

Discussion Paper No. 14-026

**Skill Formation, Career Planning,
and Transitions:
The Last Two Years in a German
Lower Track Secondary School**

Bernd Fitzenberger and Stefanie Lickleder

ZEW

Zentrum für Europäische
Wirtschaftsforschung GmbH

Centre for European
Economic Research

Discussion Paper No. 14-026

**Skill Formation, Career Planning,
and Transitions:
The Last Two Years in a German
Lower Track Secondary School**

Bernd Fitzenberger and Stefanie Lickleder

Download this ZEW Discussion Paper from our ftp server:

<http://ftp.zew.de/pub/zew-docs/dp/dp14026.pdf>

Die Discussion Papers dienen einer möglichst schnellen Verbreitung von
neueren Forschungsarbeiten des ZEW. Die Beiträge liegen in alleiniger Verantwortung
der Autoren und stellen nicht notwendigerweise die Meinung des ZEW dar.

Discussion Papers are intended to make results of ZEW research promptly available to other
economists in order to encourage discussion and suggestions for revisions. The authors are solely
responsible for the contents which do not necessarily represent the opinion of the ZEW.

Skill Formation, Career Planning, and Transitions: The Last Two Years in a German Lower Track Secondary School

Bernd Fitzenberger*, Stefanie Lickleder**

March 2014

Abstract: In Germany, the entry into the labor market for students in the non-academic tracks of secondary schools may take multiple pathways. Students graduating from lower track secondary schools (LTSS) face major problems in school-to-work transitions, prompting the provision of intensive career guidance in school. In a case study for the City of Freiburg, this paper analyzes skill formation, career guidance, and the first transition after graduation for LTSS students in the late 2000s. We find that only about 10% of LTSS students start an apprenticeship immediately after graduation. Instead, about half of the LTSS students, typically those with better school grades, participate in additional general teaching (AGT) and rather enter further schooling than an apprenticeship. In addition, the majority of students with poor school grades continue with pre-vocational training. The latter group involves a large share of male students with a migration background. Our findings show a large heterogeneity among LTSS students, most visible in the division between students with and without AGT. Furthermore, characteristics observable at the end of grade 7 have a strong predictive power on the transition after graduation, and focusing career guidance on the immediate start of an apprenticeship after graduation may be misplaced.

Keywords: school-to-work transition, lower track secondary schools, vocational training, career guidance

JEL-Classification: I20, J24

We are grateful for insightful discussions with Christian Dustmann, Eric Hanushek, Aderonke Osikominu, Markus Zimmermann, members of the Netzwerk Bildungsforschung supported by the Baden-Württemberg-Stiftung, and participants in various workshops and seminars. The research reported in this paper was supported by the Arbeitsagentur Freiburg, the City of Freiburg, and various schools in Freiburg. We acknowledge financial support by the University of Freiburg, the Ministry of Science and Art in Baden-Württemberg through the project "Die Wirkung des Bildungssystems auf den Übergang von Schule in Beruf - Evaluation des Pilotprojekts Erfolgreich in Ausbildung" (No. 31-7532.20/068), and the DFG through the project "Transitions in Education and Vocational Training and Labor Market Outcomes" (No. Fi 692/11-1). Bernd Fitzenberger dedicates his contribution for this paper to Wolfgang Franz, his mentor and friend, on the occasion of Wolfgang Franz's 70th birthday. All errors are our sole responsibility.

* University of Freiburg, IFS, IZA, ROA. ZEW. E-mail: bernd.fitzenberger@vwl.uni-freiburg.de.

** University of Freiburg. E-mail: stefanie.lickleder@vwl.uni-freiburg.de.

Contents

1	Introduction	1
2	Background and Hypotheses	3
3	Data and Descriptives Evidence	7
3.1	Description of the Survey	7
3.2	Descriptive Evidence	8
4	Multivariate Analysis for School Grades and Transitions	12
4.1	School Grades	13
4.2	Transitions after Grade 9	14
5	Conclusions	15
	References	16
	Tables	20
	Figures	22

1 Introduction

Eine gute Ausbildung bietet immer noch den besten, wenn-
gleich nicht perfekten Schutz vor Arbeitsplatzrisiken.

Quelle: Wolfgang Franz, *Jugendarbeitslosigkeit hinterlässt lebens-
lange Narben*, *Frankfurter Allgemeine Zeitung*, 3 July 2013.

Labor market conditions in Germany have been improving since 2005, and this improvement has not been hampered by the great recession 2008/09 (Dustmann et al. 2014a). Today, Germany is viewed as a role model because of its low youth unemployment rate in comparison to countries whose labor markets are still suffering from the repercussions of the great recession and the euro crisis. Nevertheless, the problems involved with the school-to-work transitions in Germany are the subject of an ongoing debate in academics and in policy circles, as reflected by the following three issues. First, young students with a low socio-economic background or with a migration background have somewhat stronger difficulties with the transition from school to work (Kristen and Granato 2005, Schwippert et al. 2003). Second, there is sizeable dropout from vocational training with a dropout rate of 24.4% during the first year of an apprenticeship in 2011 (BMBF 2013). The dropout rate among apprentices without any school degree is 38.6%, and it is 30.9% among apprentices of foreign citizenship. Third, a large number of individuals do not have a vocational training degree (2011: 1.5 Mill. individuals (16%) between the age of 25 und 35, BA 2013). It has become conventional wisdom that a successful prevention of difficulties in the school-to-work transition requires an appropriate preparation of students in schools by means of effective career guidance policies [*Berufsorientierung*, see Table 1 for the translation of the technical terms in German used in this paper] (OECD 2004).¹ Career guidance is deemed particularly important for students in the lower track secondary schools (LTSS, Hauptschulen), who show a growing concentration of students with a low socio-economic background or with a migration background.

The complex German education system involves multiple paths for school-to-work transitions. The entry into the labor market for students in the non-academic tracks of secondary schools (lower track and middle track secondary schools) is dominated by vocational training either through an apprenticeship in a firm or through full-time vo-

¹In this paper, we use the term *career guidance* for all policies denoted as *Berufsorientierung* in Germany (Table 1). *Berufsorientierung* denotes all activities to help students in early career orientation. In the lower and middle track of the German educational system (*Hauptschule* and *Realschule*) this involves providing informations about the local supply of apprenticeship suitable for individual students as well as help with finding the desired training occupation, with organizing internships, or with job applications. In terms of the economic search and matching theory of the labor market, *Berufsorientierung* attempts to bridge the asymmetric information gap between the career plans of young individuals and the heterogeneous labor demand of firms.

cational training both leading to a vocational training degree for a specific occupation (see Wolter and Ryan 2011 for a survey of the economic analysis of apprenticeships). The share of LTSS students has fallen and the labor market chances of LTSS student have deteriorated over the last decades. There are strong regional differences in labor market conditions, and therefore the demand for training in specific occupations, and in the provision of career guidance policies. When deciding upon the type of vocational training, LTSS students face a challenging decision problem at a fairly young age.

In a case study, which holds regional conditions fixed, we analyze skill formation, career planning, and the first transition after graduation for two cohorts of students in LTSS's in the City of Freiburg (in the state of Baden-Württemberg) during grades 8 and 9. Our analysis takes an economic perspective. We ran multiple surveys among students, parents, and teachers during the years 2007 to 2010. During grades 8 and 9, all LTSS students in Freiburg receive intensive career guidance through external caseworkers. The career guidance policies focus on the immediate transition into an apprenticeship. However, LTSS students at the time also had the option to participate in additional general teaching (AGT) to enable them to continue for a higher schooling degree or for a vocational degree after graduation from LTSS, an option taken by about half of the students.

Our findings imply that only about 10% of LTSS students start an apprenticeship immediately after graduation. On the one hand, about half of the students, who have better school grades already at the end of grade 7 and who typically participate in additional general teaching (AGT) during grades 8 and 9, tend to choose further schooling over apprenticeship, expecting that this will improve their future career options. On the other hand, the majority of students with poor school grades continue with pre-vocational training, even though career guidance was effective in terms of the career planning activities reported by students. These students typically do not participate in AGT. This group of students involves a large share of male students with a migration background. Our findings reflect a large heterogeneity among students within the LTSS, most visible in the division between students with and without AGT. Furthermore, the results show that a focus of career guidance on the immediate start of an apprenticeship after graduation may be misplaced.

The remainder of this paper is organized as follows. Section 2 reviews the background of the analysis and develops the hypotheses driving our empirical analysis. Section 3 describes the survey providing our data and provides first descriptive evidence. Section 4 provides the detailed multivariate analysis. Section 5 concludes. The additional Appendix (Tables and Figures starting with 'A.') provides complementary empirical results and background information.

2 Background and Hypotheses

The German education system is rather complex with different routes possibly leading to the same schooling certificate. There are three different schooling tracks (lower track [LTSS], middle track [MTSS], and upper secondary school; Table 1), and in Baden-Württemberg (as in most German states) it is decided at the end of primary school in grade 4, which track a student will go to in grade 5. However, students may achieve equivalent schooling certificates through different routes in the tracking systems. There is upward as well as downward mobility across the different tracks, and there are various alternative general or vocational schooling options after grades 9 or 10 for students from different schooling tracks. LTSS graduates have to decide whether or not to continue schooling (with or without a vocational focus) or to apply for an apprenticeship (the later involves part-time attendance of a vocational school), see Figures A.1 and A.2 (Landesinstitut für Schulentwicklung, Statistisches Landesamt Baden-Württemberg 2011, p. 36).

LTSS graduates in Germany face particular difficulties in entering the labor market because the demand for more skilled workers has increased compared to the demand for less skilled workers (Katz and Autor 1999, Reinberg and Hummel 2002). Furthermore, employment opportunities involving routine tasks have fallen both relative to those involving nonroutine manual tasks (often in service sector jobs) or abstract tasks (often in jobs requiring a high skill level) [Spitz-Oener 2006]. A job application process is a situation with asymmetric information where the graduation certificate is of particular importance because it serves as a signal for the productivity and potential the employer can expect from the applicant (Spence 1974). This puts LTSS graduates at a disadvantage when competing for apprenticeships. Thus, many training occupations, which used to be available for LTSS graduates, require a degree from a middle track secondary school. In addition, employers often complain that graduates from LTSS do not have the necessary skills to start an apprenticeship after finishing school at the end of grade 9 (Solga et al. 2012).

In response to these trends, the share of LTSS-students has been falling strongly - even in those German states like Baden-Württemberg (in 2010, the fraction of LTSS students after grade four declined to 15.7%, Autorengruppe Bildungsberichterstattung 2012, p. 263) whose state government until 2011 had the goal to keep the traditional three-track educational system in place. In addition, the age when completing successfully an apprenticeship has risen (BIBB Datenreport 2012), LTSS student have been seeking increasingly to obtain a second higher school degree after graduation from LTSS (supported by educational policies), and with the growing incidence of not starting an apprenticeship after grade 9, over time, a larger share of LTSS graduates continued in pre-vocational training after grade 9 as a preparation for the transition to the

labor market.² In 2008, a substantial share of 34.1% of all graduates from secondary schools (50.2% among LTSS graduates) in Germany start pre-vocational training after finishing school (Autorengruppe Bildungsberichterstattung 2010, p. 9). However, the absolute number of youth in pre-vocational training fell by more than a third between 2005 and 2012 (BMBF 2013, p. 40). Finally, with the decline in the share of LTSS students, the selection of students in terms of observed and unobserved determinants of educational achievements has become more negative over time. The share of students with a migration background is about 25% in 2009 (Kultusministerkonferenz 2009). More than 50 percent of the LTSS students do not reach the basic reading level (Schaffner et al. 2004), and 56 percent show mathematic skills only at the elementary school level (Klieme et al. 2001). Already in grade 4, there is a gap in reading, math, and science between native students and students with a migration background, and this gap increases further up to the age 15 between natives and students, whose parents have both a migration background (Baumert and Schümer 2001, Schwippert et al. 2003). In contrast, the difference between natives and students with only one parent born abroad decreases. Furthermore, a migration background reduces the chances to find an apprenticeship and delays its start (Beicht et al. 2007). Among LTSS students with a migration background, 66.6% enter pre-vocational training, while the share among natives is only 48.0% (BMBF 2008).

As a reflection of the aforementioned changes, LTSS graduates most often continue in full-time schooling (often in pre-vocational training) before entering the labor market. Mack (2002) noted a lack of effective career guidance policies for this group. Career guidance should motivate students at a fairly young age in their learning efforts by drawing the attention to the importance of skills and by informing students about what is required for a successful labor market entry. In Germany, in contrast to most other countries, career guidance policies in schools are mostly provided by institutions coming from outside of the schools (OECD 2004). A key provider is the Federal Labor Agency (Bundesagentur für Arbeit), often in cooperation with the chambers of commerce (BMBF 2013). For students with particular problems, often case workers from public or private non-profit welfare agencies get involved. There is a strong regional heterogeneity in the provision of career guidance in schools.³ Solga et al.

²In this paper, *pre-vocational training* denotes all school-based training after finishing regular schooling (LTSS in our case) which is supposed to prepare students for the labor market and which does not involve a regular schooling degree or regular vocational training degree. In German, *pre-vocational training* is called the *Übergangssystem* (Table 1), whose institutional setup differs strongly between the different German states. For the time period investigated in Baden-Württemberg (Landesinstitut für Schulentwicklung 2011), LTSS graduates, who did not start an apprenticeship or vocational training in a vocational school (*Berufsfachschule*) leading to a vocational training degree, are required by law to attend a preparatory vocational entry training year (*BEJ, Berufseinstiegsjahr*). Students leaving the LTSS without a school degree can start a vocational preparation year (*BVJ, Berufsvorbereitungsjahr*) that typically leads to an LTSS degree.

³The provision is often school-specific, and to our knowledge, except for the state of Lower Saxony

(2012) find that career guidance has been intensified over the last decade and that in the late 2000s LTSS graduates have concrete and realistic career plans.

To design effective career guidance policies, it is important to discuss key determinants of a successful school-to-work transition. Traditional human capital theory emphasizes the role of skills acquired in school, as reflected by school grades. The availability of apprenticeship positions in a region is tied to the regional industry structure. Given the low level of regional mobility, LTSS students have to learn about the supply of apprenticeship in their region. Making effective use of regional labor market opportunities will have a lasting positive effect on the labor market success (Jobst and Schwarze 2011). The supply of available apprenticeships may be quite limited, and LTSS students may have to apply for apprenticeships in less attractive occupations. In light of about 350 training occupations, this is a complex decision problem for LTSS students in aligning preferences with available labor market opportunities. Heckman and Kautz (2012) emphasize that both cognitive and non-cognitive skills (personality traits) are quite important for labor market success (see also Cunha and Heckman 2007). Among the non-cognitive skills, conscientiousness stands out in particular. For LTSS graduates in Germany, Solga et al. (2012) confirm that noncognitive skills, such as the motivation to learn, work ethic, and social skills, are more important to find an apprenticeship than school grades. Furthermore, early regular contacts to firms are of great importance. Hofer (2004) emphasizes that students experience a strong trade-off between school and leisure activities. Effective career guidance requires that students plan for their long-term labor market career under uncertainty, which requires to overcome to some extent myopic behavior focusing on leisure. Experimental evidence shows that myopic behavior and risk aversion are negatively correlated with cognitive skills (Dohmen et al. 2007). Students need to find a desired training occupation among a large number of potential occupations, which has to be realistic in terms of their chances in the local labor market they live in (Abraham and Hinz 2008). Both informing students about what it takes to be successful in the labor market and enabling students to make responsible decisions are the key issues for career guidance during last years of school. This goes beyond providing general informations about training occupations, job application training, and organizing internships.

Because an immediate transition of LTSS graduates into an apprenticeship has become more difficult over time and career aspirations may exceed what the labor market can offer to LTSS graduates without further credentials, a growing share of LTSS graduates strives for an MTSS degree or a vocational degree from a vocational training school. The educational system in Baden-Württemberg accommodated this demand by offering additional general teaching (AGT \equiv *Zusatzunterricht*, Table 1) to prepare LTSS students for the completion of a higher schooling degree after graduation from

(with an amount of 80 days of career assistance over grades 8 and 9, see Niedersächsisches Kultusministerium www.mk.niedersachsen.de), there is no regulation at the state level.

the LTSS. In a recent study, Dustmann et al. (2014b) find that tracking choice after grade 4 is less relevant regarding later labor outcomes for those students who are close to the margin to attend different tracks of secondary schools.⁴ Sizeable upward and downward mobility across different tracks is a key mechanism for this finding. Eligibility for AGT is based on the grades in German and Math at the end of grade 7 and on teacher assessments of the motivation and the behavior of the student.⁵ Students participating in AGT have a second chance to obtain a higher schooling degree within the tracking system, and career guidance policies must take account of the fact that these students do not strive primarily for an immediate entry into the labor market after graduation from the LTSS. Instead, these students rather pursue a more long-term career strategy and their career plans are often less concrete during grades 8 and 9 in LTSS than the career plans of those students not participating in AGT. For a transition to grade 10, LTSS students typically must have participated in AGT during grades 8 and 9, and they must have achieved a grade of 2.4 or better in the main subjects at the end of grade 9. LTSS graduates can also apply to enter a vocational training school.⁶ Our analysis combines the two options *grade 10* and *vocational training school* into the state *further schooling*.

Based on the above considerations, we state the following hypotheses to be explored in our analysis.

Hypothesis 1 (Career Planning): Higher career planning activities are associated with a higher rate of transition to apprenticeship compared to pre-vocational training.

Hypothesis 2 (Grades in schools): Higher career planning activities are associated with better grades in schools - especially for students, who are underperforming at the end of grade 7.

Hypothesis 3 (Transition after graduation from LTSS): Students with better grades taking AGT rather aim for further schooling to achieve a higher school degree instead for aiming for starting vocational training immediately. Underperforming students rather aim for entering an apprenticeship, but have a high risk to start pre-vocational training.

Hypothesis 4 (Migration background): Migration background is associated with lower career planning activities, lower grades in schools, and a higher transition rate into pre-vocational training.

⁴These are the compliers when using month of birth as instrument for age at school entry.

⁵Until 2010, the goal of AGT was to prepare students for a transition to grade 10 at the level of a MTSS, which was a setting unique to the state of Baden-Württemberg. In 2006/07, about 48% of LTSS student participated in AGT (Schwarz-Jung 2007). Other states in Germany, provided different possibilities for LTSS graduates to move up to an MTSS degree.

⁶The one-year vocational training school requires a preliminary agreement for the start of an apprenticeship afterwards. The two-year vocational training school requires a particular grade level and typically leads to a secondary school certificate. In our analysis, the two types cannot be distinguished.

3 Data and Descriptives Evidence

This section first describes our survey of LTSS students and then provides first descriptive evidence.

3.1 Description of the Survey

We run our own surveys following two consecutive cohorts of students over the last two years of LTSS's in the City of Freiburg (state of Baden-Württemberg) during the time period 2007 to 2010. In Freiburg, the share of LTSS students among all students in grade 7 is 12.75% (Statistische Ämter des Bundes und der Länder, 2013), and LTSS students in grades 8 and 9 receive Additional Career Assistance (ACA) as part of career guidance policies.⁷

For all LTSS students in grades 8 and 8 in Freiburg at the time, we conduct regular surveys among the students, the teachers, and the parents regarding the students' characteristics, career guidance policies and career plans, and teacher assessments (Figure 1). The students come from 11 different schools and 16 classes. We survey the two cohorts of LTSS students starting 8th grade in 2007 and 2008, respectively. Taking both cohorts together, 551 students (plus 78 drop outs) received ACA. Students were interviewed three or four times during grades 8 and 9 (*Timecode in brackets: grade and semester*): first semester (8:1,9:1) and second semester (8:2, 9:2) of grades 8 and 9, respectively.⁸ The class teachers were interviewed once in grades 8 and 9 each. The parents were interviewed once in grade 8 at the time when they were asked to give their declaration of consent that their child may participate in the survey. Information about the transition after grade 9 is reported by the case worker providing the ACA.⁹

As a further innovative element of our data, we can use administrative data provided by the schools on grades, gender, age, and migration background in addition to the survey data.¹⁰ We have school grades in the subjects Math and German based on the grade report (transcript, Table 1) in each semester from the end of grade 7 to the end of grade 9, i.e. for the points in time 7:2, 8:1, 8:2, 9:1, and 9:2.¹¹ We also use administrative

⁷ACA amounts to 160 hours per year and grade, see Arbeitsagentur Freiburg, Netzwerk Schule-Ausbildung Freiburg (2007). The German label of ACA in Freiburg is 'Erfolgreich in Ausbildung'.

⁸For practical reasons, it was only possible to conduct the first survey for the first cohort at the end of grade 8 (Figure 1).

⁹In case of missing values, we use the information given by the student in the last survey in 9:2. Moreover, we use information from the survey conducted after graduation to further correct the data (Figure 1).

¹⁰To merge administrative data to the survey responses, a separate written declaration of consent by the parents was required.

¹¹7:2 stands for the grade report at the end of grade 7, 8:1 for the grade report in the first semester

indicators (FR.ITZ, Freiburg)¹² characterizing the students' residential area (based on 36 city-districts), such as the share of foreigners, a proxy for the (un-)employment rate, and the share of students attending an LTSS.¹³

3.2 Descriptive Evidence

The population of the two cohorts consists of 551 students among which 448 students participate in the survey. The sample consists of slightly more boys (52%) and a large share of the students have a migration background (40%).¹⁴ More than half of the students (53%) receive Additional General Teaching (AGT) starting in grade 8, which only students with a *satisfactory performance* regarding school grades in grade 7 can participate in (Figure 2). This is one of the conditions for a continuation of schooling into 10th grade – which in turn provides the opportunity to achieve a degree from the MTSS. For our sample of LTSS students, regular schooling ends after grade 9. Only 44% of the students with a migration background participate in AGT compared to 61% of the other students. Moreover, girls participate slightly more often in AGT than boys and the gender contrast is stronger for students with a migration background.

The share of students, whose parents are married or live in cohabitation, is about 66%. The share of students with single parents is 29%. Moreover, most parents attended LTSS's, and the share of those with an upper track secondary degree is small (17% of the fathers and 11% of the mothers). About 71% of the fathers and 59% of the mothers completed a vocational training degree (including college degree). The share of foreigners in the residential area is about 14%, varying between 2% and 42%.¹⁵

Desired Occupation and Career Guidance Activities

We presume that at the beginning of grade 8 students have rather unspecific plans for their future career. For instance, they are unsure about their desired occupation which they want to start vocational training in (we take this as an indicator for career planning). For the second cohort, 60% of the students report a desired occupation at the beginning of grade 8 (Table A.1 - recall that we could not interview the first

of grade 8, and so on.

¹²Online-Statistics – City of Freiburg: <http://wiki.stadt.freiburg.de/webkatalog/>.

¹³FR.ITZ, Freiburg. For those students, who do not live in the City of Freiburg, we use information on their hometown at the municipal level (Statistisches Landesamt Baden-Württemberg, online data base).

¹⁴Migration background is defined as either having a foreign citizenship or being born in a foreign country.

¹⁵The average only slightly exceeds the overall average in the City of Freiburg in 2006 (source: FR.ITZ (2008), Freiburg - own calculations).

cohort in 8:1, section 3.1). At the end of grade 9, the share of students who report a desired occupation increases to 90%. The strongest increase is observed during grade 8 reflecting the intensive career guidance starting in grade 8. Regarding the transition state, students who continue with further schooling after grade 9 are the least likely to report a desired occupation.

In addition to providing theoretical information on different occupations, career guidance also involves practical experiences, such as internships or guided visits of firms. Generally, students are supposed to do one mandatory internship during grade 8. In our data, students do 2.3 internships on average during grade 8 and 1.4 during grade 9. In total, the internships last on average three full weeks during grade 8 and 9 days during grade 9.

Development of Individual Career Planning

At the survey dates 8:1, 8:2, and 9:1, students were asked about their plans for the time after graduation from the LTSS (Table 4). First, even though it could be the case that the share of students not knowing what to do is rather high at the beginning of grade 8, only a very small fraction of all students (4%) for the second cohort reports not to know what to do after graduation. But this is not the complete story. It seems that a considerable fraction (50%) of the students opt for further schooling thus postponing the choice and the start on an apprenticeship to the time after finishing a higher schooling degree. Only about 20% of the students want to start an apprenticeship immediately after grade 9 and this fraction remains stable over time.¹⁶ In 9:1, the fraction of students who still have no idea for their future is rather small with about 3%, whereas the share of those who want to attend further schooling but have no idea what to do afterwards declines to about 38%. We also see that the fraction of those who want to start an apprenticeship after continuing in further schooling rises from about 26% in grade 8 to about 42% in grade 9.

How do students assess their improvement in career planning up to 9:1? Whereas only 18% report that their career planning "did not improve" at all, over half of the students report a "moderate" and 28% a "substantial improvement" (Table A.1). Moreover, there is a difference for the fraction of those who report a desired occupation in 8:2 by destination state. The shares are 95% for apprenticeship, 91% for pre-vocational training, and 81% for further schooling.

¹⁶Cohort 2 is slightly more oriented towards an immediate transition into an apprenticeship, whereas students from cohort 1 are slightly more oriented towards further schooling.

Teacher Assessments

We summarize the teacher assessments of the social and cognitive skills as the mean of the first six variables reported in Table A.2, which are measured on a five-point Lickert scale and for which positive (negative) values reflect that the student has (does not have) the corresponding skill. Regarding social and cognitive skills, students with a migration background show slightly higher values than those without migration background (0.497 vs 0.376) and students with AGT show significantly higher values than those without (0.673 vs. 0.173). The latter reflects the strong positive selection of students with AGT, which is evidence for hypothesis 3.

The difficult socio-economic background of LTSS students is also reflected in the teacher assessments in 8:2 implying that, to improve the student's career planning, individual coaching/mentoring is desirable for 82% of the students. Put differently, in 8:2 only 18% of the students appear capable to implement their career planning on their own or with the help of their family. One would expect that effective career guidance policies should improve the capability for career planning in grade 9. Based on the teacher assessment in 9:1, only 20% of the students do not have the motivation and competence to realize his/her individual career plan (Table A.2), whereas 49% appear as being motivated and competent and 32% show moderate competence (32%). Thus, the share of those capable to implement their career planning increase from 18% in 8:2 to 49% in 9:1. Correspondingly, the share of students in need of individual support declines strongly from 8:2 to 9:2. For students, for whom individual support is (is not) desirable in (8:1, 8:2), the average assessments of the motivation and competence in 9:1 [based on the outcomes reported in Table A.2] are in descending order: "yes" 39.49% (84.91%), "more or less" 36.97% (9.43%), and "no" 23.54% (5.66%).

School Grades

For a successful transition after grade 9, school grades play an important role both for the application for an apprenticeship and for the admission to further schooling (Table 5). The average grade in the subjects German and Math at the end of grade 7 is 3.05 (\equiv satisfactory in the German grading scheme).¹⁷ Students with a migration background show worse grades than other students (3.22 vs. 2.96). Girls perform slightly better than boys (3.01 vs. 3.12), the gender difference being driven by students with a migration background. Student with AGT perform better than students without AGT by about 0.78. In German, girls perform better than boys, and the gender gap does not depend upon whether the student has a migration background. On average, students perform slightly worse in Math than in German. Among students

¹⁷The German grading scheme is as follows: 1 "very good", 2 "good", 3 "satisfactory", 4 "sufficient", 5 "insufficient", and 6 "with major deficiencies". 1 is the best grade. 4 is the passing grade.

without a migration background, boys perform better than girls in Math, but there is no gender gap in Math for students with a migration background.

Considering the development of grades between grades 7 and 9, the average grade for all students improves to 2.95 (+0.12). The average grade by the end of grade 9 improves only for boys but not for girls (see Figure 3). Note that girls start with slightly better grades at the end of grade 7. In fact, average grades for girls with a migration background deteriorate most strongly. In contrast, average grades for boys without AGT and for boys without a migration background improve strongly, and the improvement is strongest for boys exhibiting both characteristics. These boys catch-up because they start with the lowest grades at the end of grade 7. Grades in German improve both for boys and girls and the improvement is stronger for boys, reflecting catching-up of boys. The improvement does not depend upon whether the student has a migration background. Regarding grades in Math, the development is somewhat different. Boys already start with better Math grades than girls at the end of grade 7 and the gender gap increases up to grade 9. Thus, there is no catching-up of girls in Math and the development of the Math grade dominates the overall development for girls.

The reported evidence for boys is consistent with hypotheses 2 and 4, whereas the results are mixed for girls.

Transitions after Grade 9

Although in 9:1, 18% of all students want to make an immediate transition after grade 9 to an apprenticeship (Table 4), but only 11% in fact do so after grade 9 (Table 3). Furthermore, only about 37% among the 18%, who say that they want to make an immediate transition to an apprenticeship, in fact do so (Table 2), and 39% of all students apply for an apprenticeship (students write about 8 applications on average). Thus, in a large number of cases, students may not be able to implement their revealed career plans. Regarding the other destination states, 12% of all students continue schooling in grade 10, 48% continue further schooling in a vocational school, and 25% enter pre-vocational training. Thus, vocational schools comprise the largest destination state.

Transition patterns differ strongly between students with and without AGT (Figure 2), such that students with AGT rather continue in further schooling whereas students without AGT rather enter pre-vocational training. The rate of transitions into apprenticeship do not differ strongly, with 11.66% for students with AGT and 10.33% for students without AGT. Recall, that the decision as to whether or not a student receives AGT is based both on school grades at the end of grade 7 as well as the teacher assessment of the motivation and the behavior of the student. This implies that information available at the end of grade 7 has a strong predictive power on tran-

sitions after grade 9 regarding the alternatives further schooling vs. pre-vocational training. Of greatest concern is that among students without AGT about 50% enter pre-vocational training. Among students with AGT, the rate of transitions to grade 10 amounts only to 18%. Thus, again the revealed plans and the actual transitions differ somewhat.

Analyzing the changes in school grades between 7:2 and 9:2 by destination state, grades for students who continue in a vocational school improve most strongly (+0.28), where grades deteriorate most strongly for students entering pre-vocational training (-0.14/-0.19) [Tables 3 and 5]. Among those moving to a vocational school, 67% have AGT and their grades catch up to the grades of those continuing schooling in grade 10, the latter group showing the best grades. Students entering pre-vocational training exhibit the worst grades. There is almost no grade improvement both for students starting an apprenticeship and for students moving to grade 10.

Is there a link to the self-reported changes in career planning? Among the students, who report "no improvement" (18%) or only "moderate improvement" (54%) in career planning, one third enters "pre-vocational training", over 60% continue in further schooling, and only 5% start an apprenticeship. In contrast, among the students, who report a "substantial improvement" (28%) in career planning, 23% start an apprenticeship, while 19% enter pre-vocational training. For those starting an apprenticeship, we observe the strongest improvement in career planning, but still a larger share of students, who report a "substantial improvement" in career planning, enters pre-vocational training. These findings are in accordance with hypothesis 1, and, at the same time, they suggest that a large share of students may not be able to implement their career plans despite a high level of career planning.

4 Multivariate Analysis for School Grades and Transitions

This section conducts a multivariate econometric analysis for the two outcome "final school grade at the end of grade 9" and "first transition after grade 9". We estimate associations with the socio-economic characteristics of the students, school grades at the end of grade 7, and indicators of career planning. Our goal is to scrutinize statistically the pathways during the last two years regarding the two outcome variables considered, even though we cannot estimate causal effects. This allows us to explore the relevance of various transmission mechanisms with a particular focus on career planning.

4.1 School Grades

We use the average of the school grades for Math and German in 9:2 measuring cognitive skills as dependent variable, and we estimate eight different OLS regressions, which control for different sets of covariates. The regression results reported in Table A.3 do not control for school grades in 7:2, while the value-added regressions (Hanushek and Rivkin 2010) reported in Table A.4 do so. Among the four different specifications, the first one (1) controls only for basic individual characteristics like gender, migration background and their interaction as well as a dummy variable for the second cohort. The second specification (2) adds information on the socio-economic background of the family and on the residential area. The third specification (3) further includes the teacher assessments of social and cognitive skills and of the student's need for individual coaching/mentoring in career planning. The most comprehensive specification (4) also controls for career guidance and career planning activities, such as the number of internships, reporting a desired occupation, the self-reported assessment of the state of career planning, and the teacher assessment regarding career planning.¹⁸

Most results are in line with the descriptive evidence in section 3.2. Girls with a migration background have significantly worse school grades. For the father, being employed and a higher education level are associated with a significant improvement of the student's grade, while a higher share of foreigners in the residential area is associated with a significantly worse grade. Furthermore, students with better social and cognitive skills show a significantly better grade.¹⁹ There are no significant effects of a single-parent family and of the need for individual coaching/mentoring for career planning.

In the most comprehensive specification (4), the number of internships shows no significant influence, whereas reporting a desired occupation is associated with a worse grade. This is likely to reflect reverse causality such that students with better grades are more likely to continue in further schooling, thus postponing detailed career planning during grades 8 and 9 (Table 2). The estimated associations for improvements in career planning are ambiguous and not significant. A greater autonomy in career planning is associated with a significantly better grade.

The specifications reported in Table A.4 also control for the grade in 7:2. While the sign and the significance of most effects remain unchanged, there are some noteworthy differences. First, there are no significant coefficients of the family background

¹⁸Missings in the teacher assessment are imputed by cell averages, and the specification also includes a dummy variable for missings.

¹⁹Students with AGT show better school grades and better teacher assessments of their social and cognitive skills than students without AGT.

and the residential area, indicating that the associations with these variables discussed above operate through the grade in 7:2. Second, the size of the gender effect increases strongly, which reflects the aforementioned gender differences in grade development. Third, the coefficient for the desired occupation decreases but remains significant, which reflects that part of the association is captured by the grade in 7:2, such that students with better grades in 7:2 tend to postpone career planning. However, even conditional on the grade in 7:2, such a postponement seems to take place in anticipation of a better grade development. We conclude that the grade at the end of 7:2 is a key predictor for the career planning during and after finishing school.

Overall, these regression results provide evidence for hypotheses 2 and 3. The evidence for hypothesis 4 is somewhat mixed.

4.2 Transitions after Grade 9

To analyze the transitions after grade 9, we estimate separate probit regressions for the three destination states apprenticeship, further schooling, and pre-vocational training based on the most comprehensive specification (4) used in the previous section. Table A.5 reports the estimated average marginal effects.²⁰

Students with a migration background are significantly more likely to move into pre-vocational training than into further schooling or apprenticeship. Girls without a migration background (main effect of gender) are significantly less likely to start an apprenticeship. This effect is partly offset for girls with a migration background. Thus, holding gender constant, boys without migration background and girls with a migration background are more likely to start an apprenticeship, which reflects again the complex interaction between gender and migration background discussed above. Furthermore, students of the second cohort are significantly more likely to start an apprenticeship compared to the first cohort, reflecting the improvement in labor market conditions after the end of the great recession in 2008/09. Having a father with medium/high education increases significantly transitions into further schooling. Living in a residential area with a high share of foreigners is associated with more transitions into pre-vocational training (somewhat in accordance with hypothesis 4).

An increasing number of internships in grade 9 is associated with significantly less (more) transitions into further schooling (into an apprenticeship), which is in accordance with hypothesis 1. In contrast, the number of internships in grade 8 shows no significant effects. However, this variable may have an indirect effect through other

²⁰We estimate the average marginal effect regarding the interaction of two covariates using the approach of Ai/Norton (2003). In a robustness check, we obtain similar results applying the approach suggested by Puhani (2012) - these results are available upon request.

variables related to career planning, which in turn may have an effect on the transition and the motivation for further internships in grade 9. Students continuing in further schooling have significantly less concrete ideas about their desired occupation, which is consistent with hypothesis 3. In contrast, students, who enter pre-vocational training, are more likely to report a desired occupation. Career planning therefore shows an important role for the transition. Correspondingly, students, who report a substantial occupational improvement in 9:1, are significantly more likely to start an apprenticeship and less likely to enter pre-vocational training (in accordance with hypothesis 1). Furthermore, students with better social and cognitive skills are significantly more likely to continue in further schooling and less likely to enter pre-vocational training. A higher capability in career planning is associated with a significantly higher rate of transition into further schooling, which reflects a partial catching-up process for students which start with rather bad grades. This is consistent with the view that improvements in career planning do not necessarily result into an immediate transition into apprenticeship but rather foster a more long-term career planning through further schooling, which is partly inconsistent with hypothesis 1.

The estimated associations remain basically unchanged when controlling for the school grades in 7:2 (Table A.6). The changes found typically concern the same covariates whose coefficients were affected when adding the grade in 7:2 to the regressions of the grade in 9:2 (section 4.1). Reporting an occupation, the level of social and cognitive skills, improvement in the autonomy of career planning, the share of foreigners in the residential area are correlated with the grade in 7:2. This explains the attenuation of the coefficients for these variables regarding the transition into pre-vocational training. Finally, when we allow the effects to differ between the German grade and the Math grade, the Math grade shows a stronger effect on the transitions into pre-vocational training and further schooling (Table A.7).

Overall, these results provide evidence for hypotheses 2 to 3. The evidence for hypotheses 1 and 4 is somewhat mixed.

5 Conclusions

The complex German education system involves multiple paths for school-to-work transitions. The entry into the labor market for students in the non-academic tracks of secondary schools is dominated by vocational training either through an apprenticeship in a firm or through full-time vocational training both leading to a vocational training degree for a specific occupation. Students graduating from lower track secondary schools (LTSS) face major problems in school-to-work transitions, prompting the provision of intensive career guidance in school. There are strong regional dif-

ferences in labor market conditions, and therefore the demand for training in specific occupations, and in the provision of career guidance policies.

In a case study for the City of Freiburg, this paper analyzes skill formation, career guidance, and the first transition after graduation for LTSS students in the late 2000s. We ran multiple surveys among students, parents, and teachers during the years 2007 to 2010. LTSS students at the time also had the option to participate in additional general teaching (AGT) to enable them to continue for a higher schooling degree or for a vocational degree after graduation from LTSS.

Our findings imply that only about 10% of LTSS students start an apprenticeship immediately after graduation. On the one hand, about half of the students, who typically receive AGT during grades 8 and 9, tend to choose further schooling over apprenticeship, expecting that this will improve their future career options. On the other hand, the majority of students with poor school grades continue with pre-vocational training, even though career guidance was effective in terms of the career planning activities reported by students. These students typically do not receive AGT, and this group involves a large share of male students with a migration background. Our findings reflect a large heterogeneity among students within the LTSS, most visible in the division between students with and without AGT. Furthermore, characteristics observable at the end of grade 7 have a strong predictive power on the transition after graduation, and focusing career guidance on the immediate start of an apprenticeship after graduation may be misplaced.

References

- [1] Abraham, M., Hinz, T. (eds.) (2008): "Arbeitsmarktsoziologie - Probleme, Theorien, empirische Befunde", 2. Auflage, VS Verlag für Sozialwissenschaften, Wiesbaden.
- [2] Ai, C., Norton, E. C. (2003): "Interaction terms in logit and probit models", *Economics Letters*, 80(1), pp. 123-129.
- [3] Arbeitsagentur Freiburg, Netzwerk Schule-Ausbildung Freiburg (2007): "Konzeption 'Erfolgreich in Ausbildung'." Berufsorientierungsmassnahme für Schüler/innen Freiburger allgemeinbildender Hauptschulen nach SGB III Paragraph 33 für die Laufzeit September 2007 bis August 2009.
- [4] Autorengruppe Bildungsberichterstattung (eds.) (2010): "Bildung in Deutschland. Ein Indikatorgestützter Bericht mit einer Analyse zu Perspektiven des Bildungswesens im demografischen Wandel", Bielefeld, 2010.

- [5] Autorengruppe Bildungsberichterstattung (eds.) (2012): "Bildung in Deutschland. Ein indikatorengestützter Bericht mit einer Analyse zur kulturellen Bildung im Lebenslauf", Bielefeld, 2012.
- [6] Baumert, J., Schümer, G. (2001): "Familiäre Lebensverhältnisse, Bildungsbeteiligung und Kompetenzerwerb", in: Baumert, J., Klieme, E., Neubrand, M., Prenzel, M., Schiefele, U., Schneider, W., Stanat, P., Tillmann, K.-J., Weiß, M. (eds.) (2001). Deutsches PISA-Konsortium, "PISA 2000 : Basiskompetenzen von Schülerinnen und Schülern im internationalen Vergleich", pp. 323-407, Opladen.
- [7] Beicht, U., Friedrich, M., Ulrich, J. G. (2007), "Deutlich längere Dauer bis zum Ausbildungseinstieg. Schulabsolventen auf Lehrstellensuche", BIBB Report, Forschungs- und Arbeitsergebnisse aus dem Bundesinstitut für Berufsbildung, Nr. 2/2007.
- [8] Bundesministerium für Bildung und Forschung [Federal Ministry for Education and Research, BMBF] (2008): "Berufsbildungsbericht 2008", Bonn and Berlin.
- [9] Bundesministerium für Bildung und Forschung [Federal Ministry for Education and Research, BMBF] (2013): "Berufsbildungsbericht 2013", Bonn and Berlin.
- [10] Bundesinstitut für Berufsbildung [BIBB] (2012): "Datenreport zum Berufsbildungsbericht 2012. Informationen und Analysen zur Entwicklung der beruflichen Bildung", Bonn.
- [11] Cunha, F., Heckman, J.J. (2007): "The Technology of Skill Formation", in: The American Economic Review, Vol. 97, Number 2, 2007, pp. 31-47.
- [12] Dohmen, T., Falk, A., Huffman, D., Sunde, U. (2007): "Are Risk Aversion and Impatience related to Cognitive Ability?", IZA Discussion Paper, No. 2735, Bonn.
- [13] Dustmann, C., Fitzenberger, B., Schoenberg, U., Spitz-Oener, A. (2014b): "From Sick Man of Europe to Economic Superstar: Germany's Resurgent Economy", Journal of Economic Perspectives, Vol. 28 (1), pp. 167-188.
- [14] Dustmann, C., Puhani, P.A., Schoenberg, U. (2014a): "The Long-Term Effects of Early Track Choice", IZA Discussion Paper, No. 7897, Bonn.
- [15] FR.ITZ (2008), Stadt Freiburg, Amt für Bürgerservice und Informationsverarbeitung; <http://wiki.stadt.freiburg.de/webkatalog/> [Downloaded on 31 October 2013].
- [16] Hanushek, E. A., Rivkin, S. G. (2010). "Generalizations about using value-added measures of teacher quality", American Economic Review: Papers & Proceedings, 100(2), 267-271 (May).

- [17] Heckman, J.J., Kautz, T. (2012): "Hard Evidence on Soft Skills", Adam Smith Lecture, Labour Economics, Vol. 19(4), pp. 451-464.
- [18] Hofer, M. (2004): "Schüler wollen für die Schule lernen, aber auch anderes tun", Zeitschrift für Pädagogische Psychologie, Vol. 18(2), pp. 79-92.
- [19] Jobst, A., Schwarze, J. (2011): "Ungenutzte Potenziale in Bildung und Ausbildung: Analysemöglichkeiten des Nationalen Bildungspanels", in: Wirtschaftsdienst, 91, Sonderheft, pp. 48-53.
- [20] Katz, L., Autor, D. (1999): "Inequality in the Labor Market", in Orley Ashenfelter and David Card (eds.), Handbook of Labour Economics, Volume 3, Amsterdam and New York: North-Holland.
- [21] Kultusministerkonferenz (2010): "PISA 2009: Deutschland holt auf", Press release on 7 Dec 2010, <http://www.kmk.org/presse-und-aktuelles/meldung/pisa-2009-deutschland-holt-auf.html> (download: 20 Feb 2013).
- [22] Klieme, E., Neubrand, M., Lüdtke, O. (2001): "Mathematische Grundbildung: Testkonzeption und Ergebnisse", in: Baumert, J., Klieme, E., Neubrand, M., Prenzel, M., Schiefele, U., Schneider, W., Stanat, P., Tillmann, K.-J., Weiß, M. (eds.). Deutsches PISA-Konsortium, "PISA 2000 : Basiskompetenzen von Schülerinnen und Schülern im internationalen Vergleich", pp. 141-190, Opladen, 2001.
- [23] Kristen, C., Granato, N. (2005): "Bildungsinvestitionen in Migrantenfamilien". In: Bundesministerium für Bildung und Forschung (ed.); Arbeitsstelle Interkulturelle Konflikte und Gesellschaftliche Integration, Berlin, Migrationshintergrund von Kindern und Jugendlichen. Wege zur Weiterentwicklung der amtlichen Statistik, (Bildungsreform, 14), Bonn, pp. 25-42.
- [24] Landesinstitut für Schulentwicklung, Statistisches Landesamt Baden-Württemberg (eds.) (2011): "Bildungsberichterstattung 2011.", Stuttgart 2011.
- [25] Mack, W. (2002): "Lernförderung und Lebensweltorientierung. Herausforderungen für Hauptschulen nach PISA", Die Deutsche Schule, 94(4), pp. 426-441.
- [26] OECD (2004): "Career Guidance and Public Policy: Bridging the Gap", A Review of National Career Guidance Policies, Paris.
- [27] Reinberg, A., Hummel, M. (2002): "Zur langfristigen Entwicklung des qualifikationsspezifischen Arbeitskräfteangebots und -bedarfs in Deutschland", Mitteilungen aus der Arbeitsmarkt und Berufsforschung, No. 4, pp. 580-600.

- [28] Puhani, P.A. (2012): "The treatment effect, the cross difference, and the interaction term in nonlinear "difference-in-differences" models", *Economics Letters*, 115 (2012), pp. 85-87.
- [29] Schaffner, E., Schiefele, U., Drechsel, B., Artelt, C. (2004): "Lesekompetenz", in Prenzel, M., Baumert, J., Blum, W., Lehmann, R., Leutner, D., Neubrand, M., Pekrun, R., Rolff, H.-J., Rost, J., Schiefele, U. (eds.), *PIISA 2003. Der Bildungsstand der Jugendlichen in Deutschland - Ergebnisse des zweiten internationalen Vergleichs*, pp. 93-110, Münster: Waxmann.
- [30] Schwarz-Jung, S. (2007): "Hauptschulen in Baden-Württemberg im Schuljahr 2006/7 - eine Zusammenstellung der Fakten", in: *Statistisches Monatsheft Baden-Württemberg* 8/2007, pp. 25-29.
- [31] Schwippert, K., Bos, W., Lankes, E.-M. (2003): "Heterogenität und Chancengleichheit am Ende der vierten Jahrgangsstufe im internationalen Vergleich", in: Bos, W., Lankes, E.-M., Prenzel, K., Schwippert, Walther, G., Valtin, R. (eds.): *Erste Ergebnisse aus IGLU. Schülerleistungen am Ende der vierten Jahrgangsstufe im internationalen Vergleich*, Münster u. a. 2003.
- [32] Solga, H., Baas, M., Kohlrausch, B. (2012): "Mangelnde Ausbildungsreife - Hemmnis bei der Lehrstellensuche von Jugendlichen mit Hauptschulabschluss?", *WZBrief Bildung*, 19, Februar 2012, Berlin.
- [33] Spence, A. (1974): "Market signaling: Informational Transfer in Hiring and Related Screening Processes", Cambridge, Mass., 1974.
- [34] Spitz-Oener, A. (2006), "Technical Change, Job Tasks, and Rising Educational Demands: Looking outside the Wage Structure", *Journal of Labor Economics*, 24(2), pp. 107-127.
- [35] Statistische Ämter des Bundes und der Länder (2013): "Tabelle: Allgemeinbildende Schulen: Schulen, Schüler nach Schulart - Stichtag: Schuljahresbeginn - regionale Tiefe: Kreise und krfr. Städte (192-32-4)".
- [36] Wolter, S., Ryan, P. (2011). "Apprenticeship", in E.A. Hanushek, S. Machin, and L. Wössmann (eds.): *Handbook of the Economics of Education*, Vol. 3, Amsterdam: Elsevier, ch. 11, 521-576.

Tables

Table 1: Glossary - Translation of technical terms for the schooling and vocational training system in the state of Baden-Württemberg (Germany)

German	English
Hauptschule	lower track secondary school (LTSS) up to grade 9
Realschule	middle track secondary school (MTSS) up to grade 10
Gymnasium	upper track secondary school up to grade 13 or 12
WRS, Werkrealschule	lower track secondary school offering grade 10 (LTSS10) with possibility to complete an MTSS degree
Zeugnis	Grade report
Berufsorientierung	career guidance (policies)
Übergangssystem	pre-vocational training
BEJ, Berufseinstiegsjahr	preparatory vocational entry training year
BVJ, Berufsvorbereitungsjahr	vocational preparation year
BFS, Berufsfachschule	vocational training school
Zusatzunterricht	Additional general teaching (AGT)

Table 2: Plans for Transition after grade 9 (as reported in 9:1) and actual transition

	pre-vocational training	further schooling	apprenticeship training	total
(0) no concrete plan	71.46%	28.57%	0.00%	2.20%
(1) start an apprenticeship (appr.)	38.60%	24.56%	36.84%	17.92%
(2) first further schooling, then appr.	18.80%	80.45%	0.75%	41.82%
(3) first further schooling, then "?"	29.75%	61.98%	8.26%	38.25%
	27.67%	62.26%	10.06%	n=318

Note: row-frequencies.

Table 3: Transitions after grade 9

Transition into...	433		433
apprenticeship	10.62%	<i>apprenticeship</i>	10.62%
grade 10	12.01%	<i>further schooling</i>	59.59%
vocational school	47.58%		
pre-vocational training	25.40%	<i>pre-vocational training</i>	29.79%
other	4.39%		

Note: We use the information about the expected transition provided by the teachers at the end of grade 9. Additionally we use the self-reported transition path if teacher's information is missing and the information reported by the student half a year after finishing grade 9. We also use this information if it differs from reports of the past.

Table 4: Plans for Transition after grade 9

	8:1	8:2	9:1
(0) no concrete plan	3.82%	8.42%	2.75%
(1) start an apprenticeship (appr.)	19.75%	22.22%	18.04%
(2) first further schooling, then appr.	26.11%	33.00%	41.59%
(3) first further schooling, then "?"	50.32%	36.36%	37.60%
n	157	297	327

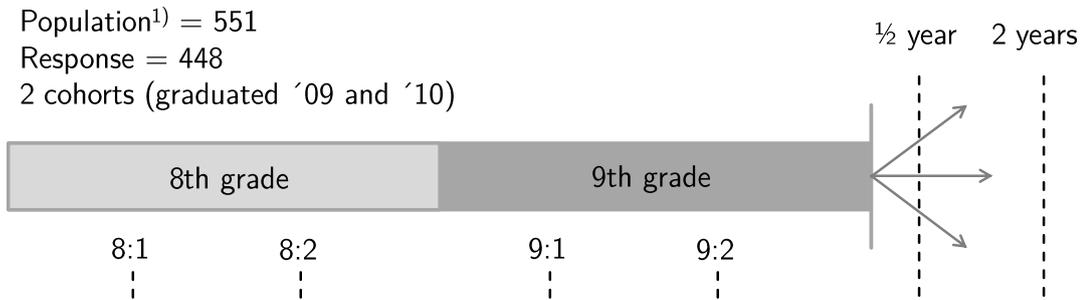
Note: Student questionnaire; in 8:1, we only observe cohort 2.

Table 5: Transition and improvement in grades

Transition	7:2	9:2	Improvement
apprenticeship	3.01	2.98	0.03
grade 10	2.62	2.59	0.03
vocational school	2.92	2.64	0.28
pre-vocational training	3.49	3.63	-0.14
other	3.06	3.25	-0.19
overall ($n=410$)	3.05	2.95	0.10

Figures

Figure 1: Design of the Survey



Note: ¹⁾ All students of lower secondary track schools in the City of Freiburg (drop outs excluded).
 Surveys in school: Student (8:1*, 8:2, 9:1, 9:2), Teacher (8:2, 9:1), Parents. *) Student survey in 8:1 only for cohort 2. Administrative data: grades (7:2, 8:1, 8:2, 9:1, 9:2), gender, age, migration background, tracking information (teacher).

Figure 2: Additional General Teaching (AGT) and transitions

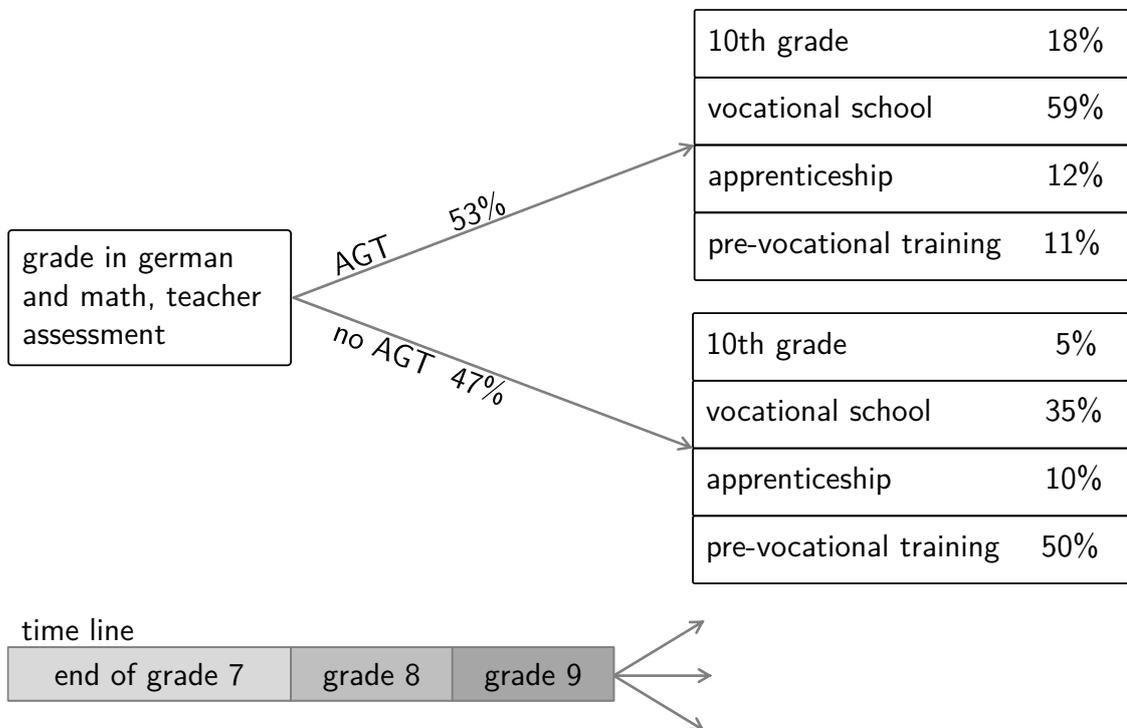
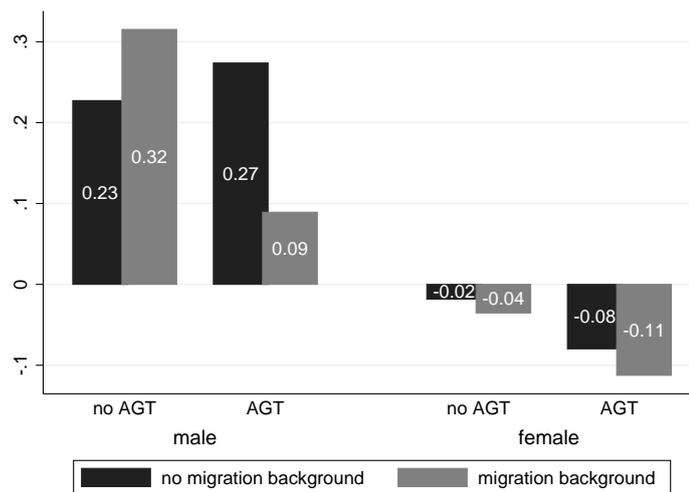


Figure 3: Improvement in school grades (average of German and Math)



Note: n=416; improvement over the last two years: 7:2 to 9:2, so positive numbers reflect an improvement; AGT in grades 8 and 9 (requirement for transition to grade 10 - secondary school track).

Additional Appendix

Figure A.1: Tracking after elementary school and lower secondary track

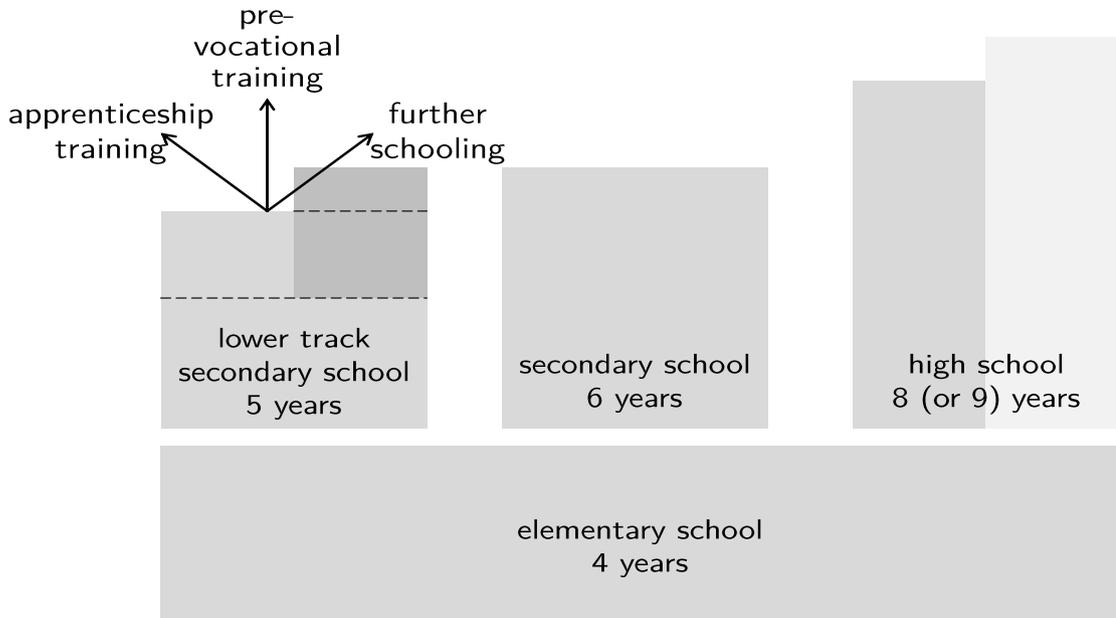


Figure A.2: Tracking after Grade 9 - Details

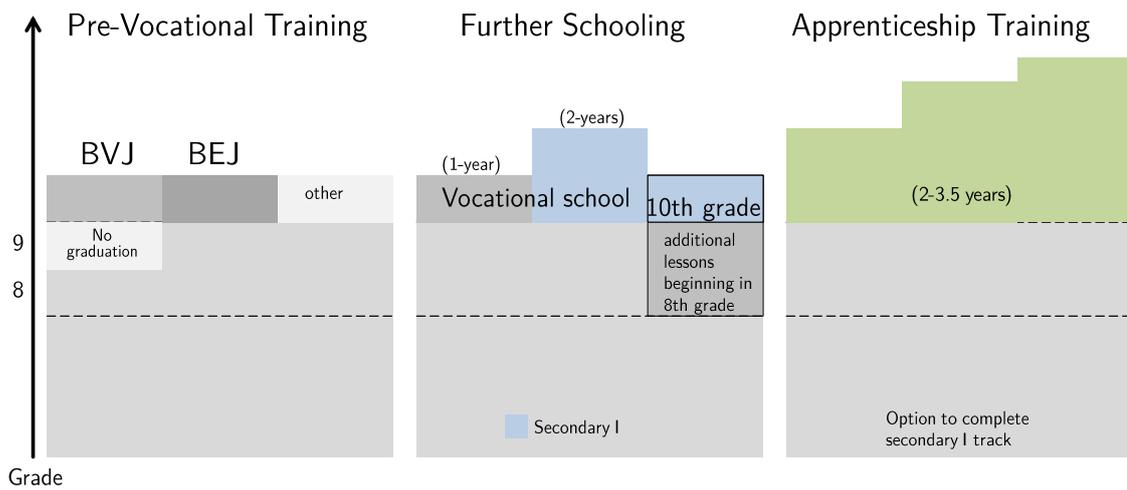


Table A.1: Career Guidance and Career Planning

Variable		n
Number of internships in grade 8	2.28 (0.86)	311
Duration (in working days)	15.91 (6.50)	311
Number of internships in grade 9	1.42 (1.15)	294
Duration (in working days)	8.44 (9.40)	294
<i>Student knows desired occupation</i>		
Beginning of grade 8* [8:1]	57.50%	160
End of grade 8 [8:2]	85.21%	257
First semester of grade 9 [9:1]	85.52%	297
End of grade 9 [9:2]	90.28%	247
<i>State of career planning: [9:1]</i>		330
(0) no improvement	18.18%	
(1) moderate improvement	53.94%	
(2) substantial improvement	27.88%	

Source: Student questionnaire; * data only available for the second cohort.

Table A.2: Teacher Assessment of Students

Social/cognitive skill The student... [8:2]	no (-2)	rather no (-1)	rather yes (1)	yes (2)	n	mean
talks about conflicts openly.	18.02%	28.53%	33.93%	19.52%	333	0.084
is prepared to make compromises.	2.74%	18.29%	53.66%	25.30%	328	0.790
tries out new things independently.	7.27%	36.67%	41.52%	14.55%	330	0.192
finds solutions.	5.44%	29.31%	44.11%	21.15%	331	0.458
is inclusive.	5.63%	25.94%	49.06%	19.38%	320	0.495
has positive influence on atmosphere in group.	3.72%	28.48%	46.75%	21.05%	323	0.514
Mean of social and cognitive skills	0.4217	0.8743 std.dev.				
Individual support to improve the student's ability to plan his/her career is desirable. (1) yes	82.26%	<i>n</i> =327		[8:2]		
Student has the motivation and competence to realize his/her career planning.						
(-1) no	19.60%					
(0) more or less	31.53%					
(1) yes	48.86%	<i>n</i> =352,		[9:1]		
Career planning: improvement in ability to plan career						
(-1; -2)	2.75%					
(0)	34.71%					
(1)	30.24%					
(2)	32.30%	<i>n</i> =291		[9:1]		

Note: The cognitive and social skills are measured on a five-point Lickert scale from -2 to +2. The shares for the response zero are omitted. "Career planning: improvement in ability to plan career" is calculated as the difference between the ability in grade 9 and 8, where ability in (8) is '-1' if individual support is desirable and '+1' if not.

Table A.3: Regression (1) - Average School Grade in German and Math in 9:2

	(1)	(2)	(3)	(4)
female	0.192 ** [0.0876]	0.177 ** [0.0874]	0.194 ** [0.0812]	0.179 ** [0.0774]
migration background	0.312 *** [0.0987]	0.256 ** [0.0994]	0.259 *** [0.0966]	0.294 *** [0.0984]
female*migration background	-0.0486 [0.1394]	-0.0527 [0.1377]	-0.0375 [0.1322]	-0.0864 [0.1290]
cohort 2	0.0353 [0.0676]	0.0279 [0.0690]	0.0823 [0.0657]	0.0827 [0.0683]
father employed		-0.199* [0.1092]	-0.240 ** [0.1053]	-0.271 ** [0.1066]
father employed missing		0.0108 [0.1897]	-0.0364 [0.1697]	-0.0787 [0.1702]
father's degree of schooling: medium-high		-0.149 ** [0.0733]	-0.136* [0.0719]	-0.145 ** [0.0727]
father's degree of schooling missing		-0.349 ** [0.1665]	-0.363 ** [0.1482]	-0.403 *** [0.1484]
single-parent family		0.0561 [0.0855]	0.0227 [0.0800]	-0.000193 [0.0766]
single-parent family missing		0.278* [0.1646]	0.422 *** [0.1534]	0.330 ** [0.1518]
share of foreigners in residential area		1.614 *** [0.5664]	1.338 ** [0.5302]	1.423 *** [0.5296]
<i>teacher assessment</i>				
social and cognitive skills [8:2]			-0.260 *** [0.0434]	-0.257 *** [0.0387]
individual coaching/mentoring: desirable [8:2]			0.106 [0.1007]	
career planning: improvement in autonomy (8:2 to 9:2)				-0.156 *** [0.0442]
teacher response missing			-0.213* [0.1275]	-0.329 *** [0.0954]
number of internships (grade 8)				0.0447 [0.0452]
number of internships (grade 8) missing				-0.0920 [0.1251]
number of internships (grade 9)				0.0184 [0.0304]
number of internships (grade 9) missing				0.161 [0.0984]
knows desired occupation [9:1]				0.308 *** [0.1074]
knows desired occupation [9:1] missing				0.423 *** [0.1321]
state of career planning: moderate improvement				0.104 [0.0966]
state of career planning: substantial improvement				-0.161 [0.1195]
constant	2.708 *** [0.0657]	2.718 *** [0.1430]	2.826 *** [0.1712]	2.644 *** [0.1916]
N	429	429	429	429
R-sq	0.057	0.106	0.201	0.264
adj. R-sq	0.048	0.082	0.174	0.224

Standard errors in brackets; * p<0.10, ** p<0.05, *** p<0.01; clustered on school level.

Table A.4: Regression (2) - Average School Grade in German and Math in 9:2

	(1)	(2)	(3)	(4)
female	0.242 *** [0.0719]	0.242 *** [0.0719]	0.246 *** [0.0697]	0.240 *** [0.0670]
migration background	0.165 ** [0.0826]	0.172 ** [0.0841]	0.184 ** [0.0832]	0.220 ** [0.0864]
female*migration background	-0.0180 [0.1122]	-0.0342 [0.1125]	-0.0260 [0.1103]	-0.0640 [0.1085]
cohort 2	0.0394 [0.0553]	0.0495 [0.0565]	0.0729 [0.0563]	0.0795 [0.0587]
<i>average grade in German and Math [7:2]</i>	0.580 *** [0.0442]	0.565 *** [0.0458]	0.518 *** [0.0461]	0.505 *** [0.0437]
father employed		-0.0583 [0.0914]	-0.0992 [0.0919]	-0.137 [0.0923]
father employed missing		0.0565 [0.1585]	0.0177 [0.1513]	-0.0275 [0.1439]
father's degree of schooling: medium-high		-0.0862 [0.0623]	-0.0804 [0.0620]	-0.0852 [0.0621]
father's degree of schooling missing		-0.341 ** [0.1357]	-0.344 *** [0.1266]	-0.357 *** [0.1212]
single-parent family		0.114 [0.0733]	0.0961 [0.0701]	0.0744 [0.0668]
single-parent family missing		0.369 ** [0.1506]	0.453 *** [0.1427]	0.391 *** [0.1409]
share of foreigners in residential area		0.569 [0.4613]	0.467 [0.4509]	0.554 [0.4319]
<i>teacher assessment</i>				
social and cognitive skills [8:2]			-0.161 *** [0.0364]	-0.160 *** [0.0341]
individual coaching/mentoring: desirable [8:2]			0.0192 [0.0773]	
career planning: improvement in autonomy (8:2 to 9:2)				-0.137 *** [0.0347]
teacher response missing			-0.180* [0.1050]	-0.291 ** [0.0811]
number of internships (grade 8)				0.0621 [0.0397]
number of internships (grade 8) missing				-0.0116 [0.1119]
number of internships (grade 9)				-0.00271 [0.0275]
number of internships (grade 9) missing				0.100 [0.0814]
knows desired occupation [9:1]				0.189 ** [0.0937]
knows desired occupation [9:1] missing				0.335 *** [0.1151]
state of career planning: moderate improvement				0.0633 [0.0786]
state of career planning: substantial improvement				-0.0604 [0.0987]
constant	0.978 *** [0.1292]	0.991 *** [0.1775]	1.244 *** [0.1951]	1.102 *** [0.2222]
N	419	419	419	419
R-sq	0.382	0.402	0.435	0.480
adj. R-sq	0.374	0.385	0.414	0.449

Standard errors in brackets; * p<0.10, ** p<0.05, *** p<0.01; clustered on school level.

Table A.5: Probit estimation (1) - Transition into...

	(1) pre-voc. training	(2) further schooling	(3) apprenticeship
female	0.0347 [0.03]	-0.0125 [0.06]	-0.0211 [0.04]
migration background	0.102 *** [0.03]	-0.0840 ** [0.04]	-0.0192 [0.03]
female*migration background	-0.1302 ** [0.073]	0.011 [0.05]	0.107* [0.071]
cohort 2	-0.0778 [0.05]	-0.0123 [0.05]	0.0812 ** [0.03]
father employed	-0.0544 [0.08]	0.0692 [0.09]	-0.015 [0.04]
father employed missing	0.00324 [0.08]	0.00269 [0.09]	-0.0499 [0.03]
father's degree of schooling: medium-high	-0.125 *** [0.04]	0.110* [0.06]	0.0129 [0.02]
father's degree of schooling missing	-0.164 *** [0.06]	0.192 ** [0.08]	-0.00714 [0.05]
single-parent family	0.0967 [0.08]	-0.0864 [0.08]	-0.028 [0.03]
single-parent family missing	0.146 [0.11]	-0.329 *** [0.10]	0.302 *** [0.10]
share of foreigners in residential area	0.00836 ** [0.00]	-0.00388 [0.00]	-0.00373 [0.00]
<i>teacher assessment</i>			
social and cognitive skills [8:2]	-0.107 *** [0.03]	0.103 *** [0.03]	0.000277 [0.02]
career planning: improvement in autonomy (8:2 to 9:2)	-0.0772 ** [0.03]	0.0713 *** [0.03]	0.00129 [0.01]
teacher response missing	-0.118 [0.07]	0.151 ** [0.06]	-0.0166 [0.04]
number of internships (grade 8)	-0.0025 [0.03]	0.0137 [0.04]	-0.0139 [0.02]
number of internships (grade 8) missing	0.00871 [0.08]	-0.0744 [0.11]	0.0468 [0.06]
number of internships (grade 9)	-0.00351 [0.03]	-0.0477 *** [0.02]	0.0411 *** [0.01]
number of internships (grade 9) missing	0.0837* [0.05]	-0.149 *** [0.05]	0.0577* [0.03]
knows desired occupation [9:1]	0.171 ** [0.07]	-0.192 *** [0.06]	0.0329 [0.05]
knows desired occupation [9:1] missing	0.148 [0.10]	-0.114 [0.09]	-0.0187 [0.04]
state of career planning: moderate improvement [9:1]	0.0144 [0.06]	0.0222 [0.05]	-0.0447 [0.05]
state of career planning: substantial improvement [9:1]	-0.104 [0.06]	-0.0327 [0.07]	0.113 [0.08]
N	433	433	433

Note: Standard errors in brackets; * p<0.10, ** p<0.05, *** p<0.01; clustered on school level. Further schooling: grade 10 and voc. schooling, Pre-voc. training: includes destination state "other". We report interaction effects as documented in Ai/Norton (2003). Results are similar following Puhani (2012).

Table A.6: Probit estimation (2) - Transition into...

	(1) pre-voc. training	(2) further schooling	(3) apprenticeship
female	0.0643 ** [0.03]	-0.0472 [0.06]	-0.0217 [0.04]
migration background	0.0905 *** [0.03]	-0.07 [0.05]	-0.02 [0.03]
female*migration background	-0.1340* [-0.08]	0.003 [0.056]	0.118* [0.07]
cohort 2	-0.0655 [0.05]	-0.0201 [0.05]	0.0845 ** [0.03]
<i>average grade in german and math [7:2]</i>	0.164 *** [0.03]	-0.183 *** [0.03]	0.00457 [0.01]
father employed	-0.0241 [0.07]	0.0196 [0.08]	-0.00363 [0.04]
father employed missing	0.0236 [0.08]	-0.0321 [0.10]	-0.0458 [0.04]
father's degree of schooling: medium-high	-0.115 *** [0.04]	0.101* [0.06]	0.0114 [0.03]
father's degree of schooling missing	-0.155 *** [0.05]	0.180 ** [0.08]	-0.0172 [0.05]
single-parent family	0.128 ** [0.06]	-0.124 ** [0.06]	-0.0208 [0.03]
single-parent family missing	0.171 [0.11]	-0.335 *** [0.09]	0.313 *** [0.10]
share of foreigners in residential area	0.00371 [0.00]	-0.000194 [0.00]	-0.0032 [0.00]
<i>teacher assessment</i>			
social and cognitive skills [8:2]	-0.0807 ** [0.04]	0.0733 ** [0.04]	-0.00269 [0.02]
career planning: improvement in autonomy (8:2 to 9:2)	-0.0610 ** [0.02]	0.0610 *** [0.02]	-0.000944 [0.01]
teacher response missing	-0.107* [0.06]	0.134 *** [0.04]	-0.014 [0.05]
number of internships (grade 8)	0.00199 [0.02]	0.00925 [0.03]	-0.0131 [0.02]
number of internships (grade 8) missing	0.0373 [0.06]	-0.112 [0.08]	0.0678 [0.06]
number of internships (grade 9)	-0.011 [0.03]	-0.0386* [0.02]	0.0425 *** [0.01]
number of internships (grade 9) missing	0.0643 [0.06]	-0.120 ** [0.05]	0.0552* [0.03]
knows desired occupation [9:1]	0.124* [0.07]	-0.140 ** [0.06]	0.0288 [0.05]
knows desired occupation [9:1] missing	0.105 [0.10]	-0.0725 [0.09]	-0.0161 [0.04]
state of career planning: moderate improvement [9:1]	0.00984 [0.05]	0.024 [0.04]	-0.0366 [0.05]
state of career planning: substantial improvement [9:1]	-0.0695 [0.07]	-0.0843 [0.07]	0.136 [0.09]
N	417	417	417

Note: Standard errors in brackets; * p<0.10, ** p<0.05, *** p<0.01; clustered on school level. Further schooling: grade 10 and voc. schooling, Pre-voc. training: includes destination state "other". We report interaction effects as documented in Ai/Norton (2003). Results are similar following Puhani (2012).

Table A.7: Probit estimation (3) - Transition into...

	(1) pre-voc. training	(2) further schooling	(3) apprenticeship
grade in German [7:2]	0.044* [0.02]	-0.066* [0.04]	0.016 [0.02]
grade in Math [7:2]	0.115*** [0.03]	-0.122*** [0.03]	-0.004 [0.01]

Note: Standard errors in brackets; * p<0.10, ** p<0.05, *** p<0.01; clustered on school level. "Further schooling": grade 10 and vocational schooling, "Pre-vocational training": includes "other".