that would be too small for multivariate analysis,

for example, but too large for an in-depth case comparison (10–50 cases). However, the main reason for choosing the QCA method is that the researcher believes that the research questions can be better explained by set relations than by correlations and linear additive effects. Basically, QCA tries to find conditions that are “sufficient” or “necessary” for a special outcome. Necessary conditions must be present for any particular outcome to occur. Sufficient conditions concern those factors that, when combined, produce a specific outcome. Thus QCA relies on so-called “truth tables”, that group together all cases with the same configurations of variables and rules of logical minimization, which combines the shortest logical expression possible that covers all the cases with the same outcome (Berg-Schlusser & Cronqvist, 2005). To implement the method, conditions must be dichotomized or re-calibrated into numbers between 0 and 1. Then, a threshold is used to distinguish whether the condition is more available or more not available (Ragin et al., 2003).

The basic feature of the QCA method is that it also can expose “conjunctural” causal relationships, which are different patterns of factor combinations. This feature may be an advantage when single conditions do not display their effect on their own, but only in combination with other conditions. In this instance, the limited number of cases would not enable an inclusion of interaction terms in the regression equations (Kangas, 1994). A second major characteristic is that different conditions or combinations of conditions can lead to the same outcome (equifinality). This characteristic stands in contrast to conventional statistical techniques, in which causes compete with each other and in which the focus is on a net effect of an independent variable controlling for other characteristics (Ragin et al., 2003). Finally, the QCA method is based on the idea that the cause of the occurrence of an outcome may not be automatically the same for a non-occurrence of an outcome (asymmetry). Thus, a concept needs two separate definitions. For example, *rich* is not the opposite of *poor*; *rich* needs a separate definition. This precision of definition often is not considered in conventional statistical techniques (Schneider & Wagemann, 2012).

In addition to its many advantages, the QCA method also has limitations and pitfalls that need to be taken into account. A crucial limitation of the QCA method is that results are very sensible on the specification of the causal conditions and the cases included in the analysis (Goldthorpe, 1997). Furthermore, measures of uncertainty are more related to the judgment of an individual researcher than to statistical methods. This understanding is especially crucial when considering the calibration of fuzzy-set memberships. Results also are very dependent on decisions about how to react to limited diversity. However, at least different results will never contradict each other. Also, the QCA method does not resolve the universal “few cases, many variables” problem. The number of macro-level characteristics that can be analyzed also depends on the number of macro-level units available.

All in all, QCA develops theories but does not rather than testing them (Schneider & Wagemann, 2012). Furthermore, QCA has been criticized as being deterministic, since it finds relationships that are invariant (Goldthorpe, 1997); whereas supporters of QCA would say that it is not determinist when using parameters of fit (consistency parameters) and fuzzy sets rather than dichotomous sets (Schneider & Wagemann, 2012). As Kangas (1994) has put it, another criticism of QCA is that causal factors cannot be evaluated by their relative significance, and even if a variable is relatively unimportant, it would not be omitted—as it would be in statistical techniques—unless it is logically unnecessary. Finally, when using the QCA method, many potential independent variables exist that could play a role, and even if a research design includes cases that share at least the same state-context, causality cannot be claimed (Ebbinghaus, 2005).

1.4 Results

1.4.1 Papers

The next section gives a short summary of the results of this thesis. I start with an overview of the three papers. Then I describe two analyses I calculated in addition to the analyses in the three papers.

1.4.1.1 Paper I: Migrants Participation in Vocational Education: A Comparison of Germany's Federal States (Laender)

So far, little attention has been paid to the idea that the chances for a successful transition into tertiary or vocational education may depend on context factors. Educational policy varies widely within Germany, which influences the educational structure in every federal state, and thus the opportunity structures for individuals. This variation does not only affect the distribution of general secondary school certificates. Also, every federal state has its own special composition of university-, apprenticeship-, full-time vocational school- and transition system sectors within the tertiary and vocational education system. So far, we do not have much information on how these differences affect the chances of school graduates in the transition to vocational education. And we do not know if characteristics of the vocational education system affect migrants and natives in the same way.

Therefore, I am interested in the following questions:

1. Do the differences in the educational structure between federal states produce a variation between federal states in the level of inequality between migrants and natives with respect to their participation in tertiary and vocational education?
2. Does the impact of general school education on a successful transition into tertiary and vocational education differ between the federal states?

The comparison between the federal states has a strongly descriptive character but also has the goal to raise hypotheses about which institutional contexts might impact the amount of inequality between natives and migrants with respect to their participation in tertiary and vocational education.

The analysis of the degree of inequality between migrants and natives with respect to their participation in tertiary and vocational education across German federal states is based on analyses at the micro-level using German microcensus data. To increase the size of the sample to be able to compare the federal states in more detail, I use pooled cross-section data from 2008 to 2010. The size of the gap between natives and migrants with respect to their participation in the tertiary and vocational educational system that can be gained from analyses of the microcensus data is compared in a descriptive way with the aggregated data from federal statistical offices regarding the supply of apprenticeships, the presence of full-time vocational schools and the number of programmes in the transition system. People with a migrant background are divided into those who were born in Germany or immigrated to Germany until age six (1.5/2nd generation) and those who migrated to Germany later than age six (1st generation). The analyses included persons aged 15 to 24 with and without a migrant background. Students in secondary schools, people in military duty or in community service, and people who already have a training qualification are excluded from the analyses.

To investigate the differences in the degree of ethnic inequality between natives and migrants across federal states, binary logistic regressions were computed separately for each federal state. The dependent variable is participation/non-participation in the tertiary and vocational educational system. The definition of a tertiary and vocational system includes apprenticeships, full-time vocational schools, and programmes in the tertiary sector.

The results of this study contribute to current research with two main results. First, the results of this paper indicate that having a migrant background has a negative effect on the probability to participate in the tertiary and vocational education system. This study differentiates these known disadvantages further by showing that while all federal states appear to be unable to sufficiently counterbalance the effects of a migrant background, they differ in their ability to mitigate these effects especially for migrants of the first generation. The inequality between natives and first generation migrants with respect to their participation in tertiary and vocational education is the largest in Bavaria, Berlin, and Germany's eastern states, and is the smallest in Schleswig-Holstein and Hamburg. The differences between the federal states regarding the amount of inequality between natives and second generation migrants are rather small: the gap between natives and second generation migrants in the participation in vocational education is the largest in Bavaria and Schleswig-Holstein and is the smallest in Lower Saxony and Germany's eastern states.

Second, the results of this study correspond to earlier research that showed that general school education has an important impact on the probability to participate in tertiary and vocational education and on the amount of inequality between natives and migrants. The present study contributes to current knowledge by showing that the impact of the general secondary school education varies in its importance in the different federal states. For example, having a high level of general secondary school education is much more important for the transition into tertiary and vocational education in Berlin or Hamburg than in the other federal states. Furthermore, the results show that differences in the average level of general secondary school education between the federal states can explain some of the variation between the federal states in terms of the amount of inequality between natives and migrants with respect to their participation in tertiary and vocational education. The large degree of inequality between natives and migrants in Bavaria and Baden Wuerttemberg, for example, can be attributed mainly to composition effects: in these federal states, the share of people with a migrant background with—on average—a lower level of educational attainment in general secondary school is comparably high.

Given the findings of this study, I conclude that policies in the different federal states seem to make an important difference to the amount of inequality between natives and migrants with respect to their participation in tertiary and vocational education, especially for first generation migrants. I assume that especially three characteristics of the vocational education system which differ between the federal states play a crucial role: the supply of apprenticeships, the amount of full-time vocational schools and the presence of a transition system. This assumption is analyzed in Paper II.

1.4.1.2 Paper II: Ethnic Inequality in Vocational Education: The Impact of Educational Policy and Contextual Factors in Germany's Federal States

The results in Paper I showed that the degree to which young people with a migrant background are underrepresented in vocational education varies between Germany's federal states. This is especially true for first generation migrants.

The main idea of this article is to examine how the supply of apprenticeships, the presence of full-time vocational schools and a transition system affect the size of the gap between first generation migrants and native Germans in the participation in vocational education. I focus on first generation migrants, as the differences in the level of ethnic inequality between the federal states for second generation migrants are rather small. The following research questions are analysed in this paper:

1. Does the composition of apprenticeships, full-time vocational schools and programmes in the transition system in each federal state play a role for the amount of ethnic inequality in the participation in vocational education?

2. Which composition might increase or decrease the amount of ethnic inequality in the participation in vocational education?

The empirical basis for the analyses is German Microcensus data (German Labour Force Survey). To increase the size of the sample to be able to compare the federal states in more detail, I use pooled cross-section data from 2008 to 2010. The analyses include persons aged 15 to 24 with and without a migrant background. Students in secondary schools, young persons in military duty or in community service, and persons who already have a training qualification are excluded from the analyses. The concept “ethnic inequality in VET” is based on results of binary logistic regressions and shows the correlation between migrant background and the dependent variable—to participate in VET or not to participate in VET. VET as defined for this paper includes in contrast to paper I only apprenticeships and full-time vocational schools. The tertiary system was left out here, as the hypotheses concentrate on the non-tertiary level.

To analyze the impact of the contextual factors on the degree of ethnic inequality, a Fuzzy Set Qualitative Comparative Analysis (Fs/QCA) is applied. Therefore, aggregated data from the Statistical Offices of the Federation and the federal states and from the Federal Employment Agency is used to compare the distribution of apprenticeships, full-time vocational schools, and the transition system between Germany’s federal states.

The findings of this analysis show, that ethnic inequality in VET for first generation migrants cannot be explained by a single factor but has multiple causes. Factors that are connected to high ethnic inequality in VET are a small supply of apprenticeships in combination with a high presence of full-time vocational schools and a low presence of transition programmes. This finding is the case in Berlin and other eastern states and in North Rhine-Westphalia. On the other hand, low ethnic inequality in VET is present in federal states with a large supply of apprenticeships in combination with a low presence of full-time vocational schools. In four federal states, these conditions were present: Baden-Wuerttemberg, Bavaria, Schleswig-Holstein, and Hamburg. High ethnic inequality also can exist when another combination of conditions is present: a small supply of apprenticeships in combination with a high number of transition programmes and a small amount of full-time vocational schools. This is the case in Lower Saxony. The opposite set of conditions produce a small degree of ethnic inequality: a large supply of apprenticeships and a low number of transition programmes. This is the case in Rhineland Palatinate, Hamburg, and Bavaria. In both paths a small supply of apprenticeships alone does not necessarily lead to a high level of ethnic inequality in VET, which occurs only when a small supply of apprenticeships is combined with a high presence of full-time vocational schools or a large number of transition programmes.

1.4.1.3 Paper III: Trends of Ethnic Inequality in the Attainment of Vocational Degrees in Germany: A Comparison of Immigration Cohorts 1960–2001

The available research on ethnic inequality in the vocational education system usually has focused on the amount of inequality at a specific point in time. However, the context has changed for different immigration cohorts. First, migration flows in itself have changed over time with respect to the diversity of their ethnic groups and the causes of the migration. Research usually has focused on people from the former recruitment countries, while only a few studies have described the integration processes for newer migration populations. Since these current migration groups constitute an increasing share of the foreign population in Germany, it is important to analyze how the integration processes for these groups are different from those of migrants from the former recruitment countries so to better anticipate what to expect in the future regarding the degree of ethnic inequality. Second, the shift from the manufacturing to the service sector and educational expansion has changed the opportunity structures. Therefore, older studies on the ethnic inequality in the attainment of vocational degrees are not comparable to newer studies on this topic.

This present article contributes to the current research with the analysis of these research questions:

1. Is there a trend to integration in the attainment of vocational degrees for migrants of different immigration cohorts?
2. What is the impact of the level of general secondary school education and social integration on the level of ethnic inequality in the attainment of vocational degrees in different immigration cohorts?

By comparing the results between different immigration cohorts, I increase the understanding of the impact that differences in individual characteristics have in the changing economic structure of Europe. Thereby, migrants from the former recruitment countries are contrasted to groups from recent migration flows.

The analyses are based on pooled German microcensus data from 1996 to 2011. I compare the attainment of vocational degrees by immigrants of the first generation who immigrated to Germany before the age of 15 to the attainment of vocational degrees by natives (the age range of both groups is 28 to 35). Students in general secondary school or vocational education programmes are not included in the sample. Ethnic inequality is compared within different immigration cohorts—migrants who moved to Germany between 1960 and 1975, 1976 and 1989, or 1990 and 2001. These immigration cohorts are compared to Germans who are differentiated by three birth cohorts—Germans who were born between 1960 and 1967, 1968 and 1975, or 1976 and 1983.

To control for the differences in demographic characteristics between the cohorts, binary logistic regressions were calculated. The outcome variable describes the existence or non-existence of a vocational degree. All models control for the nationality groups, age, federal state, sex, and year of the survey. Regarding the second research question that asks for the impact of the differences in the endowment of human and social capital, two additional models were calculated, including the general school leaving degree and immigrant-specific assimilation indicators such as Germans in the household or the percentage of non-nationals living in the neighborhood. The group of immigrants and natives is distinguished by nationality. Individuals who only hold a German citizenship are defined as German nationals. The immigrant population is defined by having a foreign nationality or a foreign citizenship besides a German citizenship. The definition of vocational degree includes apprenticeships, full-time vocational schools, and university/university of applied science degrees.

The main findings can be summarized as follows. The results of this article are comparable with previous research that found an ethnic gap in the attainment of vocational degrees, which is more or less pronounced for different nationalities. One of the contributions of this paper is to show the development over immigration cohorts. It was found that the gap between natives and migrants grew for the first generation migrants who migrated to Germany between 1990 and 2001 compared to the group who came between 1960 and 1975. Above all, the large increase in the gap over cohorts between Germans and Turks is alarming. The gap between the group of Central-/Eastern-/Southeastern European countries and natives with respect to the attainment of vocational degrees is smaller compared to the migrants from former recruitment countries. Also, this latter group shows a growing gap in the attainment of vocational degrees compared to the attainment of these degrees by native Germans, although the increase for migrants from former recruitment countries is only half as large as for the Turks.

The gap between non-national migrants and natives is still evident when holding constant the secondary school leaving degrees or social integration indicators, but decreases to a large extent. A low social integration has a negative effect on the attainment of vocational degrees, but the most negative impact is a low level of general secondary school education. Having a low secondary school leaving degree explains a large part of the ethnic gap in the attainment of vocational degrees as previous research also showed. As predicted, the results prove that the negative impact of a school leaving certificate has been increasing over cohorts. Consequently, a great deal of the negative trends can be explained by the increasing gap between the average level of general secondary education between German natives who benefited from the educational expansion and the newer immigration cohorts. However, when holding the level of general secondary school education constant, the negative trend for first generation Turks is still large.

1.4.2 Additional Analyses

The next section provides the results from the analyses I calculated in addition to the analyses provided in the three papers mentioned in the preceding section. In the first additional analysis, I compared the results from paper I and II, which were calculated with microcensus data, with the analysis calculated with the SOEP data, which offered additional information about social origin and language skills. In the second additional analysis, I compared the results gained from using the QCA method in paper II with a regression model.

1.4.2.1 Additional Analysis I: A Comparison of Ethnic Inequality in Vocational Education Between Germany's Federal States Using SOEP Data

Since microcensus data lacks information about social origin and language skills, I calculated a comparable analysis to paper I using SOEP data (survey year 2013, including the DIW-IAB Migrant Sample). Due to number of cases restrictions, it was not possible to analyze participation in vocational education as a dependent variable as I did in paper I. Therefore, the dependent variable used was the achievement of a vocational degree. Only the vocational degrees that were achieved in Germany were considered, which included degrees achieved from participation in apprenticeships, full-time vocational schools, and programmes in the tertiary sector. The analyses included people between 29 and 45 years of age. Students in general secondary school or in vocational/academic programmes were excluded from the sample. People with a migrant background could not be differentiated further by generation or nationality due to number of cases restrictions. Due to these differences in the operationalization, the results are not completely comparable to those from paper I. However, the impact of social origin can be estimated in a better way to evaluate the results gained from the microcensus data. The results shown in Table 1.1 and 1.2 are weighted.

The procedure used for the analysis is very similar to the procedure used in paper I. To investigate differences across federal states, binary logistic regressions were computed separately for each federal state. However, due to number of cases restrictions only three federal states could be compared with each other: North Rhine-Westphalia, Baden-Wuerttemberg, and Bavaria. Sex, age, education, and the sample were held constant for all models. The independent variables were included stepwise in the different models. In Model 1, only the migrant background was included as an independent variable. Model 2 also held the general secondary school degree and language skills constant. Model 3 additionally included the highest education of the parents.

The independent variables are coded as follows:

- Migrant Background (MB) (0/1)

- General secondary school degree (low=no degree or *Hauptschulabschluss*, middle=*Mittlere Reife*, high=*Abitur*)
- Education of the parents (CASMIN)
- Poor language skills (
 - 0=individuals without a migrant background, and individuals with a migrant background and good language skills;
 - 1=individuals with a migrant background and bad language skills)

Comparable to the results of the microcensus data, the descriptive statistics in Table 1.1 show that Bavaria, among all the federal states, has the highest number of people with a lower secondary school leaving certificate or no general secondary school degree, and that Bavaria also among all the federal states has the lowest number of people with *Abitur* among the group of people with a migrant background.

Table 1.2 shows the results of the multivariate analyses. Germany's federal states differ in their degree of ethnic inequality: in all three models, inequality was higher in Baden-Wuerttemberg than in North Rhine-Westphalia or Bavaria. The results of paper I and II found that for first generation migrants, North Rhine-Westphalia had the highest level of ethnic inequality. The differences between the analyses may be explained by the variation in the dependent variable.

Also, individual resources as determinants for attaining a vocational degree vary between federal states. In North Rhine-Westphalia, a general secondary school degree plays a much higher role with respect to the probability of achieving a vocational degree than in the other federal states. Paper I found the same result, which may be explained because the competition for a vocational degree in North Rhine-Westphalia is greater than in other federal states due to the small supply of apprenticeships in North Rhine Westphalia. In contrast, in Bavaria and Baden-Wuerttemberg, poor German language skills have a much larger impact on the probability of achieving a vocational degree than in North Rhine-Westphalia.

As previously described, the results of the multivariate analyses are not comparable to those of paper I. However, the most important result from these analyses is the fact that the overestimation of the degree of ethnic inequality does not seem to be that large due to the omitted variable of social origin in the microcensus data analysis, at least not for Bavaria or Baden-Wuerttemberg. The degree of ethnic inequality for North Rhine-Westphalia was slightly overestimated. Also, North Rhine-Westphalia shows the largest decrease in the degree of ethnic inequality when the education of the parents was held constant.

TABLE 1.1: Means of dependent and independent variables

	North Rhine-Westphalia				Baden-Wuerttemberg				Bavaria			
	With MB		Without MB		With MB		Without MB		With MB		Without MB	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Vocational degree available	0.66	0.48	0.90	0.31	0.63	0.48	0.96	0.20	0.76	0.43	0.93	0.26
Secondary school education:												
Low	0.38	0.48	0.13	0.34	0.25	0.43	0.19	0.39	0.41	0.49	0.29	0.46
Medium	0.23	0.42	0.	0.46	0.22	0.42	0.33	0.47	0.29	0.46	0.33	0.47
High	0.23	0.42	0.54	0.50	0.29	0.46	0.43	0.50	0.14	0.35	0.35	0.48
No answer, other degree	0.16	0.36	0.03	0.18	0.24	0.43	0.05	0.22	0.15	0.36	0.02	0.15
Poor language skills	0.12	0.33	0	0	0.22	0.41	0	0	0.08	0.27	0	0
Education of parents:												
Medium/high school degree&vocational degree	0.08	0.27	0.13	0.34	0.04	0.20	0.14	0.34	0.06	0.23	0.10	0.30
No degree	0.18	0.38	0.01	0.09	0.09	0.28	0.02	0.12	0.22	0.42	0.01	0.10
Low school degree&no vocational degree	0.10	0.30	0.05	0.22	0.18	0.38	0.03	0.16	0.09	0.29	0.05	0.23
Low school degree&vocational degree	0.21	0.41	0.59	0.49	0.18	0.38	0.56	0.50	0.17	0.38	0.64	0.48
Medium/high school degree&no vocational degree	0.02	0.15	0.02	0.13	0.00	0.05	0.02	0.14	0.03	0.16	0.02	0.13
University degree	0.17	0.37	0.19	0.40	0.21	0.41	0.20	0.40	0.24	0.43	0.14	0.34
Other degrees	0.24	0.43	0.01	0.11	0.31	0.46	0.04	0.20	0.19	0.39	0.05	0.21

Source: SOEP 2013; own analysis.

Note: People between 29 and 45 years of age. Without students in general secondary school or in vocational/academic programmes. Results are weighted.

TABLE 1.2: Logistic regression on the attainment of vocational degrees (average marginal effects)

	North Rhine-Westphalia			Baden-Wuerttemberg			Bavaria		
	M1	M2	M3	M1	M2	M3	M1	M2	M3
Migrant Background	-0.275*** (0.00)	-0.104*** (0.00)	-0.038*** (0.00)	-0.360*** (0.00)	-0.200*** (0.00)	-0.176*** (0.00)	-0.146*** (0.00)	-0.069*** (0.00)	-0.064*** (0.00)
Secondary school education (Ref: Medium)									
Low		-0.210*** (0.00)	-0.196*** (0.00)		-0.021*** (0.00)	-0.026*** (0.00)		-0.108*** (0.00)	-0.116*** (0.00)
High		0.103*** (0.00)	0.100*** (0.00)		0.020*** (0.00)	0.006*** (0.00)		-0.038*** (0.00)	-0.045*** (0.00)
No answer, other		-0.247*** (0.00)	-0.258*** (0.00)		-0.214*** (0.00)	-0.237*** (0.00)		-0.095*** (0.00)	-0.093*** (0.00)
Poor language skills		-0.005*** (0.00)	0.014*** (0.00)		-0.275*** (0.00)	-0.365*** (0.00)		-0.610*** (0.01)	-0.627*** (0.00)
Education of parents (Ref.:Medium/high school degree&vocational degree)									
No degree			-0.336*** (0.00)			0.042*** (0.00)			-0.123*** (0.00)
Low school degree&no vocational degree			-0.178*** (0.00)			-0.054*** (0.00)			0.022*** (0.00)
Low school degree&vocational degree			-0.080*** (0.00)			0.051*** (0.00)			-0.039*** (0.00)
Medium/high school degree&no vocational degree			-0.406*** (0.00)			0.131*** (0.00)			-0.279*** (0.00)
University degree			-0.082*** (0.00)			0.062*** (0.00)			-0.018*** (0.00)
Other degrees			-0.108*** (0.00)			0.076*** (0.00)			0.016*** (0.00)
R-squared	0.075	0.214	0.264	0.215	0.346	0.373	0.057	0.138	0.171
N	735	735	735	474	474	474	591	591	591

Source: SOEP 2013; own analysis.

Note: People between 29 and 45 years of age. Without students in general secondary school or in vocational/academic programmes. Results are weighted. Sex, age, sample held constant.

***: $p \leq 0.001$; **: $p \leq 0.01$; *: $p \leq 0.05$; standard error in brackets

1.4.2.2 Additional Analysis II: Comparison of Results From Two Methods: QCA vs. the Linear Regression Model

In this section I compare the results obtained with the QCA method with a regression analysis of the same data as recommended by Ragin et al. (2003). These analyses are presented for comparative purposes only to assess the degree to which the QCA results can be reproduced with conventional statistical methods.

Table 1.3 shows the results of a regression analysis that I conducted in two steps (very similar to the procedure used in paper II). The sample included people aged 15–24 who were not participating in any general secondary school programme. In the first step, I calculated a logistic regression. The dependent variable is binary: to participate in vocational education or not (apprenticeship, full-time vocational school). I controlled for age, sex, secondary school certificate, and the year of the survey. The independent variable of interest is the effect of having a migrant background and living in Germany as a first generation migrant. This analysis was carried out separately for every federal state. The average marginal effects of having a migrant background is used as information for the level of ethnic inequality with respect to participation in vocational education—between federal states. So far, the procedure is exactly the same as that used in paper II.

In the second step, instead of a QCA analysis, I calculated a linear regression. The dependent variable was the level of ethnic inequality in participation in vocational education. The independent variables are the number of apprenticeships, the number of full-time vocational schools, and the presence of a transition system (same context data as used in paper II). The cases in the analyses are the 10 federal states.

The results in Table 1.3 show that the effects are comparable to those obtained with QCA, although the number of cases is too small to have confidence in the statistical results: the lower the number of apprenticeships, the higher the number of full-time vocational schools, and the larger the size of a transition system, the higher is the degree of ethnic inequality. The key difference in the results from QCA has been discussed previously: the QCA showed how the independent variables combined, while the results of the regression showed net additive effects.

1.5 Conclusion and Future Prospects

The increase in global immigration raises the need to study integration processes. Usually, it is important to the society of the receiving country to enable immigrants to achieve an education, participate in the labour market, also in higher occupations, make a living from an income, and be included in cultural and social life. Education is one of the most important prerequisites for any further steps. Therefore, a crucial question in social re-

TABLE 1.3: Linear regression on level of ethnic inequality in participation in non-tertiary vocational education

	Model 1	Model 2	Model 3
Number of apprenticeships	-0.687** (0.14)	-0.512 (0.23)	-0.512 (0.25)
Number of full-time vocational schools		0.306 (0.31)	0.324 (0.34)
Size of transition System			0.023 (0.11)
Constant	73.127*** (11.97)	49.682 (26.53)	48.509 (29.14)
R-squared	0.741	0.773	0.775
N	10	10	10

Source: Microcensus 2008–2010; own analysis.

***: $p \leq 0.001$; **: $p \leq 0.01$; *: $p \leq 0.05$; standard error in brackets

search has focused on the inequality of participation in, and achievement of, education. Within this area, research on the transition to vocational education is relatively scarce at the moment. From the current literature, we know that migrants participate less often in vocational education, which results in a higher rate of migrants within the group of people who do not achieve a vocational degree. To date, research in this area has found that ethnic inequality in vocational education is correlated with many different factors: for example a lower social background, lower general secondary school leaving certificates, a lack of social networks, and poor language skills.

However, research also has shown that even after holding these characteristics constant, a negative effect of having a migrant background persists. Hence, the question of why migrants less often achieve vocational education has not been fully answered. The study of the impact of contextual factors on the degree of ethnic inequality can help to provide a better understanding of the lingering effect of having a migrant background. Migrants often are clustered in areas with negative context characteristics, which seem to worsen ethnic disadvantages. Characteristics that matter may be available institutions like schools and programmes, but also the economic situation or characteristics of the people living in the same area. These characteristics can differ between countries or between sub-national units within a country. In addition, they can differ between historical time contexts. Do these differences matter?

The present study had tackled some of these questions through empirical research. It has focused on researching the impact of the main characteristics of the vocational education system on the degree of ethnic inequality in participation in vocational education, and on analyzing different historical time contexts. So, does context play a role in the degree of ethnic inequality in vocational education? This present study answers yes, since the degree of ethnic inequality varies between federal states within Germany and between historical periods. But context affects migrants of the first generation much more than

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migrants of the second generation.

In the first part of the present study, I compared the degree of ethnic inequality for first generation migrants with the presence or absence of three context characteristics in each federal state: the number of apprenticeships, the presence of full-time vocational schools, and the presence of a transition system. The results showed that ethnic inequality was higher in federal states with a low number of apprenticeships and a high number of full-time vocational schools or a large transition system. In addition, the results showed that ethnic inequality was lower in federal states with a high number of apprenticeships and a low number of full-time vocational schools. In summary, the results were comparable to recent research that found that people with a migrant background have a lower chance of participating in vocational education. The contribution of this present study is to show that this condition varies between federal states within Germany and depends on the organization of the vocational education system.

One of the tasks of the programmes in the transition system is to increase the integration of migrants into vocational education. To determine whether these programmes are successful in this task, requires an evaluation of their impact. The results of this present study indicate that these transition system programmes may not have achieved their aim to increase the integration of migrants into vocational education. This result was obtained by using different methodological approaches. First, I conducted a descriptive comparison between federal states regarding the degree of ethnic inequality and the distribution of vocational education programmes. Second, I used a Qualitative Comparative Analysis (QCA). Unfortunately, these approaches cannot determine causal relationships, because it is not clear what comes first, the degree of ethnic inequality or the number of programmes in the transition system. However, causal effects have to be investigated first before providing advice to policy makers about how to organize programmes to decrease the degree of ethnic inequality. An analysis based on a panel design could determine the impact of an increase of programmes in the transition system in combination with a decline of apprenticeships on the degree of ethnic inequality. In future studies, NEPS data may help to increase the knowledge on this topic.

The present study has focused on the three main characteristics of the vocational education system in Germany. However, several other conditions also could be playing a role in creating the degree of ethnic inequality. For example, analyses of smaller spatial units would be necessary. Furthermore, the impact of the higher education sector also could be analyzed with respect to the degree of ethnic inequality in the different federal states. Research could profit from an evaluation of special programmes that aim to increase the integration of persons with migrant backgrounds into the vocational education and training system. An example of an attempt in this regard is the fostering of apprenticeships in companies with owners who have a migrant background. Have these attempts created the

expected results? Also, a large number of programmes exist to increase the integration of school-leavers who usually have problems in the transition to vocational education in general, for example, shortened apprenticeships with a duration of two years instead of three. Do these programmes help to decrease the degree of ethnic inequality? The Bundesinstitut für Berufsbildung (2015) provides an overview of other interesting programmes that might be worth evaluating. Further research also could examine the role of the prevalent economic sector on the degree of ethnic inequality. Thereby, it can be hypothesized that the economic sector has an impact on the organization of the vocational education system.

Although the differentiation of migrants into generations is crucial, recent research has shown that the additional differentiation of migrants into ethnic groups provides more precise results. Due to data restrictions, this approach could not be taken in the present study for comparisons between the federal states, but it is recommended for future research. Of special interest is the question about the differences in the impact of the characteristics of the vocational education system on the chances of newer migration flows compared to older migration flows. It could also be assumed that characteristics of the educational system of the country of origin have an impact on how a migrant copes with the educational system in Germany.

In the perspective of spatial comparisons, the present study focused on the analysis of sub-national units within Germany. However, the comparison of the impact of the organization of the vocational education system of different countries on the degree of ethnic inequality in participation in vocational education is still to be analyzed in future research. To add to the results of the present study regarding the impact of the transition system, future research could compare the degree of ethnic inequality in Germany with ethnic inequality in another country. In Switzerland, for example, the transition system has a rather good reputation. Does the transition system in Switzerland work better regarding the integration of migrants? What is different and why? This comparison could provide an insight into processes that have an impact on the success of such programmes. Regarding the impact of full-time vocational schools, a comparison with France could provide further interesting results. The vocational education system of France is more focused on full-time vocational schools. How does the integration of migrants into the vocational education system work in France compared to Germany, given that comparable ethnic groups are analyzed? In Germany, a wide range of such full-time vocational schools exist. Do they all increase ethnic inequality or are there good examples of how a vocational school might be suited to decreasing ethnic disadvantages? An analysis of a best practice case will be of interest, especially for policy makers.

The second part of the present study focused on the historical time context. From recent research, we already know that people with a migrant background have lower chances of achieving vocational education compared to natives. The findings of the present study add

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to this knowledge by showing how the level of ethnic inequality has evolved over changing immigration cohorts of different nationality groups. I showed that the gap between natives and migrants gets larger for the first generation migrants who came to Germany between 1990 and 2001, compared to the group who immigrated between 1960 and 1975. Above all, the large increase in the gap between Germans and Turks over immigration cohorts is alarming. Future research should try to find explanations for this development. The results for newer migration flows are rather positive: the gap between the group of Central-/Eastern-/Southeastern-European countries and natives with respect to the attainment of vocational degrees is smaller compared to migrants from former recruitment countries. The gap between the group of Central-/Eastern-/Southeastern-European countries and native Germans with respect to the attainment of vocational degrees has increased over immigration cohorts as well, but can be explained mainly by the level of general secondary school education. Further research could examine the development of these trends with respect to second generation migrants who are born in Germany. Above all, these analyses are crucial for newer migration flows to provide a better understanding of what to anticipate in the future. Educational expansion seems to play an important role in the explanation of the developments over cohorts. The present study found that the educational achievement of native Germans increased much more over cohorts than the educational achievement of the incoming immigrants over cohorts. This growing gap and the result that the role of secondary school leaving education increases over cohorts help to explain the increase in the degree of ethnic inequality in the attainment of vocational degrees. However, in the case of the group with a Turkish nationality, other aspects also seem to play a role.

The exact impact of educational expansion or developments of the vocational education system, such as variations in the supply of apprenticeships or full-time vocational schools, on changing cohorts was only investigated in a descriptive way and remains to be analyzed in depth in further research. Demographical development could change the proportion of supply and demand for apprenticeships, leaving, above all, small and medium size companies with a need for new apprentices. The impact of this development also could be evaluated in the future. Last, in the present study, I focused on analyzing the impact of the characteristics of Germany—at the level of the country—during different historical time contexts. However, sub-national units within a country also could be compared regarding their development.

The analysis of the interaction between individual characteristics and context was an important concern of the present study. In addition to the characteristic of having a migrant background, the impact of general secondary education and social integration indicators were examined. Results showed that a low social integration has a negative effect on the attainment of vocational degrees, although the most negative impact is generated by a low level of general secondary school education. Having a low secondary school leaving

degree explains not only a large part of the ethnic gap in participation in vocational education but also the lack of attainment of vocational degrees, as previous research also has found. The findings of the present study add to this knowledge by showing that the negative impact of a school leaving certificate has increased over cohorts and varies between federal states. Much of the variation in the degree of ethnic inequality between federal states or between immigration cohorts can be explained by the level of a general secondary school degree. The policy implication of this result is obvious: fostering the achievement of higher general secondary school education among migrants is crucial to minimize the problems confronting them in their transition to vocational education.

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2 Paper I: Migrants Participation in Vocational Education: A Comparison of Germany's Federal States (Laender)

From previous studies, we know that migrants participate less often than natives in tertiary and vocational education. The present study first investigates whether this inequality between natives' and migrants' participation in tertiary and vocational education varies across Germany's federal states. Second, the impact of general secondary school education on the probability to participate in tertiary and vocational education is compared between federal states. The results show that inequality is quite heterogeneous across federal states. A large part of this heterogeneity can be explained by the differing levels of general secondary school education that the inhabitants of the federal states have reached on average. However, when considering these differences in multivariate analyses inequality is still larger in Berlin and other eastern federal states and smaller in Hamburg or Schleswig-Holstein. This finding leads to the conclusion that the differences in the tertiary and vocational education systems between the federal states have an impact on young people in transition to the tertiary and vocational education systems.

2.1 Introduction

From primary school onwards, children with a migrant background who live in Germany have, on average, weaker educational outcomes than their native German peers. The consequence of this disparity are increased difficulties in the transition to the tertiary or vocational education sector.¹ Compared to the transitions within the general secondary school sector, the transitions to the tertiary or vocational education sector that provides a vocational degree have been explored to a much lesser degree. Not having a vocational degree has consequences. Since Germany's educational system is highly standardized, a vocational degree, in addition to a general secondary school degree, is crucial for a successful entry into the labour market. Therefore, research about this stage of the educational process is needed.

¹For a description of the German vocational and tertiary education system see section 2.

Several studies have shown that the inequality between migrants and natives in the participation in tertiary or vocational education can be explained, in part, by their lower level of general secondary education achieved or the lack of a social network (Hunkler, 2010; Helland & Støren, 2006). Migration-specific characteristics, such as generation (Seibert, 2005), ethnic origin (Seeber, 2011), and language skills (Diehl et al., 2009) also play a crucial role. However, even after holding these differences constant the negative effect of having a migrant background on the probability to participate in tertiary or vocational education persist.

So far, little attention has been paid to the fact that the chances for a successful transition into tertiary or vocational education may depend on context factors. But the analysis of the impact of context factors may help to explain the remaining effect of having a migrant background. An important context factor is the way the educational system is organized. Educational policy varies widely within Germany, which influences the educational structure in every federal state, and thus the opportunity structures for individuals. This variation does not only affect the distribution of general secondary school certificates. Also every federal state has its own special composition of university-, apprenticeship-, full-time vocational school- and transition system sectors within the tertiary and vocational education sector. These differences may explain part of the ethnic penalties. Usually, inequality is analyzed for Germany as a whole (Beicht & Granato, 2011) or by comparison with other countries (Allmendinger, 1989; Pfeffer, 2008). However, we do not know whether the different educational policies produce differences in the level of inequality between natives and migrants between the different federal states within Germany. We also do not know how the determinants of a successful transition process like the general school education work in different federal states.

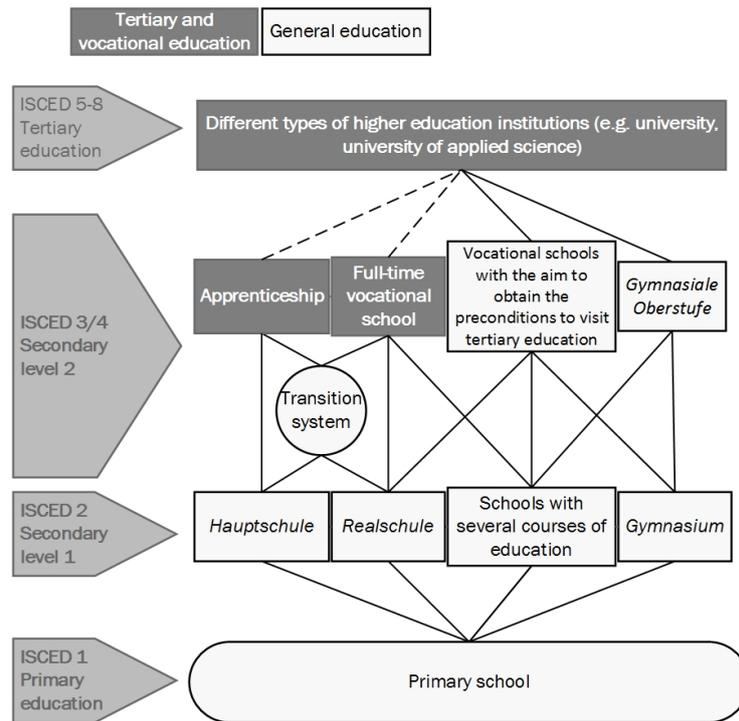
With respect to these arguments, I am interested in the following questions:

1. Is the level of inequality between natives and migrants in the participation in tertiary and vocational education different in the various federal states?
2. Does the impact of general school education on a successful transition into tertiary and vocational education differ between the federal states?

The comparison between the federal states has a strongly descriptive character but also has the goal to raise hypotheses about which institutional contexts might impact the level of inequality between natives and migrants with respect to their participation in tertiary and vocational education.

The present article is structured as follows. Section 2 describes the German educational system. Section 3 provides background information on theoretical mechanisms and empirical findings concerning transition processes to tertiary and vocational education. This

FIGURE 2.1: Structure of the educational system in Germany



Source: Own representation based on UNESCO Institute for Statistics (2012).

section also provides an overview of the important differences between Germany's federal states regarding their educational systems. Section 4 describes the data and methods used for the analysis. Section 5 turns to the analysis of the two research questions. Section 6 provides a conclusion and discusses the findings.

2.2 The German Tertiary and Vocational Education System

After general secondary school, two paths to obtaining a full qualifying vocational degree are possible: first, the tertiary sector (ISCED Levels 5–8), which comprises the different types of higher educational institutions; and second, the vocational educational system at an upper-secondary and post-secondary non-tertiary level (ISCED Levels 3 and 4) (UNESCO Institute for Statistics, 2012). Figure 2.1 provides a simplified overview of the German educational system.

The basic structure of the German vocational education system, which applies, to a greater or less extent, in every federal state, consists of two main sectors:

- Apprenticeships, which combine theoretical education at a vocational school and practical in-company training
- Full-time vocational schools

2.3 Ethnic Inequality in Tertiary and Vocational Education: Mechanisms and Empirical Findings

While regulations for apprenticeships are organized at the federal level, the federal states are responsible for vocational schools (Secretary General of the Standing Conference of the Ministers of Education and Cultural Affairs, 2013).

As a reaction to a decline of apprenticeship positions over the last years, a so-called “transition system” has evolved. This system consists of different publicly financed preparatory or substitute training measures for graduates of general secondary schools who did not manage to enter the vocational educational system. It consists of an educational offer with a duration of one year and with the aim to promote the qualifications needed in the vocational educational system or to make up for a general education degree. Furthermore, this transition system is an alternative to fulfil compulsory schooling that ends when a student reaches legal age (Vossenkuhl, 2010). However, programmes in the transition system do not provide their graduates with a full qualifying vocational degree. Since the year 2000, about forty percent of the new entrants to the vocational educational system enter the transition system, almost as many as the young people entering apprenticeships. Although these programmes have been created for disadvantaged adolescents in general, young people who have a foreign nationality are over-represented in these programmes (Baethge, 2008).

2.3 Ethnic Inequality in Tertiary and Vocational Education: Mechanisms and Empirical Findings

The current literature concludes that the level of the general secondary school leaving certificate is the most important determinant for a successful transition into the tertiary and vocational educational system. The higher the level of general school education the easier is a successful transition into the vocational education system. The minimum requirement for full-time vocational schools is a *Hauptschule* leaving certificate; some training programmes require a *Mittlere Reife* leaving certificate; and an *Abitur* is needed for tertiary tracks.² For apprenticeships there are no formal requirements, however, employers tend to prefer graduates with higher general school education. According to signaling theory, this preference can be explained by the fact that a higher general secondary school education is a “signal” for higher productivity for the employer (Spence, 1974; Stiglitz, 1975). Therefore, higher general school leaving certificates increase the possibilities to attain vocational education and therefore increases the chances to get access to the vocational and tertiary educational system.

²The German secondary school system is highly stratified. The bottom tier, *Hauptschule*, which ends at the 9th grade, provides basic skills; the middle tier, *Realschule*, which ends at the 10th grade, provides intermediate skills (*Mittlere Reife*), and the top tier, *Gymnasium*, which ends at the 12th grade in most federal states, leads to *Abitur*, the higher-education entry qualification (Cockrill & Scott, 1997).

Again, the achievement of general secondary education is dependent on social origin (the education or social status of the parents) (Erikson & Goldthorpe, 1992). Since a strong correlation exists between having a migrant background and social origin—especially for the group of former “guestworkers” and their descendants in Germany (Kalter et al., 2007)—migrants in Germany achieve, on average, lower general secondary school leaving certificates than their native German peers. This gap in the achievement of general secondary education is one of the most important contributing factors for the lower chances of migrants compared to natives in securing a place in the tertiary and vocational educational system (Beicht & Granato, 2011; Hunkler, 2010). Thus, the effect of social origin on the transition to vocational education is indirect. Social origin influences above all the level of secondary school education on the level of general secondary education. In contrast, the effect of social origin on the transition to tertiary and vocational education is rather small (Beicht & Granato, 2011; Laganà et al., 2014; Urban, 2012).

In addition to general secondary school leaving certificates, language skills (Diehl et al., 2009) and social network (Roth, 2014) have been found to play a crucial role in the transition process into the vocational and tertiary educational system. Finally, discrimination has been found to be a relevant explanation for the inequality between natives and migrants with respect to their transition to apprenticeships (Arrow, 1973; Becker, 1971).

In summary, the causes of educational inequality have been studied mainly in terms of individual characteristics that foster or hinder educational success. However, in recent years, researchers increasingly have paid attention to the fact that the probability to participate in the tertiary and vocational education system does not only depend on the characteristics of individuals (De Graaf & van Zenderen, 2013; Eberhard, 2012; Hilmert, 2010; Ulrich, 2013).

Aybek (2008), drawing on the theories of Coleman (1990) has pointed out that access to the tertiary and vocational educational system is, in addition to individual resources, also determined by developments at the macro-level because these developments regulate the opportunity structures that young people encounter in their search for a position in the tertiary and vocational educational system at a specific point in time. These opportunity structures have an impact on the choices and decisions of individuals (Heinz, 2009; Raffe, 2008). Thus, the transition process in itself is dependent on the specific structural, cultural, and institutional contexts of the different states (Walther, 2006).

In line with these theoretical insights, a number of studies have shown that national educational systems can influence educational outcomes (Alba et al., 2011; Alegre & Benito, 2014; Dronkers et al., 2012). However, differences in the sub-national units of a country also can affect educational inequality, as Stadelmann-Steffen (2011) has shown for Switzerland, Freitag and Schlicht (2009) have shown for Germany, and Ainsworth and Roscigno

2.3 Ethnic Inequality in Tertiary and Vocational Education: Mechanisms and Empirical Findings

TABLE 2.1: Distribution of participants in programmes in the tertiary and vocational education sector

Federal state	Apprenticeships ¹	Tertiary sector ²	Full-time vocational schools ³	Transition system ⁴
Bavaria (BV)	91.1	30.6	26.6	20.5
Rhineland-Palatinate (RP)	85.4	26.4	31.5	34.0
Schleswig- Holstein (SH)	88.2	17.5	25.2	41.4
Baden-Wuerttemberg (BW)	86.8	27.2	28.0	41.7
North Rhine-Westphalia (NRW)	80.7	27.0	29.5	32.8
Lower Saxony (LS)	81.7	18.4	27.4	40.4
Hamburg (HH)	88.8	37.6	23.7	24.8
Hesse (HE)	81.4	32.8	24.6	30.1
Berlin (BE)	73.2	40.2	36.1	22.3
Germany's Eastern States (GES)	75.4	31.1	35.4	19.1

Source: Bundesinstitut für Berufsbildung (2010, 2011), Statistisches Bundesamt (2013a), average of the data of 2008–2010.

¹ Relation between supply and demand. This relation shows how many apprenticeship positions can be offered to 100 applicants. Thus, the higher the number, the better the supply of apprenticeship positions.

² Percentage of school leavers starting in the tertiary sector compared to all possible transitions (tertiary sector, apprenticeships, full-time vocational schools, transition system).

³ Percentage of school leavers starting in full-time vocational schools compared to all possible transitions in the vocational education sector (apprenticeships, full-time vocational schools, transition system).

⁴ Percentage of school leavers starting in the transition system compared to all possible transitions in the vocational education sector (apprenticeships, full-time vocational schools, transition system).

(2005) have shown for the US.

Why should the chances to gain access to the tertiary and vocational education system differ between Germany's federal states? Under German federalism, each federal state enjoys educational autonomy. As a result, educational policy varies widely within Germany, which influences the educational structure in every federal state, and thus the opportunity structures for individuals (Kramer, 1998). This variation in the educational structure has two important impacts. First, federal states vary in their distribution of the different levels of general secondary school certificates. Second, every federal state has a special composition of its main sectors within the vocational and tertiary educational system: the tertiary sector, apprenticeships, the transition system, and full-time vocational schools (compare Table 2.1).

Bavaria, for example, is characterized by a large supply of apprenticeships with a rather small full-time vocational school sector and a small supply of programmes in the transition system. In contrast, Berlin and other eastern federal states offer a small supply of apprenticeships, a rather large tertiary sector, a large supply of full-time vocational schools, and a small supply of programmes in the transition system. Schleswig-Holstein stands out for its large supply of apprenticeships, a comparably small tertiary sector, and a large

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supply of transition system programmes. Hamburg is characterized by a large supply of apprenticeships and a large tertiary sector.

The federal states also differ in other relevant areas that have an impact on the composition of the tertiary and vocational educational system, for example, the unemployment rate, the prevalent economic sector (Bundesagentur für Arbeit, 2014), and the amount of funding for vocational education (Anger, Esselmann, Konegen-Grenier, & Plünnecke, 2013). However, does the differing composition of the tertiary and vocational educational system between the federal states affect the chances of natives and migrants of gaining access to these systems in the same way? The following arguments lead to the assumption that this suggestion might be the case.

According to “comparative integration context theory” (Crul & Schneider, 2010), the participation of immigrants in European cities is strongly dependent on the integration context, which includes institutional arrangements in education, the labour market, housing, religion, and legislation that differs between countries in Europe or even from city to city within one country. Crul et al. (2012) showed that different educational outcomes are a result of the interaction between varying school system characteristics and attributes typical for Turkish parents with low levels of education. Regarding the current knowledge about the impact of context factors, I assume that the following three characteristics may play a role in producing the gap between natives and migrants with respect to their participation in tertiary and vocational education: the number of apprenticeships available, the number of full-time vocational schools, and the presence of a transition system.

First, I expect that a small supply of apprenticeships could increase the gap. Because of “statistical discrimination” natives may be chosen over migrants for a job. Arrow (1973) argues that a “statistical discrimination” occurs with information deficits and productivity “beliefs” of special groups. Employers want to employ individuals with a high productivity. Because the employers do not have full information about applicants, they trust on experiences about the distribution of productivity among different groups. This is more a rational, pragmatic decision in order to save time and costs than an aversion against a special group. Different signals give employers information about probable productivity. Signals can be the secondary school leaving certificate or the membership to an ethnic group. If an applicant does not give enough information or signals to the employer, the employer will assume the average productivity of a fitting group for this special applicant. In this context one can think of many signals that ethnic groups might send that will lower the “beliefs” of their productivity. One example might be language skills or to have an accent. Another example might be the way migrants apply for position in the vocational education system. As they stem from another culture they may not know every rule how to behave in an application situation. This may “signal” a lower productivity. Since natives may be chosen over migrants for a job due to these processes, migrants will

2.3 Ethnic Inequality in Tertiary and Vocational Education: Mechanisms and Empirical Findings

suffer even more than natives when the supply of apprenticeships decreases. Therefore, the inequality between natives and migrants could be larger in federal states with a small supply of apprenticeships—for example, Berlin or other eastern federal states—and this inequality may be smaller in Bavaria, Schleswig-Holstein or Hamburg, which have a larger number of apprenticeships.

Second, regarding the impact of the supply of full-time vocational schools, Seibert et al. (2009) have found that men with a Turkish and an ex-Yugoslavian nationality living in Germany have a lower chance of gaining entry into full-time vocational schools, even when holding general secondary education constant. Since migrants seem to struggle more to attend a full-time vocational school than natives, in federal states with a high percentage of full-time vocational schools, like Berlin or other eastern states, inequality between natives and migrants may be larger.

Third, in terms of the presence of a transition system, Eberhard and Ulrich (2011) have indicated that a high number of programmes in the transition system might also be a possible determinant for the gap between natives and migrants. Crul et al. (2012) have hinted that while “Brueckenangebot” (a programme in the transition system) in Switzerland has a good reputation among the employing companies and works well to integrate students from lower secondary school tracks, comparable programmes in Germany serve as kind of “parking spot”. Furthermore, migrants are overrepresented in these programmes. They are more often accused of not having the requirements to participate in a tertiary or vocational education programme. Therefore, in federal states with a high percentage of programmes in the transition system, like in Lower Saxony, the inequality between natives and migrants may be larger.

The fact that educational policy varies between federal states and the assumption that context impacts migrants and natives in a different way, leads to the following hypothesis:

H1: The level of inequality between natives and migrants with respect to their participation in tertiary and vocational education varies between the federal states.

As I described earlier in this chapter, the general school leaving certificate has the most important impact on the probability to participate in tertiary and vocational education. However, since the composition of the tertiary and vocational educational system in every federal state varies, the requirements for an individual regarding their level of general secondary education are different. The level of general secondary education will be more important in federal states with a small supply of apprenticeships, like Berlin or other eastern federal states, because competition for a seat in these programmes will be greater. The impact of general secondary school education also will be greater when the vocational system in the federal state has a large tertiary sector or a full-time vo-

ational school sector—as in Hamburg or Berlin—in which the requirements for general secondary education are higher than for apprenticeships. Therefore I assume the following:

H2: The impact of the general secondary school degree on the probability to participate in tertiary and vocational education varies between the federal states.

The following section provides an overview of the analytical strategy used to analyze these hypotheses.

2.4 Data & Methods

The comparison of the degree of inequality between migrants and natives with respect to their participation in tertiary and vocational education across German federal states is based on analyses at the micro-level using German microcensus data. The German microcensus is the largest official representative survey of the German population and the labour market in which one percent of all households in Germany is surveyed annually. The size of the sample and the fact that the provision of information is compulsory³ are the two main advantages of the microcensus compared to other surveys, which enables a comparison of the participation of migrants in the tertiary and vocational educational system across the federal states.⁴ In spite of the large sample size that the microcensus data offers, the number of cases of migrants is small when differentiating by federal state. Therefore, pooled cross-sectional data from the years 2008 to 2010 were used to increase the size of the sample.⁵

Unfortunately, even though the microcensus data is the only data base that makes possible an analysis of the differences between the federal states with respect to the participation gap between natives and migrants in the tertiary and vocational educational system across federal states, aggregated data on the federal state level with respect to a supply of apprenticeships, the number of full-time vocational school or the presence of a transition system is not available. Therefore, the size of the gap between natives and migrants with respect to their participation in the tertiary and vocational educational system that can be gained from analyses of the microcensus data will be compared in a descriptive way with the aggregated data from federal statistical offices regarding the supply of apprenticeships, the presence of full-time vocational schools and the number of programmes in the transition system in every federal state.

³The rate of household non-response is only 2.5–3 percent.

⁴For more information on these data, see <http://www.gesis.org/en/services/data-analysis/official-microdata/microcensus/microcensus-grundfile/>

⁵The microcensus is designed as a rotating panel sample for which the households of a sample district are surveyed in four consecutive years. In order to avoid an overlapping of individuals in the pooled data set, in the years 2009 and 2010 only new graduates from secondary school were added.

To investigate the differences in the degree of ethnic inequality between natives and migrants across federal states, binary logistic regressions were computed separately for each federal state. Since the number of cases for the federal states of Saarland and Bremen was quite low, these states were excluded from the analyses. Furthermore, generally, not many migrants are living in the eastern federal states of Thuringia, Saxony, Saxony Anhalt, Mecklenburg-Western Pomerania, and Brandenburg, which is the reason that these states cannot be examined individually. However, due to the great similarity of the economic situation and educational policy in these eastern federal states, they can be examined together as one case.

The dependent variable is participation/non-participation in the tertiary and vocational educational system. The definition of a tertiary and vocational system includes apprenticeships, full-time vocational schools, and programmes in the tertiary sector. All the models hold differences in demographic characteristics (sex, age) between natives and migrants and between federal states constant.

The analyses include individuals between the age of 15 to 24 with and without a migrant background. Students attending general secondary schools, people in the military or community service, and those who already hold a vocational degree were excluded from the analyses. Thus, only persons who have a chance to secure a place in the tertiary and vocational educational system were analyzed. A total number of 26,523 individuals were included in the analyses (see Table 2.2 for an overview of the number of cases).

TABLE 2.2: Number of cases

Federal State	Without migrant background	1st generation migrants	2nd generation migrants	Total
Schleswig-Holstein	805	41	96	942
Hamburg	400	43	100	543
Lower Saxony	2,067	136	381	2,584
North Rhine-Westphalia	4,403	341	1,380	6,124
Hesse	1,400	149	505	2,054
Rhineland Palatinate	1,109	87	209	1,405
Baden-Wuerttemberg	2,481	210	745	3,436
Bavaria	3,222	224	667	4,113
Berlin	790	70	200	1,060
Germany's eastern states	4,115	75	72	4,262
Total	20,792	1,376	4,355	26,523

Source: Microcensus 2008–2010; own analysis.

Note: People between 15 and 24 years of age. People at general secondary school, in military service/community service and people with vocational degree excluded.

The definition of migrants used in this paper includes all people with a “migrant background”. According to the official German Federal Statistical Office definition people with a migrant background are:

“All persons who have immigrated into the territory of today's Federal Republic of Germany after 1949, all foreigners born in Germany and all persons born in Germany who have at least one parent who immigrated to the country or was born as a foreigner in Germany” (Statistisches Bundesamt, 2013b).

The population of people with a migrant background is further differentiated by generation. The first group are those who were born in Germany or those who migrated to Germany before the age of six (both will be called second generation throughout the article). The second group are those who migrated to Germany after age 6 and before age 18 (first generation). Further subdivisions regarding former or current nationalities are not possible due to the number of cases restrictions. General secondary school education is operationalized in three categories: low (*Hauptschulabschluss* or no general secondary school leaving certificate available), medium (*Mittlere Reife*), and high (*Abitur*).

2.5 Results

The next section describes differences between the federal states with respect to the distribution of general secondary school education and the participation in tertiary and vocational education between natives and migrants. Section 2.5.2 then describes the degree to which inequality varies between federal states after holding constant demographic characteristics and the general secondary school degree.

2.5.1 Descriptive Results

Since the general secondary school leaving certificate has the largest impact on a successful transition into the tertiary and vocational education system, in this section, I describe the differences between federal states with respect to the distribution of general secondary school education between natives and migrants. In all federal states, natives have on average a higher general secondary school education than migrants (Table 2.3).

Furthermore, differences exist between the federal states. For example, the federal states Schleswig-Holstein, Rhineland Palatinate, Baden-Wuerttemberg and above all Bavaria stand out in the percentage of people who only have attained a low general secondary school leaving certificate. However, Baden-Wuerttemberg and Bavaria not only stand out with respect to their comparably high number of people with only a low general secondary education, but also the gap between natives and migrants is the largest here. For example, in Bavaria, 36 percent of the observed population has a low general secondary school leaving certificate, which amounts to 66 percent for first generation migrants. Thus, the number of low educated migrants living in Bavaria or Baden-Wuerttemberg is extraordinary high. In contrast, especially Hamburg and Berlin stand out for their high number of people who have attained a high general secondary school education.

TABLE 2.3: Distribution of general secondary school education (row percentages)

Federal state	Variable	Without migrant background	1st generation migrants	2nd generation migrants
Schleswig-Holstein	Low	38.2	56.1	43.2
	Medium	27.1	26.8	27.4
	High	34.8	17.1	29.5
Hamburg	Low	26.5	44.2	38.5
	Medium	19.3	27.9	27.1
	High	54.2	27.9	34.4
Lower Saxony	Low	30.2	51.1	37.5
	Medium	34.4	31.9	39.8
	High	35.3	17.0	22.7
North Rhine-Westphalia	Low	32.1	43.1	44.2
	Medium	23.9	27.6	23.2
	High	43.9	29.3	32.6
Hesse	Low	31.1	53.7	43.1
	Medium	23.9	23.5	22.1
	High	45.1	22.8	34.8
Rhineland Palatinate	Low	36.3	54.0	46.4
	Medium	25.4	14.9	28.7
	High	38.3	31.0	24.9
Baden-Wuerttemberg	Low	27.8	55.5	48.4
	Medium	30.2	23.0	24.5
	High	42.0	21.5	27.1
Bavaria	Low	35.7	66.4	58.0
	Medium	27.7	15.7	18.5
	High	36.6	17.9	23.5
Berlin	Low	22.3	47.1	37.5
	Medium	24.6	17.1	23.0
	High	53.2	35.7	39.5
Germany's eastern states	Low	24.2	42.7	33.3
	Medium	38.0	37.3	31.9
	High	37.8	20.0	34.7

Source: Microcensus 2008–2010; own analysis.

Note: People between 15 and 24 years of age. People at general secondary school, in military service/community service and people with vocational degree excluded.

TABLE 2.4: Participation in academic and vocational education (row percentages)

Federal state	Without migrant background	1st generation migrants	2nd generation migrants
Schleswig-Holstein	58.4	47.6	41.7
Hamburg	61.0	44.2	42.0
Lower Saxony	61.1	39.7	51.7
North Rhine-Westphalia	59.9	41.4	46.2
Hesse	65.4	45.6	52.3
Rhineland Palatinate	62.9	44.8	48.3
Baden-Wuerttemberg	67.9	45.7	52.8
Bavaria	72.8	44.6	54.7
Berlin	62.8	34.3	46.0
Germany's eastern states	66.1	40.0	59.7

Source: Microcensus 2008-2010; own analysis.

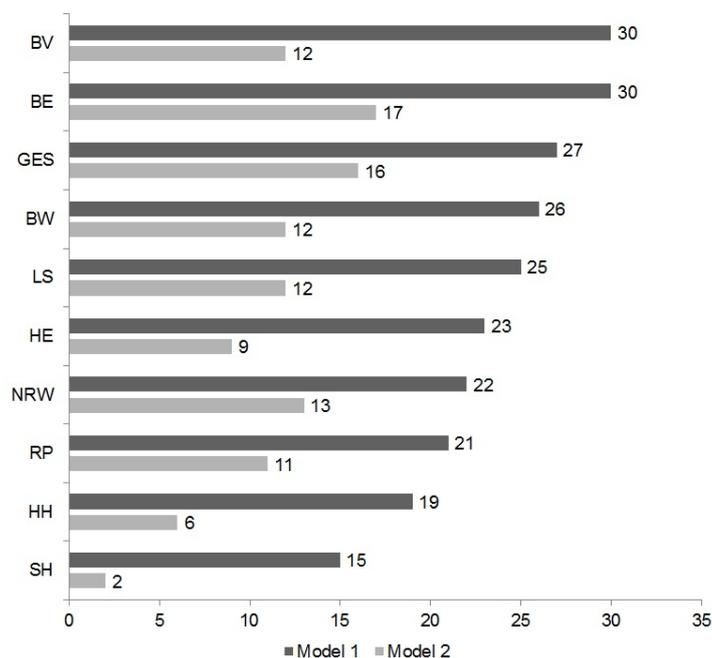
Note: People between 15 and 24 years of age. People at general secondary school, in military service/community service and people with vocational degree excluded.

Table 2.4 provides an overview of the percentage of people participating in the tertiary and vocational educational system. Participation is comparably high for people without a migrant background in Bavaria and Baden-Wuerttemberg, and rather low for this group in Schleswig-Holstein and North Rhine-Westphalia. Interestingly, first generation migrants show the comparably highest participation rate in tertiary and vocational education in Schleswig-Holstein among the federal states. In contrast, the participation of first generation migrants in Berlin and other eastern federal states is rather low. It is interesting that in Bavaria and Baden-Wuerttemberg, participation is comparably high, whereas, at the same time, the average level of secondary school education is rather low. This situation may be due to the rather large supply of apprenticeships in these federal states so that the competition amongst applicants is rather relaxed. In contrast, the rather high level of general secondary school education in Berlin and North Rhine-Westphalia does not translate into a high participation rate in tertiary and vocational education. In these two cases, the small supply of apprenticeships leads to greater competition amongst the applicants. In the following section, multivariate analyses show the impact of the differences in the level of general secondary education achieved on the probability to participate in tertiary and vocational education, and on the degree of inequality between natives and migrants with respect to their participation in tertiary and vocational education.

2.5.2 Multivariate Analyses

The multivariate analyses were carried out in two steps. First, the differences between natives and migrants with respect to their participation in tertiary and vocational education were compared between the federal states while holding demographic characteristics like sex and age constant. Second, the variations in the distribution of general secondary education described in section 2.5.1 also were held constant (compare Table A1).

FIGURE 2.2: Difference between native Germans and first generation migrants in the probability to participate in vocational and tertiary education (percentage points)



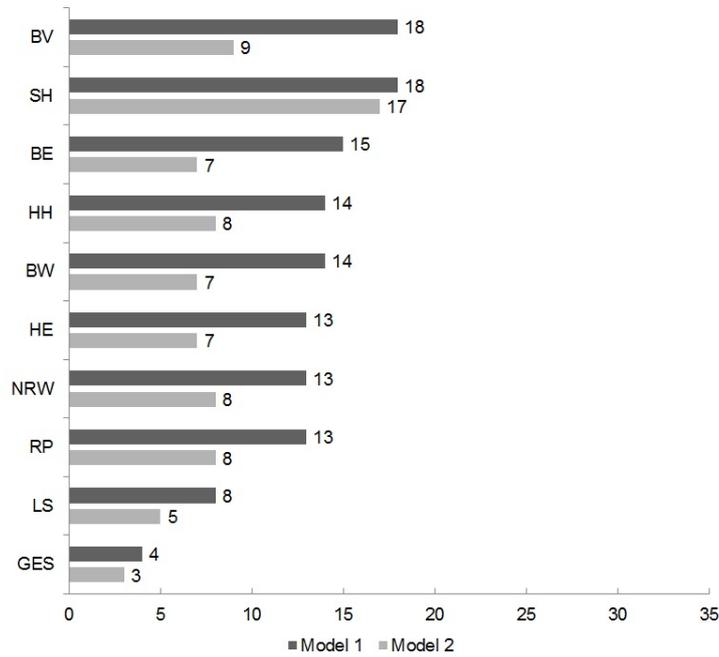
Source: Microcensus 2008–2010; own analysis.

Note: Representation of the results in Table A1

Figure 2.2 and 2.3 give an overview of the results of the two models. They show differences between natives and migrants in the participation in tertiary and vocational education in percentage points for each federal state.

Model 1 shows, as expected, that having a migrant background has a negative effect on the probability of participating in the tertiary and vocational education system in every federal state. This negative effect is statistically significant ($p \leq 0.05$), except for people with a second generation migrant background living in Germany's eastern states or for people with a first generation migrant background living in Schleswig-Holstein. The effect for people with a first generation migrant background is greater than for those with a second generation migrant background in every federal state, with the exception of Schleswig-Holstein. Furthermore, we can see that the level of the effect of having a migrant background on the probability to participate in tertiary and vocational education varies across federal states. In Bavaria, for example, the probability of participating in the tertiary and vocational education system is 30 percentage points lower for the first generation or 18 percentage points lower for the second generation than for the same age group without a migrant background. By contrast, in Schleswig-Holstein, this difference for the first generation amounts to only 15 percentage points, and in Germany's eastern states to just four percentage points for the second generation. These results support the first hypothesis that the level of ethnic inequality varies between the federal states.

FIGURE 2.3: Difference between native Germans and second generation migrants in the probability to participate in vocational and tertiary education (percentage points)



Source: Microcensus 2008–2010; own analysis.

Note: Representation of the results in Table A1

After holding the level of the secondary school degree constant in addition to the other covariates in Model 2, I found substantial changes compared to Model 1 regarding the size of the effect of having a migrant background. The level of inequality between natives and migrants decreases to a large amount, but it still persists in some federal states. The effect is statistically not significant for first generation migrants in Rhineland Palatinate, Schleswig-Holstein, Hesse, and Hamburg, and for second generation migrants in Hamburg, Berlin, Lower Saxony, and Germany's eastern states. Thereby, after holding the general secondary school degree constant, the inequality between natives and migrants in Bavaria showed the largest decrease. This result is not surprising, since Bavaria not only is the federal state with the largest number of people with a migrant background having only a low level of general secondary school education, but also because it has the largest gap between natives and migrants with respect to the level of general secondary school education. In Model 2, the variation across federal states with respect to the level of inequality between natives and migrants remains but decreases compared to Model 1, and becomes statistically insignificant except for the difference between Schleswig-Holstein and Lower Saxony for second generation migrants.⁶ After holding the school leaving certificate constant, the inequality between native Germans and first generation migrants is still the

⁶In order to test the statistical significance of the variation between the federal states I calculated a model including all federal states and interaction effects between having a migrant background and the federal state.

highest in Berlin and Germany's eastern states, and the lowest in Hamburg and Schleswig-Holstein. The variation in the level of inequality between natives and migrants in all other federal states in the middle position is now very small. After holding the general secondary school degree constant, the inequality between natives and second generation migrants is still the highest in Schleswig-Holstein and the lowest in Lower Saxony and Germany's eastern states.

The decrease in the degree of inequality, after holding constant the level of secondary school education, shows, that the rates of individuals with different levels of general secondary education within a federal state can, to a large extent, explain the differences in the degree of inequality between the federal states.⁷

However, the differing level of general secondary school education between federal states can only partly explain the variations in the gap between natives and migrants between federal states because the level of general secondary school education also varies between the federal states with respect to their impact on the probability to participate in tertiary and vocational education. Figure 2.4, using the comparative perspective of Model 2, shows the effect of general secondary school education on the probability to participate in tertiary and vocational education. Having a low general secondary school education has, as expected, a negative effect on the probability to participate in tertiary and vocational education, and having a high general secondary school education increases the probability. Especially, the positive effect of *Abitur* varies statistically significant between the federal states. Whereas having *Abitur* compared to having *Mittlere Reife* increases the probability to participate in tertiary and vocational education by 29 percentage points in Berlin, this difference is only 8 percentage points in Baden-Wuerttemberg. Thus, the second hypothesis that the impact of the level of secondary school education varies between federal states can be approved.

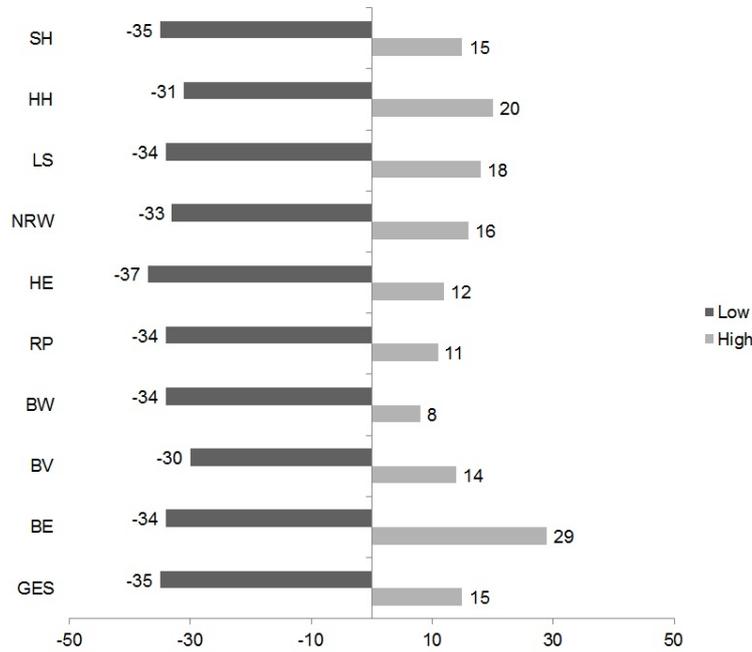
2.6 Discussion and Conclusion

The present study has investigated the extent to which the various German federal states are achieving their goal to integrate young people with a migrant background into the tertiary and vocational education system. The analysis of this research question is possible by using German microcensus data, which offers a huge number of cases that provide the means to differentiate between federal states. The results of this study contribute to current research with two main results.

⁷To make sure that the results were not biased by the varying composition of people belonging to different nationalities, the federal states were standardized regarding the number of people with a Turkish background, people from other countries of recruitment (Italy, Greece, Portugal, Jugoslawia, Spain, Marokko), and people from all other countries. The weights could not be computed for the federal states of Schleswig-Holstein, Hamburg and Germany's eastern states because of the number of cases restrictions. The results are shown in Table A2. The difference between the results from Model 2 and the standardized Model in Table A2 are rather small.

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FIGURE 2.4: Difference between a low/high compared to a medium general secondary school education on the probability to participate in vocational and tertiary education (percentage points)



Source: Microcensus 2008–2010; own analysis.

Note: Representation of the results in Table A1

First, as shown in the existing current research, the results of this paper indicate that having a migrant background has a negative effect on the probability to participate in the tertiary and vocational education system. This study differentiates these known disadvantages further by showing that while all federal states appear to be unable to sufficiently counterbalance the effects of a migrant background, they differ in their ability to mitigate these effects especially for migrants of the first generation.

The inequality between natives and migrants with respect to their participation in tertiary and vocational education is the largest in Bavaria, Berlin, and Germany's eastern states, and is the smallest in Schleswig-Holstein and Hamburg. The high level of inequality between natives and migrants in Berlin is surprising, since it is a federal state with a comparably high level of general secondary school education both for natives and those individuals with a migrant background. In contrast, in Hamburg the high level of general secondary school education for both natives and migrants seems to translate into a low level of inequality between natives and migrants. The high level of inequality in Bavaria is not surprising, since a large difference in the level of general secondary education achieved exists between natives and migrants.

The differences between the federal states regarding the level of inequality between natives and second generation migrants are rather small: inequality is the largest in Bavaria and Schleswig-Holstein and is the smallest in Lower Saxony and Germany's eastern states. Second, the results of this study correspond to earlier research that showed that general school education has an important impact on the probability to participate in tertiary and vocational education and on the level of inequality between natives and migrants. The present study contributes to current knowledge by showing that the impact of the general secondary school education varies in its importance in the different federal states. For example, having a high level of general secondary school education is much more important for the transition into tertiary and vocational education in Berlin or Hamburg than in the other federal states. Furthermore, the results show that differences in the average level of general secondary school education between the federal states can explain some of the variation between the federal states in terms of the level of inequality between natives and migrants with respect to their participation in tertiary and vocational education. The large degree of inequality between natives and migrants in Bavaria and Baden-Wuerttemberg, for example, can be attributed mainly to composition effects: in these federal states, the share of people with a migrant background with—on average—a lower level of educational attainment in general secondary school is comparably high. Given the findings of this study, I conclude that policies in the different federal states seem to make an important difference to the level of inequality between natives and migrants with respect to their participation in tertiary and vocational education, especially for first generation migrants. By looking more closely into the context of the federal states, a small number of apprenticeships and a high presence of full-time school-based vocational education and the tertiary sector—as it is the case in Berlin and Germany's eastern states—seem to foster inequality between natives and those individuals with a migrant background who belong to the first generation.

In contrast, it is not surprising to see a comparatively low level of ethnic inequality in states such as Hamburg and Schleswig-Holstein, where the number of apprenticeship positions is comparatively high. Further research is needed to explain why the observed differences between the German federal states exist and to determine whether, and to what extent, the described dimensions impact the degree of inequality between natives and migrants with respect to their participation in the tertiary and vocational education system. In summary, the analyses leave questions for further research, which could not be analysed in this research setting due to data restrictions. First, some background characteristics (e.g., social origin, grades, language skills) could not be considered in the analyses. Further research could investigate the role of these characteristics in the different federal states.

Second, in this study, people with a migrant background could only be differentiated by generation because of the number of case restrictions. However, a further differentiation by nationality would deliver more precise results.

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Finally, a comparison of the degree of inequality between natives and migrants on levels below the federal states, for example, on the level of regional labour markets, could also deliver important results and could be an important area of future research.

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Appendix

TABLE A1: Logistic regressions on the participation in the vocational and tertiary education system in different federal states (average marginal effects)

Federal state	Model	2nd generation	1st generation	Hauptschulabschluss/no school leaving certificate	Abitur	Pseudo- R^2
Schleswig-Holstein	M1	-0.183*** (0.052)	-0.146 (0.064)			0.077
	M2	-0.168*** (0.048)	-0.016 (0.069)	-0.351*** (0.038)	0.150*** (0.039)	0.200
Hamburg	M1	-0.143* (0.057)	-0.192* (0.077)			0.075
	M2	-0.076 (0.052)	-0.060 (0.072)	-0.314*** (0.059)	0.204*** (0.056)	0.194
Lower Saxony	M1	-0.083** (0.027)	-0.251*** (0.041)			0.061
	M2	-0.045 (0.024)	-0.123** (0.040)	-0.343*** (0.023)	0.175*** (0.023)	0.173
North Rhine-Westphalia	M1	-0.128*** (0.015)	-0.216*** (0.026)			0.074
	M2	-0.076*** (0.014)	-0.128*** (0.025)	-0.327*** (0.016)	0.158*** (0.016)	0.196
Hesse	M1	-0.129*** (0.024)	-0.229*** (0.040)			0.104
	M2	-0.073** (0.022)	-0.085* (0.037)	-0.371*** (0.028)	0.122*** (0.027)	0.236
Rhineland Palatinate	M1	-0.130*** (0.037)	-0.206*** (0.053)			0.070
	M2	-0.083* (0.033)	-0.109* (0.051)	-0.341*** (0.032)	0.107** (0.033)	0.174
Baden-Wuerttemberg	M1	-0.140*** (0.020)	-0.261*** (0.034)			0.084
	M2	-0.065*** (0.012)	-0.121*** (0.033)	-0.337*** (0.021)	0.077*** (0.020)	0.170
Bavaria	M1	-0.178*** (0.021)	-0.298*** (0.034)			0.044
	M2	-0.086*** (0.019)	-0.116*** (0.031)	-0.297*** (0.019)	0.141*** (0.017)	0.153
Berlin	M1	-0.145*** (0.039)	-0.296*** (0.059)			0.074
	M2	-0.074* (0.034)	-0.166** (0.058)	-0.339*** (0.039)	0.285*** (0.037)	0.261
Germany's eastern states	M1	-0.037 (0.056)	-0.271*** (0.056)			0.048
	M2	-0.026 (0.052)	-0.162** (0.054)	-0.346*** (0.019)	0.146*** (0.016)	0.167

Source: Microcensus 2008–2010; own analysis.

Note: Controlled for age, sex, and year of the survey. Reference groups: Native Germans, Mittlere Reife. *: $p \leq 0.05$; **: $p \leq 0.01$; ***: $p \leq 0.001$

TABLE A2: Differences between natives and migrants in the participation in tertiary and vocational education (in percentage points), standardized results

Federal state	2nd generation	1st generation
Lower Saxony	5	15
North Rhine-Westphalia	7	13
Hesse	7	8
Rhineland Palatinate	10	9
Baden-Wuerttemberg	7	12
Bavaria	9	12
Berlin	7	14

Source: Microcensus 2008–2010; own analysis.

Note: Binary logistic regression, controlled for age, sex, year of the survey and secondary school education (same model as Model 2 in Table A1). In addition to Model 2 nationality groups are standardized in this model.

3 Paper II: Ethnic Inequality in Vocational Education: The Impact of Educational Policy and Contextual Factors in Germany's Federal States

The degree to which young people with a migrant background are underrepresented in vocational education and training (VET) varies between Germany's federal states. The present study applies a Fuzzy Set Qualitative Comparative Analysis (Fs/QCA) to investigate the effects of the amount of apprenticeships, the presence of full-time vocational schools, and a transition system in Germany's federal states on the degree of ethnic inequality in VET for first generation migrants. The results indicate that a small supply of apprenticeships and a high presence of full-time vocational schools or transition programmes in a federal state are related to a large degree of ethnic inequality in VET. A small degree of ethnic inequality in VET is seen in federal states with a large supply of apprenticeships and a small amount of full-time vocational schools or transition programmes.

3.1 Introduction

From primary school onwards in Germany, children with a migrant background¹ have, on average, weaker education outcomes than their native German peers (Autorengruppe Bildungsberichterstattung, 2012). The comparatively low educational attainment of migrant children persists in the vocational education and training (VET) sector (Autorengruppe Bildungsberichterstattung, 2012), although researchers have not explored this issue to any great extent. The main idea of this article is to examine how the supply of apprenticeships and the presence of full-time vocational schools and a transition system affect the level of ethnic inequality in VET in Germany. To analyze the impact of the contextual factors on the degree of ethnic inequality, a Fuzzy Set Qualitative Comparative Analysis (Fs/QCA) was applied. Hence, this study is placed in a growing literature that explores the impact of

¹According to the official German Federal Statistical Office definition, "people with a migrant background" (as used in this paper) are "all persons who have immigrated into the territory of today's Federal Republic of Germany after 1949, all foreigners born in Germany and all persons born in Germany who have at least one parent who immigrated to the country or was born as a foreigner in Germany" (Statistisches Bundesamt, 2013b).

educational systems or programmes on ethnic inequality (Darmody, Byrne, & McGinnity, 2014; Dronkers et al., 2012; Stromquist, 2012).

Much of the debate about ethnic inequality in VET has focused on individual resources like human or social capital as the causes of weaker educational outcomes (Beicht & Granato, 2011; Helland & Støren, 2006). Current research on the effects of educational systems focus more on the international comparison of the effects of secondary school systems on migrants' school performance (Ammermüller, 2005; Dronkers et al., 2012) or on educational systems and labor market outcomes in general (Allmendinger, 1989; Pfeffer, 2008). However, research is lacking regarding the differences within the VET system. The few existing studies on the influence of contextual factors on the transition from general education school to VET in Germany suggest that different education policies may produce different outcomes (Seibert et al., 2009).

The present study focuses on disparities of the VET system within Germany rather than on a comparison with other countries. The advantage over an international evaluation is that the federal states are embedded in the same national political and economic system, so many characteristics can be treated as constant. However, the decentralization of the educational system in Germany—the 16 federal states enjoy educational autonomy—gives rise to major inter-state variations in educational structures.

The next section describes the German vocational educational system. Section 3 demonstrates why institutional or contextual factors play a crucial role in the transition from school to VET. Then it will be described how the concept of ethnic inequality is defined in this study and how the method fs/QCA is used to answer the research questions. Section 5 and 6 provide the results of the analysis. The final section discusses the findings and implications of the study.

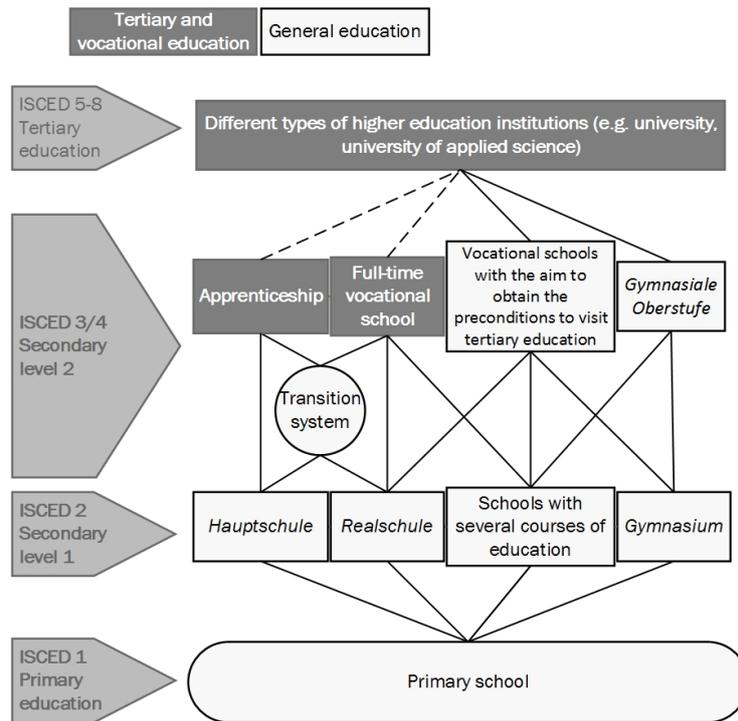
3.2 The German Vocational Education System

The basic structure of the German VET system at the upper-secondary and post-secondary non-tertiary level (ISCED Levels 3 and 4) (UNESCO Institute for Statistics, 2012), which applies, to a greater or lesser extent, in every federal state, consists of two main sectors:

- Apprenticeships, which combine theoretical education at a vocational school and practical in-company training
- Full-time vocational schools

Successful participation in both sectors leads to a full vocational qualification degree at the level of skilled worker or specialist employee. While regulations for apprenticeships are organized at the federal level, the federal states are responsible for vocational schools

FIGURE 3.1: Structure of the educational system in Germany



Source: Own representation based on UNESCO Institute for Statistics (2012).

(Secretary General of the Standing Conference of the Ministers of Education and Cultural Affairs, 2013).

As a reaction to a decline of apprenticeship positions over the last years, a so-called “transition system” has evolved. This system consists of different publicly financed preparatory or substitute training measures for graduates of general secondary schools who did not manage to enter the vocational educational system. It consists of an educational offer with a duration of one year and with the aim to promote the qualifications needed in the vocational educational system or to make up for a general education degree. Furthermore, this transition system is an alternative to fulfil compulsory schooling that ends when a student reaches legal age (Vossenkuhl, 2010). However, programmes in the transition system do not provide their graduates with a full qualifying vocational degree. Since the year 2000, about 40 percent of the new entrants to the vocational educational system enter the transition system, almost as many as the young people entering apprenticeships. Although these programmes have been created for disadvantaged adolescents in general, young people who have a foreign nationality are over-represented in these programmes (Baethge, 2008).

3.3 Effects of Structural Differences on Ethnic Inequality

Recent research has argued that the disadvantage of people with migrant background is due not only to a lack of individual resources but also to the manner in which transition to VET is affected by institutional or contextual factors (De Graaf & van Zenderen, 2013; Thränhardt, 2004). Based on the theories of Coleman (1990), Aybek (2008) pointed out that the access to VET also is determined by developments at the macro level (e.g., economic situation) or mesoscale (e.g., institutions, programmes), since they regulate opportunity structures for young people in their search for a VET position at a specific time. Thus, the transition process is embedded in specific structural, cultural, and institutional contexts that differ between different states (Walther, 2006). The differences in institutional arrangements have an impact on choices and decisions, and thus on the transition process itself (Raffe, 2008). In the end, a successful transition to VET is an interplay between the institutional arrangements as well as social and individual resources (De Graaf & van Zenderen, 2013).

Under German federalism, each federal state enjoys educational autonomy. As a result, educational policy varies widely within Germany. This influences the educational structure in every federal state, and thus the opportunity structures for individuals (Kramer, 1998). Literature has shown that differences in the subnational units of a country can affect educational inequality, as Stadelmann-Steffen (2011) shows for Switzerland, Freitag and Schlicht (2009) prove for Germany, or Ainsworth and Roscigno (2005) shows for the US.

In fact, the German federal states vary substantially in terms of the number of apprenticeship positions available, the extent of the transition system, and the availability of full-time vocational schools (see Table 3.1).

The federal states also differ in other relevant areas concerning the transition to the vocational education system, for example, their unemployment rates, prevalent economic sector (Bundesagentur für Arbeit, 2014), funding of the vocational education system, and distribution of secondary school leaving certificates (Anger et al., 2013). Entry into the vocational education system is smoother when plenty of jobs are available and the unemployment rate is low as in Bavaria or Baden-Wuerttemberg, for example. Also, the economic sector is reflected in the number of apprenticeships, being lower in federal states with a higher number of jobs in the tertiary sector (Berlin) (Bundesagentur für Arbeit, 2014).

The largest number of people with a migrant background between 15 to 24 years of age live in North Rhine-Westphalia, the largest federal state in Germany, which has 30 percent of the total population (see Table 3.2). This is among the highest in Germany, which also is high in the federal states of Hamburg, Baden-Wuerttemberg, Berlin, and

3.3 Effects of Structural Differences on Ethnic Inequality

TABLE 3.1: Contextual factors in Germany’s federal states

Federal state	Apprenticeships demand and supply ratio ¹	Distribution of participants of VET system			
		Apprenticeships	Full-time vocational schools	Transition system	Total
Bavaria	91.1	52.9	26.6	20.5	100
Rhineland-Palatinate	85.4	34.5	31.5	34.0	100
Schleswig-Holstein	88.2	33.4	25.2	41.4	100
Baden-Wuerttemberg	86.8	30.3	28.0	41.7	100
North Rhine-Westphalia	80.7	37.7	29.5	32.8	100
Lower Saxony	81.7	32.2	27.4	40.4	100
Hamburg	88.8	51.5	23.7	24.8	100
Hesse	81.4	45.3	24.6	30.1	100
Berlin	73.2	41.6	36.1	22.3	100
Germany’s eastern states	75.4	45.5	35.4	19.1	100

Source: Bundesinstitut für Berufsbildung (2010, 2011), Statistische Ämter des Bundes und der Länder (2012), Statistisches Bundesamt (2013a), average of the data of 2008–2010.

¹ Relation between supply (number of new training contracts in apprenticeships plus the at the Federal Employment Agency reported vacant apprenticeships) and demand (number of new training contracts plus the at the Federal Employment Agency reported applicants who are still looking for an apprenticeship). This relation shows how many apprenticeship positions can be offered to 100 applicants. Thus, the larger the number the better the supply of apprenticeship positions.

Hesse. In contrast, the five eastern German federal states have a low number of migrants.

As is obvious from Table 3.3, the distribution of ethnic groups varies between federal states. The largest share of people with Turkish nationality lives in North Rhine-Westphalia and Berlin, whereas the largest share of people from other countries of recruitment lives in the southern German federal states. Also, in this aspect, Germany’s eastern federal states differ from the rest of the country.

The organization of the VET system in Germany’s federal states is mainly characterized by the distribution of three characteristics: the supply of apprenticeships, the number of full-time vocational schools, and the size of the transition system. The distribution of these three characteristics can be seen as the result of the different contexts of each federal state, since, for example, the number of apprenticeships will influence the size of the transition system. Eberhard (2012) reveals that the distribution of the main parts of a VET system, the supply of apprenticeships, and the number of full-time vocational schools or the presence of a transition system seem to produce different outcomes in VET for secondary school graduates in general. For this reason, the impact of these three characteristics on the degree of ethnic inequality in VET will be analyzed. The following sections examine the effects of the supply of apprenticeships and the presence of a full-time vocational schools and transition system on a special group of people—those who have a migrant background.

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TABLE 3.2: Population by migrant background in Germany's federal states (column percentages)

Federal state	Without migrant background	With migrant background	N
Schleswig-Holstein	84.1	15.9	957
Hamburg	70.7	29.3	566
Lower Saxony	78.8	21.2	2.624
North Rhine-Westphalia	69.7	30.3	6.319
Hesse	66.1	33.9	2.117
Rhineland Palatinate	77.2	22.8	1.436
Baden-Wuerttemberg	69.6	30.4	3.564
Bavaria	76.5	23.5	4.214
Berlin	70.9	29.2	1.115
Germany's eastern states	95.8	4.2	4.294
N	20.792	6.414	27.206

Source: Microcensus 2008–2010; own analysis.

Note: People at the age of 15–24.

TABLE 3.3: Distribution of nationalities in federal states (column percentages)

Federal state	Turkey	Former Soviet Union	Other migrant background	N
Schleswig-Holstein	16.8	24.5	58.7	143
Hamburg	23.6	13.4	63.1	157
Lower Saxony	22.5	33.0	44.5	519
North Rhine-Westphalia	28.2	19.8	52.0	1.797
Hesse	24.4	15.4	60.2	664
Rhineland Palatinate	20.1	34.5	45.4	304
Baden-Wuerttemberg	23.7	20.5	55.9	988
Bavaria	24.1	21.7	54.1	929
Berlin	32.1	15.7	52.2	312
Germany's eastern states	5.4	38.7	56.0	168
N	1.475	1.308	3.198	5.981

Source: Microcensus 2008–2010; own analysis.

Note: People at the age of 15–24, only people who have a foreign nationality.

3.3.1 Apprenticeships

Most secondary school graduates seek an apprenticeship. This phenomenon applies to graduates with a migrant background (62 percent) and without a migrant background (61 percent). This pursuit of an apprenticeship is especially true for youth whose highest secondary school certificate is a *Hauptschule* leaving certificate² (Beicht & Granato, 2011).

The literature discusses several reasons why young persons with a migrant background will nonetheless have lower chances to secure a place in an apprenticeship:

Especially for the group of “Gastarbeiter” and their descendants in Germany, the on average lower social origin can explain great parts of their lower educational success (Kalter et al., 2007; Laganà et al., 2014; Urban, 2012). This leads to the fact that migrants have on average lower school leaving certificates than their native German peers, which in turn leads to lower chances in securing a place in VET (Hunkler, 2010). Migration-specific characteristics, such as generation, ethnic origin (Seibert, 2005; Seeber, 2011), or bad language skills (Diehl et al., 2009) also play a crucial role. Furthermore, graduates with a migrant background in contrast to graduates without a migrant background more often cannot rely on relevant social networks, which can be very helpful especially for positions in smaller companies (Haug, 2007). And finally discrimination could play a role. Arrow (1973) suggests a “statistical discrimination” which occurs with information deficits and beliefs in productivity “beliefs” of special groups. Also prejudice and “taste” of the employer are discussed to play a role (Becker, 1971).

When the demand for apprenticeships is higher than the supply, a competition of many high-performance applicants occurs. In this case, less preferred groups have a smaller probability of procuring apprenticeships (Thurow, 1975). Empirical evidence can be found from Crul et al. (2012). If the native group has difficulties in certain educational phases there is a “multiplier effect” for immigrants who experience the same difficulties but even worse.

To sum up, since migrants might not be in the first row in a competition, as has been shown earlier, their chances to gain an apprenticeship will get progressively smaller as the supply of apprenticeships gets smaller.

²The German secondary school system is highly stratified. The bottom tier, *Hauptschule*, which ends at grade 9, provides basic skills; the middle tier, *Realschule*, which ends at grade 10, provides intermediate skills (*Mittlere Reife*); and the top tier, *Gymnasium*, which ends at grade 12 in most federal states, leads to *Abitur*, the higher-education entry qualification. Since a secondary school certificate is not required for in-company-based vocational training, young people who leave school without a certificate also can participate in this kind of training. However, for full-time vocational schools, the minimum requirement is a *Hauptschule* leaving certificate; moreover, some training programmes require a *Realschule* leaving certificate (Cockrill & Scott, 1997).

3.3.2 Full-time Vocational Schools

The selection processes of full-time vocational schools are more standardized, focusing mostly on secondary school certificates and performance at school. Thus, the disadvantages of graduates with a migrant background with respect to social networks or a discriminatory selection process should not play a role.

However, a position in a full-time vocational school often requires higher secondary school certificates than a vocational education by way of an apprenticeship. But persons with a migrant background have on average lower secondary school certificates than graduates without a migrant background (Hunkler, 2010). Furthermore, vocational schools are often with costs and without apprenticeship pay, which is a disadvantage especially for children from families with less economic resources. These facts should, on average, decrease the chance of graduates with a migrant background to secure a place in a full-time vocational school. Seibert et al. (2009) found accordingly that men from Turkey and the ex-Yugoslavia living in Germany have a lower chance to gain entry into full-time vocational schools, even when controlling for a secondary education degree.

However, the characteristics of the VET system are not independent from each other. The size of one part of the system influences the size of another. For example, a transition system will rather be present if there is a small supply of apprenticeships. Therefore the effect of one characteristic cannot be hypothesized independently from the others. Therefore, it seems logical that a high presence of full-time vocational schools will have a negative effect on ethnic inequality if the number of available apprenticeships is small. In the case of a large supply of apprenticeships, enough alternatives would be available for many more migrants to secure a place in the VET system, so ethnic inequality would be reduced.

3.3.3 The Transition System

In times of higher demand than supply for apprenticeships, youth will have more difficulty in securing a place in the VET system. In these situations, young people might see their failure as a lack of personal qualifications. Consequently, they will try to find alternatives, for example, continue in secondary school or stay in a programme in the transition system. But in times where there is a lack of apprenticeships, several young persons are in programmes of the transition system even if their qualifications are not in deficit (Eberhard & Ulrich, 2010). Eberhard and Ulrich (2011) analyzed the impact of the size of the “transition system” in different regions of Germany and found a negative effect—the availability of a large number of these programmes reduced the chances of graduates of secondary school to get into a VET. They indicated that a high number of transition system programmes might also be a possible determinant for ethnic inequality in VET because statistics show

that migrants are overrepresented in programmes of the transition system (Baethge, 2008).

A large number of transition programmes might even be worse for graduates transitioning from school to VET when the number of apprenticeships is small. As migrants will suffer first from a shortage of apprenticeships, they are overrepresented in those programmes instead of taking part in a fully qualifying VET programme.

3.4 Data & Methods

The empirical basis for the analyses is German Microcensus data (German Labour Force Survey). The German Microcensus, the official representative survey of the population and labor market, is an annual survey of one percent of all households of Germany. De facto anonymized scientific use files (SUFs) are available for research purposes. SUF data are a 70-percent sample of the original data. The size of the sample and the high response rate³—also for individuals with a migrant background—are two of the advantages of this data.⁴ In the present study, this data was used to compare ethnic inequality between Germany’s federal states. Furthermore, aggregated data from the Statistical Offices of the Federation and of the federal states and from the Federal Employment Agency was used (Bundesinstitut für Berufsbildung, 2010, 2011; Statistische Ämter des Bundes und der Länder, 2012; Statistisches Bundesamt, 2013a) to compare the distribution of apprenticeships, full-time vocational schools, and the transition system between Germany’s federal states.

The concept “ethnic inequality in VET” is based on results of binary logistic regressions and shows the correlation between migrant background and the dependent variable—to participate in VET or not to participate in VET. People with a migrant background are divided into those who were born in Germany or immigrated to Germany until age six (1.5/2nd generation) and those who migrated to Germany later than age six (1st generation). This multivariate analysis was used to hold constant the differing compositions of the groups of persons with and without a migrant background and between the federal states in Germany, as well as interactions concerning the characteristics of sex, age, school leaving certificate, and migrant background. Binary logistic regressions were computed separately for each federal state. VET as defined for this paper includes apprenticeships and full-time vocational schools. The tertiary sector is excluded as all my hypotheses focus on the VET system. To increase the size of the sample to be able to compare the federal states in more detail, I use pooled cross-section data from 2008 to 2010. The Microcensus is designed as a rotating panel sample for which the households of a sample district are surveyed in four consecutive years. To avoid an overlapping of persons in the pooled data

³The rate of household attrition—2.5–3 percent—is relatively low. This is due to fact that the provision of information for the microcensus is compulsory.

⁴For more information on these data, see <http://www.gesis.org/en/services/data-analysis/official-microdata/microcensus/microcensus-grundfile/>

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set, I filtered for new graduates from secondary school for the years 2009 and 2010. The analyses included persons aged 15 to 24 with and without a migrant background. Students in secondary schools, young persons in military duty or in community service, and persons who already have a training qualification are excluded from the analyses. Since the number of cases for the federal states Saarland and Bremen are quite low, these states were excluded from these analyses. Generally, not many people with a migrant background are living in Germany's eastern states of Thuringia, Saxony, Saxony Anhalt, Mecklenburg Pomerania, or Brandenburg, so they cannot be examined separately; however, due to the great similarity of the economic situation and educational policy in Germany's eastern states, they can be examined together as one case.

Table 3.4 shows the probability for young persons with a migrant background from 1.5/second and first generation to gain entrance into VET in each federal state.⁵ Since the model coefficients are reported as average marginal effects (AME) so to be able to compare them between federal states, these coefficients can be interpreted as the average additive effects of an independent variable on the probability of being in VET (Mood, 2010), which is higher for higher values and lower for lower values. The level of ethnic inequality in VET varies across the federal states. For example, ethnic inequality for first generation migrants is highest in Berlin where the probability of getting into VET is 23 percentage points lower for first generation migrants than for native Germans. The difference between the two groups is only 10 percentage points and statistically insignificant in Schleswig-Holstein.

The differences in the chances for 1.5 or second generation migrants to get into VET are not as large as for first generation migrants. These probabilities range between 11 percentage points in Berlin to 4 percentage points in Germany's eastern states. For this reason, further analyses will focus on first generation migrants.⁶

⁵To take the varying distribution of people belonging to different nationalities in the different federal states into account, the federal states were standardized in a second step. This standardization adjusts for the different distribution of the three groups of people with a Turkish background, those from other countries of recruitment (Italy, Greece, Portugal, ex-Yugoslavia, Spain, Marokko), and those from all other countries. This standardization is accomplished by setting the percentage of the group in the federal state in proportion to the percentage of the group in Germany on average. Due to the small number of cases in the nationality groups in Schleswig-Holstein, Hamburg, and Germany's eastern states, the weights cannot be computed for those federal states. The results of the standardized regression models are shown in Table B1 in the Appendix.

⁶As the German Microcensus is a household survey, information about the respondent's family and household context is available, but only for those young people who still live with their parents. Otherwise, no information on the parents is available. Thus, to control also for the education of the parents leads to a biased selectivity above all for the group over 18 years of age. However, to make sure, that results are not biased by the omission of social background information, I computed the regression models with and without a variable with the information of the education of the parents (general secondary school education and vocational education) (see Table B3 in appendix). A comparison of the group chosen as the focus of the present study and the group who still lives with their parents shows, without controlling for the education of the parents, that ethnic inequality in the group who still lives with their parents is either over- or underestimated for 1.5/second and first generation migrants. Controlling for the education of the parents, the results show that parents with a higher education have a

TABLE 3.4: Level of ethnic inequality in VET

Federal state	1st generation migrants		1.5/2nd generation migrants	
	Odds ratios	AME	Odds ratios	AME
Berlin (BE)	0.257***	-0.231***	0.552**	-0.111**
Germany's eastern states (GES)	0.368***	-0.211***	0.811	-0.44
North Rhine-Westphalia (NW)	0.340***	-0.208***	0.698***	-0.074***
Lower Saxony (LS)	0.390***	-0.194***	0.778	-0.053
Baden-Wuerttemberg (BW)	0.494***	-0.149***	0.716***	-0.071
Bavaria (BV)	0.532***	-0.134***	0.651***	-0.090***
Hesse (HE)	0.505***	-0.129***	0.587***	-0.102***
Rhineland Palatinate (RP)	0.536*	-0.128*	0.627*	-0.096*
Hamburg (HH)	0.567	-0.114	0.675	-0.080
Schleswig-Holstein (SH)	0.616	-0.101	0.435**	-0.171***

Source: Microcensus 2008–2010, own analysis. People between 15 and 24 years of age.

Note: Controlled for age, sex, secondary school certificate and year of the survey. Reference category: persons without migrant background.

: $p \leq 0.05$; ** : $p \leq 0.01$; *** : $p \leq 0.001$

For the purpose of examining how the characteristics of the VET system affect ethnic inequality, a Fuzzy Set Qualitative Comparative Analysis (Fs/QCA) was applied. As explained above I expect, that the degree of ethnic inequality can be explained by a specific combination of institutional characteristics rather than by one single dimension. With Fs/QCA, it is possible to demonstrate the connections between characteristics and outcome when none of the characteristics alone is sufficient or necessary for an outcome (Ragin, 2000; Schneider & Wagemann, 2007)

To use this method, all conditions (supply of apprenticeships, full-time vocational schools, transition system) and the outcome (ethnic inequality in VET for first generation migrants) are converted into “fuzzy sets”. Thus, a federal state can have a membership in a condition and in the outcome with a value between “0” and “1”, where “0” is fully out and “1” is fully in. The cross-over point allows a qualitative distinction of cases being more in or more out of a specific set. These fuzzy sets provide a way to capture the complexities of educational policies and the variations between the federal states. The fuzzy-sets for this analysis are constructed using the direct method (Schneider & Wagemann, 2007) on the basis of the values presented in Tables 3.1 and 3.4. The qualitative thresholds that were used to do this are presented in Table 3.5. Table 3.6 presents an overview of all the fuzzy-set scores of the conditions and the outcome.

positive effect on the chances of their children to gain entrance into VET, but the size of the effects is considerably smaller (except Hamburg, Bavaria, and Germany's eastern states) and in some cases insignificant (Schleswig-Holstein, Rhineland Palatinate, Hesse, Berlin) compared to the effect of the school leaving certificate of the analyzed population. The ranking of the federal states regarding the level of ethnic inequality changes only marginal. However, the proportion of states with high and low ethnic inequality stays the same.

TABLE 3.5: Qualitative thresholds

	Threshold full non-membership	Crossover point	Threshold full membership
High ethnic inequality in VET for 1st generation migrants	-0.108	-0.172	-0.221
Small supply of apprenticeships	90.0	83.6	74.3
High presence of transition system	19.8	37.2	41.6
High presence of full-time vocational schools	24.2	28.8	35.8

TABLE 3.6: Fuzzy-set data matrix

Cases	Outcome high ethnic inequality in VET for 1st generation migrants	Small amount of apprenticeships	High presence of full-time vocational schools	High presence of the transition system
SH	0	0.10	0.09	0.95
HH	0.06	0.08	0	0.11
RP	0.11	0.30	0.76	0.37
HE	0.12	0.67	0.06	0.23
BV	0.14	0	0.19	0.05
BW	0.25	0.18	0.37	1
LS	0.79	0.65	0.29	0.90
NW	0.90	0.72	0.57	0.32
GES	0.92	0.93	0.94	0
BE	1	1	1	0.07

3.5 Finding Patterns

With the help of these fuzzy sets, patterns of similarities and differences across cases (necessary and sufficient conditions) can be discovered behind the variations in ethnic inequality in VET for first generation migrants. The computer programme *fs/QCA*⁷ was used to test the hypotheses.

The values in Table 3.6 are now transformed into dichotomous values: 1 for fuzzy scores larger than 0.5 and 0 for scores smaller than 0.5. The results are shown in Table 3.7, with 1 meaning the condition is available and 0 meaning the condition is absent. Table 3.7 lists all the logically possible combinations of conditions and shows the correspondence of cases to those configurations of characteristics according to their best fit. Column 5 in Table 3.7 displays the consistency score, which shows to what degree each condition is consistently associated with a high ethnic inequality in VET (Schneider & Wagemann, 2007).

Row 3 of Table 3.7 presents an ideal type that is characterized by the absence of all conditions that are hypothesized to be connected with high ethnic inequality (a small supply of apprenticeships, a large number of full-time vocational schools, and a large number of transition programmes). We can see that the absence of these characteristics, as in Ham-

⁷See <http://www.u.arizona.edu/cragin/fsQCA/software.shtml>.

TABLE 3.7: Dichotomous truth table including the ideal types

Small amount of apprenticeships	High presence of full-time vocational schools	High presence of transition system	Cases	Consistency sufficiency outcome high ethnic inequality in VET for 1st generation migrants
1	1	0	NW, GES, BE	0.92
0	0	1	SH, BW	0.44
0	0	0	HH, BV	0.32
1	0	1	LS	0.80
1	0	0	HE	0.54
0	1	0	RP	0.55
1	1	1	-	
0	1	1	-	

burg and Bavaria, is connected with low ethnic inequality (fuzzy score < 0.5, see Table 3.4).

Other similarities can be seen between the federal states of Schleswig-Holstein and Baden-Wuerttemberg. Both federal states are characterized by a large number of apprenticeship positions, a small number of full-time vocational schools, and a large number of transition programmes, which in both cases is connected with a small degree of ethnic inequality (fuzzy score < 0.5).⁸

The cases described above all have a common similarity in that either all the characteristics that are hypothesized to lead to high ethnic inequality are absent, or only one characteristic is present. This also is the case with Hesse and Rhineland-Palatinate.

Germany's eastern states (including Berlin) and North Rhine-Westphalia have a small supply of apprenticeships, a large number of full-time vocational schools, and a small number of transition programmes. All of these cases show a large degree of ethnic inequality (fuzzy score > 0.5). Lower Saxony, which is characterized by the presence of two conditions that are hypothesized to be connected with high ethnic inequality (small supply of apprenticeships, large number of transition programmes), also shows a comparably large degree of ethnic inequality (fuzzy score > 0.5). To summarize, the patterns described above show that at least two of the conditions need to be present to produce a high degree of ethnic inequality in a federal state.

However, no evident case exists that describes the ideal type in the last two rows of Table 3.7. So, no state has a large supply of apprenticeships, a high number of transition programmes, and a high number of full-time vocational schools, or a large supply of apprenticeships, a large number of full-time vocational schools, and a large number of transition programmes.

⁸In Baden-Wuerttemberg, people who are in their first year of their apprenticeship are taught in a full-time vocational school for one year. This partially explains the high number of transition programmes in Baden-Wuerttemberg (Baethge et al., 2007).

3.6 Necessary and Sufficient Conditions

Fuzzy QCA helps to find the necessary and sufficient conditions within the patterns shown above. A condition is necessary when it occurs with the presence of the outcome.

A higher consistency benchmark of 0.90 was used for the necessity test. For all analyses, only empirically observable configurations were included, which favors empirical complexity but is the more conservative solution (Schneider & Wagemann, 2007). The necessity test showed that none of the characteristics of the VET system analyzed appears to be consistently necessary for high ethnic inequality in VET. The same applies for the outcome of “low ethnic inequality in VET”.

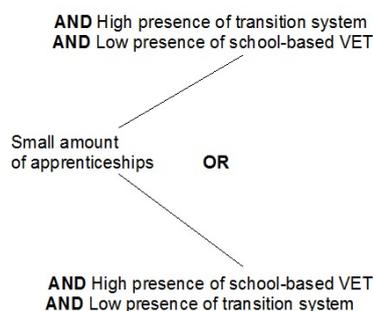
The reason for this finding might be that a high degree of ethnic inequality is caused by varying or multiple conditions. Therefore, the appearance of sufficient conditions will be analyzed. A condition is sufficient if the outcome occurs whenever the condition is present. Thus, the fuzzy score of a sufficient condition must be equivalent to or smaller than the fuzzy score of the outcome.

Regarding the outcome of high ethnic inequality in VET, the consistency threshold was set at 0.82 to configure the programme to recognize consistently higher scores than this as reasonable subsets of the outcome. The Quine-McClusky algorithm also can be used to show the conditions connected with the level of ethnic inequality, however, in a less complex but logically equivalent way.

Two different combinations of characteristics are connected with a high level of ethnic inequality in VET Figure 3.2. The Scatter plots (Figure 3.3 and 3.4) show the distribution of the 10 cases along the combination of the conditions and the outcome. The large degree of ethnic inequality in Lower Saxony is explained by a small supply of apprenticeships in combination with a high presence of transition programmes and a low presence of full-time vocational schools (Figure 3.3). The second path, which is a sufficient condition for the outcome of high ethnic inequality in VET, is a small supply of apprenticeships and a high presence of full-time vocational schools with a low presence of transition programmes. This path covers Berlin and Germany's other eastern federal states and North Rhine-Westphalia (Figure 3.4).

To compare the relevance of these two paths to each other, it is useful to take a look at the coefficients of raw coverage and unique coverage (Figure 3.3). Thirty-four percent of high ethnic inequality can be explained by the small number of apprenticeships and a high presence of transition programmes. Sixty-three percent of federal states with a high level of ethnic inequality in VET can be explained by the small number of apprenticeships

FIGURE 3.2: Minimal solution of sufficient conditions for the outcome high degree of ethnic inequality in VET for first generation migrants (complex solution)



Note: Parsimonious solution: small supply of apprenticeships and large amount of full-time vocational schools; or small supply of apprenticeships and high presence of transition system.

combined with a high presence of full-time vocational schools.

These two paths can explain all the cases with a high outcome.⁹ However, the results also showed that a small number of apprenticeships is not a sufficient condition on its own. It needs to be combined with a high presence of transition programmes or with a high presence of full-time vocational schools.

The next step is to test for the sufficient conditions for the outcome of low ethnic inequality in VET. In this case, all the conditions with a consistency higher than 0.87 were considered to be sufficient. The analyses showed that low ethnic inequality in VET is achieved by characteristics that are opposite to those connected with high ethnic inequality: a large supply of apprenticeships and a small amount of full-time vocational schools or a large supply of apprenticeships and a small number of transition programmes (Figure 3.4). However, the analyses did not explain the small degree of ethnic inequality in the federal state of Hesse. This state may have other causes of ethnic inequality. Hesse is characterized by a relatively small supply of apprenticeships but does not compensate with a higher presence of full-time vocational schools or more transition programmes.

In summary, the three characteristics of the VET system can explain ethnic inequality for first generation migrants in 9 out of the 10 federal states.¹⁰

⁹The results for ethnic inequality are the same as those obtained from the standardized regression models in Table B1 in the Appendix.

¹⁰For 1.5/2nd generation migrants no such pattern can be found. The reason for this might be that the variation of ethnic inequality for this group is not that large between Germany's federal states. Furthermore, the same analyses have been carried out for the two groups with Turkish and a former Soviet Union nationality to test the results for different ethnic groups. This can only be done for people with a foreign nationality, Germans with a migrant background will therefore be in the same group as Germans without a migrant background. Furthermore, these analyses could only be done for six federal states, which had a sufficient number of cases. However, for the group with Turkish nationality, no sufficient conditions could be found for a high or low ethnic inequality. Since generation seems to play a larger role than nationality—both ethnic groups include both first and 1.5/second generation migrants—no clear results were found. Unfortunately, the number of cases of the group with Turkish nationality was not sufficient to determine the impact of the first and 1.5/second generations. However,

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FIGURE 3.3: Sufficient paths for the outcome high ethnic inequality in VET — first generation migrants

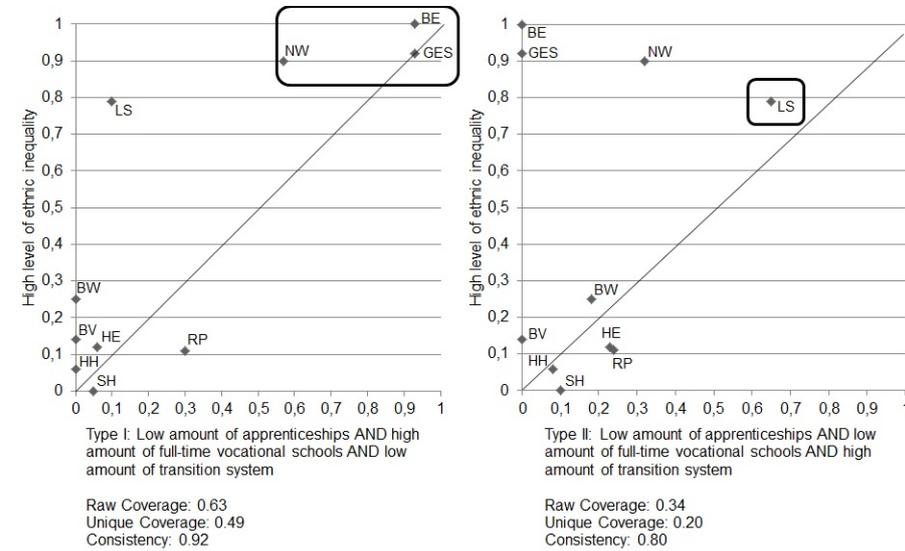
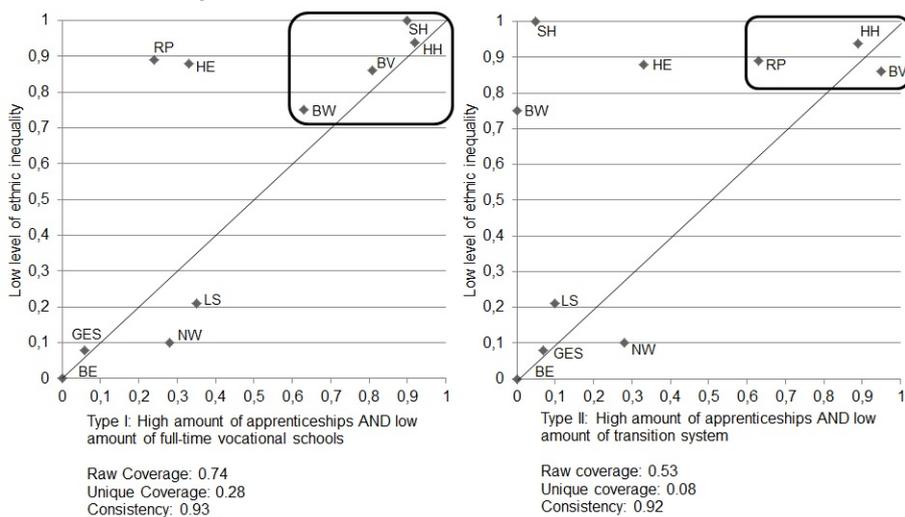


FIGURE 3.4: Sufficient paths for the outcome low ethnic inequality in VET — first generation migrants



3.7 Conclusion

The present study investigated how the supply of apprenticeships and the presence of full-time vocational schools or transition programmes affect the level of ethnic inequality in VET for first generation migrants. Two main limitations of the study should be mentioned here. First, due to data restrictions the social background of the person cannot be considered adequately in the analyses. Second, ethnic groups can either be identified by generation or by nationality, even if a combination of both characteristics would deliver more precise results. But bearing these limitations in mind, the findings of this analysis confirm, that ethnic inequality in VET for first generation migrants cannot be explained by a single factor but has multiple causes.

Factors that are connected to high ethnic inequality in VET are a small supply of apprenticeships in combination with a high presence of full-time vocational schools and a low presence of transition programmes. This finding is the case in Berlin and other eastern states and in North Rhine-Westphalia. On the other hand, low ethnic inequality in VET is present in federal states with a large supply of apprenticeships in combination with a low presence of full-time vocational schools. In four federal states, these conditions were present—Baden-Wuerttemberg, Bavaria, Schleswig-Holstein, and Hamburg.

These findings are in line with those from Seibert et al. (2009) who found a negative correlation of a high presence of full-time vocational schools on the probability of migrants to get into VET. The current study extends this knowledge by showing that a high presence of full-time vocational schools contributes to high ethnic inequality only when combined with a small supply of apprenticeships. High ethnic inequality also can exist when another combination of conditions are present: a small supply of apprenticeships in combination with a high number of transition programmes and a small amount of full-time vocational schools. This is the case in Lower Saxony. This finding supports the hypotheses of Eberhard and Ulrich (2011) that suggest that a high number of transition programmes might also be a possible determinant for ethnic inequality in VET.

The opposite set of conditions produce a small degree of ethnic inequality: a large supply of apprenticeships and a low number of transition programmes. This is the case in Rhineland Palatinate, Hamburg, and Bavaria.

In both paths a small supply of apprenticeships alone does not necessarily lead to a high level of ethnic inequality in VET, which occurs only when a small supply of apprenticeships is combined with a high presence of full-time vocational schools or a large number

a sufficient condition for high ethnic inequality was found for the group with a former soviet union nationality. Interestingly, ethnic inequality in VET was higher for this group in federal states with a high amount of apprenticeships and a low amount of full-time vocational schools. Ethnic inequality in VET was also high in federal states with a low amount of full-time vocational schools and a high number of transition programmes. For detailed results, see Table B2 in the Appendix.

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of transition programmes.

However, these conditions do not explain the low ethnic inequality in the federal state of Hesse. Future research could focus on this federal state to learn more about its success in the structural integration of persons with migrant backgrounds. Furthermore, research could profit from the evaluation of special programmes for persons with migrant backgrounds to increase their chances for placement in the VET system. Another reason for low ethnic inequality in VET could be, for example, programmes like “Supplementary apprenticeships in organizations with migrant proprietors (Migranten schaffen zusaetzliche Lehrstellen) (TG S-H)” in Schleswig-Holstein.

Several further conditions also could be playing a role in creating high ethnic inequality. The fact that with each condition taken into the analysis the number of possible combinations and therefore the number of combinations where there are no cases increases, limits the choice of conditions that can be analyzed. Further research also could discuss the role of the prevalent economic sector. Also analyses on smaller regional level would be necessary. An analysis also could be done to consider ethnic inequality in full-time vocational schools and in apprenticeships. In part, this research also could discuss the differences in vocational schools in the various federal states. The effects of educational policies and contextual factors on different ethnic groups also could be tested. Furthermore, the impact of the higher education sector could also be analyzed with respect to the degree of ethnic inequality in the different federal states.

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Appendix

TABLE B1: Level of ethnic inequality in VET, standardized results

Federal state	AME on chances to be in VET	
	1st generation migrants	1.5/2nd generation migrants
Berlin (BE)	-0.208***	-0.109***
North Rhine-Westphalia (NW)	-0.205***	-0.071***
Lower Saxony (LS)	-0.216***	-0.052
Baden-Wuerttemberg (BW)	-0.147***	-0.073***
Bavaria (BV)	-0.134***	-0.090***
Hesse (HE)	-0.113**	-0.101***
Rhineland Palatinate (RP)	-0.123*	-0.111**

Source: Microcensus 2008–2010. Own analysis.

Note: People between 15 and 24 years of age. Controlled for age, sex, secondary school certificate and year of the survey. Weighted for different distributions of nationality groups in different federal states. Reference categories: persons without a migrant background.

* : $p \leq 0.05$; ** : $p \leq 0.01$; *** : $p \leq 0.001$

TABLE B2: Minimal solution of sufficient conditions for the outcome 1 “High degree of ethnic inequality in non-academic VET” for people with a former soviet union nationality (complex solution)

Measures of fit	Sufficient conditions	
	High amount of apprenticeships AND Low amount of full-time vocational schools	OR Low amount of full-time vocational schools AND High presence of transition system
Raw coverage	0.70	0.68
Unique coverage	0.23	0.21
Consistency	0.89	0.95
Cases explained	Bavaria, Baden Wuerttemberg	Lower Saxony, Baden Wuerttemberg
Cases not explained		-
Solution consistency		0.91
Solution coverage		0.89

TABLE B3: The role of social background on the probability to participate in VET, logistic regression

Federal state	Model 1		Model 2		Model 3	
	1.5/2nd gen.	1st gen.	1.5/2nd gen.	1st gen.	1.5/2nd gen.	1st gen.
Generation						
Berlin	-0.111**	-0.231***	-0.100	-0.096	-0.057	-0.062
Germany's eastern states	-0.440	-0.211***	-0.205***	0.047	-0.197***	0.051
North Rhine-Westphalia	-0.074***	-0.208***	-0.076***	-0.110**	-0.061*	-0.094*
Lower Saxony	-0.053	-0.194***	-0.110***	-0.109*	-0.097***	-0.101*
Baden-Wuerttemberg	-0.071	-0.149***	-0.082***	-0.161***	-0.066***	-0.148***
Bavaria	-0.090***	-0.134***	-0.056	-0.179***	-0.045	-0.158**
Hesse	-0.102***	-0.129***	-0.094*	-0.117	-0.076	-0.091
Rhineland Palatinate	-0.096*	-0.128*	-0.106***	-0.053	-0.095**	-0.041
Hamburg	-0.080	-0.114	-0.119*	-0.228**	-0.146**	-0.244***
Schleswig-Holstein	-0.171***	-0.101	-0.044	-0.163*	-0.018	-0.135

Source: Microcensus 2008–2010; own analysis.

Note: Model 1: Controlled for education, age, sex, and year of the survey. Reference groups: Native Germans. Coefficients from Table 3.4.

Model 2: Controlled for education, age, sex, and year of the survey. Reference groups: Native Germans. Only persons who are still living at their parents, without controlling for education of the parents.

Model 3: Controlled for education, age, sex, and year of the survey and here additionally for education of the father and of the mother. Reference groups: Native Germans. Only persons who are still living at their parents.

TABLE B4: Number of cases

Federal state	1st generation migrants	1.5/2nd generation migrants
Schleswig-Holstein	55	96
Hamburg	65	100
Lower Saxony	173	381
North Rhine-Westphalia	518	1,380
Hesse	211	505
Rhineland Palatinate	117	209
Baden Wuerttemberg	323	745
Bavaria	317	667
Berlin	120	200
Germany's eastern states	106	72

Source: Microcensus 2008–2010; own analysis.

4 Paper III: Trends of Ethnic Inequality in the Attainment of Vocational Degrees in Germany: A Comparison of Immigration Cohorts 1960-2001

The present article analyzes the development of the ethnic gap—with respect to the attainment of vocational degrees—between non-nationals of the first generation who migrated to Germany (between 1960–1975, 1976–1989, and 1990–2001) and native Germans (born between 1960–67, 1968–1975, and 1976–83) by examining how social integration indicators and general secondary school education may help to explain this gap. It was found that the gap between natives and migrants grew for the first generation migrants who migrated to Germany between 1990 and 2001 compared to the group who came between 1960 and 1975. Above all, the large increase in the gap over cohorts between Germans and Turks is alarming. In contrast to that the gap and its increase between the group of immigrants from Central-/Eastern-/Southeastern European countries and German natives is comparably small. The gap between non-national migrants and natives is still evident when holding constant the secondary school leaving degrees or social integration indicators, but decreases to a large extent. A low social integration has a negative effect on the attainment of vocational degrees, but the most negative impact is a low level of general secondary school education. The negative impact of a school leaving certificate even has been increasing over cohorts. Thus, part of the negative trends can be explained by a growing gap regarding the levels of general secondary education among the newer immigration cohorts and native Germans.

4.1 Introduction

A key requirement for integrating migrants into the society of a receiving country is their attainment of educational certificates. Therefore, it is alarming that current studies have shown that migrants often do not have a vocational degree.¹ as compared to their Ger-

¹After general education in secondary school, two paths are available for obtaining a vocational degree: first, the tertiary sector (ISCED Levels 5–8), which comprises the different types of higher education institutions; and second, the vocational education and training (VET) system at the upper-secondary

man peers (Diehl et al., 2009; Hunkler, 2010). Ethnic inequality in the attainment of vocational degrees has been much less explored than the inequality in the achievement of general secondary school education. Since vocational degrees are an entry requirement for most jobs, especially in countries with standardized educational systems like Germany (Müller & Gangl, 2003), and hence a crucial achievement in one's life course, research into this educational step within an educational career is needed.

Existing research on ethnic inequality in the vocational education system usually focuses on the level of inequality at a specific point in time. However, at least two historical developments have made it necessary to embed research results in a particular time context to fully understand the processes of this inequality: First, migration flows have changed over time with respect to the diversity of their ethnic groups and the causes of the migrations. In the 1960s and early 1970s, Germany recruited millions of guest workers from Greece, Italy, the former Yugoslavia, Portugal, Spain, Turkey, Morocco, and Tunisia to fill job vacancies for low-skilled workers. The 1990s marked the beginning of a further major wave of immigration to Germany through the influx of ethnic German repatriates from the former Soviet Union, Poland, and Romania. Moreover, asylum seekers, war refugees, quota refugees, Jewish immigrants from the former Soviet Union, and—since the financial crisis of 2008 and the eastern European expansion—immigrants from other EU member states, as well as temporary labor migrants who currently are a growing group of migrants to Germany (Bundesamt für Migration und Flüchtlinge, 2013). Research usually has focused on people from the former recruitment countries, while only a few studies have described the integration processes for newer migration populations. Since these current migration groups constitute an increasing share of the foreign population in Germany, it is important to analyze how the integration processes for these groups are different from those of migrants from the former recruitment countries so to better anticipate what to expect in the future regarding the degree of ethnic inequality. Second, the shift from the manufacturing to the service sector and educational expansion has changed the opportunity structures. Therefore, older studies on the ethnic inequality in the attainment of vocational degrees are not comparable to newer studies on this topic.

This present article contributes to the current research in two main ways. First, I analyze the trend in the attainment of vocational degrees for migrants who belong to different immigration cohorts. Thereby, migrants from the former recruitment countries are contrasted to groups from recent migration flows. Second I ask how differences in the level of general secondary education achieved and social segregation are correlated with the level of ethnic inequality in the attainment of vocational degrees. By comparing the results between different immigration cohorts, I increase the understanding of the impact that

and post-secondary non-tertiary level (ISCED Levels 3 and 4) (UNESCO Institute for Statistics, 2012) Within the VET system, vocational degrees can be obtained through apprenticeships (combining vocational training in a company and in a vocational school) or in full-time vocational schools.

differences in individual characteristics have in the changing economic structure of Europe. This paper proceeds as follows. Section 2 provides an overview of integration theories and previous research. Section 3 describes the data used and the analytical strategy. Section 4 presents the results, and Section 5 provides the conclusion and discussion.

4.2 Integration Theory and Empirical Results in a Changing Historical Time Context

The process of the integration of immigrants is on the one hand dependent on group size and the composition of the migrant population, and on the other hand on the attitudes toward migration held by the native population in the receiving country (Esser, 2008). Also, the “expected utility” of integration plays a crucial role for migrants. If enough alternatives exist for migrants in the receiving country in form of ethnic organizations, or if plans exist concerning a remigration back to the country of origin, integration may not be seen as useful.

Group size, the composition of the immigrant groups, and the attitudes of the native population towards migration develop over time, which results in varying conditions for the different immigration cohorts. Regarding the attitude of the native population in Germany, an increasing tolerance and decreasing discriminatory opinions towards non-nationals have evolved during the last decades (Blohm & Wasmer, 2013, 207). Policy has reflected this increasing openness to immigration with efforts in the establishment of language courses, with in the increasing acceptance of foreign educational certificates, and above all with the reform of the citizenship law in 2000, which makes naturalization easier (Heckmann, 2015). Due to these developments, it can be assumed that later migration cohorts will perform better with respect to the attainment of vocational degrees than earlier migration cohorts.

Regarding the composition of the migrant group, immigration to Germany has been increasing in diversity, especially since the 1990s (Heckmann, 2015). After the Second World War, immigration to Germany was dominated by refugees from former German territories in the East. By 1961, a total of 13.3 million refugees had immigrated to Germany. With the recruitment of workers, the late 1950s marked a new migration flow into Germany, which reached its maximum in 1973 with 2.6 million foreigners living in Germany. In the 1970s and 1980s mostly families of recruited guest workers came to Germany. Their descendants and people from the former recruitment countries still make up a large share of the population (about 30 %) who have a migrant background living in Germany today (Heckmann, 2015). Since the beginning of the Eastern and Middle European revolutions in 1989, migration now also occurs for political reasons, bringing ethnic Germans, asylum seekers, and refugees to Germany. Since the expansion of the European Union in 2004

and the financial crisis at the end of that decade, immigrants from other EU member states have constituted an increasing percentage of immigration to Germany. In 2012, immigration from Europe totaled 77.5 % of all immigrants coming to Germany—Poland (17 %), Romania (11 %), and Bulgaria (5 %) being the main countries of origin (Bundesamt für Migration und Flüchtlinge, 2013, 17–18). In contrast to the immigrants from former recruitment countries who often stayed permanently in Germany after immigration, new migration flows, especially since the 1990s have been increasingly characterized by a multiple-migration experience at the individual level, which includes emigration or remigration after some years. In 2012, about one million persons immigrated to Germany and about 700.000 emigrated the same year (Bundesamt für Migration und Flüchtlinge, 2013, 19–20). This fact is important when analyzing the integration processes of immigrants since the 1990s.

It is not clear how these developments regarding the composition of immigrants impact the integration processes in Germany. Classical assimilation theory (CAT) assumes a process of integration of migrants in the long run, or over the course of their following generations, which always occurs for every group (Park, 1914). In contrast, the Theory of Segmented Assimilation (SAT) argues that this process is not an inevitable mechanism, especially since “new immigration” developments differ greatly. Depending on individual resources and the societal context, a “downward assimilation” or an “upward assimilation combined with biculturalism” are possible (Portes & Rumbaut, 2001, 63). New Assimilation Theory (NAT) combines the very positive CAT and rather negative SAT, and argues that the integration process of the newer forms of migration is not a completely different integration process from the older immigration forms (Alba & Nee, 1999). Usually, an integration process occurs, although different ethnic groups may integrate at different paces, and for some ethnic groups, their distance from the native population may never disappear. These theories are based on developments in the USA. However, no strong evidence exists that the perspective of New Assimilation Theory might not be true for Germany as well. Empirical studies have shown that the overall chances of foreigners to obtain a vocational degree increases within the cohorts from 1960 to 1971 (Seibert, 2005). However, this result seems to vary with respect to different migrant groups. For example, Siegert (2009) examined the period 2000 to 2006 and found that participation in vocational education and training decreased, especially for young people with a Serbian, Montenegrin, or Turkish nationality; however, in contrast to these results, it was found that young immigrants from Russia had a higher rate of participation in vocational education. When considering the gap between migrants and Germans with respect to the attainment of vocational degrees, the story is different. Wagner (2005) revealed an increase of young individuals from migrant families within the population without a vocational degree over the cohorts of the 1959–1975 born.

4.2 Integration Theory and Empirical Results in a Changing Historical Time Context

Considering all these developments, I assume that the gap between non-nationals and Germans with respect to the attainment of vocational degrees decreases over immigration cohorts, although this trend may be different for different nationality groups (H1).

The second part of this article asks how the differences in the level of human and social capital correlate with the probability of attaining a vocational degree within different immigration cohorts. Human capital theory suggests that education plays a role in individual success in the labor market, since her/his productivity can be seen as the accumulation of previous education and training. Since higher education is connected with higher productivity, the higher the education, the more attractive an individual is to a company (Becker, 1993). Signaling theory assumes that the school leaving certificate and grades an individual holds are signals for human capital, which means that companies prefer applicants with higher school leaving certificates (Spence, 1974; Stiglitz, 1975). A large number of graduates from general secondary school in Germany gain their vocational education in apprenticeships (Autorengruppe Bildungsberichterstattung, 2014), where part of the training occurs within companies. When employers take school leaving certificates as signals for human capital, these qualifications play a crucial role in an application for an apprenticeship even if a formal requirement does not exist for these certificates (Solga, 2005). General secondary education also plays a role for other sectors within the vocational education system. Full-time vocational schools often require at least a medium-level school leaving certificate, and universities require a high level school leaving certificate. Consequently, higher school leaving certificates ease the transition into any kind of vocational or academic education programmes, and therefore, they are an essential requirement for the attainment of vocational degrees. Hence, to a great degree, the fact that non-nationals have on average lower school leaving certificates explains the ethnic gap in the attainment of vocational degrees (Hunkler, 2010).

The integration processes of different immigration cohorts occur in different time periods, and therefore, the determinants of the integration process may change in their relevance over immigration cohorts. Regarding the relevance of the general school leaving degree as a beneficial factor in the attainment of vocational degrees, two developments may be crucial. Due to challenges posed by globalization—the shift from the manufacturing to the service sector and demographic changes within Germany—the German vocational system has been confronted with significant developments in the last decades. With the changing economy, the educational requirements for jobs have increased (Kupfer, 2010). Moreover, due to these extended educational requirements, young people with lower secondary school leaving degrees or without school leaving certificates are being challenged by a much stronger competition in the workforce (Solga, 2005). The fact that native Germans have benefitted from this educational expansion more than foreigners (Riphan, 2005) may have widened the educational gap between immigrants and natives.

Both facts lead to the assumption that a low general secondary education increasingly explains the attainment of vocational degrees over immigration cohorts (H2).

According to Granovetter (1974), a social network can be crucial to the successful job search or apprenticeship position. Furthermore, classical assimilation theory assumes that a social network of people from a receiving country will help immigrants to foster the integration process, whereas a social network of people from the country of origin should be abandoned (Esser, 1980). Roth (2014) adds to this knowledge by showing that, above all, the network of the parents plays a crucial role in the search for an apprenticeship. Due to different developments, the importance of a social network with Germans could change over immigration cohorts. Blohm and Wasmer (2013, 211) showed that immigrant contact with German natives has increased since the 1980s in all parts of everyday life. With the follow up migration from these same countries, the demand for, and also the supply of, ethnic resources and services has increased (Esser, 2008). This means, for example, that migrants now also could get an apprenticeship at an organization whose owners have a migrant background as well, and they might, therefore, be less dependent on a German social network.

As the support from ethnic groups grow, I assume that the impact of having contact with native Germans regarding the attainment of vocational degrees decreases over immigration cohorts (H3).

4.3 Data & Methods

The analyses are based on pooled German microcensus data from 1996 to 2011 (German Labor Force Survey)². The German microcensus is the official representative survey of the population and the labor market in which 1 % of all households in Germany are surveyed annually. The size of the sample and the high response rate due to the fact that participation in the micro census is compulsory³—also for individuals with a foreign nationality—are two of the advantages of these data. Since Scientific Use Files (SUF) are available beginning in 1973⁴, this data makes it possible to analyze patterns of ethnic inequality using a trend design.⁵ Nevertheless, this trend analysis begins with the survey year of 1996, since from this year forward, vocational degrees that are full-qualifying can be distinguished from not full-qualifying degrees (for example, semi-skilled training) in a more precise way.

²The results are not weighted, since the change in the expansion factors in 2005 makes a comparison difficult. The disadvantage of unweighted results is that since microcensus data is a clustered sample, standard errors could be underestimated (Schimpl-Neimanns, 2010). However, I calculated a regression model that includes the cluster, which showed that the results are robust.

³The rate of household non-response—2.5 to 3 %—is relatively low.

⁴However, information on education is only available since 1976.

⁵For more information on these data and harmonization procedures, see <http://mz-trendfile.gesis.org/>.

TABLE 4.1: Sample composition

Nationality/immigration cohort	1960–1975	1976–1989	1990–2001	Total
Turkey	2,089	5,048	556	7,693
Former recruitment countries	1,511	1,775	698	3,984
Central/Eastern/Southeastern countries	83	410	129	622
Non-european countries	68	558	243	869
Nationality/Birth cohort	1960–1967	1968–1975	1977–1983	Total
German	238,329	315,145	131,229	684,703

Source: Microcensus 1996–2011. Own analysis.

The analyses in the present article compare the attainment of vocational degrees by immigrants of the first generation who immigrated to Germany before the age of 15 to the attainment of vocational degrees by natives (the age range of both groups is 28 to 35). Students in general secondary school or vocational education programmes are not included in the sample. Ethnic inequality is compared within different immigration cohorts—migrants who moved to Germany between 1960 and 1975, 1976 and 1989, or 1990 and 2001.⁶ These immigration cohorts are compared to Germans who are differentiated by three birth cohorts—Germans who were born between 1960 and 1967, 1968 and 1975, or 1976 and 1983 (for an overview of the sample by nationality and immigration/birth cohort see Table 4.1. The subdivision of the birth cohorts for Germans were created according to the mean birth date of the immigration cohorts.

To control for the differences in demographic characteristics between the cohorts, binary logistic regressions were calculated. The outcome variable describes the existence or non-existence of a vocational degree. All models control for the nationality groups⁷, age, federal state, sex, and year of the survey. Regarding the second research question that asks for the impact of the differences in the endowment of human and social capital, two additional models were calculated, including the general school leaving degree⁸ and the immigrant-specific assimilation indicators such as Germans in the household or the percentage of non-nationals living in the neighborhood.

The group of immigrants and natives is distinguished by nationality. Individuals who only hold a German citizenship are defined as German nationals. The immigrant popula-

⁶These immigration cohorts were build according to the immigration flows described in section 2.

⁷The nationality groups are Turkey; other former recruitment countries (Italy, Spain, Greece, Portugal, Bosnia-Herzegovina, Croatia, Jugoslavia [Serbia Montenegro]); Central-/Eastern-/Southeastern European countries (Poland, Rumania, Slovakia, GUS, rest of Europe); other non-European countries (Morocco, Iran, Vietnam, other African countries, other American countries, other Middle East countries, other South Asian countries, East Asia, other non-European countries). EU-25 countries—except Poland, Slovakia, and Czech Republic—and the USA are omitted from the analyses, since their differences with native Germans is very small, and so to simplify the results that are shown.

⁸The German secondary school system is highly stratified. The bottom tier, *Hauptschule*, provides basic skills; the middle tier, *Realschule*, provides intermediate skills (*Mittlere Reife*); and the top tier, *Gymnasium*, leads to *Abitur*, the higher-education entry qualification (Secretary General of the Standing Conference of the Ministers of Education and Cultural Affairs, 2013).

tion is defined by having a foreign nationality.

The definition of vocational degree includes apprenticeships, full-time vocational schools, and university/university of applied science degrees. As the microcensus is a household survey, information about other household members are available. This information is used to create a the variable only non-national in the household. The variable is coded in three categories. The first includes Germans and foreigners who live with Germans in one household. The second category is defined by individuals who have a foreign nationality and are living with at least one other non-national in one household. The third category distinguishes single households from the other two categories. To indicate the percentage of non-nationals living in the neighborhood, the information about the primary sampling unit the individual belonged to was used. Primary sampling units are units which were chosen in order to draw the sample for the microcensus. From the 1990s forward, the primary sampling units have included, on average, nine dwellings (six dwellings in the SUF). The indicator was calculated by counting the number of foreigners in the neighborhood and then setting this number in ratio with the total number of people living in the neighborhood. I thereby excluded the household the individual is living in.

4.4 Results

The following section first describes the distribution of the characteristics of the nationality and the cohort groups. Then, the development of ethnic inequality over cohorts and the impact of education and social integration on the attainment of vocational degrees will be described.

4.4.1 Descriptive Results

A descriptive overview of the distribution of general school education and social integration indicators shows some important differences between nationality and cohort groups that will be important to an interpretation of the results (Table 4.2). Native Germans reached, on average, higher secondary school leaving certificates than the immigrant groups, and more often live in neighborhoods with an, on average, lower percentage of non-nationals. Within the group of non-nationals, people with a Turkish nationality have the, on average, lowest general school education, and non-nationals from Central/Eastern/Southeastern Europe and other non-European countries have the highest general school education. However, differences exist between the immigration cohorts—the gap in the level of secondary school education increases between non-national newer immigration cohorts and native Germans.

Regarding the composition of the neighborhood and of the household, again non-nationals from Turkey are more segregated from natives, and non-nationals from Central-/Eastern-

/Southeastern European countries are less segregated from natives than other nationality groups.

Over cohorts, the social segregation of non-nationals seems to decline. Non-national younger cohorts less often live only with non-nationals in a household or in neighborhoods with a high percentage of foreigners, with one exception—no clear change exists in the composition of neighborhoods for first generation non-national immigration cohorts from former recruitment countries. The multivariate analysis of the following section analyzes the effects of these differences and developments on the level of ethnic inequality with respect to the attainment of vocational degrees.

4.4.2 The Development of Ethnic Inequality over Cohorts

This section of the article analyzes the differences in the attainment of vocational degrees between nationals and non-nationals, and investigates if this gap narrows over immigration cohorts. The results in Table 4.3 show that the opportunity for non-nationals to obtain a vocational degree is lower than nationals for all immigration cohorts (Model 1). However, differences exist for various nationalities. For example, non-nationals from Turkey or other non-European countries are amongst those groups with the largest differences to natives with respect to the attainment of vocational degrees. The gap with natives is comparably smaller for individuals from Central-/Eastern-/Southeastern European countries and from other former recruitment countries. Those individuals with a Turkish nationality who migrated to Germany between 1960–1975 have a 42 percentage point lower chance of obtaining a vocational degree compared to Germans, whereas the gap for individuals with a nationality from a Central-/Eastern-/Southeastern European country who migrated to Germany between 1960–1975 is only 22 percentage points lower (Table 4.3, Model 1).

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TABLE 4.2: Explanatory variables: Foreigners by immigration cohort/Germans by birth cohort

		German	Turkey	Former recruit- ment countries	Central/ Eastern/ South- eastern countries	Non- european countries
Vocational degree available						
60-75/60-67	Mean	0.89	43.6	0.62	0.65	0.61
	S.D.	0.32	0.50	0.49	0.48	0.49
76-89/68-75	Mean	0.88	0.35	0.59	0.63	0.38
	S.D.	0.32	0.48	0.49	0.49	0.49
90-01/76-83	Mean	0.88	0.22	0.53	0.54	0.32
	S.D.	0.33	0.42	0.50	0.50	0.47
General school leaving degree						
Low						
60-75/60-67	Mean	0.32	0.79	0.65	0.60	0.54
	S.D.	0.47	0.41	0.48	0.49	0.50
76-89/68-75	Mean	0.27	0.86	0.69	0.53	0.69
	S.D.	0.45	0.34	0.46	0.50	0.46
90-01/76-83	Mean	0.24	0.87	0.80	0.64	0.67
	S.D.	0.43	0.33	0.40	0.48	0.47
Medium						
60-75/60-67	Mean	0.42	0.16	0.25	0.28	0.23
	S.D.	0.49	0.37	0.43	0.45	0.42
76-89/68-75	Mean	0.42	0.12	0.23	0.26	0.18
	S.D.	0.49	0.32	0.42	0.44	0.38
90-01/76-83	Mean	0.38	0.14	0.17	0.24	0.28
	S.D.	0.49	0.35	0.38	0.43	0.45
High						
60-75/60-67	Mean	0.27	0.07	0.12	0.14	0.28
	S.D.	0.44	0.25	0.32	0.35	0.45
76-89/68-75	Mean	0.32	0.04	0.12	0.26	0.21
	S.D.	0.47	0.20	0.32	0.44	0.41
90-01/76-83	Mean	0.39	0.04	0.07	0.18	0.16
	S.D.	0.49	0.20	0.26	0.39	0.37
Percentage of non-nationals in neighborhood						
60-75/60-67	Mean	5.55	29.66	21.62	21.40	16.22
	S.D.	14.14	31.94	28.76	29.83	19.87
76-89/68-75	Mean	6.39	32.05	24.01	19.55	24.08
	S.D.	14.97	31.63	28.64	25.41	28.98
90-01/76-83	Mean	7.84	29.55	23.09	15.62	21.82
	S.D.	16.22	28.84	27.07	23.11	26.17
Only non-nationals in household						
60-75/60-67	Mean	0.00	0.71	0.52	0.49	0.49
	S.D.	0.00	0.45	0.50	0.50	0.50
76-89/68-75	Mean	0.00	0.72	0.54	0.39	0.41
	S.D.	0.00	0.45	0.50	0.49	0.49
90-01/76-83	Mean	0.00	0.44	0.41	0.25	0.37
	S.D.	0.00	0.49	0.49	0.43	0.48

Source: Microcensus 1996-2011. Own analysis.

TABLE 4.3: Logistic regression on attainment of vocational degrees (average marginal effects)

Immigration cohort	1960–75			1976–89			1990–2001		
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3
Ref.: German (by birth cohorts 60–67, 68–75, 76–83)									
Turkey	-0.417*** (0.01)	-0.253*** (0.01)	-0.179*** (0.01)	-0.496*** (0.01)	-0.297*** (0.01)	-0.200*** (0.01)	-0.634*** (0.02)	-0.364*** (0.02)	-0.313*** (0.02)
Former recruitment countries	-0.235*** (0.01)	-0.141*** (0.01)	-0.096*** (0.01)	-0.280*** (0.01)	-0.144*** (0.01)	-0.098*** (0.01)	-0.351*** (0.02)	-0.140*** (0.01)	-0.110*** (0.01)
Central/Eastern/Southeastern countries	-0.219*** (0.05)	-0.128** (0.04)	-0.084* (0.02)	-0.230*** (0.02)	-0.139*** (0.02)	-0.104*** (0.02)	-0.318*** (0.04)	-0.158*** (0.03)	-0.141*** (0.03)
Non-europ. countries	-0.271*** (0.06)	-0.199*** (0.05)	-0.157** (0.05)	-0.448*** (0.02)	-0.287*** (0.02)	-0.238*** (0.02)	-0.519*** (0.03)	-0.334*** (0.03)	-0.301*** (0.03)
Ref. <i>Mittlere Reife</i>									
<=lower secondary school		-0.170*** (0.00)	-0.169*** (0.00)		-0.208*** (0.00)	-0.205*** (0.00)		-0.246*** (0.00)	-0.242*** (0.00)
Higher secondary school		0.012*** (0.00)	0.012*** (0.00)		0.020*** (0.00)	0.020*** (0.00)		0.026*** (0.00)	0.027*** (0.00)
Only non-nationals in household			-0.028** (0.01)			-0.023*** (0.01)			-0.014 (0.01)
Single household			-0.013*** (0.00)			-0.008*** (0.00)			-0.003 (0.00)
P. of non-nationals in neighborhood			-0.001*** (0.00)			-0.001*** (0.00)			-0.001*** (0.00)
Age	yes								
Sex	yes								
Survey year fixed effects	yes								
Federal state fixed effects	yes								
Observations	651279	651279	651279	655149	655149	655149	649443	649443	649443
AIC	154271.5	141397.3	140744.2	218330.5	196028.3	194525.9	96192.7	84249.7	83670.6
Pseudo R-squared	0.043	0.123	0.127	0.054	0.151	0.157	0.037	0.157	0.163

Source: Own calculations based on Microcensus 1996–2011.

Note: Foreigners by immigration cohorts, Germans by birth cohorts.

***: $p \leq 0.001$; **: $p \leq 0.01$; *: $p \leq 0.05$; standard error in brackets

When comparing the attainment of vocational degrees over the diverse range of immigration cohorts, we can see that the gap between the first generation non-nationals and natives widens. Non-nationals from Turkey show the largest shift as the gap between them and natives—with respect to the attainment of vocational degrees—grows from 42 percentage points for those who immigrated to Germany between 1960–1975 to 63 percentage points for those who immigrated between 1990–2001. The group of non-nationals from non-European countries also shows a large increase in the gap to natives with respect to the attainment of vocational degrees, but since this group is very diverse, I will not try to interpret this data. The gap between natives and non-nationals from other former recruitment countries and from Central-/Eastern-/Southeastern European countries also increases over the diverse range of immigration cohorts, but the increase is just ten or eleven percentage points, only half as large as the increase in the gap for the Turks. The next subsection shows the development of ethnic inequality with respect to the attainment of vocational degrees after controlling for the general secondary school leaving degree and social integration indicators.

4.4.3 The Contribution of General Secondary School Education

As suggested in previous research, general secondary school education plays a crucial role in the attainment of vocational degrees. Holding a lower secondary school leaving certificate (*Hauptschulabschluss*) or having no school leaving degree has a strong negative effect on the probability of obtaining a vocational degree—the probability is reduced by 17 percentage points, for the first generation non-national cohort group who immigrated to Germany between 1960 and 1975 and for the comparison group of native Germans (Table 4.3, Model 2). However, it seems that the negative effect of a low general secondary school education increases over cohorts. For the immigration cohort 1976–1989, a low or absent general school leaving certificate reduced their chances to obtain a vocational degree by 21 percentage points, and for the youngest cohort 1990–2001, the reduction is by 25 percentage points.

When holding constant the general school leaving degree, the negative effect of having a foreign nationality persists but declines to a large extent. After controlling for secondary school education, the largest decrease in the gap regarding the attainment of vocational degrees is found for first generation Turks. Interestingly, the increase in the gap between non-nationals and natives over immigration cohorts is a lot smaller after general school education is held constant. There are two possible explanations for this finding. First, as we saw in the descriptive results, the gap between natives and immigrants in the level of general school education grows over immigration cohorts, as natives seem to have profited more from educational expansion than immigrants. Second, to have a higher level of general school education became more important in order to secure a place in the vocational education system over cohorts.

4.4.4 The Contribution of Social Integration

In the next step of the analysis, indicators of social integration are added to the model (Table 4.3, Model 3). Individuals with a foreign nationality who immigrated to Germany during the years 1960–1975, and who do not live in a household with a person who has German citizenship, have a three percentage points lower chance of obtaining a vocational degree. The effect of not living in a household with a German citizen is rather small compared to the effect of general secondary school education, which may be due to the fact that this indicator is only available for the small group of immigrants in the sample. In the last immigration cohort, this small effect decreases to a difference of one percentage point, which supports the hypothesis that with increasing support of an ethnic social network, contact with German natives decreases in importance with respect to the attainment of vocational degrees. Also, social integration explains the gap between natives and Germans, with respect to the attainment of vocational degrees, to a smaller extent for later cohorts than earlier cohorts. However, the effect of not living with a German in one household is small, and decreases over cohorts. Therefore, these results should not be overinterpreted.

Regarding the neighborhood in which non-nationals are living, the following can be assumed. An increase of one percent of non-nationals in a neighborhood decreases their chances of obtaining a vocational degree by 0.1 percentage points. However, these results do not provide empirical evidence that the negative impact of living in a neighborhood with a high percentage of foreigners decreases over cohorts.

4.5 Conclusion and Discussion

The present article analyzed the development of the ethnic gap—with respect to the attainment of vocational degrees—between non-nationals of the first generation who migrated to Germany (between 1960–1975, 1976–1989, and 1990–2001) and native Germans (born between 1960–67, 1968–1975, and 1976–83) by examining how social integration indicators and general secondary school education may help to explain this gap. The article is a contribution to the literature on ethnic inequality in vocational and tertiary education, which is very rare at present.

The main findings can be summarized as follows. The results of this article are comparable with previous research that found an ethnic gap in the attainment of vocational degrees, which is more or less pronounced for different nationalities. One of the contributions of this paper is to show the development over immigration cohorts. It was found that the gap between natives and migrants grew for the first generation migrants who migrated to Germany between 1990 and 2001 compared to the group who came between 1960 and 1975. Above all, the large increase in the gap over cohorts between Germans and Turks is alarming. In contrast, the gap between the group of Central-/Eastern-/Southeastern

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European countries and natives with respect to the attainment of vocational degrees is smaller compared to the migrants from former recruitment countries. Also, this latter group contributes to a growing gap in the attainment of vocational degrees compared to the attainment of these degrees by native Germans, although the increase for migrants from former recruitment countries is only half as large as for the Turks. Reasons for the increase in the gap between non-nationals from Central-/Eastern-/Southeastern European countries and Germans could be that the groups of migrants from Central-/Eastern-/Southeastern European countries is very diverse and constantly changing in its composition. As a whole, this group is characterized—compared to immigrants from former recruitment countries—by more emigration and remigration, which lead in turn to an interruption of integration processes and the establishment of ethnic capital. Certainly more research is needed on this topic. The results show the example of Germany regarding the integration of old versus new migration. Therefore, the results for Germany work as a test case to help to identify the trends that currently are emerging in other countries as well.

The gap between non-national migrants and natives is still evident when holding constant the secondary school leaving degrees or social integration indicators, but decreases to a large extent. A low social integration has a negative effect on the attainment of vocational degrees, but the most negative impact is a low level of general secondary school education as previous research showed as well. Having a low secondary school leaving degree explains a large part of the ethnic gap in the attainment of vocational degrees as previous research also showed. This article now showed in addition to previous research that that the negative impact of a school leaving certificate has been increasing over cohorts. Consequently, a great deal of the negative trends can be explained by increasing weight of the level of secondary school education and by the growing gap in the level of secondary school education between natives and migrants due to educational expansion. The policy implication of this result is obvious—fostering the achievement of higher general secondary school education among migrants is crucial to minimize the problems in the transition to vocational education. Moreover, when holding the level of general secondary school education constant, the negative trend for first generation Turks is still large. Further research should examine the potential causes for this alarming development. In sum, these results support the New Assimilation Theory, which predicted that for most groups an integration process will happen, although different ethnic groups may integrate at different paces, and for some ethnic groups, their distance from the native population may never disappear.

Unfortunately, I could not analyze the impact of parental characteristics in this article, since the availability of such information depends on the fact that an individual is living with her/his parents in the same household, which typically is not the case with individuals aged 28 and above. Especially in Germany, the negative impact of having a

migrant background is strongly linked to social background. Consequently, not controlling for parental characteristics can be seen as a limitation of this article. Also, the results for the impact of neighborhood composition need to be interpreted with caution, since neighborhoods with a high percentage of foreigners often are also economically-deprived areas.

Finally, the exact impact of educational expansion or a further development of the vocational education system—such as variations in the supply of apprenticeships or school-based vocational education over for immigration cohorts—could not be investigated in this paper and remains to be analyzed.

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5 Eidesstattliche Erklärung

Bei der eingereichten Dissertation handelt es sich um mein eigenständig erstelltes eigenes Werk. Ich habe nur die angegebenen Quellen und Hilfsmittel benutzt und mich keiner unzulässigen Hilfe Dritter bedient. Insbesondere habe ich wörtliche Zitate aus anderen Werken als solche kenntlich gemacht. Die Arbeit oder Teile davon habe ich bisher nicht an einer Hochschule des In- oder Auslands als Bestandteil einer Prüfungs- oder Qualifikationsleistung vorgelegt.

Ort, Datum

Karin Schuller