Schumpeter School
of Business and Economics

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Andrea Riedel
Kerstin Schneider
Claudia Schuchart
Horst Weishaupt

BERGISCHE
UNIVERSITÄT
WUPPERTAL

School Choice in German Primary Schools:

How binding are school districts?[†]

Andrea Riedel

Schumpeter School of Business and Economics, University of Wuppertal

Kerstin Schneider[‡]

Schumpeter School of Business and Economics, University of Wuppertal and CESifo

Claudia Schuchart

ZBL, University of Wuppertal

Horst Weishaupt

DIPF, Frankfurt

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[‡] Email: schneider@wiwi.uni-wuppertal.de

Abstract. In this paper we look at school choice in primary schools in Germany. The data used is from Wuppertal, a major city in North-Rhine Westphalia (NRW), where school districts were abolished in 2008 to allow for free school choice. Here we look at the situation before 2008 to learn more about choice in the presence of school districts. Our analysis shows that it is not uncommon to visit a primary school that is not the assigned public school. Moreover, parents choose schools taking into account the distance to school, the quality and the socioeconomic composition of the school. Families from disadvantaged neighborhoods tend to send their children to the assigned school. A high percentage of migrants and/or economically disadvantaged families in the school district, however, induces parents to choose another school. Advantaged families make segregating choices, whereas the results for disadvantaged are not clear cut. The negative external effect of choice on the composition of the not chosen school is significant and the level of segregation in the primary schools is high and exceeds the level of residential segregation.

1.   Introduction

Unlike in other countries, school choice is not a prominent topic in education research in Germany. One reason might be that choice appears to be rather limited, because of the existence of school districts in particular at the primary school level. At the level of secondary schooling, sorting is primarily driven by the rigid German tracking system, where students are allocated to the various tracks according to past performance or academic ability. But school choice and ethnic school segregation exist in Germany, as was shown by Kristen (2005), and clearly deserve more attention.

 Past research and also the political discussion of the tracking system have pointed out that the German school system leads to social and ethnic disintegration with strong effects of the socioeconomic background on performance in school (Entorf & Minoiu, 2005). Interestingly, the focus of research and also the political debate has been more on tracking and selection into secondary schools (Dustmann, 2004) or even tertiary education. Research on sorting in earlier education in Germany has not been studied in much detail yet. This is a shortcoming, as recent literature points out the importance of early education and the associated high returns (Cunha, Heckman, Lochner & Masterov, 2006). Pre-primary and primary education is important for educational success and in particular for the opportunities of disadvantaged groups. In this paper the focus is on primary education and in particular on the determinants and effects of primary school choice in Germany.

School choice has been analyzed in numerous international studies. Choice is thought to have a positive impact on competition between schools and therefore might increase the quality of schooling (Hoxby, 2003). And also, choice can give parents a chance to find the school that fits their preferences for education best. However, school choice has potential negative effects as well. Choice might increase ethnic and social segregation (Burgess & Briggs, 2006). Moreover, allowing parents to apply at a school of their choice does not necessarily mean that the child is accepted at the chosen school. The capacity of the school and the distance to school remains the most important restrictions to choice. Furthermore, due to limited economic, cultural, and social resources (Bourdieu 1983) school choice tends to be not or at least less practiced in disadvantaged families.

In particular in the US the issue of school choice has drawn considerable attention. The intention of increased school choice by means of charter school programs was to reduce racial and social segregation and to improve the chances for education of the more disadvantaged groups (Hanushek, Kain, & Rivkin, 2002, Fryer & Levitt, 2004). The results of many studies suggest the opposite (Lankfort & Wyckoff, 2001; Bifulco, Ladd & Ross, 2008).

School choice tends to increase rather than to decrease segregation. Walsh (2008) does not argue against this finding but claims that even without choice the within-school heterogeneity is so low, that cream-skimming of the remaining high ability kids would not have a sizable effect on those left behind. Echenique and Fryer (2007) and Echenique, Fryer, & Kaufman (2006) also point to the fact that not only between school segregation but also within school segregation matters. A percentage of more than 25 percent black students in a school results in complete segregation, with respect to social interactions of the different ethnic groups.

In summary, the international literature has identified the distance to school, the socio-economic background of the student, and the composition and the quality of the school as relevant variables for explaining school choice. Also, more choice tends to increase social and ethnic segregation and only little is known about the potential benefits of school choice.

In this paper we look at school choice in a German context and try to explain choices made by parents of primary school children. The German education system is strongly influenced by the federal structure of Germany. Each federal state can decide on its schooling system. This has led to 16 education systems in Germany, with a lot of variation between the federal states. For instance, each state decides on whether there should be central exit exams (Jürges & Schneider, 2009) or how many tracks there are in secondary education. Even the number of years in elementary school differs between the federal states and there is no trend of convergence to a common education system in Germany. While the federal system imposes substantial cost, the diversity within Germany leads to numerous quasi-experimental situations that can be exploited for research.

One interesting feature of German federalism in schooling that we are going to exploit in this study is that two German states allow for public denominational schools, i.e., schools that are fully publically funded – just as other public schools – but are (mostly) Catholic or Protestant schools. This gives parents an option not to choose the assigned public school, even though there are school districts. The two states with fully publically funded denominational schools are Lower Saxony (but only in some smaller regions) and North-Rhine Westphalia (NRW). NRW is with a population of 18 Mio the most populous German state and it is also very densely populated (528 inhabitants per km^2). Moreover, in 2005 the NRW government decided to allow for more choice by abolishing the school districts. The school year 2008/2009 was the first in which every community had to enforce the new rule. In this paper we evaluate school choice before 2008, to get a better understanding of how binding school districts are in practice, how denominational schools affect the sorting of the students and how German parents choose the primary school for their children. The data used in this paper

is from Wuppertal, a city with a population of about 350.000 that is located in NRW, south of the Ruhr area and east of the Rhineland. The study shows that it is not uncommon to visit a primary school that is not the public school in the school district.

Moreover, we confirm many of the findings from international studies. When parents choose a school, they take into account the distance to the assigned school and the distance to the alternatives, the quality of the school, and the socioeconomic composition of the school. Families from disadvantaged neighborhoods tend to send their children to the assigned school. If the public school is in a school district with a high percentage of migrants and/or economically disadvantaged families, parents tend to choose another school. Advantaged families make segregating choices, i.e., they choose schools with a more favorable composition. Disadvantaged families on the other hand tend to make integrating choices, i.e., if a disadvantaged family chooses a school they choose a school with a more favorable student body. Overall, however, school choice increases segregation to a level that is substantial and exceeds the level of residential segregation.

The paper is organized as follows. Section 2 gives some more information on the institutional details of school choice in NRW and also in Wuppertal. The data is described in Section 3 and in Section 4 we explain our analytical strategy and formulate our hypothesis. Section 5 presents the results and we conclude and give an outlook for future research in Section 6.

2.   School choice in North-Rhine Westphalia: The situation before 2008

At first sight, there is rather limited school choice in German primary schools. Students are assigned to a public school (Gemeinschaftsgrundschule) in a school district. However, choice is not as limited as it appears to be. First, parents can apply for permission to send their child to a different school (§39 SchulG-NRW (school law NRW)). They have to present a convincing argument like a child care person in another school district. The quality or the social composition of the school are not acceptable arguments. The application is discussed by the principals of the chosen school and the principal of the assigned school in the school district of residency. The final decision is made by the school authority. To our knowledge, there is no research that analyzes the permissions to visit a not assigned public primary school in Germany.

Second, there are public denominational schools (Bekenntnisschule). Public schools and public denominational schools do not charge school fees. They are fully publically funded. In the following, we simply label them public schools and denominational schools.

In addition to the public and the denominational schools, there are few private primary schools, which however will be disregarded in this study. Private schools might charge a school fee and are often Waldorf schools, Montessori schools or private denominational schools with a strong focus on the religious education.[1] Private denominational schools are partly funded by the church. This is not the case with the public denominational schools in NRW. Children in NRW have the right to attend a denominational school in their community or a neighboring community, if the child belongs to that denomination (§26 SchulG-NRW). They might also be admitted to the denominational school if they don't belong to the school's denomination, but the parents wish their child to be educated according to that denomination. This is clearly a soft condition, which is not verifiable. Moreover, children of a different denomination might be admitted if there is no school of the child's denomination that can be reached within a reasonable distance.

One fairly unknown feature of the public denominational school system in NRW is that parents can vote to turn a public school into a public denominational school (§27 SchulG-NRW). As a result, denominational schools exist in some but not all municipalities. For instance the cities that are evaluated in the context of a larger school choice project are the two neighboring cities Wuppertal and Solingen. Wuppertal has 356.000 inhabitants and runs 48 public primary schools, 11 public Catholic schools, and 2 public Protestant schools. Solingen has a population of 161.416 inhabitants and runs 24 primary schools all of which are public schools. Unlike in Wuppertal, denominational schools were disestablished in the 1965s by the local government in Solingen and were not reintroduced again.

The present paper analyzes school choice in Wuppertal before 2008. We use data from the official statistics on the level of the school districts, data on the city block level, data from the school statistics and individual level data from the schools, to get learn about the determinants of school choice in the presence of school districts.

Wuppertal is a city with a heterogeneous population. The unemployment rate in 2007 stood at 12.6 percent and the welfare dependence rate was 16.5 percent, which is above the

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[1] Wuppertal has two Waldorf schools, one Catholic private school, one Greece primary school, and one private primary school.

German as well as the NRW level. As Figure 2 illustrates, Wuppertal is not only a city with economic problems, but also a city with a lot of socioeconomic diversity. Just looking at the welfare dependency rates in the school districts in Figure 2a, it shows that welfare dependency is in particular high in the middle axis of the city around the famous Wuppertaler Schwebebahn (suspension railway). The suspension railway is not only the city's landmark but also the most important element of the public transportation system.

Welfare dependency drops considerably if one moves away from the suspension line, which is in the Wupper valley, to the outer parts, the mountains of Wuppertal. A rather similar picture is obtained, when looking at the distribution of immigrants in Wuppertal in Figure 2b. Furthermore, the parts of Wuppertal close to the axis are also more densely populated, when compared to the outer city regions.

3.   The data description and summary statistics

The data used in this analysis is from different sources and different years. Most of the data is from 2007. The exception is the welfare dependency rate on the school district level that was only available for 2006. Table 1 summarizes the data for the total sample in column (1), Catholic and Protestant denominational schools in (2) and (3), and public schools in column (4). Note that three schools did not provide the student data and one school was excluded because it is about to be closed. The total number of students in the sample is 11976.[2] 9494 students visit a public school, 2124 students attend a Catholic school and 358 students chose a Protestant school.

The first interesting result of the sample statistics is that despite the still existing school districts 33 percent of the students do not visit the assigned public schools, either because they attend a denominational school or they attend a different public school, which applies to 15 percent of the sample. The percentage of students who visit a different public school seems high, since parents have to apply to be admitted to another public school and, as mentioned earlier, they have to present persuasive arguments.

Moreover, we can calculate the distance between the student's home and school. Note that for each student there is, besides an assigned public school, also an assigned Catholic school and an assigned Protestant school.

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[2] This accounts for 92 percent of primary school students in Wuppertal in 2007/2008.

The average distance to the chosen school is 0.744 km for the overall sample (column (1)). In column (2) only students who visit a Catholic school are included. On average, the distance is 0.68 km, which is even a little bit shorter than the overall average. Thus students who visit a catholic school do not incur extra travelling time. This indicates that Catholic schools might be chosen because they are convenient to reach and Catholic schools are located in the densely populated parts of Wuppertal. The distance is with 1.19 km substantially longer for those who visit a Protestant school. This is expected, because there are only two Protestant schools in Wuppertal (cf. Figure 1). We also report the distance to the assigned public school. The average distance is 0.622 km, and for students who attend a public school, the distance to the assigned school is with 0.591 km even shorter. When comparing the distance to the chosen and the assigned school, it turns out that as expected, the distance to the chosen school is slightly longer than the distance to the assigned school – with the exception of the Catholic schools. Children who attend a Catholic school have on average a shorter way to school. Similarly, we find that Protestant schools are visited by those who live relatively close to the school. Thus distance appears to be an important factor when choosing a school. Figure 3 shows the distribution of distances to the various types of schools in more detail.

The data also contains information on the availability of alternatives and their costs measured by the distance to another school. Provided that the quality of a school can be described by the composition of socially advantaged and disadvantaged students, a variable measuring the distance to the next school with a more favorable composition can be constructed. Here, we use the distance to the next school with a five percentage point lower rate of students with migration background (compared to the assigned school)[3]. The average distance is two km for the total sample and about one km for children who attend a denominational school. Thus students, who are enrolled in a denominational school, can find a school with a five points lower percentage of migrants – compared to the assigned public school – within one km of their home.

While the ethnic composition of a school might be one aspect of school choice, school quality is another. School quality is clearly hard to asses and no generally accepted measure of school quality exists. While in other countries student achievement, as one possible indicator, is measured and published, Germany is lacking comparable information. Hence we follow a different strategy to gather information on school quality.

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[3] If there is no school with a five percentage points lower rate of immigrants, the distance to the school with the lowest percentage of immigrants is chosen.

After primary school, German students get a (more or less binding) recommendation for a secondary school. In NRW, the choice is between a basic track school, an intermediate track school, an academic track school, and a comprehensive school, which has an internal tracking system as well. The recommendation allows the student to choose between a comprehensive school and one of the three other tracks. The most prestigious is the academic track school. Students can always transfer to a lower track school than was recommended by the primary school teacher. To calculate a proxy for the availability of a higher quality school, we used the distance to the next school with a five percentage points higher transfer rate to the academic track.[4] On average the distance is 1.4 km and as before, students of denominational schools live closer to better schools.

In addition to the distance variables, we also have information on the migration status[5] and the religious denomination. The information on the migration status, measured by citizenship, is available for 87 percent of the sample and the denomination is known for 70 percent. Within these subsamples, 21 percent of the students are non-Germans and 20 percent are Muslims.[6]

Besides the information on the student level, we can enrich the data with register data for 2452 city blocks in Wuppertal. We have information on nationality and welfare dependency on the city block level and the school district level that we can assign to each student. This serves as a description of the students' neighborhood, which is an important predictor for the socioeconomic performance of children (Borjas, 1995). For instance, if a student lives in a city block with 15 percent migrants, which is the sample average, he or she will be non-German with a probability of 15 percent. Interestingly the proportion of migrants is higher than the overall average, when looking at the composition of the Catholic schools. One explanation could be that migrants from EU countries like Italy and Spain tend to keep their citizenship, even though the families have been living in Germany for generations. Since they are often Catholics, they might also tend to visit Catholic schools. Moreover, as Figure 1 shows, the Catholic schools are directly located in areas with a high percentage of migrants, hence they are also convenient to reach for students with a migration background.

When it comes to issues of integration, citizenship has become an increasingly less reliable indicator of integration. As has been recently shown in an integration report, the

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[4] If there is no school with a five percentage points higher academic track transfer rate, the distance to the school with the highest transfer rate is chosen.

[5] The available information is German versus non-German according to the students' citizenship.

[6] Information the denomination is available from 42 schools (34 public, 6 Catholic, 2 Protestant) and the migration status is known for students of 52 schools (41 public, 9 Catholic, 2 Protestant).

Turkish people are the least integrated group among the major ethnic groups in Germany (Berlin Institut für Bevölkerung und Entwicklung, 2009). But since the children in families of Turkish descent are mostly born in Germany, they have the German citizenship and are not counted as migrants in the official statistics. For instance, the average percentage of Turks among the children aged 6-10 in a city block is only 5 percent, which underestimates the number of children of Turkish descent in Wuppertal. This conjecture is supported by looking at the school statistics. From the school statistics 2005 we know that 19 percent of the students in primary schools are Muslims and the majority of the Muslims in Wuppertal have a Turkish background. This indicates that the percentage of Turkish people in the official statistics underestimates the size of the population with a Turkish background.

In order to describe the socioeconomic background of the students by characterizing the neighborhood, information on welfare dependency rates are also included. The lowest welfare dependency rates are found for the Protestant schools. Students in Protestant schools live in city blocks with average welfare dependency rates of 14 percent. This compares to 21 percent for students in Catholic schools. Thus the average socioeconomic composition is less favorable in Catholic schools than in public or Protestant schools. We also distinguish between German and non-German Catholics in the city blocks. The average percentage of German Catholics in the city blocks is about 20 percent and there are 3 percent non-German Catholics in Wuppertal. While the percentage of German Protestants in the city blocks is 33 percent, only 0.3 percent are non-German Protestants.

To describe the characteristics of the school districts and the schools, we use two data sources: register data and the school statistics. The information on the nationality, the percentage of Turks, and the welfare dependency rates are also aggregated on the school district level.

The schools in Wuppertal vary widely with respect to the percentage of students transferring to the academic track. The average transfer rate between 2003 and 2006 is 34 percent, but ranges from the lowest value of 10.6 percent to a maximum of 66.8 percent. Comparing the types of schools, the Protestant schools have on average the highest transfer rates. However, the public schools are the most heterogeneous schools. Catholic schools in Wuppertal show only average performance.

According to the school statistics, the proportion of non-Germans in Wuppertal primary schools is 22 percent. The percentage is again highest in Catholic schools with 25 percent and with less than 10 percent lowest in Protestant schools. At first sight the difference between the register data and the school statistics is stunning. However, the city blocks vary

in terms of inhabitants and hence also in terms of number of observations per city block in our sample. The average size in the sample is 309 inhabitants, but the standard deviation is with a value of 270 fairly high. Furthermore, migrants live in the larger city blocks. The correlation is positive and highly significant. Thus there will be more students from large city blocks with a high probability of being non-German, which is reflected in the school statistics but not in the register data. Moreover, the reliability of the school data is a little uncertain, as the procedure to collect the data on the migration background has not been completely standardized across schools.

In addition to the variables already described, we have information on whether the visited school is an-all-day school or a (in Germany traditional) half-day school and the average class size. More than 73 percent of the students in the sample attend a school with an all-day-schooling option.[7] However, all-day schooling in primary schools is neither compulsory nor is it available for all students.

4.   The analytical strategy

Our analysis proceeds in three steps and draws on the analysis in Bifulco, Ladd & Ross, 2008.

Determinants of choice

First we model the decision to opt out of the assigned school. We model the likelihood that student *i* will not visit the assigned primary school as a function of the distance between the students residence and the assigned public school, D_{iz}, students neighborhood (city block) characteristics, S_{iz}, the school district characteristics, C_z, and the characteristics of the assigned school, S_z, such as the percentage of students that transfer to the academic track school after grade 4, the availability of alternatives, A_i and the random error term e.

$$Y_{iz} = f(S_{iz}, D_{iz}, C_z, S_z, A_i, e) \tag{1}$$

Equation (1) is estimated as a probit regression.

Since we use the neighborhood characteristics as information to describe the socioeconomic background of the student, S_{iz}, students from economically disadvantaged neighborhoods should be less likely to choose a school than students from more advantaged backgrounds. Thus a high percentage of immigrants in the neighborhood is expected to reduce the probability that the student chooses another than the assigned public school. The distance to the assigned school, D_{iz}, should have a positive impact on the decision to opt out, as it is a

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[7] 41 of the primary schools had an all-day option. However, the quality of all-day schooling is not yet standardized but varies widely across schools.

good indicator for travelling costs but also for the social costs a student has to incur if her classmates do not live in the student's neighborhood.

The variables describing the characteristics of the school district and the school are from two sources: register data and the school statistics. The school district variables, C_Z, are not as much an indicator of the students' neighborhood, but reflect the socioeconomic composition of the schools. A school district with a high percentage of families that receive welfare payments or a large proportion of migrants suggest an unfavorable socioeconomic composition of the schools and should therefore lead families to send their children to schools with a more favorable composition.

Moreover, we have information about the chosen school, S_z. The better the situation at the school, the more likely it is that the school is chosen. One available indicator of quality is the transfer rate to the academic track. The higher the transfer rate, the better the school and hence also the chances for the child to be in a high quality peer group. Alternatively, a high percentage of children with migration background might indicate an unfavorable composition of the student body. Another variable that is commonly thought to be an indicator of high quality is a small average class size and the existence of all-day-schooling. Since not every primary school has all-day-schooling, but school is out at noon or 1:30pm, having access better child care could be an argument to choose a school with an all-day option for working parents.

Finally, variables that describe alternatives, A_i, are the distance to the next school with a more favorable composition and/or a higher transfer rate to the academic track. It is expected that the availability of alternatives increases the probability to opt out.

Second we consider the decision to choose a denominational school. Even though the Catholics are a smaller group of the population in Wuppertal – 23 percent of the population is Catholic and 35 percent is Protestant – Catholic schools clearly outnumber the Protestant school.[8] Since the family's denomination, and in particular being Catholic (Protestant) might be of importance when deciding to send the child to a public denominational school and in particular a Catholic (Protestant) school, we include in (1) also variables that indicate the percentage of German and non-German Catholics (Protestants) in the neighborhood, RK_{iZ}. The effect of Catholic (Protestant) neighborhoods – German and non-German – is expected to be positive. Included is also the distance between the student's residence and the denominational school, D_{iD}. The equation to be estimated is thus modified to

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[8] See West & Wößmann (2008) for a study with historic data.

$$R_{iz} = f(S_{iZ}, RK_{iZ}, D_{iZ}, D_{iD}, C_Z, S_Z, e).$$ (2)

Choice and the composition of schools

In a second step, we look at the composition of the schools. Since we are mainly interested in the effect of choice on the distribution of the disadvantaged groups, the focus is on the relative size of the disadvantaged group in the schools. In particular, the percentage of disadvantaged students at the chosen (actually visited) school is compared to the percentage of disadvantaged students at the assigned school, and finally also to the percentage of disadvantaged students, had every student visited the assigned school, i.e., the counterfactual distribution.

Here, we use the variable 'student is Muslim' as an example, but other characteristics like citizenship or socioeconomic status could be used as well. First, consider the percentage of Muslims in schools that are visited by students who do not attend the assigned school. The students are differentiated by the students' denomination (Muslim versus non-Muslim). For each subgroup we compute the composition of the chosen school, the assigned school, and the counterfactual. Choice can have an integrating or a segregating effect. For Muslims choice is called integrating (segregating) if the chosen school that has fewer (more) Muslims than at the assigned public school. In contrast for non-Muslim students, an integrating (segregating) choice is defined as the choice of a school that has more (fewer) Muslims than the student´s assigned public school.

Second, look at the average percentage of Muslims in the schools that are visited by those who attend the assigned school. Within that group, we also differentiate according to the denomination of the students. Thus the composition of the schools visited by Muslims and non-Muslims can be compared.

Segregation

A third measure considered in this paper, is the extent of the observed segregation, according to the denomination. In particular we consider the level of residential segregation and the level of segregation in the schools that are actually observed. The segregation index between group *a* and *b* is computed as

$$S = \frac{1}{2} \sum_{i=1}^{N} \left| \frac{a_i}{A} - \frac{b_i}{B} \right|,$$ (4)

where a_i and b_i are the number of individuals in group a and b in school district i and A and B are the total number of individuals in group a and b. If choice is predominantly segregating, the level of segregation at school exceeds the residential segregation.

5. Results

Determinants of choice

Tables 2-4 summarize the results of the regression analysis. Note that all t-values reported are adjusted for clustering within school districts, and the reported coefficients in Tables 2-4 are marginal effects from a probit model.

In Table 2 the dependent variable is a binary variable indicating whether the student chooses a school other than the assigned public school. In model (1) we include the distance to the assigned school, the percentages of immigrants in the city block and in the school district, the percentage of students who transferred to the academic track school and the distance to the next school with a 5 percentage points higher transfer rate than the assigned school.

As expected and in line with the literature, the distance to the assigned school distance has a positive and significant effect. Increasing the distance by one 100 m, increases the likelihood of opting out by three percent. To make sure that the variables immigrants at the city block level and on the school district level are not collinear, we include the city block level in deviations from the school district level. The effect of the variable is positive if the percentage of migrants in the city block exceeds the school district average. The city block variable is not significant. Whereas the percentage of migrants in the school district level is positive and significant. Raising the percentage of immigrants in the school district by one percent raises the probability to choose another school by 2.3 percent. The academic track transfer rate, our measure of academic quality, has the expected positive and significant effect. Better schools are more often chosen. The availability of a better alternative, as measured by the distance to the next school with a five percentage point higher transfer rate, raises the chances to opt out significantly. Increasing the distance to the next school with a higher transfer rate than the assigned public school by 100 m reduces the probability that the student opts out by 1.2 percent.

Instead of using the school district variable, we also use the information on the percentage of immigrants from the school statistics and the distance to a school with a five percentage points lower percentage of immigrants than the assigned public school. As Model

(2) shows, the results are fairly stable. The percentage of immigrants at the assigned school raises the likelihood to choose another than the assigned school. However, the distance to a school with a more favorable composition has a negative but insignificant effect. Parents tend to opt out of schools with a high percentage of migrants, but the distance to an alternative school is not relevant for the decision.

As noted earlier, the group of immigrants in Germany is a heterogeneous group. The largest group and also the group that are least integrated among the major ethnic groups in Germany are the Turkish people. In model (3) and (4) the immigrant variables are replaced by the percentages of Turkish people, the largest ethnic group in Wuppertal. In model (3) we consider the total sample. In model (4) we restrict the sample to the public schools, because the Turks are predominantly Muslims and hence might not consider sending their children to a Christian school, even if they choose a school. The coefficients on the distance to the assigned school remain positive and significant in both samples. Unlike in the earlier regressions, where the percentage of immigrants in the neighborhood had no effect on choice, the percentage of Turkish people in the city block has a significant negative effect and the percentage on the school district level is positive and significant. Since we interpret the city block variables as characterizing the students by their neighborhood and the school district variables as characterizing the school environment, the results are quite intuitive. If a student has a higher probability of having a Turkish background, the parents will not choose another than the assigned school. A school with a large proportion of Turkish students, however, signals an unfavorable composition and leads parents to choose.

In Model (4) denominational schools are excluded. While the results remain qualitatively stable, the coefficients change in magnitude. For instance, the coefficient on the distance to the assigned school remains significant but drops by more than half. This is due to the fact that there are more public schools in Wuppertal that are fairly close to each other (cf. Figure 1). Hence distance becomes less important for school choice. The percentage of Turks in the school district is again positive and significant and increasing the percentage of Turkish people in the city block by one percentage point lowers the probability to choose by 0.5 percent. The distance to a school with a lower percentage of immigrant students is negative and now significant, whereas the coefficient on transfer rate variable remains significant but is reduced in magnitude.

In models (5) and (6) all students are included. But instead of using the composition of the schools and the neighborhood by ethnic groups, we include the welfare dependency rates as an alternative to characterize the economic status. The earlier results on the distance and

the academic quality variables are confirmed. Living in a school district with a higher welfare dependency rate increases the likelihood to choose, and the coefficient is almost the same as the coefficient of the percentage of immigrants in model (1). This is not too surprising, as welfare dependency and migration background are highly correlated. The welfare dependency rate of the city block has no effect on choice. One explanation for this is that the catholic schools are primarily located in the disadvantaged parts of Wuppertal. Hence they are a convenient option also for the economically disadvantaged groups, often immigrants of catholic faith. Catholic schools are also convenient to reach for the (economically disadvantaged) Turkish population but due to religious beliefs and restrictions in the admission process for denominational schools is not an easy option for Turkish families. This might explain the differences between (1) and (5) versus (3) and (4).

Finally, in model (6) we include average class size of the assigned school and whether the assigned school has the all-day school option as additional school quality variables. Small classes and the all-day-school option at the assigned school are expected to reduce the likelihood to choose another school. However, the results do not confirm the expectation. While the class size variable is insignificant, the coefficient on the all-day-school variable is positive and significant. One reason for this counterintuitive result is that the all-day-school option was primarily introduced in more disadvantaged schools to help those schools to become more attractive. Apparently, the quality effect of extended day care is not strong enough to outweigh the disadvantages of an unfavorable composition.

The results in Table 2 show that the distance variables, measuring the cost of traveling to school, show the expected significant effects. The closer the assigned school, the more likely it is that the student will attend the assigned school. Choosing another school, that is not as close, is imposing additional costs on the student. The variables describing the ethnic and socioeconomic background also show the expected effects. Living in a school district with a disadvantaged population leads parents to choose another school than the assigned school. The neighborhood variables are a useful description of the characteristics of the student background. If students live in a disadvantaged neighborhood, they tend to visit the assigned school. Parents also decide based on the quality of the school. Schools with a larger proportion of students transferring to an academic track school at the end of primary education are more likely to be chosen.

Since the analysis has shown that the ethnic composition plays a significant role for explaining school choice, we continue by looking at school choice by ethnic groups. Unfortunately, the information on the nationality of the students is not very reliable as noted

earlier and distinguishes only between Germans and non-Germans. However, we have information about the religious denomination of the students. And in particular we can distinguish between Muslims and non-Muslims. This distinction is valuable because it identifies a group of disadvantaged students – about 60 percent are of Turkish descent – in Germany. In Table 3 we use the student information on the religious denomination and run different regressions for Muslims (columns 2 and 5) and non-Muslims (columns 1 and 4). In model (3) all students for whom we do not have the information on the denomination are included. Moreover, we do the analysis on the sample of all schools (models (1) to (3)) and in addition on the sample of public schools only (model (1) and (2)).

If Muslims are less informed about the education system and have less access to information on the schools (Kristen 2005), they should respond less to the quality indicators but should respond to the distance variables which reflect the (travelling) cost of choice. Moreover, Muslims are expected to choose less often in general and in particular they are expected to choose less often a denominational (Catholic or Protestant) school.

Note that due to missing observations the number of observations drops to 8339. The first observation is that Muslims choose in fact less often. While 33 percent of non-Muslim students choose a school, only 23 percent of the Muslim students do not attend the assigned school. If the sample is restricted to the public schools only, we find 16 percent choosers among the non-Muslim and 10 percent among the Muslim population. The regressions identify the factors explaining choice by denomination. In models (1) and (2) students from all school types (public and denominational schools) are included. The distance to the assigned school has the expected positive and significant effect. Interestingly, the magnitude is almost identical for both groups. Distance affects the decision to choose in a comparable way. However, differences in the choice behavior become apparent when looking at the variables describing the ethnic composition of the school district and the neighborhood. While non-Muslims' choice depends on the composition of the school district (the more Turkish people in the school district, the more likely they choose another school), Muslim families choose less likely, if they live in a neighborhood with a high percentage of Turks. The composition of the school district has no effect on the decision. Moreover, if it is more convenient to reach a school with fewer immigrants, non-Muslims will choose more often. The effect is insignificant for Muslims. In the restricted model, the transfer rate to academic track schools has a positive but insignificant effect, which is surprising given the results in Table 2. One explanation might be the availability of the students' denomination – some schools did not provide the data – which causes some selection bias. In fact, running the

regression on the students without information on the denomination yields the expected strong positive and significant effect on the transfer rate variable (cf. Model (3)).

In Models (4) and (5) only students who attend a public school are included and students from denominational schools are excluded. The difference between the denominations is now even more apparent. Non-Muslims react to the ethnic composition of the school district as well as to the neighborhood variables. Moreover, if a school with a more favorable composition is closer to the students' home, families chose a school. Non-Muslims also chose schools with a higher transfer rate. The choice of Muslims in column (5) is hard to predict, the only variable that enters significantly is the distance to the assigned school. Hence we do in fact observe difference between families of different denominations.

In the next step, look at the denominational schools in more detail. It is commonly thought that denominational schools in NRW are merely an option for children from advantaged background to opt out of the public school, which might be of lower quality. The results of the analysis for denominational schools are summarized in Table 4. In models (1) to (3) the dependent variable is a binary indicator for whether the student attends a Catholic school or not. In models (4) and (5) only Protestant schools are included. In model (1) we use the distance variables, the ethnic composition of the school district and the neighborhood, and the transfer rate are as explanatory variables. The results are qualitatively similar to the results in Table 2. However, the migration variables are smaller in magnitude and significance. The distance to the assigned school is still significant, but the coefficient is only about a third of the magnitude compared to the effect estimated in Table 2. Interestingly, the distance to the Catholic school has a very strong effect. If the distance to the Catholic school rises by 100 m, the likelihood to choose a Catholic school decreases by 1.5 percent. Thus the location of Catholic schools is an important predictor of choice. To test whether it is also the religious belief that makes parents choose a denominational school, the percentage of German and non-German Catholics in the city block are included in column (2). Both variables show a positive and significant effect and the coefficients on the other variables are left unchanged. Hence religious beliefs matter, when choosing a Catholic school. This is confirmed when using the students' denomination. Being Catholic raises the likelihood to attend a Catholic school. The percentage of Turks in the school district appears not to matter at all for the decision and the academic track transfer rate – our quality indicator – looses significance. Similarly, when using the decision to choose a Protestant school in model (34), it turns out that Protestants choose Protestant school more often. But note that the effects are significant but rather small in magnitude. Interestingly, the distance variables are not as important as they were in the

other models. This can be explained by the fact that there are only 358 students in Wuppertal who visit one of only two protestant schools. As Table 1 shows, the average distance between home and school is the largest for students attending a Protestant school. Moreover, Protestant schools have additional characteristics that make them attractive schools. They have on average the highest academic track transfer rates in Wuppertal (41 percent) and the lowest percentage of migrants (10 percent).) and the lowest percentage of migrants (10 percent). Finally, in model (5) a dummy variable for Protestant students is included. The results of the regression are in contrast to model (3), in which a catholic dummy has been included. Being a Protestant raises the likelihood to attend a Protestant school, but the effect is insignificant. The academic track transfer rate, however, remains significant. Thus while religious beliefs are relevant for choosing a catholic school, they are less important for choosing a protestant school. Protestant schools in Wuppertal are mainly chosen because of the academic quality.

In summary, the regression analysis broadly supports our hypotheses: parents who live in disadvantaged school districts (high welfare dependency rates, higher percentage of immigrants) tend to choose another than the assigned school. If, however, the families live in disadvantaged neighborhoods the send the children to the assigned school, which is in 64 percent also the closest school. Parents also react to quality indicators like the transfer rate to academic track schools, but they also take into account the costs that arise from larger distances that result from choice.

Choice and the composition of schools

In the next step we look at the effect of choice on the composition of the schools. In the analysis we consider the percentage of Muslim students.[9] Figure 4 shows the average percentage of Muslim students under three different scenarios. First we present the percentage Muslims at the chosen school (labeled `chosen school' in Figure 4). This can be compared with the percentage Muslims that would prevail had every student chosen the assigned public school (labeled `counterfactual'; situation without denominational schools and without school choice). Finally we display the actual percentage of Muslims in the assigned public school (labeled `assigned school'; situation with denominational schools and school choice). In the upper panel of Figure 4 only students who choose another than the assigned public school are

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[9] A similar analysis has been done for the percentage of migrants, using city block information. The results are available from the authors on request.

included and in the lower panel students who visit the assigned school are included. Within these groups of students we further distinguish between Muslim and non-Muslim students.

Comparing the three scenarios allows getting insights into the effects of choice on the composition of students at the assigned public school, because students who choose another school change the composition of the assigned school. If for instance a non-Muslim does not attend the assigned public school, the percentage of Muslims will *ceteris paribus* increase at the assigned public school. We label this externality of choice, i.e. the difference between the composition of the assigned school and the counterfactual, the composition effect. The composition effect is negative, whenever as a result of choice, the percentage of students from disadvantaged groups increases at the assigned school. It is positive if the percentage of disadvantaged students decreases. Furthermore, comparing the composition at the chosen school with the counterfactual of the assigned school yields information about the direction of choice (integrating or segregating). Choice is integrating if students from disadvantaged (advantaged) groups choose a school with a higher percentage of advantaged (disadvantaged) students and segregating if they choose a school with a higher percentage of other disadvantaged (advantaged) students.

Figure 4 shows that for non-Muslim students who choose a school other than the assigned school the composition effect is negative. The assigned public schools have a higher percentage of Muslim students than the counterfactual. For non-Muslim students who choose a denominational school, the average percentage of Muslim students is 13 percent at the chosen school. Had every student attended the assigned school, the average of Muslim students at the assigned public school was 21 percent. And due to choice, the actual percentage of Muslim students is with 31 percent even higher. Thus, the composition effect is negative and choice of non-Muslim students is segregating. For non-Muslims who choose a (not assigned) public school the effect is less pronounced. The composition effect (assigned school – counterfactual) is two percentage points and the segregation effect (chosen school-counterfactual) is with minus 5 percentage points much smaller that for the denominational schools. Thus choice has an effect of the composition of schools and choice of non-Muslims is segregating.

Looking at the Muslims who choose a denominational school, we find that choice has again an adverse effect on the composition of the assigned schools. It should be noted though, that the percentage of Muslims is in all three scenarios higher than for the non-Muslims. However, Muslims who choose a denominational school choose integrating (they choose a

school with a higher percentage of non-Muslims). Interestingly, when Muslim students choose a public school, the results differ. The chosen school has a higher percentage of Muslim students than the counterfactual or the assigned school. Hence choice is segregating in this case.

The second panel describes the situation for the students who attend the assigned school. The reported figures for the chosen school and the assigned school are of course identical. As in the upper panel non-Muslim students attend schools with a lower percentage of Muslim students. The average percentage of Muslims in school visited by non-Muslims is 17 percent versus 36 percent for schools visited by Muslim students. And due to choice, the composition becomes less favorable. The counterfactual, i.e. the composition in the absence of choice, is lower than the actual percentage of Muslim students in the school.

Summarizing, we state that choice of advantaged students (non-Muslims) has a segregating effect, whereas the choice of the disadvantaged students (Muslims) tends to have an integrating effect, when a denominational school is chosen. When Muslim-students choose a public school, the effect is on average segregating. This confirms the results in Bifulco et al. (2008). Moreover, choice has an effect on the social composition of the schools. The socio-economic composition of the assigned schools becomes less balanced.

Segregation

To conclude the analysis we calculate the net effect of school choice to learn more about the level of segregation. Therefore we compute for different indicators of the social and ethnic segregation the segregation indices of the actual (row 2-7) and counterfactual (row 1) composition of students. We differentiate between German and non-German students (column 1), Muslim and non-Muslim students (column 2). The results are reported in Table 5.

The first row shows the segregation index, had every student decided to attend the assigned public school, i.e., the index for the schools in Wuppertal in a situation without school choice and denominational schools. The value of 0.294 in column (1) indicates that 30 percent of the students would have to move to a different school to result in an equal distribution of Germans at each public school. Thus even in the absence of school choice, the level of segregation would be substantial, because the socioeconomic mix of the school districts is heterogeneous, i.e., there is residential segregation.

Comparing the counterfactual in row one with the actual segregation indices for the schools we expect to find differences between the counterfactual and the actual segregation

indices if choice can alter the degree of segregation. We find that the segregation index for German students versus non-German students increases by nine points from 0.29 to 0.38. The segregation index for denominational schools is with a value of 0.39 even higher. The segregation indices calculated by using the school statistics show a very similar pattern. The small differences might be explained by the schools that did not provide us with student data on nationality and the religious denomination.

The degree of segregation is even higher when looking at the Muslim versus non-Muslim characteristic in column 2. Moreover, the values differ again depending on the source of data, since we do not have the information on the denomination for 30 percent of the students in the individual data. Another source of variation might be that the data from the school statistics on the denomination variable is from 2005. The individual data is from 2007.[10] When comparing segregation across school types, it turns out that the level of denominational segregation is with 0.32 lowest for the group of denominational schools which compares to 0.44 for the entire sample. Our results show that ethnic segregation increases when choice is possible, even with the existence of school districts.

Within the group of denominational schools the degree of segregation is lowest when looking at the Muslim – non-Muslim comparison. When comparing the German and the non-German groups, denominational schools show a higher level of segregation, which is mostly driven by the two Protestant schools and not as much by the Catholic schools that are often chosen by non-Germans.

6. Conclusions and outlook

This study is one of the first to analyze primary school choice in Germany. Even though school districts with an assigned public school exist and choosing a different school is thought to be more of an exception than the rule, our data for Wuppertal – a major city in NRW close to the Ruhr-Area – shows that this is not the case. Choice exists because in addition to the public schools there are denominational schools the students can choose. Furthermore, there is the possibility to apply for admittance at another than the assigned public school. 32.5 percent of primary school students in Wuppertal do not visit the assigned public school in 2007/8. 20 percent visit a denominational school and of the students who attend a public school, 15 percent attend a public school that is not the assigned public school.

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[10] Since 2005 some primary schools have been shut down or are about to be shut down in the next years. Four schools that still exist in 2005 have been shut down by 2007.

The paper gets some first insights on the determinants of choice. We find that the distance to school and the perceived quality of the school influence the decision significantly. Other important factors are the socioeconomic background of the students and the composition of the school district. Families from disadvantaged neighborhoods tend to send their children to the assigned school. A high percentage of migrants and/or economically disadvantaged families in the school district lead parents to choose another school for their children. Advantaged families make segregating choices, whereas for disadvantaged families the effect of choice is ambiguous. The external effect of choice on the composition of the not chosen school is significant and it affects the composition adversely. Overall, the level of segregation in the Wuppertal primary schools is high and exceeds the level of segregation of the population in the school districts.

In future research, we will compare the situation in Wuppertal to the situation in the neighboring city of Solingen, which is one of the few cities in NRW without denominational schools, and continue to analyze if and how choice has been altered after the school districts have been abolished in 2008.

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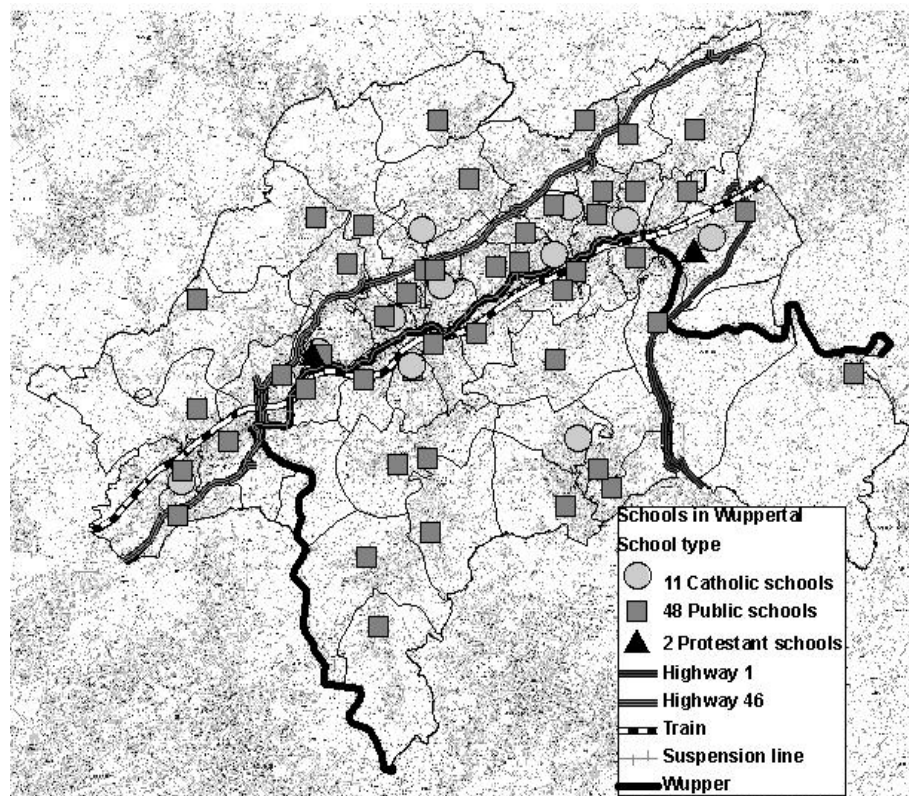
Figure 1. *Public and public denominational schools in Wuppertal*
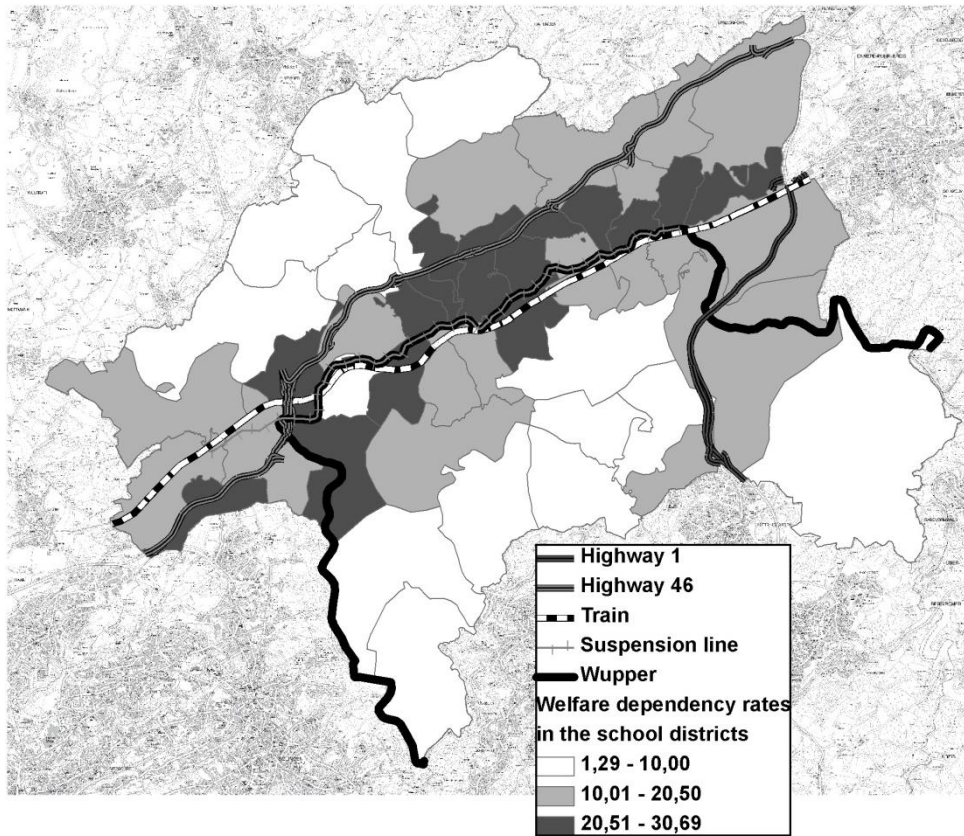
Figure 2a. *Welfare dependency rates in the Wuppertal school districts (2006)*
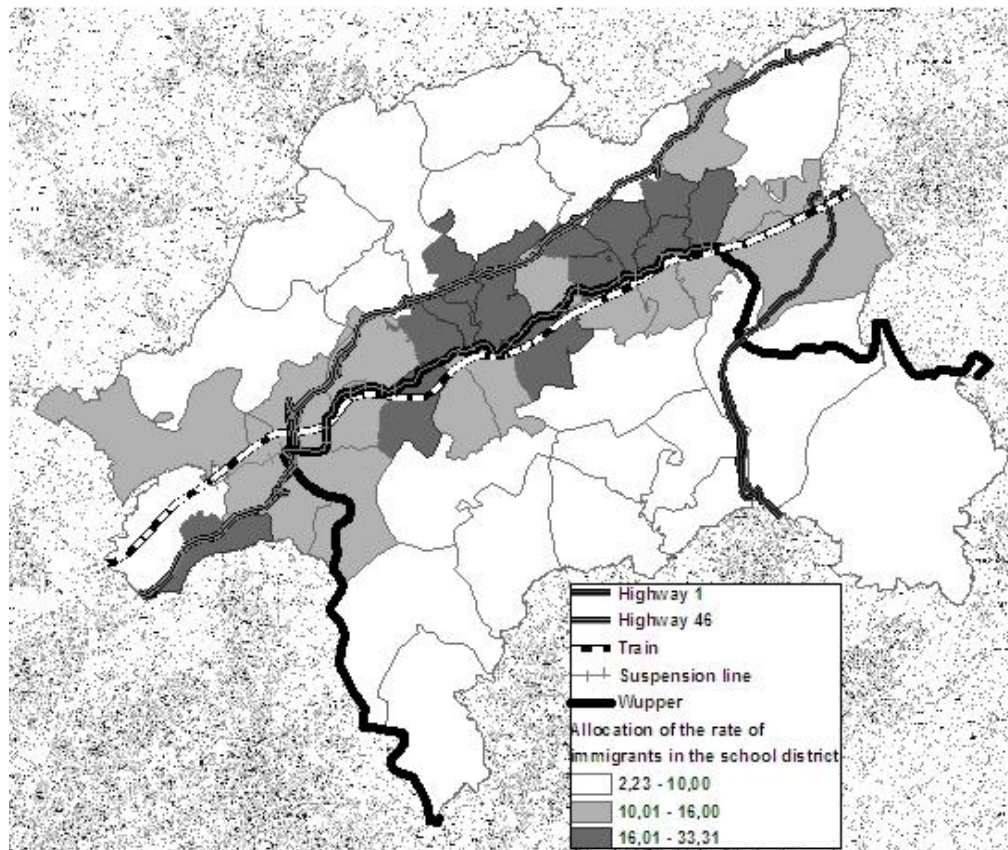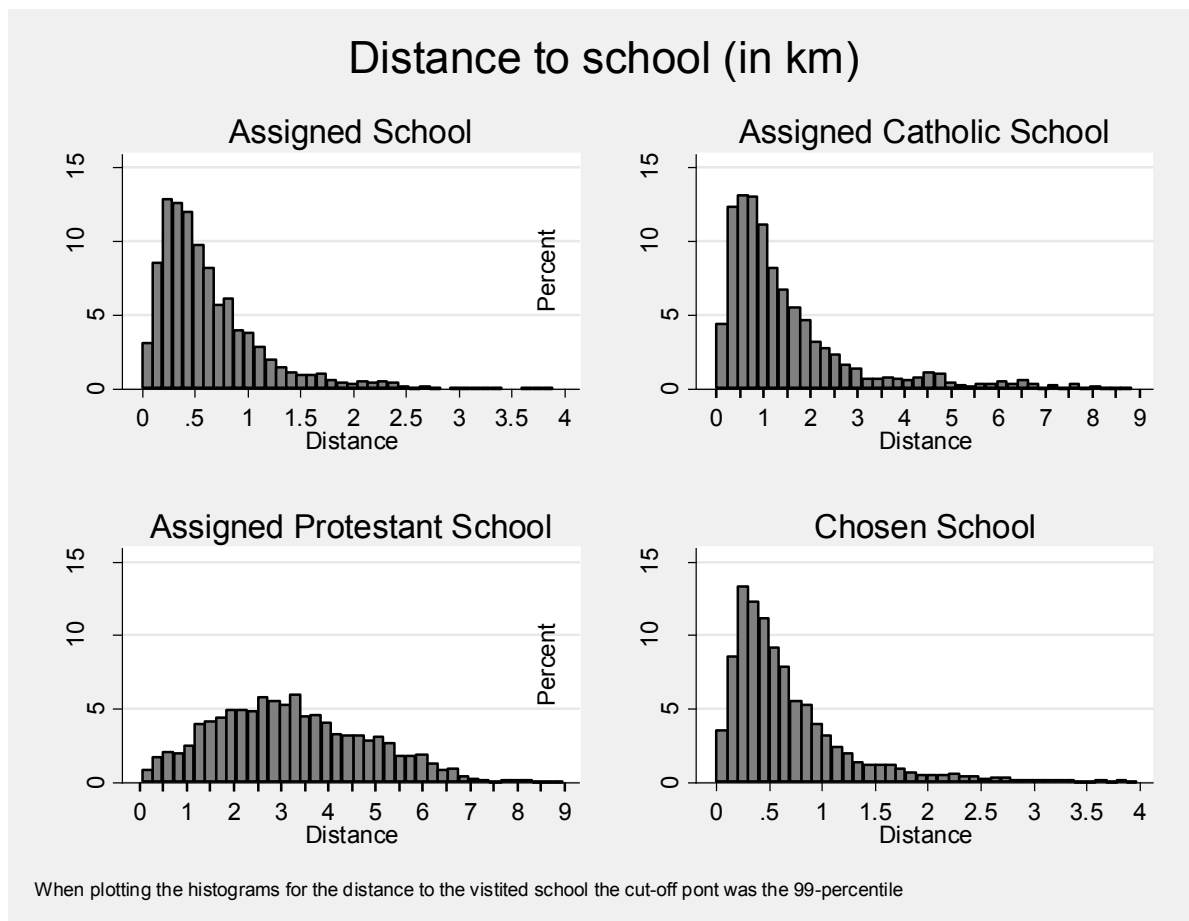
Figure 2b. *Allocation of immigrants in Wuppertal (2007)*
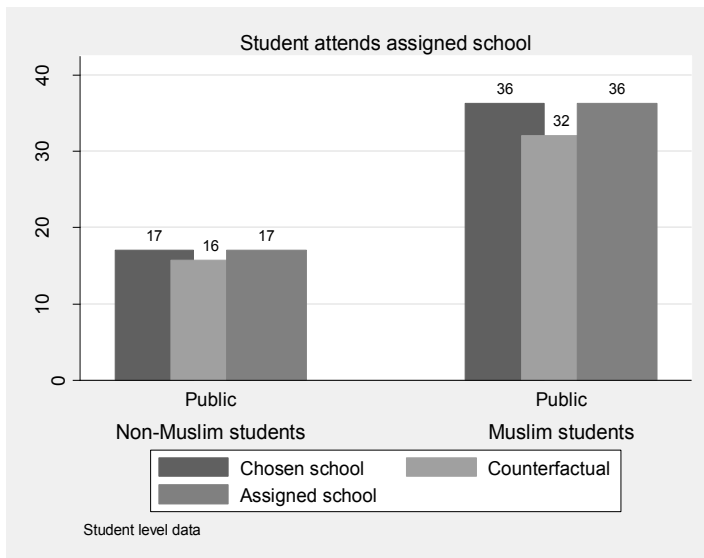
Figure 3. *Distance to school*
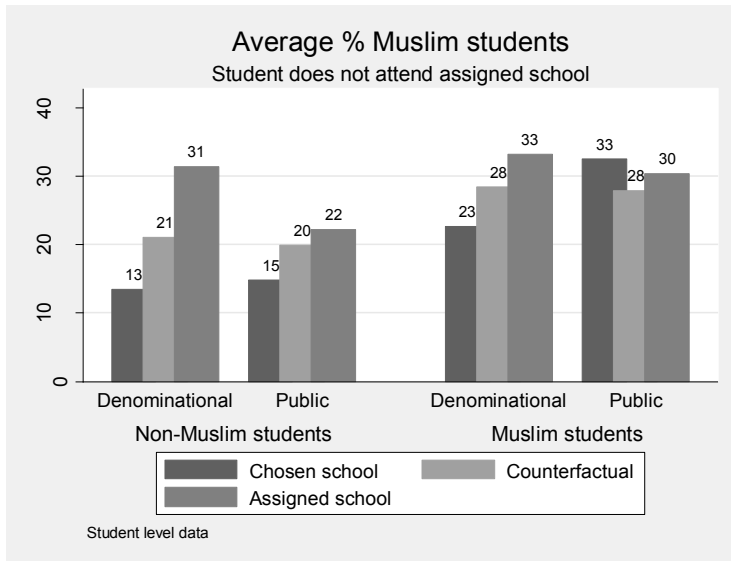
Figure 4. *Effects of choice on school composition*

Table 1. *Sample description*

	(1) All	(2) Catholic Schools	(3) Protestant Schools	(4) Public schools
Student data				
Not assigned school	0.325 (0.468)			0.149 (0.356)
km to assigned school	0.622 (0.471)	0.694 (0.424)	1.023 (0.575)	0.591 (0.468)
km to chosen school	0.744 (0.833)	0.683 (0.684)	1.191 (1.122)	0.741 (0.846)
km to assigned Catholic school	1.463 (1.387)	0.638 (0.467)	1.114 (0.945)	1.660 (1.466)
km to assigned Protestant school	3.201 (1.585)	3.024 (1.339)	1.164 (1.012)	3.317 (1.598)
km to school with 5 PPT less immigrants	2.059 (2.493)	1.121 (1.268)	0.958 (1.225)	2.311 (2.668)
km to school with 5 PPT higher transfer rate	1.363 (1.257)	0.779 (0.577)	0.794 (0.808)	1.515 (1.336)
City block data				
% Immigrants city block	15.33 (12.50)	18.87 (12.82)	12.53 (11.33)	14.64 (12.33)
% Turks city block	4.541 (6.290)	5.266 (5.554)	2.724 (4.408)	4.448 (6.483)
% Welfare dep. rate city block	18.13 (14.01)	21.49 (13.21)	13.66 (12.16)	17.55 (14.13)
% Non-German Catholics city block	3.105 (3.187)	3.554 (3.966)	3.595 (4.240)	2.986 (2.924)
% German Catholics city block	19.66 (7.352)	19.51 (6.952)	18.91 (6.180)	19.72 (7.477)
% Non-German Protestants city block	0.283 (0.610)	0.302 (0.511)	0.293 (0.494)	0.279 (0.634)
% German Protestants city block	32.92 (11.12)	29.91 (10.33)	36.95 (11.27)	33.44 (11.16)

Table 1. cont

	(1) All	(2) Catholic Schools	(3) Protestant Schools	(4) Public schools
School district data				
% Immigrants school district	13.92	17.08	13.57	13.23
	(7.106)	(6.063)	(5.082)	(7.197)
% Turks school district	3.806	4.930	3.338	3.572
	(2.997)	(2.775)	(2.396)	(3.008)
% Welfare dep. rate school district	16.67	20.24	15.56	15.91
	(7.712)	(6.227)	(5.301)	(7.863)
School data				
% Transfer rate academic track chosen school	33.88	33.57	41.49	33.66
	(13.40)	(9.287)	(9.723)	(14.19)
% Migrants in chosen school	22.35	25.27	9.737	22.17
	(15.00)	(13.79)	(3.237)	(15.26)
Average class size chosen school	24.15	24.55	24.53	24.04
	(2.212)	(1.372)	(0.966)	(2.379)
All-day school in 2007 chosen school	0.739	0.534	0.436	0.796
	(0.439)	(0.499)	(0.497)	(0.403)
Observations	11976	2124	358	9494

Table 2. Decision to opt out

	(1)[b]	(2)	(3)	(4)	(5)	(6)
km to assigned school	0.300** (5.55)	0.228** (7.09)	0.263** (5.57)	0.126** (5.81)	0.267** (5.17)	0.287** (5.88)
% Immigrants city block (a)	-0.000756 (-0.61)	-0.000717 (-0.66)				
% Immigrants school district	0.0234** (4.33)					
% Turks city block (a)			-0.00636** (-3.23)	-0.00504** (-3.90)		
% Turks school district			0.0279** (2.88)	0.0146** (3.76)		
% Migrants in assigned school		0.00985** (5.21)				
km to school with 5 PPT less immigrants		-0.0140 (-0.82)	-0.0337+ (-1.67)	-0.0138* (-2.19)		
% Transfer rate academic track chosen school	0.0123** (3.23)	0.0123** (3.26)	0.00934** (2.68)	0.00445** (2.92)	0.0136** (3.25)	0.0158** (3.71)
km to school with 5 PPT higher transfer rate	-0.120** (-3.52)	-0.0940** (-2.97)	-0.102** (-3.00)	-0.0229* (-2.10)	-0.121** (-3.49)	-0.114** (-3.86)
% Welfare dep. rate city block (a)					-0.000230 (-0.27)	-0.000139 (-0.19)
% Welfare dep. rate school district					0.0227** (4.61)	0.0236** (4.46)
All-day school in 2007, assigned school (c)						0.167** (2.97)
Average class size, assigned school						-0.00175 (-0.16)
Observations	11976	11976	11976	9494	11976	11976
Pseudo R^2	0.168	0.171	0.153	0.093	0.170	0.184

Marginal effects; t statistics in parentheses

The dependent variable =1 if the student attends school other than the assigned public school and 0 otherwise. Figures reported are marginal effects from a probit estimation. In parentheses we report the t-values that are based on robust standard errors adjusted for clustering within school districts.

(a) Variables in deviations from school district level.

(b) In Model (1)-(3) and (5) and (6) all schools are included. Model (4) includes only public schools.

(c) for discrete change of dummy variable from 0 to 1

$^+ p < 0.10$, $^* p < 0.05$, $^{**} p < 0.01$

Table 3. Decision to opt out - by denomination

	(1)	(2)	(3)	(4)	(5)
		All schools		Public schools	
	Non-Muslims	Muslims	No Denomin.	Non-Mulsims	Muslims
km to assigned school	0.272**	0.270**	0.238*	0.137**	0.127**
	(5.38)	(3.44)	(2.17)	(5.39)	(2.82)
% Turks city block (a)	-0.00460	-0.00297+	-0.00457+	-0.00693**	-0.00163
	(-1.39)	(-1.71)	(-1.76)	(-3.44)	(-1.28)
% Turks school district	0.0223	0.00674	0.0428+	0.0215**	0.0120
	(1.57)	(0.34)	(1.69)	(3.59)	(1.01)
km to school with 5 PPT less immigrants	-0.0421*	-0.0501	0.0300	-0.0186*	0.00636
	(-2.05)	(-1.35)	(0.60)	(-2.02)	(0.49)
% Transfer rate academic track chosen school	0.00607+	0.00675	0.0202**	0.00536**	0.000330
	(1.67)	(1.12)	(2.87)	(2.73)	(0.12)
km to school with 5 PPT higher transfer rate	-0.0585+	0.0313	-0.311**	-0.0126	0.0342
	(-1.71)	(0.53)	(-2.58)	(-0.67)	(1.43)
Observations	6699	1640	3637	5342	1394
Pseudo R^2	0.139	0.085	0.314	0.121	0.058

Marginal effects; t statistics in parentheses
(a) Variables in deviations from school district level. The dependent variable =1 if the student attends school other than the assigned public school and 0 otherwise. Figures reported are marginal effects from a probit estimation. In parentheses we report the t-values that are based on robust standard errors adjusted for clustering within school districts.
$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 4. Decision to choose a denominational school

	(1)	(2)	(3)	(4)	(5)
	Catholic Schools			Protestant Schools	
km to assigned school	0.0986**	0.0972**	0.0628**	0.00266	0.00488+
	(5.26)	(5.25)	(3.32)	(1.45)	(1.68)
km to catholic school	-0.147**	-0.146**	-0.100**		
	(-10.40)	(-10.54)	(-5.92)		
km to protestant school				-0.00464*	-0.00553*
				(-2.44)	(-2.25)
% Non-German Catholics city block		0.00217+			
		(1.84)			
Student is Catholic (d)			0.100**		
			(3.88)		
% German Catholics city block		0.00168**			
		(3.03)			
Student is Protestant (d)					0.00712
					(1.32)
% Turks city block (a)	-0.000999	-0.000377	-0.0000416	-0.000137	-0.000218
	(-1.23)	(-0.43)	(-0.06)	(-1.25)	(-1.29)
% Turks school district	0.00700*	0.00743*	-0.00323	0.000334+	0.000474
	(2.16)	(2.26)	(-0.65)	(1.93)	(1.44)
% Transfer rate academic track chosen school	0.00316*	0.00312*	0.000235	0.000241*	0.000303*
	(2.53)	(2.56)	(0.19)	(2.16)	(1.99)
% Non-German Protestants city block				0.000714*	
				(2.01)	
% German Protestants city block				0.000123	
				(1.41)	
Observations	11976	11976	8339	11976	8339
Pseudo R^2	0.232	0.235	0.248	0.375	0.419

Marginal effects; t statistics in parentheses
(a) Variables in deviations from school district level. The dependent variable is in models (1) and (2) =1 if the student attends a Catholic primary school and 0 otherwise. In model (3) the dependent variable =1 if the student attends a Protestant denominational school and 0 otherwise. Figures reported are marginal effects from a probit estimation. In parentheses we report the t-values that are based on robust standard errors adjusted for clustering within school districts.
(b) For discrete change of dummy variable from 0 to 1
$^+$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$

Table 5. Segregation Index

	German	Muslim	N Schools
Assigned public school (counterfactual)	0.294	0.386	45
Chosen school	0.375	0.435	57
Chosen public school	0.362	0.406	45
Chosen denominational school	0.385	0.320	12
Chosen School (school statistics)	0.350	0.409	57
Chosen public school (school statistics)	0.352	0.423	45
Chosen denominational school (school statistics)	0.340	0.361	12