

**An exploration of the career decision
making process from school to work**

Von der Fakultät Wirtschaftswissenschaften
der Leuphana Universität Lüneburg

zur Erlangung des Grades
Doktorin der Wirtschafts- und Sozialwissenschaften
(Dr. rer. pol.)

genehmigte Dissertation von
Katja Seidel

aus Pirna

Eingereicht am: 29.09.2020

Mündliche Verteidigung (Disputation): 16.03.2021

Erstbetreuer und -gutachter: Prof. Dr. Christian Pfeifer

Zweitgutachter: Prof. Dr. Joachim Wagner

Drittgutachter: Prof. Dr. Mario Mechtel

Die einzelnen Beiträge des kumulativen Dissertationsvorhabens sind oder werden ggf. inkl. des Rahmenpapiers wie folgt veröffentlicht:

Students' time allocation and school performance: A comparison between student jobs, sports and music participation.

Journal of Economics and Statistics, 2020, 240(5): 607-652.

The transition from School to Post-Secondary Education – What factors affect educational decisions?

Working Paper Series in Economics, Leuphana University Lüneburg, 2021, DP No. 398.

The Intention to Quit Apprenticeships and the Role of Secondary Jobs.

Journal of Vocational Education and Training, 71(4), 556-578.

Earlier version published at: Working Paper Series in Economics, Leuphana University Lüneburg, 2016, DP No. 361.

Consequences of holding Multiple Jobs.

Job Characteristics and their Effect on the Intention to Leave Apprenticeships early.

Working Paper Series in Economics, Leuphana University Lüneburg, 2016, DP No. 362.

Veröffentlichungsjahr: 2021

Veröffentlicht im Onlineangebot der Universitätsbibliothek unter der URL:

<http://www.leuphana.de/ub>

Acknowledgements

First of all, I would like to thank my supervisor, Christian Pfeifer, for his support, guidance and encouragement throughout the doctoral studies. Further, I would like to thank the second and third referee of this thesis Joachim Wagner and Mario Mechtel. I am also very grateful to all my colleagues at the Institute of Economics for the helpful discussions and advice as well as for the constructive criticism which helped to improve my dissertation. I would like to express my sincere gratitude for the Leuphana doctoral studies grant.

Finally, the completion of my dissertation would not have been possible without my family and friends. Thank you for all the encouragement and emotional support. You always were there for me and motivated me to keep on going.

CONTENTS

LIST OF TABLES.....6

LIST OF FIGURES.....9

1 INTRODUCTION10

1.1 REFERENCES FOR CHAPTER 116

**2 STUDENTS’ TIME ALLOCATION AND SCHOOL PERFORMANCE: A
COMPARISON BETWEEN STUDENT JOBS, SPORTS AND MUSIC
PARTICIPATION.....17**

2.1 INTRODUCTION17

2.2 LITERATURE SURVEY18

2.3 DATA, VARIABLES, AND ESTIMATION APPROACH.....23

2.4 REGRESSION RESULTS27

2.5 CONCLUSION.....33

2.6 REFERENCES FOR CHAPTER 235

2.7 APPENDIX FOR CHAPTER 238

**3 THE TRANSITION FROM SCHOOL TO POST-SECONDARY EDUCATION –
WHAT FACTORS AFFECT EDUCATIONAL DECISIONS?52**

3.1 INTRODUCTION52

3.2 LITERATURE.....53

3.3 DATA57

3.4 EMPIRICAL FRAMEWORK AND RESULTS60

3.5 CONCLUSION.....69

3.6 REFERENCES FOR CHAPTER 371

3.7 APPENDIX FOR CHAPTER 375

**4 THE INTENTION TO QUIT APPRENTICESHIPS AND THE ROLE OF
SECONDARY JOBS.....80**

4.1 INTRODUCTION80

4.2 THE GERMAN VET SYSTEM AND WORKING CONDITIONS82

4.3 LITERATURE.....83

4.4 DATA AND DESCRIPTIVE STATISTICS.....85

4.5 EMPIRICAL FRAMEWORK AND RESULTS91

4.6 CONCLUSION.....98

4.7 REFERENCES FOR CHAPTER 4102

4.8 APPENDIX FOR CHAPTER 4106

| | | |
|----------|---|------------|
| 5 | CONSEQUENCES OF HOLDING MULTIPLE JOBS | 118 |
| 5.1 | INTRODUCTION | 118 |
| 5.2 | RELEVANT LITERATURE | 118 |
| 5.3 | DATA AND DESCRIPTIVE STATISTICS..... | 120 |
| 5.4 | METHOD AND RESULTS | 125 |
| 5.5 | CONCLUSION..... | 131 |
| 5.6 | REFERENCES FOR CHAPTER 5 | 132 |
| 5.7 | APPENDIX FOR CHAPTER 5 | 135 |
| 6 | JOB CHARACTERISTICS AND THEIR EFFECT ON THE INTENTION TO LEAVE APPRENTICESHIPS EARLY | 146 |
| 6.1 | INTRODUCTION | 146 |
| 6.2 | LITERATURE..... | 147 |
| 6.3 | DATA AND DESCRIPTIVE STATISTICS..... | 150 |
| 6.4 | EMPIRICAL FRAMEWORK AND RESULTS | 155 |
| 6.5 | CONCLUSION..... | 163 |
| 6.6 | REFERENCES FOR CHAPTER 6 | 165 |
| 6.7 | APPENDIX FOR CHAPTER 6 | 169 |

List of Tables

| | |
|--|----|
| Table 1.1 University students and first-year university students in Germany | 11 |
| Table 1.2 Graduates/school leavers by type of qualification between 2000 and 2018. | 11 |
| Table 2.1 Combination of activities job, sports, music | 25 |
| Table 2.2 OLS results for specifications with binary indicators for job, sports, and music | 28 |
| Table 2.3 OLS results for specifications with job, sports with/without competitions, and music | 29 |
| Table 2.4 OLS results for specifications with length of participation in job, sports, and music | 30 |
| Table 2.5 OLS results for specifications with types of job, sports, and music | 32 |
| Table 2.6 Literature Survey | 38 |
| Table 2.7 Summary statistics | 43 |
| Table 2.8 Complete OLS results for specifications with binary indicators for job, sports, and music..... | 45 |
| Table 2.9 Ordered probit results for specifications with binary indicators for job, sports, and music..... | 50 |
| Table 2.10 OLS results for specifications with binary indicators for job, sports, and music without controlling for students' pocket money..... | 51 |
| Table 3.1 Characteristics by educational pathway | 60 |
| Table 3.2 T-test for risk tolerance differences between university and apprenticeship starters | 60 |
| Table 3.3 Probability of enrolling at university | 63 |
| Table 3.4 Contrasts of predictive margins across risk preferences and academic background | 64 |
| Table 3.5 Contrasts of predictive margins across school performance (mathematics) and academic background of parents..... | 65 |
| Table 3.6 Contrasts of predictive margins across school performance (German) and academic background of parents | 65 |
| Table 3.7 Contrasts of predictive margins across support during schooling and academic background..... | 66 |
| Table 3.8 Probit Regression – Probability of enrolling at university with different measures of risk aversion..... | 67 |
| Table 3.9 Probit regression - Probability of enrolling at university in 2009 - Career risk preference vs. general risk preferences..... | 67 |

| | |
|---|-----|
| Table 3.10 Summary statistics | 75 |
| Table 3.11 Probability of enrolling at university in detail | 76 |
| Table 3.12 Probability of enrolling at university – Controls for cognitive skills | 78 |
| Table 3.13 T-test: Probability of enrolling at university by academic background and gender | 79 |
| Table 4.1 Intention to quit by gender | 89 |
| Table 4.2 Intention to quit by type of occupation | 89 |
| Table 4.3 Characteristics by type of occupation | 90 |
| Table 4.4 Intention to quit by type of secondary job..... | 90 |
| Table 4.5 Probit regression – Intention to quit apprenticeship | 92 |
| Table 4.6 Summary statistics | 106 |
| Table 4.7 Wald test for equality - Model C | 106 |
| Table 4.8 Wald test for equality - Model D..... | 107 |
| Table 4.9 Intention to quit apprenticeship by secondary job and gender..... | 107 |
| Table 4.10 Intention to quit apprenticeship by type of occupation and secondary job | 107 |
| Table 4.11 Intention to quit by gender | 108 |
| Table 4.12 Intention to quit by gender and type of occupation | 108 |
| Table 4.13 The intention to quit (robust standard errors) I..... | 109 |
| Table 4.14 The intention to quit (robust standard errors) II | 112 |
| Table 4.15 The intention to quit - separate estimations by gender | 115 |
| Table 4.16 The intention to quit - Separate estimations by migration background | 116 |
| Table 4.17 T-test: Intention to quit by gender, migration background and region | 117 |
| Table 5.1 Characteristics by intention to quit | 124 |
| Table 5.2 Intention to quit and the probability of job-related burdens..... | 128 |
| Table 5.3 Ordered Probit regression- Quality of training..... | 129 |
| Table 5.4 Summary statistics | 135 |
| Table 5.5 T-test with unequal variances – Probability of job related burdens and the intention to quit..... | 136 |
| Table 5.6 Wald test for equality | 136 |
| Table 5.7 Results in detail without robust standard errors | 137 |
| Table 5.8 Regressions in detail with robust standard errors | 139 |
| Table 5.9 Types of occupation..... | 140 |
| Table 5.10 BIBB data vs. own survey data..... | 141 |
| Table 6.1 Intention to cancel early by characteristics | 153 |

| | |
|--|-----|
| Table 6.2 Intention to cancel a contract early by goal..... | 154 |
| Table 6.3 The intention to cancel the contract early | 157 |
| Table 6.4 Contrasts of predictive margins across type of occupation I..... | 159 |
| Table 6.5 Contrasts of predictive margins by gender..... | 161 |
| Table 6.6 Summary statistics | 169 |
| Table 6.7 Contrasts of predictive margins across types of occupation II..... | 171 |
| Table 6.8 Intention to cancel a contract early - Results in detail | 174 |
| Table 6.9 Intention to cancel a contract early- Original categories | 176 |
| Table 6.10 T-test: Intention to cancel a contract early by expected goal | 177 |
| Table 6.11 T-test: Intention to cancel a contract early by gender, migration background and region..... | 178 |
| Table 6.12 Contrasts of predictive margins across the in advance rated importance of a goal | 179 |

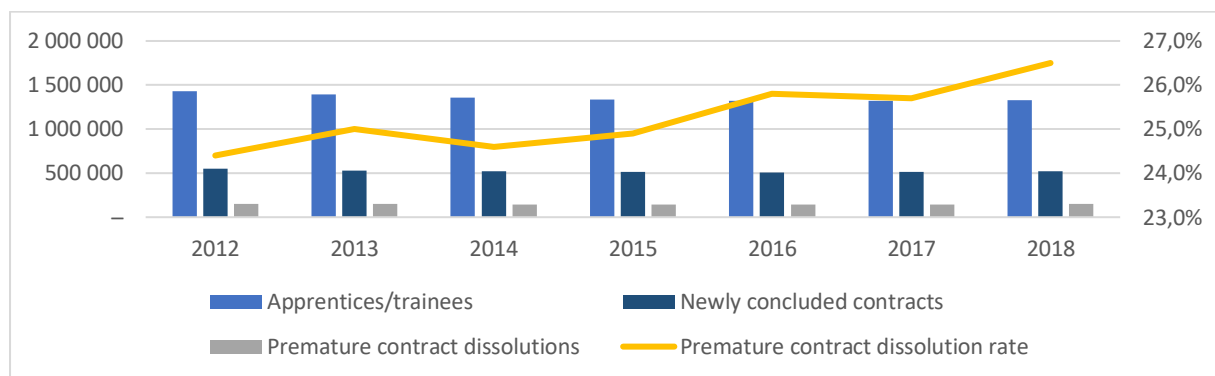
List of Figures

| | |
|--|-----|
| Figure 1.1 Development of the German training market..... | 10 |
| Figure 4.1 Predictive margins of secondary jobs with 95% CIs..... | 95 |
| Figure 4.2 Predictive margins of types of occupation with 95% CIs..... | 97 |
| Figure 5.1 Histogram - Quality of training..... | 142 |

1 Introduction

Over the last years, demographic and technological changes have increased the demand for skilled workers in Germany (e.g. Bundesagentur für Arbeit, 2019). This change has gone hand in hand with changes in the demand structure for education itself. As a result, in Germany, the choice of students has undergone a shift from Vocational Education and Training (VET) to higher education. Hence, Germany has not only recorded a decline in the demand for training places, but also an increase in the number of unfilled training positions (BIBB 2020: 15f.).

Figure 1.1 Development of the German training market



Source: Statistisches Bundesamt/Federal Statistical Office (Destatis) (2020a), Fachserie 11, Reihe 3, Bildung und Kultur, Berufliche Bildung 2012–2018.

In addition, the rate of premature contract dissolution has also increased (see Figure 1.1, BIBB 2020: 146). Early contract cancellations do not necessarily have to result in leaving the VET system without a vocational degree. They can also result in a change of occupation or training firm, or in an upgrade to university. However, different outcomes are possible depending on the type of early contract cancellation. Changing the occupation or upgrading to university can lead to a higher level of satisfaction (e.g. Stalder and Schmid, 2016). However, leaving the VET system is often related to a higher probability of unemployment and low income in the future (e.g. Bessey and Backes-Gellner, 2015; Beicht and Walden, 2013; BIBB, 2020: 263), and, therefore, should be avoided. Unfortunately, Germany lacks observational data on ‘VET-system leavers’. However, studies estimate that 50% of apprentices re-enter the VET system by changing occupation or training company (Schöngen, 2003; Uhly, 2013).

In contrast, more and more individuals are entering tertiary education. Since 2006, the number of university students has increased by 42.7%, from 1,733,076 to 2,473,557. This rise is also reflected in a 47.7% increase in first-year university students at German universities (from 294,946 in 2006 to 435,731 in 2018; see Table 1.1).

Table 1.1 University students and first-year university students in Germany

| Semester | Students* | First year students** |
|------------|-----------|-----------------------|
| WS 2006/07 | 1,733,076 | 294,946 |
| WS 2007/08 | 1,708,157 | 313,540 |
| WS 2008/09 | 1,786,599 | 345,625 |
| WS 2009/10 | 1,876,414 | 369,273 |
| WS 2010/11 | 1,965,572 | 386,921 |
| WS 2011/12 | 2,115,682 | 445,320 |
| WS 2012/13 | 2,217,208 | 427,825 |
| WS 2013/14 | 2,315,531 | 438,913 |
| WS 2014/15 | 2,377,341 | 432,280 |
| WS 2015/16 | 2,417,494 | 432,589 |
| WS 2016/17 | 2,448,115 | 435,427 |
| WS 2017/18 | 2,470,395 | 437,737 |
| WS 2018/19 | 2,473,557 | 435,731 |

Source: *Statistisches Bundesamt/Federal Statistical Office (Destatis) 2020b, Fachserie 11, Reihe 4.1, Bildung und Kultur, Studierende an Hochschulen, Sommersemester 2019.

**Statistisches Bundesamt/Federal Statistical Office (Destatis) 2020c, Statistik der Studenten, Studienanfänger.

The demand for higher education is caused by a higher level of schooling among students. Since 2000, there has been a 10% increase in individuals with a general higher education entrance qualification, while the share of individuals with a secondary general certificate has decreased by almost 10% (see Table 1.2).

Table 1.2 Graduates/school leavers by type of qualification between 2000 and 2018.

| | 2000 | 2005 | 2010 | 2015 | 2016 | 2017 | 2018 |
|---|-------|-------|-------|-------|-------|-------|-------|
| Without a secondary general school certificate | 9.3% | 8.2% | 6.1% | 5.6% | 5.7% | 6.3% | 6.6% |
| With a secondary general school certificate | 25.1% | 24.8% | 20.8% | 16.5% | 16.3% | 16.2% | 16.4% |
| With an intermediate school degree | 39.9% | 41.6% | 40.5% | 43.7% | 43.2% | 42.9% | 42.1% |
| With a qualification for entry into higher education in an university of applied sciences | 1.1% | 1.3% | 1.6% | 0.1% | 0.1% | 0.1% | 0.1% |
| With a general qualification for entry into higher education | 24.6% | 24.1% | 31.0% | 34.0% | 34.7% | 34.5% | 34.8% |

Source: Statistisches Bundesamt/Federal Statistical Office (Destatis) 2020d, Fachserie 11, Reihe 1, Bildung und Kultur, Allgemeinbildende Schulen, Schuljahr 2018/2019.

Similar to individuals with a higher level of education, those with a lower level are able to benefit from the positive trend in the labour market. However, they still face a greater probability of unemployment. Compared to individuals educated to ISCED levels 5–8, in Germany, those with ISCED level 0–2 (ISCED level 3–4) qualifications are 4.4 (1.5) times more likely to be unemployed (Eurostat, 2020).¹ Hence, the level of education is related to future prospects.

¹ ISCED, 2011: levels 0–2 = less than primary, primary, or lower secondary education; levels 3–4 = upper secondary, post-secondary non-tertiary education; levels 5–8 = tertiary education.

Taking these developments into account, performance in school, level of schooling achieved, and school-to-school and school-to-work transitions have become increasingly important to avoid unemployment and low income in the future. In conjunction with this, the process of educational and career decision-making itself has become even more important. Therefore, this thesis aims to contribute to the existing literature by focusing on different aspects of the decision-making process of students in Germany.

Therefore, Chapter 2 begins by analysing the nexus between students' time allocation and school performance in terms of grades and satisfaction with their own performance in mathematics, the German language and a first foreign language, as well as overall achievement. While previous studies have primarily focused on isolated activities, this chapter looks at the heterogeneity of three important extracurricular activities: student jobs, sports and participation in music. Moreover, the heterogeneity of each activity is addressed by accounting for different types of the particular activity and differences in the number of years the activity has been pursued. So far, research is ambiguous on whether time allocated to student jobs, sports, and music may eliminate time for 'bad' leisure activities, such as consuming alcohol, doing drugs, or participating in criminal activities, or may help to improve performance in school or non-cognitive skills such as motivation, confidence, self-esteem, perseverance, and responsibility. For this purpose, data from the SOEP, as a representative panel survey of private households and people in Germany, in particular cross-sectional survey data of 3388 students who are about 17 years old and enrolled in a German secondary school, were used. The main findings are that having a job as a student is negatively correlated with school performance, whereas participation in sports and music is positively correlated. However, the results reveal heterogeneity in each activity, especially with respect to intensity. Moreover, performance in mathematics seems to be more sensitive to extracurricular activities than performance in the German language and a first foreign language. The empirical analysis was accompanied by an extensive survey of the empirical literature on the association between student jobs, sports, and participation in music and school performance.

Chapter 3 addresses the concrete post-school decision of school students whether to study or to enter the German VET system. It focuses on the investigation of individual risk preferences and the social background of individuals, and the effect on the ultimate decision to enrol in university or to start an apprenticeship, given the same level of qualification. For the empirical approach, the chapter uses the German SOEP, and considers information on individuals'

educational decisions between 2007 and 2013. The results indicate that (i) individual risk preferences do not have an overall effect on the real transition and are not conditional on the academic background of parents; (ii) privileged individuals are more likely to take up higher education; and (iii) even when parents without an academic background support their children during school, they are less likely to guide their children into tertiary education.

Chapter 4 deals with the possibility of revision of educational decisions in terms of early contract cancellations in VET. In particular, the effects of a second job on the intention to leave an apprenticeship and quit early are analysed for apprentices in Germany. To date, the literature in this research area mainly focuses on income as a determinant of early contract cancellation in VET, but is lacking in investigations of the consequences of low income during an apprenticeship, such as the need for a second job. For the empirical approach, the representative German firm-level study ‘BIBB Survey Vocational Training from the Trainee’s Point of View 2008’, conducted by the Federal Institute for Vocational Education and Training (BIBB), is used. The survey contains 5901 apprentices that were interviewed during their second year of apprenticeship (205 schools, 340 classes, and 15 common occupations). Furthermore, it includes the design, procedures, basic conditions, and quality criteria of apprenticeships. The applied probit regressions in Chapter 4 show a higher intention to quit if apprentices require a secondary job to cover their living costs.

In Chapter 5, new data on 191 apprentices from a vocational school, located in a northern German federal state, are used to validate the empirical results of Chapter 4. This chapter presents new insights into secondary-job-related burdens during apprenticeship. Due to limitations in the data, the applied empirical approach in Chapter 4 lacks to analyse how holding multiple jobs increases the intention to leave an apprenticeship early. Therefore, Chapter 5 includes burdens related to the second job. The results indicate a lower intention to quit the apprenticeship if an apprentice holds a second job to cover living costs. However, secondary jobs are linked to lower quality of training, which, on the other hand, increases the intention to leave the apprenticeship early. Furthermore, the probability of secondary-job-related burdens increases with the number of working hours.

Chapter 6 concludes the thesis by investigating subjective determinants of early contract cancellations in VET. It examines ten questions on what apprentices want to achieve and how unfulfilled expectations affect the intention to leave the apprenticeship early. To date, research

on early contract cancellation in VET has concentrated on objective determinants, such as income, schooling level, age, gender, or migration background. Hence, the findings of this investigation in the thesis contributes to the existing research. The questions considered include information on performance, personal development, career development and prospects or position in society and their meaning to apprentices. For the research approach, the 'BIBB Survey Vocational Training from the Trainee's Point of View 2008' is considered again. The probit and ordered probit regressions applied show significant effects of job characteristics that represent job security. The expectation of being retained after an apprenticeship and encouragement to consistently train further decrease the intention to leave the apprenticeship early. Furthermore, women appear to be more affected by job security signals than men, but they also sort more often into occupations with lower retention probabilities. Consequently, this result may be an indication of occupational segregation rather than a sign of differences between sexes.

This thesis has some limitations. The research approach relies on (pooled) cross-sectional data. Hence, differences across individuals at a certain point in time were compared. Problems such as selection bias, omitted variable bias, endogeneity or measurement error can occur and might be a problem in terms of biased and inconsistent estimates (e.g. Wooldridge, 2005). However, suitable instruments or panel data in the context of early contract cancellation in VET are missing for Germany.

A valid instrument would provide consistent and unbiased estimates if it is correlated strongly with the confounding factor (treatment variable), but is uncorrelated with the outcome variable and the error term. Here, by extracting the exogenous variation in the treatment variable, the instrument identifies the causal effect of the treatment variable on the outcome variable. On the one hand, a valid and suitable instrument would enable causal inference by controlling for confounding. On the other hand, weak instruments can lead to inconsistency or a loss of efficiency. Hence, instruments have to be chosen carefully and are often difficult to find (e.g. Angrist and Pischke, 2009: Chapter 4; Wooldridge, 2005: Chapter 15).

Panel data on the educational and vocational path of apprentices, in particular in the context of early contract cancellation in VET that would help in the analysis of causal inference, are missing for Germany. Panel data would allow the evaluation of changes in variables over time for the same individuals. However, to date, Germany has no information on how apprentices

proceed when they decide to leave the VET system without a vocational degree. However, the National Educational Panel (NEPS) has great future potential. This study has been following, inter alia, a cohort of 9th graders since 2010, and has tracked their educational and vocational path from then on. The sub-study began collecting data on the students' skills by questioning the targeted students, parents, teachers and principals regularly. Moreover, the study continues to follow this cohort after they left the general education school system and observes their educational and vocational path as well as the educational decision-making processes behind it. Furthermore, the data collected are linked to the Integrated Employment Biographies (IEB) of the IAB (Institut für Arbeitsmarkt-und Berufsforschung/Institute for Employment Research) which contain complete information on the 9th graders' history of employment and unemployment and job-seeking history.²

However, the first cohort of 9th graders had only just completed their school to post-school transition at the start of this thesis. Hence, at that point in time, detailed information on the students' vocational path was not available. Due to this, the cross-sectional data mentioned above were considered instead.

² See <https://www.neps-data.de/Data-Center/Data-and-Documentation/Starting-Cohort-Grade-9>.

1.1 References for Chapter 1

- Angrist, J., and J.S. Pischke, 2008. *Mostly Harmless Econometrics: An Empiricist's Companion*. Princeton University Press, Chapter 4.
- Beicht, U., and G. Walden, 2013. *Duale Berufsausbildung ohne Abschluss – Ursachen und weiterer bildungsbiografischer Verlauf. Analyse auf Basis der BIBB-Übergangsstudie 2011*. BIBB-Report 21/2013, Bonn.
- Bessey, D., and U. Backes-Gellner, 2015. Staying within or leaving the apprenticeship system? Revisions of educational choices in apprenticeship training. *Journal of Economics and Statistics (Jahrbuecher fuer Nationaloekonomie und Statistik)*, 235(6): 539-552.
- BIBB Bundesinstitut für Berufsbildung, 2020. Datenreport zum Berufsbildungsbericht 2020 - Informationen und Analysen zur Entwicklung der beruflichen Bildung. Bonn.
- Bundesagentur für Arbeit (BA), 2019. Statistik/Arbeitsmarktberichterstattung, Berichte: Blickpunkt Arbeitsmarkt – Fachkräfteengpassanalyse, Nürnberg, Dezember 2019.
- Eurostat, 2020. Unemployment rate by educational attainment level [TEPSR_WC140]. Last update of data 01/09/2020, last download 13/09/2020: https://ec.europa.eu/eurostat/databrowser/view/TEPSR_WC140/default/table.
- Schöngen, K. 2003, Ausbildungsvertrag gelöst = Ausbildung abgebrochen? In: BWP 32(5): 35–39.
- Stalder, B. E., and E. Schmid, 2016. Lehrvertragsauflösung und Ausbildungserfolg - kein Widerspruch. Wege und Umwege zum Berufsabschluss [Cancellation of apprenticeship contracts and educational success - no contradiction. Paths and detours to vocational qualifications]. Bern: Hep-Verlag Bern.
- Uhly, A., 2013. Vorzeitige Lösung von Ausbildungsverträgen – einseitige Perspektive dominiert die öffentliche Diskussion. In: *Berufsbildung in Wissenschaft und Praxis*: 6/2013: 4 f.
- Wooldridge, J.,M., 2005. *Introductory Econometrics: A MODERN APPROACH*. 3rd international student edition, Cengage Learning Services.

2 Students' time allocation and school performance: A comparison between student jobs, sports and music participation³

2.1 Introduction

The theoretical effects of extracurricular activities such as student jobs, sports, and music participation on school performance are ambiguous. On the one hand, one might argue that time allocated to student jobs, sports, and music crowds out time that should be allocated to learning and school attendance and is, therefore, harmful for school performance. On the other hand, these negative effects might be offset by potential positive effects on school performance. For example, time allocated to student jobs, sports, and music might eliminate time for 'bad' leisure activities such as drinking, doing drugs, or participating in criminal activities. Student jobs, sports, and music participation might also increase network building with schoolmates, and they might help each other with homework, exam preparation, etc. and improve non-cognitive skills such as motivation, confidence, self-esteem, perseverance, and responsibility. Moreover, sports can increase physical and mental health and music can increase cognitive skills. Thus, it is not very surprising that recent empirical literature reports mainly positive effects of sports and music participation. But empirical evidence for student jobs and the heterogeneity between and within extracurricular activities is rather scarce. Therefore, we add a new empirical analysis.

For our empirical investigation, we use cross-sectional survey data for 3388 students who are about 17 years old and enrolled in a German secondary school in order to estimate the correlation between students' time allocation and school performance in terms of school grades and satisfaction with their own performance in math, German, a first foreign language, and overall. In addition to the inclusion of all three extracurricular activities (student jobs, sports, and music) in our regression analysis, we address the heterogeneity within each activity by taking into account differences in the years an activity has been pursued and different types of activity. Different job types are jobs that are done either to earn money or out of interest. Different sports include organized and non-organized sports as well as competitive or non-

³ **Co-author:** Christian Pfeifer

Presented at: Workshop on "Leisure Time Activities, Education, and Economic Performance" in Tuebingen, 2016.

Published in: Journal of Economics and Statistics, 2020, 240(5): 607-652.

<https://doi.org/10.1515/jbnst-2018-0039>.

Acknowledgements: We thank the participants of the workshop on „Leisure Time Activities“ in Tuebingen on July 22, 2016, and the two reviewers of the Journal of Economics and Statistics.

competitive sports. Different music types include making music in a group or alone. Even though we control for differences in many important characteristics at the student-, parent- and school-level in our regression analysis, it is descriptive in nature due to potential identification problems stemming from selection and reverse causality. To find suitable instruments or natural experiments for each activity and activity characteristic seems, however, to be an impossible task. Nevertheless, we think it is important to shed light on the heterogeneity between and within extracurricular activities in order to stimulate more specific research in this area so that more specific policy recommendations can be generated.

The remainder of this chapter is structured as follows. In the next section (2.2), we present an extensive literature survey, which focuses on empirical studies that have analyzed the association between student jobs, sports, and music participation and school performance. Section 2.3 describes our data set, variables, and estimation approach. The results of our regression analyses are presented in Section 2.4. Section 2.5 concludes with a short summary and discussion of our results.

2.2 Literature survey⁴

2.2.1 Student jobs

While there are several empirical studies on student jobs and their effects on school performance in the US, Canada, and for the UK (e.g. Buscha et al., 2012; Dustmann and van Soest, 2007; Eckstein and Wolpin, 1999; Marsh, 1991; Montmarquette et al., 2007), less empirical work has been done in Germany (e.g. Balsmeier and Peters, 2009; Schneider and Wagner, 2003; Tully, 2004). The main objective of these studies is to explore the question of whether working while in school is a substitute for or complement to education. On the one hand, students with a job can develop their cognitive and non-cognitive skills. On the other hand, the time students spend at work reduces the time they could spend on education. Eckstein and Wolpin (1999) studied why white male high school students drop out. They report a lower school performance for US high school students who work while in school. Prohibiting working while in school legally, however, would have only small effects on school performance. Montmarquette et al. (2007) focus on the heterogeneity in a group of part-time workers in Canada: students who prefer school over entering the labor market and vice versa. Overall, they

⁴ Table 2.6 in the Appendix summarizes the surveyed literature and gives more details about the data and estimation strategies.

conclude that as long as high school students work no more than 15 hours per week, there are no harmful effects on school success. Dustmann and van Soest (2007) find similar results for UK students but report differences between male and female students. Based on the UK dataset National Child Development Study, they find no negative impact on school performance and no indication of a higher probability of leaving school among female students. For male students, negative effects were found. More important and positively related to exam success and educational attainment seems to be parental involvement in terms of what they want for their children in the future. However, since the analysis is based on a 1974 cohort, the authors note the problem of currency and a possible lack of transferability to today.

For Germany, we only found some descriptive results (e.g. Schneider and Wagner, 2003; Tully, 2004) or only loosely discussed effects of working part-time while in school (e.g. Balsmeier and Peters, 2009). Schneider and Wagner (2003), for example, use the German Socio-Economic Panel (SOEP) information on the work behaviour of students aged 17 in the years 2000, 2001, and 2002. Overall, their descriptive results indicate no negative association between working and school success. Even though students with a job perform worse on average in school, the difference is negligible. Additionally, they find no indication that other leisure activities are substituted with work. Moreover, it seems that students with a job are generally more active in sports and music. Tully (2004) finds similar results. Balsmeier and Peters (2009) mainly use SOEP information about German adolescents aged 17 in the years 2000 to 2007 to determine individual characteristics that affect high school graduation. The applied Cox hazard rate model suggests a significantly higher likelihood of graduation (42%) if students work during school. Balsmeier and Peters (2009) argue that students, who work part-time are more skilled compared to non-working students, which makes graduation more likely. With a 68% higher likelihood of graduation, women benefit the most from working when compared to non-working female students (male students: 27% higher likelihood of graduation, but insignificant). However, a deeper look into the impact of working while in school in Germany seems to be absent.

2.2.2 Sports participation

Another string of the literature focuses on the effect of sports participation during childhood and adolescence on educational attainment (e.g. Anderson, 1998; Barron, Ewing, and Waddell, 2000; Eide and Ronan, 2001; Long and Caudill, 1991; Pfeifer and Cornelissen, 2010; Rees and Sabia, 2010) or on the development of cognitive and non-cognitive skills or school achievements (e.g. Cabane et al., 2016; Felfe et al., 2016; Gorry, 2016; Lipscomp, 2007;

Maloney and McCormick, 1993). Overall, the empirical research on sport activities reports positive effects of sports on educational success. Rees and Sabia (2010) analyze athletic activities among US high school students, arguing that previous empirical research neglects the problem of endogeneity and hence overestimates the positive effect of sports on school performance and educational attainment. To address the problem of endogeneity, fixed effects and IV estimations are used. They conclude that athletic activities in school have no or at most little effect on school performance. However, they do associate sports participation in school with a higher aspiration to attend college. In a recent paper, Gorry (2016) concentrates on different dimensions of school-sponsored sports participation in the US. Whether it is sports participation in general, team sports, or individual sports participation, sports are associated with positive effects on GPA and high school graduation rates. The results indicate that team sports participants benefit the most. Gorry (2016) argues that the interaction with team members helps develop skills and enhances school performance. Quantile regressions reveal, furthermore, higher gains for low-achieving participants. In particular, incentives to continue doing sports and contact with high-achieving teammates might enhance the performance of these students.

For Germany, Pfeifer and Cornelissen (2010) report higher secondary school and professional degrees for individuals who have participated in athletic activities outside of school during their youth, using the German Socio-Economic Panel (SOEP). Both conclude that the better performance of athletes might be the result of choosing leisure activities outside of school that foster educational productivity more. Felfe et al. (2016) focus on sports participation early in life (children aged 3 to 10) and the impact on education, health, and behavior. Based on the datasets German Health Interview and Examination Survey for Children and Adolescents and German Child Panel, Felfe et al. (2016) find that children in Germany who participate in sports clubs compared to children who do not participate have a better overall school grade by 0.13 standard deviations. Moreover, they have fewer peer relationship problems and seem to be healthier. Further, they confirm the suggestion of Pfeifer and Cornelissen (2010) and show evidence that participants reduce their time spent on less beneficial activities such as watching television.

2.2.3 Music participation

Research in the field of psychology and music education often focuses on the effects of music participation during youth on the development of cognitive and non-cognitive skills, but the

empirical research often lacks identifying causal effects (e.g. Bilhartz et al., 1999; Fitzpatrick, 2006), with some exceptions (e.g. Elpus, 2013; Schellenberg, 2004). Elpus (2013), for example, uses binary music enrollment of US high school students, binary enrollment in music subareas (e.g. band, choir, guitar, piano), and credits in music earned during high school. He finds that better performing students and students with a higher status sort more often into music. Using a fixed effects approach reveals no significant differences in SAT scores between music and non-music participants. This is true over all music activity specifications. Hence, differences between music and non-music participants seem to be driven by unobserved characteristics.

On the contrary, in economics, music participation during youth and its effects on educational achievements and attainment is explored very little (e.g. Cabane et al., 2016; Hille and Schupp, 2015; Southgate and Roscigno, 2009; Yang, 2015). Southgate and Roscigno (2009) investigate different forms of music participation in the US by using the Early Childhood Longitudinal Study and the National Educational Longitudinal Study. Both authors find better reading and math scores for children who participate in music in school. Adolescents involved in music, in and outside of school, perform better in math. Furthermore, Southgate and Roscigno find evidence for the importance of time. For example, the longer adolescents take music lessons (amount of music coursework from 8th to 10th grade), the better they perform in math and reading tasks. However, the results indicate that music involvement is a mediator variable, which is driven by social background, rather than a predictor of educational achievements.

Yang (2015) concentrates on the effects of music on educational attainment in Germany. He uses information on adolescence from the SOEP by analyzing individuals that answered the Youth Questionnaire at the age of 17. Using a rich set of retrospective information on childhood and adolescence as well as family background information, he measures the effect of different music indicators on school track recommendation of teachers at the age of 10 and on the actual school track choice at the age of 17. Applying ordinary least square regressions, ordered probit regressions, and fixed effects regressions, he finds higher school track recommendations as well as higher school tracks at the age of 17 for individuals who are musically active. Furthermore, the higher the intensity (on a daily basis) and the earlier one started music in childhood, the higher the school track recommendation and the school track itself at the age of 17. Hille and Schupp (2015), on the other hand, are interested in the long-term effects of music training in childhood and adolescence. Besides educational achievements and attainment, they also concentrate on personality development, changes in time use, and differences between music

and alternative leisure activities. Like in Yang (2015), the responses to the Youth Questionnaire of the SOEP are used. The applied propensity score matching reveals better cognitive skills and grades, higher academic ambitions, as well as more openness and conscientiousness for adolescents who play a musical instrument for at least nine years.

2.2.4 Combined

Since students have the opportunity to choose a variety of extracurricular activities and often choose more than one activity, analyzing activities separately will probably lead to biased results. Hence, there are some studies that analyze the effects of different kinds of extracurricular activities together (e.g. Balsmeier and Peters, 2009; Barron, Ewing, and Waddell, 2000; Cabane et al., 2016; Covay and Carbonaro, 2010; Del Boca et al., 2017; Hille and Schupp 2015; Lipscomb, 2007; Schellenberg, 2004). Lipscomb (2007) concentrates on sports and club participation⁵ in 8th to 12th grade among US students. The applied fixed effects approach reveals that, compared to non-participants, sport participants perform better in math and in science and have higher degree attainment expectations. Club participants have higher math scores and have higher degree attainment expectations as well. Women seem to benefit more from sports participation. Hille and Schupp (2015) mainly focus on musically active students in Germany. However, considering other activities such as sports in general, dancing, and theater, they conclude that playing a musical instrument is the most influential activity. While music affects almost all outcome variables positively, dancing and/or theater fosters personality traits and academic ambitions. Sport activities, on the contrary, affect academic ambitions positively. Besides other leisure activities, Balsmeier and Peters (2009) consider music and sports participation as well as working part-time while in school. Since this study focuses on overall characteristics that influence high school graduation, a deeper look into the involvement in music, sports, and working part-time, however, is missing. According to the results, female students seem to benefit from leisure activities the most. Females' likelihood of graduation increases if they work part-time during school or if they do school sports, and it decreases if no extracurricular activity is observed. On the contrary, male students are not affected by leisure activities at all.

Del Boca et al. (2017) and Cabane et al. (2016) choose a different approach. While Del Boca et al. (2017) compare a grouped variety of extracurricular activity-participants to non-

⁵ Club participation includes band, theater, student government, honors societies, school publications, service academic, hobby, and vocational clubs.

participants in the US, Cabane et al. (2016) compare music participation with sports participation directly by using the SOEP. In contrast to previous studies, Cabane et al. (2016) investigate the extent that music participants outperform sport participants with respect to school grades, non-cognitive and cognitive skills, personality traits or health and vice versa. Adolescents are grouped into doing sports only, doing music only, or doing both. For comparison reasons, music and sports participants have to be active at the time of the interview (at age 16 or 17) and for at least for three years (started at least at 14 years). Moreover, they analyze whether students who participate in two activities perform better or worse than those who participate in either one or no activity. This helps to identify possible crowding out effects such as the substitution of time spent on homework and learning with time spent playing music and/or doing sports. Applying propensity score matching and IV estimations, their results suggest that doing only music improves school performance (school grades as well as cognitive skills) and leads to academic ambitions compared to doing only sports. However, doing only sports improves health compared to doing only music. Students who participate in two activities instead of one have better cognitive skills.

2.3 Data, variables, and estimation approach

The SOEP⁶ is a representative panel survey of private households and people in Germany that provides a rather stable set of core questions asked every year (e.g. employment, education, health) and yearly topics with additional detailed questions (Wagner et al., 2007). Every year a sample of approximately 17-year-olds is interviewed, which can be linked to their parents in the same household. We use the pooled cross-sections for the years 2001 to 2014 and restrict our sample to students who attend a German secondary school and have no missing values in the used variables. Overall, 3388 students remain in our sample. About 50% of the students are female, 22% live in East Germany, and about 24% have a migration background. As Germany has different secondary school types, it should be noted that about 10% of the students attend the lowest type ('Hauptschule'), 29% the medium type ('Realschule'), 51% the highest type ('Gymnasium'), and 10% an integrated type ('integrierte Gesamtschule'), whereby the highest type is comparable to American high schools (12-13 years) and the integrated type includes the three other school types.

⁶ Socio-Economic Panel (SOEP), data for years 1984-2014, version 31, SOEP, 2015, doi:10.5684/soep.v31.

In order to analyze the conditional correlations between students' time allocation and school performance, we estimate OLS regression models, in which coefficients can be interpreted directly compared to other regression models such as ordered probit, which we have estimated as robustness checks that support the OLS results.⁷ In order to account for heteroskedasticity in the error terms, we have computed robust standard errors. In addition to conventional p-values, we have also computed adjusted p-values taking the family-wise error rate into account using the Westfall-Young-procedure.⁸ We measure students' school performance by employing several outcome variables. First, we use students' grades in math, German, and a foreign language in their last school reports. School grades in Germany usually range from 1 (very good) to 6 (failed). But in some school types and school years, different systems are used. In order to make the grades comparable, we have adjusted them to the normal grade scale from 1 to 6. The average grades in math and first foreign language are 2.9, and the average grades in German are 2.8 in our sample. Second, we use students' satisfaction with their own school performance in math, German, foreign language, and overall on an 11-point-Likert scale (0: very unhappy, 10: very happy). The average satisfaction with school performance in math is 6.3 and the average satisfaction with German, first foreign language, and overall school performance is about 6.5 satisfaction points. While satisfaction ratings are quite subjective, students' grades are an objective measure of school performance.

We estimate four specifications for each outcome variable, in which non-participation in an activity is always the reference category. Unfortunately, we only have cross-sectional information about the students. So, we only have information about leisure time activities at the time of the interview. If a student has participated in an activity in earlier years and stopped, the student belongs to our reference category of non-active. The first specification includes only dummies for participation in job, sports, and music.⁹ About 44% of the students in our sample

⁷ As an example, the results of ordered probit regressions for the first specification are displayed in Table 2.9 in the Appendix.

⁸ Because we use several outcome variables that measure student performance and can be interpreted as a "family", we take into account the family wise error rate, i.e., the probability of rejecting at least one true null hypothesis (i.e., a "false discovery") belonging to this "family" of outcomes. We apply the Westfall-Young-procedure and the user written Stata program "wyoung" with 10,000 bootstraps to compute adjusted p-values (Westfall and Young 1993; Jones et al. 2018). We thank the reviewer of this journal for giving this advice.

⁹ Please see Cabane et al. (2016) for a detailed description of the questions in the SOEP and information about sports and music in Germany. Also note that the SOEP includes many other interesting time activities such as watching television, playing computer, going to church, or meeting with friends. Taking all available time activities into account would, however, result into multicollinearity problems. Thus, a choice had to be made. We have decided to focus on three of the most frequent time activities and the heterogeneity within these activities, for which jobs, sport and music have additional information on the types, which are not available for other time activities. But for some of the time activities – and also for sports and music, but not for jobs – the information

have a job, 75% do sports, and 30% do music. Table 2.1 illustrates all the combinations of these activities. For example, only 13% of the students are not active at all (0,0,0), and about the same number is active in all three activities (1,1,1). The most frequent combination (28%) is to do only sports (0,1,0). About 11% have no job but do sports and music (0,1,1).

Table 2.1 Combination of activities job, sports, music

| Combination (J,S,M) | Number observations | % |
|---------------------|---------------------|---------|
| (0,0,0) | 447 | 13.19% |
| (0,1,0) | 956 | 28.22% |
| (0,0,1) | 117 | 3.45% |
| (0,1,1) | 366 | 10.80% |
| (1,0,0) | 183 | 5.40% |
| (1,1,0) | 795 | 23.47% |
| (1,0,1) | 101 | 2.98% |
| (1,1,1) | 423 | 12.49% |
| Total | 3388 | 100.00% |

Notes: Combination takes the values of the dummy variables. (0,1,0) indicates, for example, no job, sports participation, no music.
Data source: SOEP 2001-2014 (youth), version 31, SOEP, 2015, doi:10.5684/soep.v31.

In the second specification, we replace the sports participation dummy with two dummy variables that differentiate between sports with and sports without competitions. As can be expected, participating in sports competitions is related to more intense sports participation, and the correlations with school performance might be more pronounced for sports with competitions than for sports without competitions (e.g. Pfeifer and Cornelissen, 2010). About 39% of all students participate in sports without competitions and 36% participate in sports with competitions. The third specification looks at the length of the participation (≤ 1 year, 2-3 years, ≥ 4 years) at a job, in sports, and music. If the length of participation is an indicator of intensity due to the accumulation of potential effects over time, we should expect the correlations with school performance to be more pronounced the longer an activity has been performed. About 9% of all students do a job for one year or less, 8% for at least four years, and the majority (28%) for two to three years.¹⁰ If we look at sports participation, the length is significantly larger, as only 6% do sports for one year or less, 15% for two or three years, and the majority,

about the frequency of the performance (e.g. daily, weekly, monthly) would be available as an intensity variable. We have decided, however, to look at the length of the participation in years in order to account for accumulated effects over time, which is also available for jobs and can be compared with sport and music participation length.

¹⁰ One might wonder why 8% of all students, who are about 17 years old, have a job for at least four years, which corresponds with a starting age of younger than 14 years. During our observation period, the legal minimum age for taking up employment in Germany was still 14 years. But the minimum age has recently been increased to 15 years. The law has also some exemptions allowing 13-year-olds to take a job. Moreover, it should be kept in mind that we use survey data with typical sources of bias such as a recall bias about the exact timing of events. Due to the confidentiality of the survey data, students might also report irregular employment such as shopping for the old neighbor or doing some gardening at an age below the legal minimum age.

54%, for at least four years. Music participation length is also relatively long, as only 1% of all students started to do music in the last year, 4% do music for two or three years, and the majority, 25%, for at least four years. Thus, most students start to play sports and make music at a relatively early age.¹¹

In the fourth specification, the types of job (main reason: interest, money, other), types of sports (school, club, non-organized group, non-organized alone), and types of music (alone/with teacher, group) are considered. About 7% of all students do their job out of interest, 34% to earn money, and less than 4% for other reasons. The majority of students, 43%, does organized sports in a sports club or in a commercial sports facility, and 8% do organized sports via the school, which is not part of the school curriculum (e.g. voluntary teams after school has finished). About 11% do non-organized sports with others and 8% alone. About 6% have not given information about the sports type. If we look at music participation, nearly 14% of all students do music alone or with a music teacher, and nearly 14% do music in a group (e.g. orchestra, choir, band). Less than 3% do not belong to these two music types.

Selection into specific activities is an important issue in our application. For example, the social background and the financial situation of parents are likely to affect decisions to work or to participate in sports and music activities (e.g. Cabane et al., 2016). Moreover, a reverse causality issue could arise if students with academic problems are not allowed by their parents to devote time to jobs, sports, or music, which would lead to a positive correlation between school performance and these activities. Even though we cannot deal with the selection and reverse causality problems explicitly in the absence of suitable instruments or natural experiments for each variable of interest, we can at least partly reduce potential bias by taking into account a set of important control variables in our regressions. First, we control for the four school types in order to make the school performance outcomes comparable. We further take into account five categories for the share of students with migration backgrounds in the class, a dummy variable for having a migration background, and a dummy variable for being female. The financial situation and the broad social background are further taken into account by the inclusion of the students' pocket money in Euros, the household income in Euros, and seven categories for the parents' schooling.¹² Finally, we include dummies for the 16 federal states

¹¹ Note that Cabane et al. (2016) define students as active in sports and music based on the intensity, as students have to be active for at least 3 years.

¹² As one might argue that students' pocket money is a bad control variable, if pocket money is an outcome of the time activities rather than a confounding factor, we have repeated all estimates without pocket money. The results

and the 14 survey years. Descriptive statistics for all variables are presented in Table 2.7 in the Appendix.

2.4 Regression results¹³

Note for the interpretation of the estimates that higher values in the grade variables mean worse grades (1: very good, 6: failed) and that higher values in the satisfaction variables mean higher satisfaction with own school performance (0: very unhappy, 10: very happy). In order to evaluate the size of the estimated coefficients, we can put them simply in relation to the sample means of the outcome variables: a 0.1 better absolute grade would result in an approximately 3.5% better grade, and 0.1 points higher satisfaction would result in an approximately 1.5% higher satisfaction with own school performance. An alternative to evaluate the size of the estimated coefficients is to put the coefficient of interest in relation to another coefficient. For example, OLS results for all control variables (Table 2.8 in the Appendix) indicate that students with migration background have on average 0.125 worse grades in Math. Hence, a 0.1 better absolute grade would ‘compensate’ $0.1/0.125=80\%$ of this disadvantage. This being said, we can turn to the estimates of interest.

The OLS regression results for the first specification with dummy variables for having a job, participating in sports and in music are displayed in Table 2.2 (OLS results for all control variables are displayed in Table 2.8 in the Appendix). Even though the coefficients for having a job on the school performance measures indicate worse grades and lower satisfaction with own school performance, the coefficients do not differ statistically significantly from zero at conventional levels. Only for the first foreign language we find that students, who have a job, have, on average, 0.05 worse grades at $p=0.129$ and less satisfaction by 0.13 points at $p=0.100$. We also find mixed results for sports participation. Grades in math and German are slightly better, but not statistically significant, and satisfaction with school performance is larger. Doing sports is correlated with 0.21 points ($p=0.045$) higher satisfaction with performance in math and with 0.16 points ($p=0.055$) higher satisfaction with overall school performance. Music participation is significantly ($p<0.01$) correlated with all school performance measures. Grades are on average better by 0.12 in math, by 0.14 in German, and by 0.10 in the first foreign

did not change noteworthy and we have decided to include pocket money as control variable. As an example, the OLS results for the first specification without controlling for student’s pocket money are displayed in Table 2.10 in the Appendix. The complete regression results for all other specifications can be requested from the corresponding author.

¹³ Statistical software: Stata, Version 13.1

language. Satisfaction with the school performance is on average higher by 0.30 points in math, 0.27 points in German, 0.26 points in the first foreign language, and 0.20 points overall.

Table 2.2 OLS results for specifications with binary indicators for job, sports, and music

| | Grade - Math | Grade - German | Grade - Foreign | Satis - Math | Satis - German | Satis - Foreign | Satis - Overall |
|-------------------------|--|--|--|---|---|---|--|
| Job (44.33%) | 0.035 (0.038) [0.349] {0.769} | 0.004 (0.028) [0.883] {0.984} | 0.048+ (0.031) [0.129] {0.474} | -0.098 (0.092) [0.284] {0.736} | -0.002 (0.075) [0.982] {0.984} | -0.132* (0.080) [0.100] {0.423} | -0.057 (0.069) [0.407] {0.769} |
| Sports (74.97%) | -0.052 (0.043) [0.224] {0.636} | -0.012 (0.033) [0.727] {0.919} | 0.002 (0.038) [0.962] {0.962} | 0.213** (0.106) [0.045] {0.220} | 0.065 (0.089) [0.464] {0.808} | 0.107 (0.096) [0.266] {0.636} | 0.162* (0.084) [0.055] {0.235} |
| Music (29.72%) | -0.119*** (0.042) [0.005] {0.014} | -0.143*** (0.032) [<0.001] {<0.001} | -0.097*** (0.035) [0.006] {0.014} | 0.295*** (0.103) [0.004] {0.014} | 0.266*** (0.083) [0.001] {0.008} | 0.263*** (0.087) [0.003] {0.013} | 0.200** (0.078) [0.011] {0.014} |
| R ² | 0.053 | 0.143 | 0.101 | 0.035 | 0.060 | 0.058 | 0.034 |
| Mean (SD) of outcome | 2.92 (1.05) | 2.83 (0.85) | 2.89 (0.91) | 6.29 (2.56) | 6.53 (2.15) | 6.53 (2.29) | 6.55 (1.96) |

Notes: Number of yearly observations is N=3,388. All regressions include the full set of control variables: four school types, five categories for the share of students with migration background in the class, a dummy variable for having a migration background, a dummy variable for being female, students' pocket money in Euros, the household income in Euros, seven categories for the schooling of the father and of the mother, 16 federal states, and 14 survey years. The complete results for all control variables are displayed in Appendix Table A.3. The explanatory variables of interest are dummies (share in percent). School grades range from 1 (very good) to 6 (failed). Satisfaction with own school performance is measured on an 11-point-Likert scale (0: very unhappy, 10: very happy). Robust standard errors are in parentheses, conventional p-values in brackets, and adjusted p-values taking the family-wise error rate into account in curly braces. Coefficients are significant at + p<0.20, * p<0.10, ** p<0.05, *** p<0.01 (conventional).

Data source: SOEP 2001-2014 (youth), version 31, SOEP, 2015, doi:10.5684/soep.v31.

Table 2.3 presents the results for the second specification. As we only replace the dummy variable for sports by the categories for doing sports without and with competitions, the results for having a job and doing music remain virtually unchanged. While the outcomes do not differ significantly between non-sports participants and students doing sports without competitions, students who do sports with competitions have on average significantly better grades in math (0.09) and are significantly more satisfied with their performance in math (0.34) and overall (0.22).¹⁴ These findings indicate that school performance is on average better the more intense the sports participation is. As the time devoted should also increase with the intensity, our findings suggest that the potential positive effects of sports (e.g. better non-cognitive skills and health) overtake the potential negative time allocation effect.

¹⁴ We have applied Wald tests for the equality of coefficients between different groups.

Table 2.3 OLS results for specifications with job, sports with/without competitions, and music

| | Grade - Math | Grade - German | Grade - Foreign | Satis - Math | Satis - German | Satis - Foreign | Satis - Overall |
|---|---|--|--|---|---|---|---|
| Job (44.33%) | 0.038 (0.038) [0.306] {0.716} | 0.005 (0.028) [0.861] {0.978} | 0.047+ (0.031) [0.135] {0.490} | -0.109 (0.092) [0.238] {0.654} | -0.008 (0.075) [0.914] {0.978} | -0.131+ (0.080) [0.102] {0.432} | -0.062 (0.069) [0.371] {0.716} |
| Sports (reference: none) | | | | | | | |
| Sports without competitions (39.40%) | -0.021 (0.047) [0.657] {0.978} | -0.004 (0.036) [0.915] {0.998} | -0.005 (0.041) [0.893] {0.998} | 0.114 (0.116) [0.329] {0.804} | 0.003 (0.097) [0.974] {0.998} | 0.112 (0.104) [0.281] {0.782} | 0.117+ (0.091) [0.196] {0.670} |
| Sports with competitions (35.57%) | -0.093* (0.049) [0.058] {0.219} | -0.022 (0.038) [0.562] {0.786} | 0.011 (0.042) [0.789] {0.792} | 0.344*** (0.120) [0.004] {0.028} | 0.146+ (0.099) [0.143] {0.398} | 0.100 (0.108) [0.353] {0.672} | 0.220** (0.095) [0.020] {0.100} |
| Music (29.72%) | 0.122*** (0.042) [0.004] {0.012} | -0.143*** (0.032) [<0.001] {<0.001} | -0.096*** (0.035) [0.006] {0.012} | 0.305*** (0.103) [0.003] {0.012} | 0.272*** (0.084) [0.001] {0.007} | 0.263*** (0.088) [0.003] {0.012} | 0.204*** (0.078) [0.009] {0.012} |
| R ² | 0.053 | 0.143 | 0.101 | 0.036 | 0.061 | 0.058 | 0.035 |
| Mean (SD) of outcome | 2.92 (1.05) | 2.83 (0.85) | 2.89 (0.91) | 6.29 (2.56) | 6.53 (2.15) | 6.53 (2.29) | 6.55 (1.96) |

Notes: Number of yearly observations is N=3,388. All regressions include the full set of control variables: four school types, five categories for the share of students with migration background in the class, a dummy variable for having a migration background, a dummy variable for being female, students' pocket money in Euros, the household income in Euros, seven categories for the schooling of the father and of the mother, 16 federal states, and 14 survey years. The explanatory variables of interest are dummies (share in percent). School grades range from 1 (very good) to 6 (failed). Satisfaction with own school performance is measured on an 11-point-Likert scale (0: very unhappy, 10: very happy). Robust standard errors are in parentheses, conventional p-values in brackets, and adjusted p-values taking the family-wise error rate into account in curly braces. Coefficients are significant at + p<0.20, * p<0.10, ** p<0.05, *** p<0.01 (conventional).

Data source: SOEP 2001-2014 (youth), version 31, SOEP, 2015, doi:10.5684/soep.v31.

The third specification in Table 2.4 takes the length of participation in jobs, sports, and music into account. The overall results suggest that the correlations of having a job, participating in sports and in music with school performance are only significant if performed for a longer time period – in our case for at least four years – which corresponds with a starting age of younger than 14 years. While we could not observe significant differences between having a job or not in our previous specifications, we can now observe worse school grades and lower satisfaction with school performance for students who have a job for at least four years. We further find that longer participation in sports of at least four years is significantly correlated with better grades in math and higher satisfaction with performance in math and overall. This corresponds with our findings on sports with competitions, as both variables measure to some extent intensity (accumulated over time) and are highly correlated, i.e., most students who do sports

with competitions also perform sports for at least four years. Surprisingly, better grades and higher satisfaction with school performance for students who do music also stem mainly from the group that does music for at least four years.

Table 2.4 OLS results for specifications with length of participation in job, sports, and music

| | Grade - Math | Grade - German | Grade - Foreign | Satis - Math | Satis - German | Satis - Foreign | Satis - Overall |
|-----------------------------|---|--|---|---|---|--|--|
| Job (reference: none) | | | | | | | |
| ≤ 1 year (8.77%) | -0.056 (0.064) [0.380] {0.900} | -0.025 (0.052) [0.635] {0.990} | 0.024 (0.057) [0.679] {0.990} | 0.047 (0.158) [0.765] {0.990} | 0.019 (0.134) [0.885] {0.990} | -0.134 (0.136) [0.324] {0.870} | -0.015 (0.120) [0.899] {0.990} |
| 2-3 years (28.01%) | 0.019 (0.043) [0.665] {0.981} | -0.009 (0.033) [0.784] {0.983} | 0.033 (0.035) [0.344] {0.865} | -0.055 (0.104) [0.598] {0.979} | -0.008 (0.086) [0.927] {0.983} | -0.138+ (0.092) [0.133] {0.531} | -0.017 (0.079) [0.828] {0.983} |
| ≥4 years (7.56%) | 0.191*** (0.073) [0.009] {0.057} | 0.071+ (0.054) [0.185] {0.419} | 0.119* (0.062) [0.055] {0.199} | -0.405** (0.192) [0.035] {0.165} | 0.006 (0.143) [0.964] {0.963} | -0.117 (0.154) [0.448] {0.677} | -0.231* (0.128) [0.072] {0.224} |
| Sports (reference: none) | | | | | | | |
| ≤ 1 year (6.02%) | 0.072 (0.077) [0.351] {0.879} | 0.084+ (0.060) [0.159] {0.620} | 0.021 (0.069) [0.762] {0.990} | -0.108 (0.198) [0.585] {0.979} | 0.020 (0.159) [0.900] {0.990} | -0.067 (0.188) [0.723] {0.990} | -0.011 (0.150) [0.942] {0.990} |
| 2-3 years (14.67%) | 0.029 (0.060) [0.634] {0.984} | -0.010 (0.047) [0.833] {0.993} | -0.028 (0.051) [0.580] {0.984} | -0.064 (0.150) [0.668] {0.984} | 0.007 (0.124) [0.957] {0.993} | 0.191+ (0.130) [0.142] {0.548} | 0.021 (0.114) [0.857] {0.993} |
| ≥ 4 years (54.28%) | -0.086* (0.045) [0.056] {0.215} | -0.021 (0.035) [0.547] {0.774} | 0.009 (0.039) [0.827] {0.835} | 0.324*** (0.111) [0.003] {0.022} | 0.086 (0.093) [0.354] {0.681} | 0.107 (0.100) [0.287] {0.662} | 0.220** (0.088) [0.012] {0.063} |
| Music (reference: none) | | | | | | | |
| ≤ 1 year (1.45%) | -0.017 (0.148) [0.910] {0.998} | 0.033 (0.119) [0.779] {0.998} | -0.031 (0.142) [0.828] {0.998} | 0.109 (0.318) [0.732] {0.998} | 0.148 (0.280) [0.596] {0.988} | 0.679** (0.276) [0.014] {0.103} | -0.029 (0.284) [0.920] {0.998} |
| 2-3 years (3.57%) | 0.008 (0.101) [0.936] {0.939} | -0.109+ (0.079) [0.168] {0.616} | 0.051 (0.082) [0.534] {0.871} | -0.095 (0.237) [0.689] {0.874} | 0.156 (0.203) [0.442] {0.871} | 0.192 (0.210) [0.383] {0.857} | -0.240 (0.194) [0.217] {0.669} |

| | Grade - Math | Grade - German | Grade - Foreign | Satis - Math | Satis - German | Satis - Foreign | Satis - Overall |
|-------------------------|--|--|--|--|---|---|--|
| ≥ 4 years (24.70%) | -0.150*** (0.046) [0.001] {0.003} | -0.160*** (0.034) [<0.001] {<0.001} | -0.124*** (0.037) [0.001] {0.003} | 0.386*** (0.111) [<0.001] {0.002} | 0.295*** (0.090) [0.001] {0.003} | 0.248*** (0.093) [0.008] {0.008} | 0.294*** (0.083) [<0.001] {0.002} |
| R ² | 0.058 | 0.145 | 0.103 | 0.041 | 0.060 | 0.059 | 0.039 |
| Mean (SD) of outcome | 2.92 (1.05) | 2.83 (0.85) | 2.89 (0.91) | 6.29 (2.56) | 6.53 (2.15) | 6.53 (2.29) | 6.55 (1.96) |

Notes: Number of yearly observations is N=3,388. All regressions include the full set of control variables: four school types, five categories for the share of students with migration background in the class, a dummy variable for having a migration background, a dummy variable for being female, students' pocket money in Euros, the household income in Euros, seven categories for the schooling of the father and of the mother, 16 federal states, and 14 survey years. The explanatory variables of interest are dummies (share in percent). School grades range from 1 (very good) to 6 (failed). Satisfaction with own school performance is measured on an 11-point-Likert scale (0: very unhappy, 10: very happy). Robust standard errors are in parentheses, conventional p-values in brackets, and adjusted p-values taking the family-wise error rate into account in curly braces. Coefficients are significant at + p<0.20, * p<0.10, ** p<0.05, *** p<0.01 (conventional).

Data source: SOEP 2001-2014 (youth), version 31, SOEP, 2015, doi:10.5684/soep.v31.

The results for the fourth specification with the types of job, sports, and music are presented in Table 2.5. Interestingly, the coefficients for doing the job – out of interest and to earn money – have opposing directions. Even if the coefficients do not indicate statistically significant differences to the reference group of students who do not have a job, the differences between the two job types are significant for most school performance measures in Wald tests. For example, we find that students who do the job out of interest have on average 0.07 better grades in math at p=0.335, and that students who do the job for money have on average 0.06 worse grades in math at p=0.120 than the reference group without jobs. Thus, the difference between the two job types indicates that students who do the job for money have on average 0.13 worse grades in math than students who do the job out of interest, which is statistically different from zero at p=0.070 in a Wald test. The same pattern can be observed for all other school performance measures except for satisfaction with performance in the first foreign language. Thus, students, who do a job for money seem to have, on average, worse grades and are less satisfied with their school performance. For the different sports types, we find only a few significant differences. Compared to the reference group of non-active students, extracurricular sports in schools is positively correlated with satisfaction with overall school performance (0.32), and organized sports in clubs, etc., are correlated with better grades in math (0.11), higher satisfaction with own performance in math (0.34), and higher satisfaction with overall performance (0.20). Non-organized sports seem not be significantly correlated with school performance. Note that the findings correspond with our previous findings, as organized sports are positively correlated with competition and participation length. Doing music alone/ with a teacher as well as doing music in a group are significantly correlated with better grades and

higher satisfaction with own school performance for all outcomes. The differences between these two music types are not significant.

Table 2.5 OLS results for specifications with types of job, sports, and music

| | Grade - Math | Grade - German | Grade - Foreign | Satis - Math | Satis - German | Satis - Foreign | Satis - Overall |
|---------------------------------------|---|---|--|---|--|---|--|
| Job (reference: none) | | | | | | | |
| Out of interest (7.08%) | -0.073 (0.075) [0.335] {0.607} | -0.119** (0.056) [0.034] {0.183} | -0.049 (0.063) [0.439] {0.607} | 0.290+ (0.181) [0.109] {0.405} | 0.215+ (0.141) [0.126] {0.405} | -0.172 (0.158) [0.276] {0.607} | 0.272** (0.132) [0.040] {0.187} |
| For money (33.74%) | 0.062+ (0.040) [0.120] {0.442} | 0.032 (0.031) [0.295] {0.462} | 0.070** (0.034) [0.039] {0.193} | -0.148+ (0.098) [0.131] {0.442} | -0.061 (0.081) [0.452] {0.462} | -0.111 (0.086) [0.199] {0.442} | -0.109+ (0.074) [0.140] {0.442} |
| Other reason / no information (3.51%) | -0.011 (0.102) [0.913] {0.994} | -0.018 (0.081) [0.824] {0.994} | 0.011 (0.079) [0.889] {0.994} | -0.301 (0.270) [0.265] {0.810} | 0.151 (0.209) [0.470] {0.896} | -0.230 (0.215) [0.285] {0.810} | -0.164 (0.178) [0.357] {0.843} |
| Sports (reference: none) | | | | | | | |
| Extracurricular in school (7.67%) | -0.052 (0.069) [0.454] {0.922} | -0.005 (0.056) [0.935] {0.995} | 0.001 (0.064) [0.988] {0.995} | 0.257+ (0.178) [0.148] {0.531} | 0.104 (0.157) [0.510] {0.922} | 0.073 (0.167) [0.660] {0.944} | 0.319** (0.137) [0.020] {0.107} |
| Sports club etc. (42.74%) | -0.107** (0.048) [0.025] {0.119} | -0.028 (0.037) [0.450] {0.793} | -0.006 (0.041) [0.877] {0.879} | 0.337*** (0.116) [0.004] {0.021} | 0.065 (0.098) [0.506] {0.793} | 0.130 (0.104) [0.214] {0.534} | 0.195** (0.092) [0.033] {0.126} |
| Non-organized with others (10.86%) | 0.023 (0.069) [0.738] {0.997} | 0.039 (0.052) [0.453] {0.935} | 0.075+ (0.057) [0.190] {0.658} | 0.051 (0.166) [0.757] {0.997} | -0.037 (0.136) [0.782] {0.997} | -0.042 (0.147) [0.775] {0.997} | <0.001 (0.127) [0.999] {0.999} |
| Non-organized alone (7.67%) | 0.038 (0.074) [0.614] {0.968} | -0.040 (0.058) [0.489] {0.947} | -0.011 (0.061) [0.861] {0.980} | -0.062 (0.188) [0.742] {0.980} | 0.048 (0.150) [0.750] {0.980} | 0.155 (0.160) [0.332] {0.892} | 0.109 (0.139) [0.427] {0.937} |
| No information (6.02%) | 0.073 (0.081) [0.369] {0.887} | 0.055 (0.064) [0.388] {0.887} | -0.016 (0.068) [0.810] {0.959} | -0.155 (0.211) [0.463] {0.887} | 0.137 (0.171) [0.423] {0.887} | 0.182 (0.181) [0.315] {0.861} | -0.004 (0.160) [0.980] {0.982} |
| Music (reference: none) | | | | | | | |
| Alone / with teacher (13.55%) | -0.090+ (0.057) [0.110] {0.110} | -0.121*** (0.042) [0.004] {0.021} | -0.121*** (0.047) [0.010] {0.043} | 0.348** (0.136) [0.011] {0.043} | 0.273** (0.107) [0.010] {0.043} | 0.340*** (0.112) [0.002] {0.014} | 0.197* (0.102) [0.053] {0.099} |
| With group (13.49%) | -0.138** (0.056) [0.014] {0.066} | -0.149*** (0.042) [<0.001] {0.003} | -0.081* (0.046) [0.077] {0.152} | 0.252* (0.134) [0.061] {0.152} | 0.266** (0.111) [0.017] {0.072} | 0.250** (0.116) [0.032] {0.103} | 0.165+ (0.102) [0.107] {0.152} |

| | Grade - Math | Grade - German | Grade - Foreign | Satis - Math | Satis - German | Satis - Foreign | Satis - Overall |
|-----------------------------------|---|---|---|--|--|---|---|
| Other / no information (2.69%) | -0.136 (0.120) [0.258] {0.707} | -0.192** (0.084) [0.022] {0.127} | -0.059 (0.093) [0.528] {0.871} | 0.168 (0.328) [0.608] {0.871} | 0.230 (0.262) [0.379] {0.812} | -0.016 (0.270) [0.954] {0.956} | 0.334+ (0.245) [0.174] {0.584} |
| R ² | 0.057 | 0.145 | 0.103 | 0.040 | 0.062 | 0.059 | 0.039 |
| Mean (SD) of outcome | 2.92 (1.05) | 2.83 (0.85) | 2.89 (0.91) | 6.29 (2.56) | 6.53 (2.15) | 6.53 (2.29) | 6.55 (1.96) |

Notes: Number of yearly observations is N=3,388. All regressions include the full set of control variables: four school types, five categories for the share of students with migration background in the class, a dummy variable for having a migration background, a dummy variable for being female, students' pocket money in Euros, the household income in Euros, seven categories for the schooling of the father and of the mother, 16 federal states, and 14 survey years. The explanatory variables of interest are dummies (share in percent). School grades range from 1 (very good) to 6 (failed). Satisfaction with own school performance is measured on an 11-point-Likert scale (0: very unhappy, 10: very happy). Robust standard errors are in parentheses, conventional p-values in brackets, and adjusted p-values taking the family-wise error rate into account in curly braces. Coefficients are significant at + p<0.20, * p<0.10, ** p<0.05, *** p<0.01 (conventional).

Data source: SOEP 2001-2014 (youth), version 31, SOEP, 2015, doi:10.5684/soep.v31.

2.5 Conclusion

We have made two contributions in this chapter. First, we surveyed the empirical literature on the association between having a job, participating in sports and in music, and school performance. Whereas many studies have analyzed the isolated effects of these extracurricular activities, empirical evidence for student jobs and for the heterogeneity between and within activities is rather scarce. Our second contribution is an empirical analysis that takes into account different characteristics of jobs, sports, and music. Our main findings indicate that having a job as a student is rather negatively correlated with school performance, whereas participating in sports and in music is rather positively correlated with school performance, which is in line with previous studies. But not all estimated coefficients are significant and the results reveal heterogeneity within each activity. The correlation of having a job is more negative if students started to work at an age younger than 14 years and if the main reason is to earn money rather than an interest in the job. If sports participation is related to competitions, if sports have been performed for more years, and if sports participation is organized, the positive correlation with school performance is more pronounced. Note, however, that sports competitions, length of participation, and organized sports are highly correlated with each other, i.e., students who do sports with competitions are more likely to have performed for more years and to do organized sports. Of all three analyzed activities, music seems to be most strongly correlated with better school performance, which is mainly driven by those who perform for a long time. Furthermore, we do not find significant differences between doing music alone or in a group. Concerning our outcomes, the results suggest that performance in math is more sensitive to extracurricular activities than performance in German and a first foreign language.

Although we do not claim causality of our results due to potential selection on unobservables and reverse causality issues, our findings on the heterogeneity between and within extracurricular activities might stimulate more specific research in this area, from which more specific policy recommendations can be generated. Based on our findings, potential policy implications might be an even stronger regulation of child work and larger child benefits, because student jobs seem to harm school performance mainly if started too early with the aim and/ or necessity to earn money. A first step into this direction has been made recently in Germany by increasing the standard minimum age for jobs from 14 to 15 years. Sports and music seem to be especially beneficial for school performance if started rather early in organized settings and if sports competitions take place, which would justify public subsidies for sports and music activities of children and teenagers. But to give definitive policy advice on these issues, further research is needed to establish causality. Panel data on students, which need to include detailed information about students' activities and their school performance and which should start as early as possible in life and follow through childhood, adolescence, and adulthood, would tremendously help to solve the identification problem.

2.6 References for Chapter 2

- Anderson, D.J., 1998. If You Let Me Play: The effects of participation in high school athletics on students' educational and labor market success. Cornell University, Ph.D. Dissertation.
- Balsmeier, B., and H. Peters, 2009. Family background or the characteristics of children: What determines high school success in Germany? *Journal of Economics and Economic Education Research*, 10(1): 21-43.
- Barron, J., B. Ewing, and G. Waddell, 2000. The effects of high school athletic participation on education and labor market outcomes. *Review of Economics and Statistics*, 82: 409-421.
- Bilhartz, T.D., R.A. Bruhn, and J. E. Olson, 1999. The effect of early music training on child cognitive development. *Journal of Applied Developmental Psychology*, 20(4): 615-636.
- Buscha, F., M. Arnaud, P. Lionel, and S. Speckesser, 2012. The effect of employment while in high school on educational attainment: A conditional difference-in-differences approach. *Oxford Bulletin of Economics and Statistics*, 74(3): 380-396.
- Cabane, C., A. Hille, and M. Lechner, 2016. Mozart or Pelé? The effects of adolescents' participation in music and sports. *Labour Economics*, 41: 90-103.
- Covay, E., and W. Carbonaro, 2010. After the bell: Participation in extracurricular activities, classroom behavior, and academic achievement. *Sociology of Education*, 83(1): 20-45.
- Del Boca, D., C. Monfardini, and C. Nicoletti, 2017. Parental and child time investments and the cognitive development of adolescents. *Journal of Labor Economics*, 35(2): 565-608.
- Dustmann, C., and A. van Soest, 2007. Part-time work, school success and school leaving. *Empirical Economics*, 32: 277-299.
- Eckstein, Z., and K.I. Wolpin, 1999. Why youth drop out of high school: The impact of preferences, opportunities and abilities. *Econometrica*, 67: 1295-1339.
- Eiden, E.R., and N. Ronan, 2001. Is participation in high school athletics an investment or a consumption good? Evidence from high school and beyond. *Economics of Education Review*, 20(5): 431-442.
- Elpus, K., 2013. Is it the music or is it selection bias? A nationwide analysis of music and non-music students' SAT scores. *Journal of Research in Music Education*, 61: 175-194.
- Felfe, C., M. Lechner, and A. Steinmayr, 2016. Sports and child development. *PLoS ONE*, 11(5): e0151729.

- Fitzpatrick, K.R., 2006. The effect of instrumental music participation and socioeconomic status on Ohio fourth-, sixth-, and ninth-grade proficiency test performance. *Journal of Research in Music Education*, 54(1): 73-84.
- Gorry, D., 2016. Heterogenous effects of sports participation on education and labor market outcomes. *Education Economics*, 24(6): 622-638.
- Hille, A., and J. Schupp, 2015. How learning a musical instrument affects the development of skills. *Economics of Education Review*, 44: 56-82.
- Jones, D., D. Molitor, and J. Reif, 2018. What do workplace wellness programs do? Evidence from the Illinois workplace wellness study. National Bureau of Economic Research Working Paper No. 24229.
- Lipscomb, S., 2007. Secondary school extracurricular involvement and academic achievement: a fixed effects approach. *Economics of Education Review*, 26: 463-472.
- Long, J., and S. Caudill, 1991. The impact of participation in intercollegiate athletics on income and graduation. *Review of Economics and Statistics*, 73(3): 525-31.
- Maloney, M.T., and R.E. McCormick, 1993. An examination of the role that intercollegiate athletic participation plays in academic achievement. Athletes' feats in the classroom. *Journal of Human Resources*, 28(3): 555-570.
- Marsh, H.W., 1991. Employment during high school: Character building or a subversion of academic goals? *Sociology of Education*, 64: 172-189.
- Montmarquette, C., N. Viennot-Briot, and M. Dagenais, 2007. Dropout, school performance, and working while in school. *Review of Economics and Statistics*, 89: 752-760.
- Pfeifer, C., and T. Cornelissen, 2010. The impact of participation in sports on educational attainment – New evidence from Germany. *Economics of Education Review*, 29: 94-103.
- Rees, I., and J. Sabia, 2010. Sports participation and academic performance: Evidence from the National Longitudinal Study of Adolescent Health. *Economics of Education Review*, 29(5): 751-759.
- Schellenberg, E. G., 2004. Music lessons enhance IQ. *Psychological Science*, 15(8): 511-514.
- Schneider, T., and G.G. Wagner, 2003. Jobben von Jugendlichen beeinträchtigt weder Schulleistungen noch Freizeit: Ergebnisse des SOEP für die Jahre 2000 bis 2002. *DIW Wochenbericht*, 70(38): 574-575.
- Southgate, D., and V. Roscigno, 2009. The impact of music on childhood and adolescent achievement. *Social Science Quarterly*, 90(1): 4-21.

- Tully, C. J., 2004. Schule und Job. Vom Nacheinander zum Nebeneinander. *Diskurs*, 14(1): 54-63.
- Wagner, G.G., J.R.Frick, and J. Schupp, 2007. The German Socio-Economic Panel Study (SOEP): Scope, evolution and enhancements. *Journal of Applied Social Science (Schmollers Jahrbuch)*, 127: 139-169.
- Westfall, P.H., and S.S. Young, 1993. Resampling-based multiple testing: Examples and methods for p-value adjustment. John Wiley & Sons.
- Yang, P., 2015. The impact of music on educational attainment. *Journal of Cultural Economics*, 39(4): 369-396.

2.7 Appendix for Chapter 2

Table 2.6 Literature Survey

| Author (year) | Country; Years | Activity variables; School performance outcomes | Identification strategy | Results |
|-------------------------------|--|--|--|--|
| <i>Student jobs</i> | | | | |
| Buscha et al. (2012) | USA 1988/1992 | Hours worked part-time while in high school (grade 12): binary part-time in general, stratified by intensity (measured in hours) and occupation; Composite scores of math and reading tests | Semi-parametric propensity score matching combined with difference-in-differences/difference-in-differences | Negligibly small effects on reading and math performance when working part-time during 12 th grade of high school |
| Dustmann and van Soest (2007) | England, Wales 1974-1975 (cohort 1958) | Index of hours worked part-time at the age of 16; Educational performance at the age of 16 (number of O'levels/CSE Grade Ones), economic activity at the age of 16 (staying in school, enrollment in training schemes, enter labor market full time) | Three equation model estimated separately and jointly: (1) hours worked (grouped regression model), (2) number of O'levels (censored regression model), (3) educational involvement (ordered probit model) | No negative effects for female students on educational performance or engagement; results indicate minor negative effect for male students on school outcomes and involvement; parents' interest in the child's educational achievements is most important for exam success and school leaving decision |
| Eckstein and Wolpin (1999) | USA 1979-1991 | Hours worked during school, hourly wage rate; Course grades, dropout probabilities in high school | Sequential decision model | Worse school performance in high school for white male part-time worker; prohibiting work while in school legally, would reduce graduation rates only slightly and has almost no effect on grades |
| Marsh (1991) | USA 1980, 1982, 1984 | Hours worked in sophomore year, junior year and senior year of high school; Outcome variables collected in sophomore and senior year of high school (standardized achievement tests, GPA, courses selected, self-concept, locus of control, self-esteem, educational and occupational aspiration), postsecondary outcomes (educational attainment, educational and occupational aspiration) | Multiple regression | Working during sophomore year seems to increase the probability to drop out of high school, is negatively related to almost all postsecondary outcomes (e.g. educational and occupational aspirations, unemployment) and to senior year outcomes (e.g. grades, homework, educational and occupational aspirations); working in order to save money for college has positive effects on school performance and aspirations in senior year and on postsecondary outcomes; less commitment to school (motivation/investment) causes negative effects on school outcomes, not the hours spend on working |
| Montmarquette et al. (2007) | Canada 1991 | Working while in school conditional on individual's preference for schooling or labor market entry (binary); Hours worked while in school, grades, probability of dropping out of high school | Joint maximum likelihood estimation (incl. utility of school performance, utility of working, utility of dropping out of school) conditional on the type of student | Female students, students from private schools, and students whose parents obtain a postsecondary degree prefer school over work; working a moderate number of hours per week during full time education has no negative effects on school performance and attainment |
| Schneider and Wagner (2003) | Germany 2000-2002 | Binary part-time work, binary music, binary sports, binary reading, binary friends or binary volunteer work; School performance in math, German and first foreign language (descriptive statistics) | Descriptive statistics | No crowding out of good leisure activities such as sport, music, reading, friends or volunteer work; part-time workers seem to be more active; overall negligibly worse school performance for part-time worker while in school; starting to work part-time before turning 15 worsened school performance on average |
| Tully (2004) | Germany 2002 | Part-time worker while in school; School performance measured in grades | Descriptive statistics | Correlations between part-time work and school performance close to zero |

Sports participation

| | | | | |
|------------------------------|---|---|--|--|
| Anderson (1998) | USA 1980-1992, 1988-1994, | Binary sport in general, binary team sports, binary individual sports, binary football, binary baseball, binary basketball, binary other team sports (in and outside of school during the school year); Binary high school dropout, binary enrollment in a four-year college, years of completed education | OLS, IV | IV estimations reveal that differences between athletes and non-athletes seem to be driven by unobserved characteristics; lower high school dropout probabilities, higher college enrollment probabilities and more years in completed education for white female and male athletes; sports are less beneficial for minorities; female minorities have a lower dropout probability if they do team sports; no harmful effects for male minorities on educational success |
| Eide and Ronan (2001) | USA 1980-1992 | Binary sports participation in the sophomore year/participation in varsity sports in the senior year; Binary high school dropout in 1982, binary 4-year college or university enrollment between 1982-1984, binary college graduation until 1992 | OLS, IV | Sport participation increases white female's college attendance and graduation probabilities; results indicate negative effects for male athletes with respect to educational attainment; higher college attendance rates for black males; neither harmful nor beneficial effects on educational attainment for Hispanic male and female athletes |
| Felfe et al. (2016) | Germany 2003-2006 | Binary sports regularly in a sports club (at least once a week) among children aged 3 to 10; Average school grade (math + German), health outcomes (subjective health, BMI, skinfold, pulse), behavioral outcomes (emotions, hyperactivity, peer relationships, antisocial behavior, total difficulties score) | Matching, IV | Results reveal positive effects of sports during early childhood (3 to 10) on health, school performance and behavior; in particular peer relationship problems are reduced and the subjective health is increased; estimations suggest crowding out of watching TV by sports participation in clubs; less time spend on unstructured activities and more contact to instructors and older peers might increase the development of personal skills; sport participation stimulates physical activity |
| Gorry (2016) | USA 1994-1997, 2001-2002, 2008 -2009 | Binary sports, binary team sports and binary individual sports; Reported and transcript GPA, binary high school diploma | Fixed effects, quantile regression, IV | Positive effect of sport in general, team and individual sport on GPA and high school graduation rates; team sport participants seem to benefit the most; interacting with team members might help to develop further skills; low achieving participants benefit the most, being in contact with high achieving peers or incentives to continue doing sports leads to better grades and higher graduation probabilities |
| Long and Caudill (1991) | USA 1971, 1980 | Binary varsity letter was earned in a college sport; College graduation | Logit regressions | Results suggest higher graduation probabilities for male and female college varsity athletes compared to non-athletes; being an athlete while in college might enhance discipline, competitiveness, motivation or other personnel traits that influence educational success positively |
| Maloney and McCormick (1993) | USA 1985-1988 | Individual GPA over all courses taken in a term; Binary NCAA intercollegiate sport, binary revenue sports, binary non-revenue sports | ML censored-sample estimation | Athletes perform worse, but the overall effect is small; the effects differ across sports; only revenue sports such as football and men's basketball show significantly negatively effects (one-tenth of a grade point worse); for revenue sports grades |

| | | | | |
|--------------------------------|----------------------|--|--|---|
| | | | | are worse in season than out of season, which indicates exploitation of this athletes; non-revenue athletes perform like non-athletes |
| Pfeifer and Cornelissen (2010) | Germany 2000-2005 | Binary sports participation outside of school and binary participation in competitions during childhood and adolescence; Secondary school degrees, professional degrees | Generalized ordered probit regression, IV, linear treatment regression | Positive effects of sport during childhood and adolescence on educational achievements for men and women; outperformance might be a results of choosing leisure activities outside of school, which foster the educational productivity more; participation in competitions has only significant effect for women (increasing probability of an intermediate school degree and a lower probability to obtain the lowest school degree, higher probability of attaining vocational training); the larger effects for women who participate in competition might be due to an increased competitive orientation compared to men |
| Rees and Sabia (2010) | USA 1995, 1996 | Binary sports participation during high school (not at all, 1 or 2 times, 3 or 4 times, 5 or more times the past week); Grades in math and English, comprehensive grade, difficulties paying attention in class at least once a week, difficulties in completing homework on time at least once a week, college aspiration | OLS, Fixed effects, IV | OLS reports positive effects on grades and college aspirations; fixed effects and IV estimations reveal only small or no human capital spillover effects of sports on student grades or college aspirations; OLS estimations are driven by unobserved heterogeneity |
| <i>Music participation</i> | | | | |
| Bilartz et al. (1999) | USA 1997-1998 | Binary music at different compliance and income levels; Stanford-Binet (SB) Intelligence Score of 4-6 years old children (composite score and subtests score (vocabulary, memory for sentences, bead memory, pattern analysis, quantitative reasoning)), Young Child Music Skills Assessment (MSA) score of 4-6 years old children (composite score and subtest score (steady beat, rhythmic pattern, vocal pitch, aural discrimination)). | ANOVA (Bonferroni corrective method), four-order partial correlations analysis | MSA: only the aural discrimination tests shows no significant improvement for the treated group (music involvement); in particular high income and high compliance children benefit the most; SB: even under minimal treating the bead memory score improves more compared to the control group; children who were treated fully improve their bead memory the most, developing kinesthetic, visualization, and aural skills by music training seem to improve visual imaginary and sequencing strategies (bead memory), no improvement in verbal reasoning abilities |
| Elpus (2013) | USA 2002, 2004 | Binary music enrollment in high school, number of credits earned in music, binary music subareas; SAT scores | Fixed effects | Music participants do not perform better than non-music participants; better performing students and students with a higher status are more likely to select into music |
| Fitzpatrick (2006) | USA 2003-2004 | Instrumental music students receiving free or reduced lunch, instrumental music students paying full price for lunch, non-instrumental students receiving free or reduced lunch, non-instrumental students paying full price for lunch (students in grades 9-12 during school year 2003-2004); Four scaled scores (Ohio Proficiency Test: citizenship, math, reading, science) at 4 th , 6 th and 9 th grade | Two-tailed t-test statistic | Indication for self-selection into instrumental music courses; higher performing students sort into music courses; students who participated in instrumental music courses during school year 2003-2004 outperformed non-instrumental students in citizenship, math, reading and science in grade 4,6 and 9 (before they started playing instrumental music) |
| Hille and Schupp (2015) | Germany 2001-2012 | Binary playing music at least for 9 years (8-17) and outside of school, binary sports participation for at least 9 years and regularly participating in | Matching | Being musically active for at least 9 years during childhood improves cognitive skills, school grades, educational ambitions and increases the level of conscientiousness and openness; playing music lowers the probability of watching TV |

| | | | | |
|-------------------------------|-------------------------------|--|--|--|
| | | competitions, binary playing theatre or dancing at least weekly; Cognitive skills (analogies, figures, and mathematics operators measured in std. deviations), school grades normalized within each secondary school type (math, German, first foreign language, average grade measured in std. deviations), personality traits (conscientiousness, extraversion, agreeableness, openness, neuroticism measured in std. deviations), time use (watching TV, reading books measured in percent), ambitions (school degree, university measured in percent) | | and increases the probability of reading books; compared to alternative activities, music has the strongest effects; music affects almost all outcome variables positive; dancing and/or playing theatre foster personality traits and academic ambitions; sport activities, on the contrary, affect academic ambitions positively |
| Southgate and Roscigno (2009) | USA 1988-2000 | Binary music participation in school, binary music participation outside of school, binary parents attend concerts, amount of music coursework from 8 th to 10 th grade (measured in years); Standardized reading IRT scores, standardized mathematics IRT scores | Logit and OLS regressions | Music participation in school increases reading and math performance of children; music involvement in and outside of school increases math performance of adolescents; the intensive music is played (amount of music coursework from 8 th to 10 th grade), the better the performance of adolescents in math and reading; cultural capital is more able to explain school achievements; results indicate that music involvement is more a mediator variable than a predictor variable (statistically significant, but low explanation power) |
| Yang (2015) | Germany 2001-2009 | Binary active in music, binary intensity (often, seldom), binary peers (alone, with), binary paid music lessons, binary started playing music at a age of (0-5, 6-10, >10); Track recommendation after elementary school and track at the age of 17 (lower, intermediate, higher track) | OLS and probit regressions, Fixed effects | Higher track recommendations and track at 17 for all music indicators; in particular starting early during childhood and practicing often have the largest effects; the effect of music is strongly affected by ability and educational background |
| <i>Combined</i> | | | | |
| Balsmeier and Peters (2008) | Germany 2000-2007 | Binary part-time working, binary leisure time sport/club sport, binary school sport, binary paid music lessons, binary no extracurricular activities, binary TV, binary reading, binary voluntary activities; Binary high school graduation | Survival analysis (Cox proportional hazard rate model) | Significant higher likelihood of graduation if students work part-time during school; selection of more highly skilled adolescents into part-time working; female students benefit the most from working; while doing school sports increases likelihood of graduation and no extracurricular activity decreases the likelihood of graduation for female students, no significant effect for male students is observed |
| Barron et al. (2000) | USA 1972-1985 1979-1992 | Binary participation in high school athletics, binary participation in high school athletics as a leader/most active, binary participation in other extracurricular activities (school-sponsored hobby or subject-matter clubs); only for men; Educational attainment | IV | Athletic involvement enhances productivity; higher educational attainment for high school athletes |
| Cabane et al. (2016) | Germany 2001-2012 | Binary music (general, paid, monthly basis) and binary sports (general, competitive, non-competitive) participation (at least 3 years active); Grades, cognitive and non-cognitive skills, Big 5, educational engagement, health (subjective/current | Matching, IV | Music improves school performance and increases academic ambitions more than sports; music participants read more books, watch less TV and play less computer compared to sport participants; sports improves health more than music; doing |

| | | | | |
|----------------------------|-------------------------------|--|---|--|
| | | situation), other leisure activities (TV, playing computer, reading) | | both activities vs. doing one activity improves educational performance |
| Covay and Carbonaro (2010) | USA 2002 | Binary music, binary dance, binary sports, binary performing art activities, binary art in the last year; Approaches to learning 1-4 scale (math and reading) | Logit regressions, OLS | Being active during childhood improves non-cognitive skills and academic benefits; sports participations improve non-academic skills the most compared to other activities; through the interaction with authorities and privileged peer students who participate in extracurricular activities have access to non-cognitive skills and improve their school performance |
| Del Boca et al. (2017) | USA 1997, 2002, 2003, 2007 | Weekly time investment decision of children (aged 6-10) and adolescents (aged 11-15) on leisure activities (aggregated leisure activities measured in hours are homework, doing arts and craft, sport, playing, attending performances and museums, religious activities); Standardized measure of cognitive ability, learning and reading abilities, comprehension and vocabulary skills, mathematical skills | OLS, Fixed effects | Time investment decisions of children during adolescence improve test scores more than time investment decisions by mothers; time investment decisions during childhood are more beneficial if rather made by mother than by children |
| Lipscomb (2007) | USA 1988, 1990, 1992 | Binary participation in school-supported sports, binary participation in school-supported clubs, binary clubs conditional on highest math score among members; Scores in math and science at different school grades, educational expectations at different school grades (earning at least an B.A. or equivalent) | Fixed effects | Short-run learning effect of sports and club participation on student learning; long-run effect on educational attainment; sport participants perform better in math and science and have higher degree attainment expectations; club participants have higher math scores and higher degree attainment expectations; women benefit more from sports participation than men; participating in clubs with generally low scoring members do not help students learning; students who participate in clubs with high achieving members benefit more (higher degree attainment expectations) |
| Schellenberg (2004) | Canada | Binary music lessons for 36 weeks (keyboard or voice training), binary drama lessons 36 weeks, binary no music lessons; IQ score, fours index score (verbal comprehension, perceptual organization, freedom from distractibility, processing speed) and 12 subgroups (e.g. picture arrangement, coding, information, arithmetic), maladaptive and adaptive behaviors | Experimental design, 144 6-year-olds were offered a free weekly arts lesson for 36 weeks, randomly grouped into keyboard lessons, voice lessons, drama lessons or no lessons, descriptive statistics and analysis of variance | Small increases for music lessons on IQ; drama lessons on the contrary have positive effects on social behavior; multiple experience in music lessons might improve a range of abilities |

Table 2.7 Summary statistics

| | Mean | Std. Dev. | Min | Max |
|---|-------|-----------|-----|-----|
| Grade Math | 2.923 | 1.054 | 1 | 6 |
| Grade German | 2.828 | 0.848 | 1 | 6 |
| Grade foreign language | 2.890 | 0.915 | 1 | 6 |
| Satisfaction with own performance in Math | 6.293 | 2.564 | 0 | 10 |
| Satisfaction with own performance in German | 6.526 | 2.148 | 0 | 10 |
| Satisfaction with own performance in foreign language | 6.525 | 2.286 | 0 | 10 |
| Satisfaction with own overall performance | 6.547 | 1.965 | 0 | 10 |
| Job (dummy) | 0.443 | 0.497 | 0 | 1 |
| Job participation length (dummies) | | | | |
| No job | 0.557 | 0.497 | 0 | 1 |
| ≤ 1 year | 0.088 | 0.283 | 0 | 1 |
| 2-3 years | 0.280 | 0.449 | 0 | 1 |
| ≥4 years | 0.076 | 0.264 | 0 | 1 |
| Job type (dummies) | | | | |
| No job | 0.557 | 0.497 | 0 | 1 |
| Out of interest | 0.071 | 0.257 | 0 | 1 |
| For money | 0.337 | 0.473 | 0 | 1 |
| Other reason / no information | 0.035 | 0.184 | 0 | 1 |
| Sport (dummy) | 0.750 | 0.433 | 0 | 1 |
| Sport competition (dummies) | | | | |
| No sport | 0.250 | 0.433 | 0 | 1 |
| Sport without competition | 0.394 | 0.489 | 0 | 1 |
| Sport with competition | 0.356 | 0.479 | 0 | 1 |
| Sport participation length (dummies) | | | | |
| No sport | 0.250 | 0.433 | 0 | 1 |
| ≤ 1 year | 0.060 | 0.238 | 0 | 1 |
| 2-3 years | 0.147 | 0.354 | 0 | 1 |
| ≥4 years | 0.543 | 0.498 | 0 | 1 |
| Sport type (dummies) | | | | |
| No sport | 0.250 | 0.433 | 0 | 1 |
| Extracurricular in school | 0.077 | 0.266 | 0 | 1 |
| Sports club etc. | 0.427 | 0.495 | 0 | 1 |
| Non-organized with others | 0.109 | 0.311 | 0 | 1 |
| Non-organized alone | 0.077 | 0.266 | 0 | 1 |
| No information | 0.060 | 0.238 | 0 | 1 |
| Music (dummy) | 0.297 | 0.457 | 0 | 1 |
| Music participation length (dummies) | | | | |
| No music | 0.703 | 0.457 | 0 | 1 |
| ≤ 1 year | 0.014 | 0.119 | 0 | 1 |
| 2-3 years | 0.036 | 0.186 | 0 | 1 |
| ≥4 years | 0.247 | 0.431 | 0 | 1 |
| Music type (dummies) | | | | |
| No music | 0.703 | 0.457 | 0 | 1 |
| Alone / with teacher | 0.135 | 0.342 | 0 | 1 |
| With group | 0.135 | 0.342 | 0 | 1 |
| Other / no information | 0.027 | 0.162 | 0 | 1 |
| School type (dummies) | | | | |
| Secondary general school | 0.102 | 0.302 | 0 | 1 |
| Intermediate school | 0.289 | 0.453 | 0 | 1 |
| Comprehensive school/other | 0.101 | 0.301 | 0 | 1 |
| Upper secondary school | 0.509 | 0.500 | 0 | 1 |
| Students with migration background in class (dummies) | | | | |
| No students with migration background in class | 0.222 | 0.415 | 0 | 1 |
| Less than a quarter | 0.478 | 0.500 | 0 | 1 |
| About a quarter | 0.143 | 0.350 | 0 | 1 |

| | | | | |
|----------------------------------|----------|----------|---|-------|
| About half | 0.086 | 0.281 | 0 | 1 |
| Most or all | 0.071 | 0.258 | 0 | 1 |
| Own migration background (dummy) | 0.239 | 0.427 | 0 | 1 |
| Female (dummy) | 0.504 | 0.500 | 0 | 1 |
| Students' pocket money in Euros | 42.671 | 42.005 | 0 | 600 |
| Household income in Euros | 3330.633 | 2013.484 | 0 | 35000 |
| Schooling of father (dummies) | | | | |
| Do not know | 0.031 | 0.174 | 0 | 1 |
| Second general school | 0.254 | 0.435 | 0 | 1 |
| Intermediate secondary school | 0.282 | 0.450 | 0 | 1 |
| Technical school degree | 0.055 | 0.227 | 0 | 1 |
| Upper secondary school | 0.245 | 0.430 | 0 | 1 |
| Other degree | 0.108 | 0.310 | 0 | 1 |
| No school degree | 0.026 | 0.160 | 0 | 1 |
| Schooling of mother (dummies) | | | | |
| Do not know | 0.001 | 0.034 | 0 | 1 |
| Second general school | 0.193 | 0.395 | 0 | 1 |
| Intermediate secondary school | 0.415 | 0.493 | 0 | 1 |
| Technical school degree | 0.042 | 0.201 | 0 | 1 |
| Upper secondary school | 0.214 | 0.410 | 0 | 1 |
| Other degree | 0.113 | 0.317 | 0 | 1 |
| No school degree | 0.022 | 0.145 | 0 | 1 |
| Federal state (dummies) | | | | |
| Schleswig-Holstein | 0.036 | 0.187 | 0 | 1 |
| Hamburg | 0.013 | 0.114 | 0 | 1 |
| Lower Saxony | 0.102 | 0.303 | 0 | 1 |
| Bremen | 0.008 | 0.087 | 0 | 1 |
| North Rhine-Westphalia | 0.223 | 0.416 | 0 | 1 |
| Hesse | 0.068 | 0.253 | 0 | 1 |
| Rhineland-Palatinate | 0.045 | 0.207 | 0 | 1 |
| Baden-Wuerttemberg | 0.126 | 0.332 | 0 | 1 |
| Bavaria | 0.133 | 0.340 | 0 | 1 |
| Saarland | 0.008 | 0.089 | 0 | 1 |
| Berlin | 0.033 | 0.179 | 0 | 1 |
| Brandenburg | 0.043 | 0.202 | 0 | 1 |
| Mecklenburg-West Pomerania | 0.023 | 0.149 | 0 | 1 |
| Saxony | 0.060 | 0.237 | 0 | 1 |
| Saxony-Anhalt | 0.041 | 0.199 | 0 | 1 |
| Thuringia | 0.037 | 0.189 | 0 | 1 |
| Survey year (dummies) | | | | |
| 2001 | 0.077 | 0.267 | 0 | 1 |
| 2002 | 0.061 | 0.240 | 0 | 1 |
| 2003 | 0.061 | 0.240 | 0 | 1 |
| 2004 | 0.064 | 0.245 | 0 | 1 |
| 2005 | 0.064 | 0.244 | 0 | 1 |
| 2006 | 0.055 | 0.228 | 0 | 1 |
| 2007 | 0.066 | 0.247 | 0 | 1 |
| 2008 | 0.040 | 0.195 | 0 | 1 |
| 2009 | 0.043 | 0.204 | 0 | 1 |
| 2010 | 0.071 | 0.257 | 0 | 1 |
| 2011 | 0.088 | 0.283 | 0 | 1 |
| 2012 | 0.093 | 0.291 | 0 | 1 |
| 2013 | 0.116 | 0.321 | 0 | 1 |
| 2014 | 0.100 | 0.301 | 0 | 1 |

Notes: Number of yearly observations is N=3,388.

Data source: SOEP 2001-2014 (youth), version 31, SOEP, 2015, doi:10.5684/soep.v31.

Table 2.8 Complete OLS results for specifications with binary indicators for job, sports, and music

| | Grade - Math | Grade - German | Grade - Foreign | Satis - Math | Satis - German | Satis - Foreign | Satis - Overall |
|---|---------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|
| Job | 0.035 (0.038) [0.349] | 0.004 (0.028) [0.883] | 0.048+ (0.031) [0.129] | -0.098 (0.092) [0.284] | -0.002 (0.075) [0.982] | -0.132* (0.080) [0.100] | -0.057 (0.069) [0.407] |
| Sport | -0.052 (0.043) [0.224] | -0.012 (0.033) [0.727] | 0.002 (0.038) [0.962] | 0.213** (0.106) [0.045] | 0.065 (0.089) [0.464] | 0.107 (0.096) [0.266] | 0.162* (0.084) [0.055] |
| Music | -0.119*** (0.042) [0.005] | -0.143*** (0.032) [0.000] | -0.097*** (0.035) [0.006] | 0.295*** (0.103) [0.004] | 0.266*** (0.083) [0.001] | 0.263*** (0.087) [0.003] | 0.200** (0.078) [0.011] |
| Intermediate school | -0.080 (0.066) [0.225] | -0.060 (0.050) [0.234] | 0.042 (0.057) [0.468] | -0.055 (0.161) [0.734] | 0.174+ (0.135) [0.196] | 0.237+ (0.157) [0.129] | 0.045 (0.128) [0.728] |
| Comprehens ive school/other | -0.043 (0.081) [0.596] | -0.085+ (0.061) [0.163] | -0.074 (0.072) [0.304] | -0.459** (0.200) [0.022] | -0.160 (0.167) [0.338] | 0.138 (0.190) [0.466] | 0.013 (0.153) [0.934] |
| Upper secondary school | -0.217*** (0.069) [0.002] | -0.250*** (0.053) [0.000] | -0.234*** (0.059) [0.000] | -0.120 (0.168) [0.474] | 0.253* (0.138) [0.068] | 0.472*** (0.160) [0.003] | 0.190+ (0.129) [0.142] |
| Less than a quarter of students in class with migration background | 0.007 (0.053) [0.902] | 0.010 (0.038) [0.785] | 0.039 (0.043) [0.366] | 0.147 (0.128) [0.251] | 0.021 (0.104) [0.842] | 0.045 (0.108) [0.675] | -0.069 (0.099) [0.489] |
| About a quarter with migration background | 0.048 (0.069) [0.487] | -0.034 (0.051) [0.507] | -0.011 (0.057) [0.850] | 0.050 (0.170) [0.768] | -0.046 (0.142) [0.748] | -0.054 (0.150) [0.719] | -0.120 (0.130) [0.355] |
| About half with migration background | -0.003 (0.082) [0.974] | 0.026 (0.063) [0.684] | 0.124* (0.069) [0.073] | -0.011 (0.199) [0.957] | -0.081 (0.162) [0.618] | -0.345* (0.179) [0.055] | -0.247+ (0.158) [0.118] |
| Most or all with migration background | 0.055 (0.090) [0.539] | -0.097+ (0.067) [0.143] | 0.028 (0.078) [0.717] | -0.014 (0.221) [0.949] | 0.257+ (0.179) [0.152] | 0.066 (0.196) [0.736] | -0.107 (0.171) [0.534] |
| Own migration background | 0.125** (0.058) [0.032] | 0.046 (0.045) [0.304] | -0.145*** (0.050) [0.004] | -0.085 (0.137) [0.537] | 0.154+ (0.113) [0.175] | 0.571*** (0.129) [0.000] | 0.071 (0.113) [0.530] |

| | | | | | | | |
|---|--------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Female | 0.045 (0.037) [0.222] | -0.372*** (0.028) [0.000] | -0.258*** (0.030) [0.000] | -0.406*** (0.089) [0.000] | 0.721*** (0.074) [0.000] | 0.396*** (0.078) [0.000] | 0.292*** (0.068) [0.000] |
| Students' pocket money in Euros | 0.001 (0.000) [0.283] | -0.001+ (0.000) [0.113] | -0.001** (0.000) [0.046] | -0.002+ (0.001) [0.182] | 0.001 (0.001) [0.534] | 0.002*** (0.001) [0.005] | -0.000 (0.001) [0.759] |
| Household income in Euros | -0.000 (0.000) [0.930] | -0.000 (0.000) [0.624] | -0.000 (0.000) [0.995] | 0.000 (0.000) [0.226] | 0.000 (0.000) [0.735] | 0.000+ (0.000) [0.116] | 0.000 (0.000) [0.972] |
| Second general school of father | -0.083 (0.103) [0.425] | 0.049 (0.087) [0.575] | 0.020 (0.097) [0.834] | 0.564** (0.270) [0.037] | 0.171 (0.223) [0.444] | 0.198 (0.257) [0.440] | 0.268 (0.222) [0.226] |
| Intermediate secondary school of father | -0.099 (0.105) [0.348] | 0.036 (0.088) [0.680] | 0.008 (0.098) [0.935] | 0.590** (0.273) [0.031] | 0.096 (0.228) [0.675] | 0.252 (0.257) [0.325] | 0.280 (0.223) [0.210] |
| Technical school degree of father | -0.174+ (0.129) [0.178] | 0.138+ (0.104) [0.186] | 0.097 (0.117) [0.408] | 0.610* (0.324) [0.060] | 0.012 (0.268) [0.966] | -0.111 (0.306) [0.716] | 0.076 (0.265) [0.776] |
| Upper secondary school of father | -0.270** (0.108) [0.013] | -0.051 (0.091) [0.577] | -0.073 (0.101) [0.468] | 0.771*** (0.279) [0.006] | 0.208 (0.235) [0.377] | 0.355+ (0.264) [0.178] | 0.293 (0.230) [0.204] |
| Other degree of father | -0.217* (0.119) [0.067] | 0.042 (0.097) [0.667] | -0.017 (0.108) [0.876] | 0.518* (0.312) [0.096] | -0.065 (0.257) [0.800] | 0.055 (0.288) [0.848] | 0.024 (0.252) [0.926] |
| No school degree of father | -0.125 (0.155) [0.420] | 0.166+ (0.114) [0.147] | 0.099 (0.136) [0.464] | 0.549+ (0.384) [0.153] | -0.079 (0.316) [0.803] | 0.050 (0.361) [0.890] | 0.186 (0.296) [0.530] |
| Second general school of mother | -0.438* (0.257) [0.088] | -0.169 (0.165) [0.305] | -0.239 (0.320) [0.456] | 0.625+ (0.420) [0.137] | 1.774*** (0.560) [0.002] | 0.984*** (0.299) [0.001] | 1.063*** (0.351) [0.002] |
| Intermediate secondary school of mother | -0.556** (0.255) [0.030] | -0.276* (0.163) [0.091] | -0.406 (0.319) [0.204] | 0.911** (0.413) [0.028] | 1.814*** (0.557) [0.001] | 1.247*** (0.292) [0.000] | 1.164*** (0.346) [0.001] |
| Technical school | -0.595** | -0.296* | -0.348 | 1.025** | 2.098*** | 1.102*** | 1.227*** |

| | | | | | | | |
|----------------------------------|-----------|-----------|---------|---------|----------|-----------|----------|
| degree of mother | (0.268) | (0.177) | (0.326) | (0.457) | (0.580) | (0.338) | (0.377) |
| | [0.026] | [0.095] | [0.287] | [0.025] | [0.000] | [0.001] | [0.001] |
| Upper secondary school of mother | -0.635** | -0.377** | -0.512+ | 0.899** | 1.967*** | 1.270*** | 1.439*** |
| | (0.260) | (0.167) | (0.322) | (0.429) | (0.565) | (0.306) | (0.356) |
| | [0.015] | [0.024] | [0.112] | [0.036] | [0.001] | [0.000] | [0.000] |
| Other degree of mother | -0.660** | -0.221+ | -0.347 | 1.068** | 1.645*** | 1.248*** | 1.104*** |
| | (0.265) | (0.171) | (0.324) | (0.448) | (0.577) | (0.331) | (0.371) |
| | [0.013] | [0.198] | [0.284] | [0.017] | [0.004] | [0.000] | [0.003] |
| No school degree of mother | -0.622** | -0.188 | -0.248 | 1.094** | 1.759*** | 0.863** | 1.222*** |
| | (0.290) | (0.186) | (0.339) | (0.549) | (0.627) | (0.429) | (0.432) |
| | [0.032] | [0.311] | [0.464] | [0.046] | [0.005] | [0.044] | [0.005] |
| Hamburg | -0.112 | -0.083 | 0.049 | 0.069 | -0.023 | -0.678* | 0.101 |
| | (0.177) | (0.152) | (0.158) | (0.422) | (0.362) | (0.393) | (0.315) |
| | [0.527] | [0.585] | [0.755] | [0.870] | [0.949] | [0.084] | [0.748] |
| Lower Saxony | -0.131 | -0.078 | 0.126+ | 0.192 | 0.068 | -0.408* | 0.025 |
| | (0.103) | (0.092) | (0.093) | (0.246) | (0.217) | (0.227) | (0.200) |
| | [0.204] | [0.394] | [0.177] | [0.435] | [0.754] | [0.072] | [0.902] |
| Bremen | 0.006 | -0.102 | 0.037 | 0.183 | 0.795* | -0.210 | 0.637+ |
| | (0.190) | (0.179) | (0.213) | (0.489) | (0.420) | (0.606) | (0.434) |
| | [0.975] | [0.569] | [0.862] | [0.709] | [0.058] | [0.729] | [0.143] |
| North Rhine-Westphalia | -0.103 | -0.058 | 0.022 | -0.016 | -0.014 | -0.328+ | -0.019 |
| | (0.097) | (0.087) | (0.090) | (0.231) | (0.203) | (0.215) | (0.188) |
| | [0.286] | [0.504] | [0.802] | [0.946] | [0.946] | [0.127] | [0.921] |
| Hesse | -0.167+ | -0.080 | 0.044 | 0.201 | 0.183 | -0.322 | 0.141 |
| | (0.115) | (0.100) | (0.102) | (0.273) | (0.229) | (0.255) | (0.212) |
| | [0.147] | [0.426] | [0.668] | [0.461] | [0.425] | [0.208] | [0.506] |
| Rhineland-Palatinate | -0.239** | -0.154+ | -0.014 | 0.089 | -0.080 | -0.271 | 0.021 |
| | (0.119) | (0.106) | (0.109) | (0.284) | (0.242) | (0.260) | (0.219) |
| | [0.045] | [0.145] | [0.894] | [0.754] | [0.740] | [0.298] | [0.925] |
| Baden-Wuerttemberg | -0.226** | -0.282*** | -0.179* | -0.257 | 0.060 | -0.476** | 0.068 |
| | (0.104) | (0.089) | (0.092) | (0.250) | (0.214) | (0.225) | (0.199) |
| | [0.029] | [0.002] | [0.052] | [0.305] | [0.780] | [0.034] | [0.734] |
| Bavaria | -0.010 | 0.000 | 0.032 | -0.414* | -0.298+ | -0.497** | -0.046 |
| | (0.103) | (0.088) | (0.092) | (0.243) | (0.212) | (0.222) | (0.193) |
| | [0.925] | [0.997] | [0.730] | [0.089] | [0.160] | [0.025] | [0.811] |
| Saarland | -0.594*** | 0.026 | 0.040 | 0.626 | -0.153 | -0.081 | 0.516+ |
| | (0.165) | (0.186) | (0.193) | (0.510) | (0.497) | (0.455) | (0.387) |
| | [0.000] | [0.888] | [0.837] | [0.220] | [0.759] | [0.858] | [0.182] |
| Berlin | -0.105 | -0.076 | 0.049 | -0.334 | -0.307 | -0.406+ | -0.286 |
| | (0.137) | (0.111) | (0.122) | (0.338) | (0.290) | (0.303) | (0.273) |
| | [0.441] | [0.496] | [0.690] | [0.324] | [0.289] | [0.180] | [0.295] |
| Brandenburg | -0.249** | -0.358*** | -0.003 | -0.187 | 0.142 | -0.797*** | -0.208 |
| | (0.125) | (0.102) | (0.111) | (0.298) | (0.251) | (0.274) | (0.235) |
| | [0.046] | [0.000] | [0.979] | [0.530] | [0.572] | [0.004] | [0.376] |

| | | | | | | | |
|-----------------------------------|---------------------------------|---------------------------------|--------------------------------|------------------------------|-------------------------------|--------------------------------|------------------------------|
| Mecklenbur g-West Pomerania | -0.295** (0.147) [0.044] | -0.251** (0.120) [0.037] | -0.034 (0.127) [0.791] | 0.230 (0.352) [0.513] | 0.165 (0.281) [0.559] | -0.119 (0.314) [0.704] | 0.169 (0.264) [0.521] |
| Saxony | -0.242** (0.117) [0.039] | -0.312*** (0.097) [0.001] | -0.171+ (0.105) [0.104] | -0.098 (0.283) [0.729] | 0.070 (0.247) [0.777] | -0.562** (0.261) [0.032] | -0.127 (0.231) [0.582] |
| Saxony- Anhalt | -0.352*** (0.135) [0.009] | -0.390*** (0.108) [0.000] | -0.132 (0.118) [0.265] | -0.161 (0.318) [0.613] | 0.222 (0.270) [0.411] | -0.339 (0.273) [0.214] | -0.269 (0.258) [0.297] |
| Thuringia | -0.276** (0.129) [0.032] | -0.391*** (0.107) [0.000] | -0.237** (0.116) [0.041] | 0.020 (0.310) [0.949] | 0.233 (0.266) [0.382] | -0.438+ (0.283) [0.122] | -0.093 (0.246) [0.706] |
| Survey year 2002 | -0.086 (0.096) [0.370] | 0.204*** (0.074) [0.006] | 0.149* (0.083) [0.071] | 0.307 (0.250) [0.221] | -0.320+ (0.214) [0.134] | -0.362* (0.213) [0.089] | -0.096 (0.188) [0.612] |
| Survey year 2003 | -0.057 (0.101) [0.573] | 0.144* (0.077) [0.063] | 0.206** (0.081) [0.011] | 0.188 (0.252) [0.456] | -0.164 (0.212) [0.439] | -0.218 (0.209) [0.296] | 0.058 (0.190) [0.760] |
| Survey year 2004 | -0.005 (0.098) [0.958] | 0.091 (0.072) [0.209] | 0.165** (0.084) [0.049] | 0.278 (0.244) [0.255] | -0.089 (0.204) [0.662] | -0.432** (0.214) [0.044] | -0.073 (0.188) [0.697] |
| Survey year 2005 | 0.052 (0.097) [0.594] | 0.194*** (0.075) [0.009] | 0.163** (0.081) [0.044] | 0.061 (0.247) [0.806] | -0.148 (0.205) [0.469] | -0.200 (0.214) [0.349] | -0.029 (0.191) [0.877] |
| Survey year 2006 | -0.040 (0.100) [0.687] | 0.141* (0.077) [0.067] | 0.041 (0.083) [0.619] | 0.135 (0.252) [0.593] | -0.305+ (0.220) [0.165] | -0.423* (0.230) [0.066] | -0.071 (0.200) [0.721] |
| Survey year 2007 | 0.040 (0.095) [0.671] | 0.150** (0.072) [0.038] | 0.173** (0.078) [0.027] | 0.043 (0.243) [0.861] | -0.148 (0.206) [0.472] | -0.081 (0.207) [0.696] | -0.067 (0.192) [0.727] |
| Survey year 2008 | 0.047 (0.118) [0.691] | 0.197** (0.087) [0.023] | 0.162* (0.094) [0.083] | 0.268 (0.275) [0.329] | -0.290 (0.243) [0.234] | -0.087 (0.234) [0.710] | -0.016 (0.221) [0.944] |
| Survey year 2009 | -0.031 (0.112) [0.782] | -0.070 (0.090) [0.435] | 0.022 (0.095) [0.820] | 0.249 (0.274) [0.364] | 0.401* (0.218) [0.066] | -0.000 (0.247) [0.999] | 0.097 (0.205) [0.635] |
| Survey year 2010 | -0.105 (0.098) [0.282] | 0.061 (0.072) [0.399] | 0.121+ (0.078) [0.119] | 0.231 (0.250) [0.355] | 0.059 (0.201) [0.769] | -0.057 (0.214) [0.789] | 0.122 (0.186) [0.512] |
| Survey year 2011 | -0.016 (0.095) [0.868] | 0.029 (0.071) [0.682] | 0.041 (0.076) [0.586] | 0.400* (0.226) [0.076] | 0.239 (0.194) [0.219] | 0.346* (0.187) [0.064] | 0.285* (0.171) [0.095] |
| Survey year 2012 | -0.025 (0.095) [0.793] | 0.030 (0.071) [0.674] | -0.001 (0.076) [0.989] | 0.063 (0.233) [0.788] | 0.039 (0.198) [0.846] | -0.063 (0.201) [0.755] | 0.026 (0.177) [0.882] |
| Survey year 2013 | -0.139+ (0.087) | 0.037 (0.067) | -0.007 (0.073) | 0.341+ (0.217) | 0.032 (0.185) | -0.096 (0.188) | 0.150 (0.163) |

| | | | | | | | |
|----------------|----------|----------|----------|----------|----------|----------|----------|
| | [0.110] | [0.586] | [0.922] | [0.116] | [0.864] | [0.610] | [0.358] |
| Survey year | | | | | | | |
| 2014 | -0.145+ | -0.029 | -0.051 | 0.235 | 0.249+ | 0.097 | 0.329* |
| | (0.091) | (0.069) | (0.075) | (0.226) | (0.187) | (0.191) | (0.172) |
| | [0.110] | [0.675] | [0.499] | [0.299] | [0.182] | [0.610] | [0.056] |
| Constant | 3.951*** | 3.563*** | 3.516*** | 4.715*** | 3.831*** | 4.659*** | 4.717*** |
| | (0.306) | (0.215) | (0.352) | (0.587) | (0.661) | (0.480) | (0.479) |
| | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] | [0.000] |
| R ² | 0.053 | 0.143 | 0.101 | 0.035 | 0.060 | 0.058 | 0.034 |

Notes: Number of yearly observations is N=3,388. All regressions include the full set of control variables: four school types, five categories for the share of students with migration background in the class, a dummy variable for having a migration background, a dummy variable for being female, students' pocket money in Euros, the household income in Euros, seven categories for the schooling of the father and of the mother, 16 federal states, and 14 survey years. The explanatory variables of interest are dummies (share in percent). School grades range from 1 (very good) to 6 (failed). Satisfaction with own school performance is measured on an 11-point-Likert scale (0: very unhappy, 10: very happy). Robust standard errors are in parentheses and p-values in brackets. Coefficients are significant at + p<0.20, * p<0.10, ** p<0.05, *** p<0.01. Data source: SOEP 2001-2014 (youth), version 31, SOEP, 2015, doi:10.5684/soep.v31.

Table 2.9 Ordered probit results for specifications with binary indicators for job, sports, and music

| | Grade - Math | Grade - German | Grade - Foreign | Satis - Math | Satis - German | Satis - Foreign | Satis - Overall |
|-------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| Job (44.33%) | 0.035 (0.038) [0.354] | 0.005 (0.039) [0.892] | 0.056+ (0.038) [0.140] | -0.037 (0.037) [0.310] | -0.006 (0.036) [0.877] | -0.066* (0.036) [0.069] | -0.043 (0.036) [0.238] |
| Sports (74.97%) | -0.050 (0.043) [0.247] | -0.014 (0.045) [0.758] | 0.006 (0.046) [0.898] | 0.081* (0.042) [0.056] | 0.025 (0.043) [0.558] | 0.029 (0.044) [0.502] | 0.068+ (0.044) [0.122] |
| Music (29.72%) | -0.124*** (0.043) [0.004] | -0.197*** (0.043) [0.000] | -0.120*** (0.043) [0.005] | 0.133*** (0.042) [0.001] | 0.142*** (0.041) [0.001] | 0.124*** (0.040) [0.002] | 0.115*** (0.041) [0.005] |
| Mean (SD) of outcome | 2.92 (1.05) | 2.83 (0.85) | 2.89 (0.91) | 6.29 (2.56) | 6.53 (2.15) | 6.53 (2.29) | 6.55 (1.96) |

Notes: Number of yearly observations is N=3,388. All ordered probit regressions include the full set of control variables: four school types, five categories for the share of students with migration background in the class, a dummy variable for having a migration background, a dummy variable for being female, students' pocket money in Euros, the household income in Euros, seven categories for the schooling of the father and of the mother, 16 federal states, and 14 survey years. The explanatory variables of interest are dummies (share in percent). School grades range from 1 (very good) to 6 (failed). Satisfaction with own school performance is measured on an 11-point-Likert scale (0: very unhappy, 10: very happy). Robust standard errors are in parentheses and p-values in brackets. Coefficients are significant at + p<0.20, * p<0.10, ** p<0.05, *** p<0.01. Data source: SOEP 2001-2014 (youth), version 31, SOEP, 2015, doi:10.5684/soep.v31.

Table 2.10 OLS results for specifications with binary indicators for job, sports, and music without controlling for students' pocket money

| | Grade - Math | Grade - German | Grade - Foreign | Satis - Math | Satis - German | Satis - Foreign | Satis - Overall |
|-------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------|
| Job (44.33%) | 0.033 (0.038) [0.373] | 0.006 (0.028) [0.834] | 0.050+ (0.031) [0.111] | -0.093 (0.092) [0.309] | -0.004 (0.075) [0.961] | -0.140* (0.080) [0.081] | -0.057 (0.069) [0.414] |
| Sports (74.97%) | -0.051 (0.043) [0.233] | -0.013 (0.033) [0.704] | 0.000 (0.038) [0.991] | 0.211** (0.106) [0.048] | 0.066 (0.089) [0.457] | 0.112 (0.096) [0.247] | 0.161* (0.084) [0.055] |
| Music (29.72%) | -0.121*** (0.042) [0.004] | -0.140*** (0.032) [0.000] | -0.093*** (0.035) [0.008] | 0.303*** (0.102) [0.003] | 0.263*** (0.083) [0.002] | 0.251*** (0.087) [0.004] | 0.201** (0.078) [0.010] |
| R ² | 0.052 | 0.142 | 0.100 | 0.034 | 0.060 | 0.056 | 0.034 |
| Mean (SD) of outcome | 2.92 (1.05) | 2.83 (0.85) | 2.89 (0.91) | 6.29 (2.56) | 6.53 (2.15) | 6.53 (2.29) | 6.55 (1.96) |

Notes: Number of yearly observations is N=3,388. All regressions include the full set of control variables without students' pocket money in Euros: four school types, five categories for the share of students with migration background in the class, a dummy variable for having a migration background, a dummy variable for being female, the household income in Euros, seven categories for the schooling of the father and of the mother, 16 federal states, and 14 survey years. The explanatory variables of interest are dummies (share in percent). School grades range from 1 (very good) to 6 (failed). Satisfaction with own school performance is measured on an 11-point-Likert scale (0: very unhappy, 10: very happy). Robust standard errors are in parentheses and p-values in brackets. Coefficients are significant at + p<0.20, * p<0.10, ** p<0.05, *** p<0.01. Data source: SOEP 2001-2014 (youth), version 31, SOEP, 2015, doi:10.5684/soep.v31.

3 The transition from School to Post-Secondary Education – What factors affect educational decisions?¹⁵

3.1 Introduction

In the past, the highly stratified German school system has often prevented those from the lower social classes obtaining the higher education entry qualification (*Abitur*, gained in school years 12–13).¹⁶ However, structural school reforms have decreased social inequality by reducing existing barriers and easing access to upper secondary school for all students. As a result, access to higher education should be possible irrespective of social status. Nevertheless, students from lower social classes are still less likely to pursue university studies (see Middendorff, 2013).¹⁷

The educational decision to study at university is closely related to family background characteristics, such as income and parents' level of education, but depends also on individual risk preferences. Income prospects, as well as employment uncertainty, can lead to different educational decisions, depending on an individual's tolerance or aversion to risk and which social background they are from. To date, an extensive body of literature in sociology (e.g. Becker and Hecken, 2007; Boudon, 1974; Breen et al. 2014; Breen and Goldthorpe, 1997; Esser, 1999; Jaeger and Holm, 2012) as well as in economics (e.g. Fossen and Glocker, 2014; Hartlaub and Schneider, 2012; Hartog, Ding and Liao, 2014; Hillmert and Jacob, 2003; Huebener, 2015; Levhari and Weiss, 1974) has focused on risk or risk preferences and their effect on educational decisions; however, some questions remain unanswered.

Firstly, in the economic literature, particularly that related to Germany, research focuses either on students in school and their hypothetical transition after school, neglecting the transition itself (e.g. Becker and Hecken, 2007; Hartlaub and Schneider, 2012) or fails to specify the transition possibilities (e.g. Fossen and Glocker, 2014). Secondly, it is suggested that family background and educational decisions are strongly related (e.g. Aakvik, Salvanes and Vaage, 2005; Blundell, 1997; Card, 2001; Carneiro and Heckman, 2002; Ermisch and Francesconi,

¹⁵ **Presented at:** BIBB Conference on “The Economics of Vocational Education and Training: Markets, Institutions, Systems”, Bonn (Germany), 2015.

Available as: Working Paper Series in Economics, Leuphana University Lueneburg, 2020, DP No. 398.

Acknowledgements: I thank the participants of the BIBB conference on “The Economics of Vocational Education and Training: Markets, Institutions, Systems” in Bonn (Germany) for their comments.

¹⁶ *Abitur* = Upper secondary school leaving qualification.

¹⁷ Upper social class = parents have an academic degree; lower social class = parents have no academic degree

2001; Gregg and Machin, 2000). In particular, research on the time parents invest in their children and how this contributes to their children's cognitive and non-cognitive skill development has grown in importance recently (e.g. Carneiro and Ginja, 2016; Cunha, Heckman and Schennach, 2010; Del Boca, Monfardini and Nicoletti, 2012). However, to date, recent research in this context concentrates on skill development rather than on the effect on educational decisions and evidence specific to the German context is lacking. Hence, this research contributes by analysing (1) the transition after high school, as affected by individual risk preferences and (2) the extent to which a lack of parental support in schooling affects the decision of their children to enrol at university.

For the empirical part of this research, I use German Socio-Economic Panel information on individuals' educational decisions after secondary school. In contrast to the existing literature, I do not identify the overall impact of individuals' attitudes to risk on the probability that they will study at university, nor that of the academic background of parents. However, the academic background of parents seems to be most important when individuals are deciding between university study and apprenticeships. In particular, the support parents are able to offer during school life seems to be highly important. Of political importance is the fact that, even when trying to support their children in school, parents with no academic background are often not able to guide their children towards tertiary education.

This chapter is organised as follows. Section 3.2 gives an overview of the relevant literature. Section 3.3 provides data and variable descriptions, as well as descriptive results. Section 3.4 presents the empirical framework and discusses the results. Section 3.5 concludes the empirical analysis of Chapter 3 .

3.2 Literature

In general terms, family background and individual risk preferences have been suggested to be important in shaping the educational pathway of individuals. In particular, family background characteristics, such as family income and parents' level of education seem to affect educational achievement. Firstly, higher family income is associated with higher educational attainments of children. However, the research is not conclusive as to whether long-term or short-term family-income difficulties affect children's education. While, initially, the prevailing view among economists was that short-term family-income difficulties dominate (e.g. Blundell, 1997; Card, 2001; Ermisch and Francesconi, 2001; Gregg and Machin, 2000), the focus has moved to long-

term income difficulties as well (e.g. Aakvik, Salvanes and Vaage, 2005; Carneiro and Heckman, 2002; Gregg and Machin, 2000). In the case of short-term income constraints, a lack of financial resources prevent children from entering higher education. Long-term income constraints, on the other hand, harm cognitive and non-cognitive development early in life, making access to higher education less likely. Ermisch and Francesconi, for example, examine information on British youth cohorts (1974–1981) and find lower educational attainment among adolescents from lower-income families (first income quartile measured at the age of 16–17, short-term constraints), when applying ordered probit and logit regressions. Furthermore, the higher the parents' level of education, the higher the educational attainment of their children. A mother's influence on her children, however, seems to increase with her own level of education and dominates over the father's influence at a certain level of education, due possibly to, firstly, a higher bargaining effect and, secondly, a higher productivity in human capital investment by mothers. Gregg and Machin (2010) investigate British individuals born in 1958 and their educational and economic outcomes at the ages of 16, 23 and 33. Financial constraints early in life as well as later are shown to affect educational and economic outcomes, with the experience of income difficulties in early childhood lowering school attendance and the likelihood of staying on at school. Lower school attendance, in turn, results in lower levels of education, lower hourly wages and lower employment probabilities later in life. Experiencing financial difficulties at the age of 11 or 16 (short-term constraints) also affects hourly wages and employment probabilities negatively. Aakvik, Salvanes and Vaage (2005) focus, in particular, on financial constraints at certain stages of life in Norway, suggesting that financial constraints early in childhood (0–6) and parents' level of education both lead to lower educational attainment, but that parents' level of education dominates. According to the results, parents with a higher level of education are better at motivating or stimulating cognitive and non-cognitive skill development in their children, which is decisive in terms of performance and educational attainment later in life. Carneiro and Heckman (2002) find similar results for males in the US and claim that educated parents are better able to develop scholastic aptitude in their children, by assisting and directing them.

Besides family background characteristics, such as income and parents' level of education, the time parents invest in their children seems important (e.g. Carneiro and Ginja, 2016; Cunha, Heckman and Schennach, 2010; Del Boca, Flinn and Wisswall, 2016; Del Boca, Monfardini and Nicoletti, 2017; Del Bono et al., 2016; Gayle, Golan and Soytaş, 2015). By applying multistage models of skill formation, Cunha, Heckman and Schennach (2010) suggest that

parents' investment in non-cognitive skills early in childhood improves the later performance of their children; investment in cognitive skills, in contrast, is not long-lasting. Del Boca, Monfardini and Nicoletti (2017) and Del Boca, Flinn and Wisswall (2016) find similar results for the US and UK. In Del Boca, Monfardini and Nicoletti (2017), active time investment by US mothers is found to matter more in childhood than in adolescence. For the children's own time investment, however, the converse is true. The results, moreover, show a long-lasting effect, with mothers' active time investment during childhood being decisive in later school performance. Del Boca, Flinn and Wisswall's 2016 research focuses on how transfer-based interventions (unrestricted and restricted transfers) change the investment behaviour of parents. Similar to Del Boca, Monfardini and Nicoletti (2017), children's abilities improve with increasing time investment by mothers and fathers early in childhood, independent of the type of transfer-based intervention. Restricted transfers, which are linked to child-related criteria yet be fulfilled, however, are most effective, since parents are motivated to adapt their behaviour efficiently to meet the criteria in order to receive the cash transfers.

Since variations in income and employment prospects are associated with uncertainty, another important factor is the risk attitude of individuals and its effect on educational decisions. Levhari and Weiss (1974) first started to consider uncertainty with respect to educational decisions by adopting the expected utility theory. They show theoretical evidence for decreasing investment in human capital if risk, or risk aversion, increases. Eaton and Rosen (1980) extend the Levhari and Weiss model, including taxes, in order to measure the effect of taxes on human capital investment under conditions of uncertainty. Groot and Oosterbeek (1992), furthermore, examine optimal investment in human capital under uncertain conditions, but assume risk-neutral decision-makers. They consider job-offer opportunities and income as well as unemployment prospects with respect to the optimal length of schooling.

Bilkic et al. (2011), in contrast, focus on the effect of continuous schooling costs on human capital investment. By assuming that educational decisions depend on schooling costs, earning streams, option values of staying in school and risk of change over time, they are able to develop a timing rule for leaving school. They conclude, firstly, that an individual's decision to invest in human capital is sequential in time and, secondly, that higher risks (e.g. a greater variation in income) have to be compensated with higher future income in order to continue schooling, even when assuming individuals are risk-neutral. Hence, as long as higher costs are compensated by higher future income, individuals postpone their decision to leave school.

Empirical evidence can be found in Belzil and Leonardi (2007), Brunello (2002), Fossen and Glocker (2014) or in Hartlaub and Schneider (2012). Brunello (2002) uses information on male Italian householders to investigate the effect of schooling on earnings. Addressing the problem of endogeneity, absolute risk aversion is taken as an instrument of schooling. The study showed lower levels of education in individuals with higher risk aversion; higher income levels are associated with higher levels of educational attainment. Belzil and Leonardi (2007) assume, firstly, that individual risk aversion has a time-invariant and a time-variable component and, secondly, that educational decisions follow a time-sequential process. They apply a hazard function model to measure the effect of risk aversion on schooling decisions in Italy. The results reveal lower school attainment as risk aversion increases. However, they conclude that educational background and ability appear to be more important in explaining differences in school attainment.

Fossen and Glocker (2014) and Hartlaub and Schneider (2012) focus, in particular, on university enrolment in Germany in relation to risk preferences. Fossen and Glocker (2014), on the one hand, concentrate primarily on whether stated risk preferences align with actual behaviour. According to their results, stated risk preferences are valid measures of risk behaviour. Using the German Socio-Economic Panel data (SOEP) from 2000 to 2010, and applying discrete hazard rate models, they find that risk-averse individuals are less likely to enrol in university. Hartlaub and Schneider (2012), on the other hand, combine sociological and economic theories on educational decisions. They analyse the intentions of 17–18-year-old high-school students in Germany to continue education after secondary school. They consider risk aversion as a personal attitude, as assumed in economic theory, and rely also on the Relative Risk Aversion theory (RRA) of Boudon (1974) and Breen and Goldthorpe (1997), according to which, educational decisions are class-specific, as individuals opt to maintain their parents' social class in order to avoid downward mobility. Students from upper social classes, therefore, decide in favour of tertiary education to avoid loss of status and to maintain their parents' social class position. In contrast, individuals from lower social classes can choose between different pathways without downgrading. Hartlaub and Schneider (2012) conclude that risk-averse students and students with less-educated parents are, overall, more likely to favour vocational training over university. However, their decision varies with their level of risk aversion. While individuals from the higher social classes seem to have no choice but to opt for university, in

order to remain their current social class, individuals from lower social classes, in contrast, are more likely to enrol in university if they are more risk tolerant.

Becker and Hecken (2007) and Davies et al. (2002) also investigate the theory of RRA and the consequences of social inequality. However, Becker and Hecken (2007) deny the hypotheses of status maintenance and of marginal return of schooling, using information on German students from Saxony. They conclude, similar to Esser (1999), Erikson and Jonsson (1996) and Jonsson and Erikson (2000), that educational costs are decisive in opting for or against university. Depending on social class, educational costs have different effects on financial wealth and lead to educational inequality. Davies et al. (2002), however, using information on young Danish individuals, support the RRA theory in its attempt to explain educational inequalities as motivated by status maintenance. Tieben and Wolbers (2010) find similar results for the Netherlands. Young people with more highly educated parents are more likely to continue education after secondary education. Even when the level of qualification obtained is taken into account, individuals from lower social classes tend to choose less ambitious educational pathways.

Overall, four principal determinants of educational decisions have been identified: (1) Family income; (2) parents' level of education; (3) parents' investment of time in their children throughout their children's school life and (4) an individual's risk preferences. Taking this into account, this paper contributes by its focus not only on individual risk preferences, but also on social class affiliation by accounting for heterogeneity across family background. Related to previous research on parental investment of time in the UK and the US, I consider parents' support during school life, as affected by their own academic background. Moreover, and in contrast to the existing research on investment of time, I concentrate on educational attainment rather than on performance at school to contribute to the existing research.

3.3 Data

The empirical analysis relies on data from the German Socio-Economic Panel (SOEP). This representative longitudinal study has collected micro-data on individuals, households and families annually since 1984, and includes a constant set of core questions on employment, family, housing and income. More importantly, with respect to the research question, it provides information on the course of education, on the risk tolerance or aversion of individuals and on

parents' involvement in their children's school life. See Wagner et al. (2007) for more information.

3.3.1 Sample and variables

The sample is restricted to the 'starters'. In $t-1$ these individuals are reported neither as apprentices nor as students, but they change their employment status to one of these two states in t . Students from universities of applied science are excluded, since these provide courses which are less academic and more vocational. This enables a clear distinction between academic and non-academic pathways for individuals.

Since I am interested in analysing why some individuals opt for an apprenticeship and others start to study after high school, further limitations to the sample are necessary. The sample includes all individuals, subject to the following criteria: (1) they are aged 18 to 25; (2) they have no vocational degree; (3) they have a high school certificate¹⁸; (4) they have started an apprenticeship or university course. The adapted dependent variable takes on the value 0 (apprenticeship starter) or 1 (university starter).

The phrase

How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid risks? Please tick a box on the scale, where the value 0 means 'not at all willing to take risks' and the value 10 means 'very willing to take risks'

is used to capture individual risk aversion or tolerance. Risk tolerance/aversion was included in 2004 for the first time, but has been considered regularly since 2008. Although it is often criticised as too subjective, Dohmen et al. (2011) validate its use in performing a field experiment and relying on SOEP information. Although questions on risk attitudes in a specific context are more accurate (e.g. the relationship between the willingness to take risks in employment and the probability of being self-employed), the question on general risk tolerance is identified as the best all-round predictor.

¹⁸ Abitur = Upper secondary school leaving qualification

The choice between starting an apprenticeship or being able to study further often depends on school grades. Therefore, school performance is considered, using information on individuals' school grades in mathematics, German and their first foreign language in their final school report.¹⁹

Social class position, furthermore, is taken into account by using parents' level of education. Parents with a higher level of education are often able to support their children, not only financially, but also by providing better support during school or by motivating their children (e.g. Carneiro and Heckman, 2002). A dummy variable defines parents as having higher education (1: academic background (upper social class)) if at least one parent has a university degree, and as having a lower educational level (0: no academic background (lower social class)) if both parents have a vocational degree, one parent has a vocational degree, or neither parents has a degree of any kind.

Parental investment of time in children is also considered. The respondents were asked whether their parents supported them 'not at all', 'not very much', 'pretty strongly' 'greatly' during their school life. Note that, due to a low number of observations, the original indicator was aggregated from four to three categories. The adapted variable takes on the value 0 'not at all/not very much support', the value 1 'pretty strong support' and the value 2 'great support'.

Finally, information on age, gender, migration background, region (federal states, east/west, urban/rural) and year of observation are used as controls.

Since SOEP started to include information on individual risk tolerance on a regular basis in 2008, the earliest possible observation of 'starters' is 2008. Based on this, the main analysis relies on a pooled cross-section sample, including 419 observed individuals in the waves 2007–2013, with no missing values in the variables used.

3.3.2 Descriptive statistics

Overall, approximately 80% of the sample decided to enrol at university instead of beginning an apprenticeship. With 50.6% of the starters being female and 49.4% being male, men and women are distributed equally overall and across the educational pathways (see Table 3.1). Of

¹⁹ Depending on the school type, the grading system in Germany can differ. Due to comparison reasons adjusted grades are used in the empirical part and range from 1 (very good) to 6 (failed).

the total, 13.1% have a migration background and the average individual is 21 years old (see Table 3.10 in the Appendix).

Table 3.1 Characteristics by educational pathway

| | Apprenticeship starter | University starter | Total |
|-----------------------------------|------------------------|--------------------|-------|
| Gender | | | |
| Men | 49.4% | 49.4% | 49.4% |
| Women | 50.6% | 50.6% | 50.6% |
| N | 87 | 332 | 419 |
| Parents level of education | | | |
| No academic background | 67.8% | 38.9% | 44.9% |
| Academic background | 32.2% | 61.1% | 55.1% |
| N | 87 | 332 | 419 |
| Risk tolerance | 5.03 | 4.85 | 4.89 |
| N | 87 | 332 | 419 |

Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Table 3.1 shows the link between educational decisions and social background. Overall, 55.1% of all individuals have parents with a higher level of education. Moreover, almost 70.0% of the individuals who started an apprenticeship have parents with a lower level of education. In contrast, this only applies to 38.9% of the individuals who entered university.²⁰ Surprisingly, on average, apprenticeship starters are more risk-tolerant (5.03) than university starters (4.85). However, the t-test reveals no significant differences between the groups (see Table 3.2). For detailed information, see the summary statistics in Table 3.10 in the Appendix.

Table 3.2 T-test for risk tolerance differences between university and apprenticeship starters

| | Mean | T-test | N |
|------------------------|------|--------|-----|
| Risk tolerance | | | 419 |
| University starter | 4.85 | 0.4413 | 332 |
| Apprenticeship starter | 5.03 | | 87 |

Notes: T-test with equal variances. Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks). Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

3.4 Empirical framework and results

3.4.1 Empirical method

I assume, in line with Levhari and Weiss (1974), that individuals compare the expected utilities of each educational opportunity by anticipating future income and employment prospects. Since

²⁰ See t-test in Table 3.13 in the Appendix

income and employment prospects are associated with uncertainty, risk attitudes are considered as well as academic background, to account for a possible heterogeneity between social classes. Based on the literature, two hypotheses with respect to transition after secondary school are examined:

- 1) Educational decisions are affected by risk preferences.
- 2) Family background is more likely to affect educational decisions than individual risk preferences.

I apply standard probit regressions to estimate the probability of enrolling at university. y is the binary dependent variable which either takes on the value 1 (university starter) or 0 (apprenticeship starter):

$$\Pr(y = 1|X) = \Phi(X\beta) \quad (1)$$

Φ is the cdf of the standard normal distribution, X a matrix of explanatory variables and β the corresponding parameter values.

The underlying latent model is as follows:

$$y_i = \begin{cases} 0, & y_i^* \leq \tau \\ 1, & y_i^* > \tau \end{cases} \quad (2)$$

where

$$y_i^* = \beta_0 + \beta_1 x_{i1} + \dots + \beta_k x_{ik} + \epsilon_i = x_i' \beta + \epsilon_i, \quad (3)$$

and represents the net benefit of entering university. ϵ_i is i.i.d and standard normal distributed:

$$\epsilon_i | x_i \sim N(0,1) \quad (4).$$

x_i' is a vector of individual characteristics and β is the corresponding vector of parameters. According to equations 2 and 3, individual i chooses university if the net benefit of entering university is greater than 0, while the same individual chooses to begin an apprenticeship if the net benefit of entering university is lower than or equal to.

3.4.2 Results²¹

Table 3.3 displays five different probit regression specifications. Model I starts with a standard probit regression including only the risk attitude variable. From then on, a basic set of control variables, suggested by the literature, is introduced into Models II–V (gender, age, migration background, region, federal states and years). In addition, parents' level of education (Model III), performance in school (Model IV) and the support of parents in school (Model V) are considered in turn. The results shown contain no robust standard errors. Since the robustness checks with robust standard errors showed no differences in the significance levels, I rely on the estimations without robust standard errors. Overall, Table 3.3 displays average marginal effects and standard errors in parentheses.²²

All five models reveal a negative relationship between the individual's risk attitude and enrolment in university. A higher tolerance of risk, thus, lowers the probability of entering university. Since the literature predicts that more risk-averse individuals decrease their investment in human capital (e.g. Levhari and Weiss, 1974; Belzil and Leonardi, 2007), this result is somewhat unexpected. However, the individual's risk attitude remains insignificant across all models, and further interpretations are, therefore, avoided for now.

²¹ Statistical software: Stata Version 13.1

²² For each observation, the marginal effect is computed for a discrete or partial change of a variable, while all other variables are held constant at their observed values. Finally, the average over all marginal effects is computed. Essentially, it is the average size of the effect across all observations (Long and Freese, 2014).

Table 3.3 Probability of enrolling at university

| | I | II | III | IV | V | Relative effect (Model V) |
|--------------------------------------|---------------------|---------------------|-----------------------|-----------------------|-----------------------|---------------------------|
| Risk tolerance | -0.0076 (0.0098) | -0.0088 (0.0101) | -0.0062 (0.0097) | -0.0020 (0.0096) | -0.0033 (0.0095) | -0.42% |
| Parents with academic background | | | 0.2028*** (0.0412) | 0.1894*** (0.0405) | 0.1886*** (0.0402) | 23.87% |
| School grade: German | | | | -0.0569** (0.0277) | -0.0554** (0.0275) | -7.01% |
| School grade: Mathematics | | | | -0.0395** (0.0181) | -0.0438** (0.0182) | -5.55% |
| School grade: Foreign language | | | | -0.0094 (0.0255) | -0.0092 (0.0254) | -1.16% |
| Support during school: Pretty strong | | | | | 0.0868* (0.0479) | 10.99% |
| Support during school: Great | | | | | 0.0610 (0.0535) | 7.72% |
| Controls | No | Yes | Yes | Yes | Yes | - |
| Pseudo R ² | 0.0014 | 0.0489 | 0.1060 | 0.1409 | 0.1489 | - |
| N | 419 | 419 | 419 | 419 | 419 | - |

Notes: Average marginal effects and standard errors in parentheses. Model II-V control for gender, age, migration background, region, federal states and year. Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks). * p<0.10, ** p<0.05, *** p<0.01. Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Performance at school and academic background of parents are, in contrast to the above, highly significant and increase the explanatory power of the models, if included. Having at least one parent with an academic degree increases the probability of studying by 18.86 percentage points at a 1%-level (Model V, full specification). This is in line with the literature, since the support and guidance gained through experience, as well as the financial wealth of more highly educated parents, ease children's enrolment at university (e.g. Carneiro and Heckman, 2002; Jonsson and Erikson, 2000).

Moreover, the poorer a student's performance in mathematics or German, the lower the probability of enrolling at university; performance in the first foreign language, however, seems to have no effect. School grades can affect educational decisions in several ways. Firstly, since many study programmes have restricted numbers and therefore impose entry requirements, poorer school performers are less likely to be accepted by a university. Secondly, poor performance at school reduces the own assessment of completing a university course successfully, in particular for individuals from lower social classes. Thirdly, lower grades might be the result of having no enjoyment in learning; hence, this type of student might prefer a mix of theory and practice-based learning and therefore favour an apprenticeship.

The support parents provide in school is also important. Supporting children ‘pretty strongly’ increases the probability of studying by 8.68 percentage points at a 10%-level, compared to children with less or no support. Surprisingly, supporting children ‘greatly’ does not significantly increase the probability of entering university. Too much support may be associated with performance pressure and could counteract the decision to study at university.

In summary, so far, the results suggest that parents have a significant impact on children's educational choices. Hence, in order to test Hypothesis 2, differences in the academic background of parents will be discussed in section 3.4.3.

3.4.3 Differences in the academic background of parents

The estimated contrast of margins in Table 3.4 shows no evidence for a motive of maintaining status, as was suggested by Hartlaub and Schneider (2012).²³ Instead, the analysis reveals no significant effect of risk preferences on the decision to enter university, either for individuals from higher social classes or for those from lower social classes.²⁴

Table 3.4 Contrasts of predictive margins across risk preferences and academic background

| | Probability to enter university |
|---|---|
| | b/se/ci95 |
| (Risk tolerant vs. risk averse) Parents without academic background | -0.0675 (0.0675) [-0.1998,0.0647] |
| (Risk tolerant vs. risk averse) Parents with academic background | -0.0021 (0.0426) [-0.0857,0.0815] |
| Joint | 1.00 |

Notes: Model contains contrast of margins and standard errors in parentheses. Controls: Gender, age, migration background, school grades, support by parents, region, federal states and year. Risk averse < median; risk tolerant ≥ median. * p<0.10, ** p<0.05, *** p<0.02. Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Other determinants, however, appear more important. Following Esser’s model in 1999, individuals from lower social classes have a lower expected probability of success, compared to those from upper social classes, which is why they differ in their educational attainment, even if their performance level in school is similar.

²³ Contrast of margins: To test whether the probability of being risk-tolerant is the same across academic backgrounds.

²⁴ For easier interpretation, a dummy variable, measuring whether individuals are risk-tolerant or risk-averse, is used. Applied robustness checks confirm that the definition of risk tolerance or risk aversion has no effect on the results. See Table 3.8.

Table 3.5 Contrasts of predictive margins across school performance (mathematics) and academic background of parents

| | Probability to enter university |
|---|--|
| | b/se/ci95 |
| (w. academic background vs. wo. academic background) School grade mathematics 1 | 0.1226** (0.0528) [0.0191,0.2262] |
| (w. academic background vs. wo. academic background) School grade mathematics 2 | 0.1754*** (0.0458) [0.0856,0.2651] |
| (w. academic background vs. wo. academic background) School grade mathematics 3 | 0.2090*** (0.0447) [0.1215,0.2965] |
| (w. academic background vs. wo. academic background) School grade mathematics 4 | 0.2342*** (0.0700) [0.0971,0.3714] |
| (w. academic background vs. wo. academic background) School grade mathematics 5 | 0.2422** (0.1051) [0.0363,0.4480] |
| Joint | 23.04*** |

Notes: Model contains contrast of margins and standard errors in parentheses. Controls: Gender, age, migration background, support by parents, risk tolerance, region, federal states and year. No individual with a grade worse than 5. *p < 0.10, **p < 0.05, *** p < 0.01. Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Table 3.5 and Table 3.6 support the stated assumptions. For instance, achieving a 2 in mathematics (German) is associated with a 17.53 (16.19) percentage-point higher probability of enrolling at university in individuals with more highly educated parents (at a 1%-level). Moreover, the lower the school grades, the greater the difference in probabilities between these groups.

Table 3.6 Contrasts of predictive margins across school performance (German) and academic background of parents

| | Probability to enter university |
|--|--|
| | b/se/ci95 |
| (w. academic background vs. wo. academic background) School grade German 1 | 0.1152* (0.0607) [-0.0038,0.2341] |
| (w. academic background vs. wo. academic background) School grade German 2 | 0.1619*** (0.0454) [0.0729,0.2509] |
| (w. academic background vs. wo. academic background) School grade German 3 | 0.2128*** (0.0484) [0.1180,0.3076] |

| | |
|--|--|
| (w. academic background vs. wo. academic background) School grade German 4 | 0.2419*** (0.0931) [0.0595,0.4243] |
| (w. academic background vs. wo. academic background) School grade German 5 | 0.2453 (0.1543) [-0.0572,0.5477] |
| Joint | 23.40*** |

Notes: Model contains contrast of margins and standard errors in parentheses. Controls for gender, age, migration background, support by parents, risk tolerance, region, federal states and year. No individual with a grade worse than 5. *p < 0.10, ** p < 0.05, *** p < 0.01. Data source: Socio-Economic Panel, data 1984 2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Additionally, the support that parents are able to offer during school life is another important aspect. The contrast of margins in Table 3.7 indicates that, given the same amount of support, parents with higher levels of educations are more successful in guiding their children towards the direction of tertiary education. The reasons are obvious. With the knowledge gained through own experience, highly educated parents are able to motivate and to give valuable advice. However, even if no or less support is provided in school, individuals from the higher social classes are in any case advantaged, being 14.63 percentage points more likely to study at university. In conclusion, Hypothesis 2 cannot be rejected.

Table 3.7 Contrasts of predictive margins across support during schooling and academic background

| | Probability to enter university b/se/ci95 |
|---|--|
| (w. academic background vs. wo. academic background) Not very much/no support | 0.1463* (0.0821) [-0.0146,0.3073] |
| (w. academic background vs. wo. academic background) pretty strong | 0.2104*** (0.0561) [0.1004,0.3204] |
| (w. academic background vs. wo. academic background) great support | 0.1912** (0.0745) [0.0452,0.3373] |
| Joint | 22.90*** |

Notes: Model contains contrast of margins and standard errors in Parentheses. Controls: Gender, age, migration background, school grades, risk aversion region, federal states and year. * p<0.10, ** p<0.05, *** p<0.01. Data source: Socio-Economic Panel, data 1984-2013,version 30, SOEP, 2015, doi:10.5684/soep.v30.

3.4.4 Measures of risk aversion

To account for the heterogeneity of risk preferences across individuals, I checked three further risk preference indicators. Firstly, I considered the sample median of stated willingness to take risks. All individuals in the sample are defined as risk-averse (0) if their stated level of willingness to take risks lies below the median, while individuals with a stated level above or equal to the median are defined as risk-tolerant (1). There are, furthermore, inconclusive

research results on the stability of risk preferences over time, which is why information on risk preferences in the period before individuals started to study or began an apprenticeship is used as well (e.g. Eckel et al., 2009; Harrison et al., 2005; Sahm, 2012). The third indicator is a dummy variable which defines individuals with a stated level of willingness to take risks of 7 and greater as risk-tolerant (1), and risk-averse (0) otherwise. The results, however, remain unaffected by the definition of risk tolerance (see Table 3.8).

Table 3.8 Probit Regression – Probability of enrolling at university with different measures of risk aversion

| | Probability to enter university | | | |
|-------------------------------|---------------------------------|---------------------|---------------------|---------------------|
| | I | II | III | IV |
| Risk tolerance | -0.0033 (0.0095) | | | |
| Dummy risk tolerant >= median | | -0.0295 (0.0384) | | |
| Dummy risk tolerant >= 7 | | | -0.0046 (0.0455) | |
| Risk tolerance in the past | | | | -0.0007 (0.0109) |
| Pseudo R ² | 0.1489 | 0.1500 | 0.1487 | 0.1794 |
| N | 419 | 419 | 419 | 334 |

Notes: Average marginal effects and standard errors in parentheses. Each model controls for gender, age, migration background, academic background of parents, grades in school, support by parents, region, federal states and years. Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks). *p < 0.10, **p < 0.05, *** p < 0.01. Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

I furthermore tested whether high-risk behaviour in general, or high-risk behaviour in a specific context (occupational risk behaviour in 2009), affects the results differently. However, no differences are found (see Table 3.9). Since risk preferences do not affect educational decisions in general and are not conditional on parents' level of education, hypothesis 1 is rejected.

Table 3.9 Probit regression - Probability of enrolling at university in 2009 - Career risk preference vs. general risk preferences

| | Probability to enter university | |
|---------------------------|---------------------------------|--------------------|
| | I | II |
| Risk tolerance in general | 0.0522 (0.0655) | |
| Risk tolerance career | | 0.0502 (0.0320) |
| Pseudo R ² | 0.211 | 0.2413 |
| N | 45 | 45 |

Notes: Average marginal effects and standard errors in parentheses. Each model controls for gender, age, migration background, school performance, support by parents, academic background of parents, region, federal states and year. Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks). * p < 0.10, ** p < 0.05, *** p < 0.01. Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

3.4.5 Limitations

To validate my results, different model specifications are applied (see Table 3.3), different definitions of risk tolerance are chosen (see Table 3.8), and I checked for heterogeneity across the academic background of parents (see Table 3.4). Although existing research supports the indication that basic considerations as to whether to study or start an apprenticeship might be affected by an individual's risk preferences and the motivation of maintaining status (see Hartlaub and Schneider, 2012), the results indicate that this transition might be affected by other determinants, such as performance at school, parental level of education and the support offered by parents during school.

To account for heterogeneity across subgroups, I estimated the effect of risk preferences, and the effect of parental involvement in schooling on the decision to study at university, separately for men and women, for individuals with parents educated to higher and lower levels, and for those with and without a migration background. No significant effect of risk preferences on the decision to enter university is revealed for any subgroup. Women, however, appear to be more sensitive to school performance and to the support provided by parents. Moreover, the probability of studying at university increases if highly educated parents (upper social classes) support their children during schooling, while support during schooling provided by parents educated to a lower level (lower social classes) has no significant effect.

Since I rely on pooled cross-sectional data, the results might be biased, in particular due to unobserved characteristics. One major concern is capturing the abilities of individuals correctly. Considering performance at school alone may lead to measurement error and biased results, which is why ability in a broader sense is captured by including cognitive skills (analogies, arithmetic operators, figures, summated index of all given answers). However, the results remain almost unaffected. School performance and parental support still influence the educational decision significantly, and risk preferences remain insignificant.²⁵ Another concern is that economic circumstances could alter the decision to study at university. Thus, a worse economic outlook (locally or throughout Germany) could force individuals to enter university in order to avoid unemployment. The inclusion of year and federal state dummies, however, should reduce potential bias. Unfortunately, there is no suitable instrument for individual risk preferences, nor is there panel data on individuals' school performance or detailed information

²⁵ Note: Considering cognitive skills reduces the sample to 232 observations (Table 3.12 in the Appendix).

on parents' involvement throughout childhood and youth. Nevertheless, considering an important set of control variables and applying robustness checks helps to reduce potential bias and supports the stated assumptions (see Table 3.11 in the Appendix).

3.5 Conclusion

Using the German Socio-Economic Panel, I analysed whether individual risk preferences or family background characteristics affect educational decisions after high school. I concentrate on the decision between studying at university or starting an apprenticeship and, furthermore, consider parental investment in their children's school life, conditional on different family backgrounds and risk preferences. Since I rely only on pooled cross-sectional data, there is a risk of omitted variable bias. Controlling for an important set of control variables and performing several robustness checks, however, reduce potential bias. Compared to the literature reviewed about time investment, the variable of parental support during school life seems to scratch at the surface, but gives new insights for Germany. A suitable instrument for individual risk preferences as well as panel data on individuals' school performance or detailed information on parents' involvement throughout childhood and youth would help to further validate the results, but is not available.

This research was intended to test two hypotheses. Hypothesis 1, that risk preferences affect the educational decision of individuals, is rejected. The results indicate that individual risk preferences have no overall effect on the decision to study at university and are not conditional on social class as suggested by economic and sociological theory. On the contrary, the decision as to whether to continue with education is affected rather by performance in school and parents' support during school life and varies according to the educational level of parents. It seems that individuals with parents educated to a lower level (lower social class position) have lower educational goals than their peers with more highly educated parents (upper social class position). Even when students have similar school performance, those with parents educated to a lower level are less likely to study. Moreover, the poorer the performance in school, the greater the gap between individuals with and without highly educated parents in terms of likelihood to study at university. Hence, the expected probability of success or the relative costs of education seem more likely to affect the decision to enrol at university than the motive of maintaining status. This, in turn, is in line with Becker and Hecken (2007), Esser (1999) and Jonsson and Erikson (2000). It is politically interesting that, while highly educated parents increase their children's probability of enrolling at university if they support their children during their school

life, less educated parents are not able to guide their children into tertiary education, even if they provide support during schooling. In conclusion, the second stated hypothesis, according to which educational decisions are affected by family background rather than by individual risk preferences, cannot be rejected.

Hence, using unexploited potential by supporting the decision-making process of students from lower social classes to achieve educational targets, such as increasing the rate of highly qualified individuals, could be a political recommendation.

Further research should focus on the support of parents during schooling and how this improves their children's performance and educational decisions later in life. Whether parents are able to guide their children into tertiary education seems to be related to their own academic background. Two important factors are worthy of investigation in this context. Firstly, is there a qualitative difference between the support provided by parents with and without an academic background and, secondly, if this difference exists, does it affect the level of performance and/or the educational decisions of their children. To support disadvantaged children systematically, further research should also concentrate on identifying in which phase of their educational life children are most greatly affected by a lack of support: childhood, adolescence or young adulthood.

3.6 References for Chapter 3

- Aakvik, A., Salvanes, K. G., and K. Vaage, 2005. Educational attainment and family background. *German Economic Review*, 6(3): 377–394.
- Becker, R., and A. E. Hecken, 2007. Studium oder Berufsausbildung? Eine empirische Überprüfung der Modelle zur Erklärung von Bildungsentscheidungen von Esser sowie von Breen und Goldthorpe/University or vocational training? An empirical test of the rational choice model of educational choices suggested by Esser as well as Breen and Goldthorpe. *Zeitschrift für Soziologie*, 36(2): 100–117.
- Belzil, C., and M. Leonardi, 2013. Risk aversion and schooling decisions. *Annals of Economics and Statistics*, (111/112): 35–70.
- Bilkic, N., Gries, T., and M. Pilichowski, 2012. Stay in school or start working? The human capital investment decision under uncertainty and irreversibility. *Labour Economics*, 19(5): 706–717. Special Section on: Price, Wage and Employment Adjustments in 2007-2008 and Some Inferences for the Current European Crisis.
- Blundell, R., Dearden, L., Goodman, A., and H. Reed, 2000. The returns to higher education in Britain: Evidence from a British cohort. *The Economic Journal*, 110(461): 82–99.
- Boudon, R., 1997. *Education, opportunity, and social Inequality*. New York: Wiley.
- Breen, R., and J. H. Goldthorpe, 1997. Explaining educational differentials: towards a formal rational action theory. *Rationality and Society*, 9(3): 275–305.
- Breen, R., van de Werfhorst, H. G., and M. M. Jæger, 2014. Deciding under doubt: A theory of risk aversion, time discounting preferences, and educational decision-making. *European Sociological Review*, 30(2): 258-270.
- Brunello, G., 2002. Absolute risk aversion and the returns to education. *Economics of Education Review*, 21(6): 635 – 640.
- Card, D., 1999. *Chapter 30 - The Causal Effect of Education on Earnings*. Vol. 3 of Handbook of Labor Economics, Elsevier, 1801 – 1863.
- Card, D., 2001. Estimating the return to schooling: Progress on some persistent econometric problems. *Econometrica*, 69(5): 1127–1160.
- Carneiro, P., and R. Ginja, 2016. Partial insurance and investments in children. *The Economic Journal*, 126(596): F66–F95.

- Carneiro, P., and J. J. Heckman, 2002). The evidence on credit constraints in post-secondary schooling. *The Economic Journal*, 112(482): 705–734.
- Cunha, F., Heckman, J. J., and S. M. Schennach, 2010. Estimating the technology of cognitive and noncognitive skill formation. *Econometrica*, 78(3): 883–931.
- Davies, R., Heinesen, E., and A. Holm, 2002. The relative risk aversion hypothesis of educational choice. *Journal of Population Economics*, 15(4): 683–713.
- Del Boca, D., Flinn, C., and M. Wiswall, 2016. Transfers to households with children and child Development. *The Economic Journal*, 126(596): F136–F183.
- Del Boca, D., Monfardini, C., and C. Nicoletti, 2017. Parental and child time investments and the cognitive development of adolescents. *Journal of Labor Economics*, 35(2): 565–608.
- Del Bono, E., Francesconi, M., Kelly, Y., and A. Sacker, 2016. Early maternal time investment and early child outcomes. *The Economic Journal*, 126(596): F96–F135.
- Dohmen, T., Huffman, D., Schupp, J., Falk, A., Sunde, U., and G. G. Wagner, 2011. Individual risk attitudes: Measurement, determinants, and behavioral consequences. *Journal of the European Economic Association*, 9(3): 522–550.
- Eaton, J., and H. S. Rosen, 1980). Taxation, human capital, and uncertainty. *American Economic Review*, 70(4): 705–715.
- Eckel, C. C., El-Gamal, M. A., and R. K. Wilson, 2009. Risk loving after the storm: a bayesiannetwork study of hurricane Katrina evacuees. *Journal of Economic Behavior and Organization*, 69(2): 110 – 124.
- Erikson, R., and J. O. Jonsson, 1996. *Explaining class inequality in education: the Swedish test case*. In R. Erikson-J.O. Jonsson (eds.): *Can Education be Equalised? The Swedish Case in Comparative Perspective*, Boulder: Westview Press.
- Ermisch, J., and M. Francesconi, 2001. Family matters: impacts of family background on educational attainments. *Economica*, 68(270): 137–156.
- Esser, H., 1999. *Soziologie. Spezielle Grundlagen. Band 1: Situationslogik und Handeln*, Frankfurt am Main: Campus.
- Fossen, F. M., and D. Glocker, 2014. Stated and revealed heterogeneous risk preferences in educational choice. IZA Discussion Paper 7950, Institute for the Study of Labor (IZA).

- Gayle, G.-L., Golan, L., and M. A. Soytaş, 2015. What accounts for the racial gap in time allocation and intergenerational transmission of human capital? FRB St. Louis Working Paper Series 2015-018, Federal Reserve Bank of St. Louis.
- Gregg, P., and S. Machin, 2000. Child development and success or failure in the youth labor market. In: Blanchflower, D. G. & Freeman, R. B. [Hrsg.]: Youth employment and joblessness in advanced countries, 247-288. University of Chicago Press, Chicago and London.
- Groot, W., and H. Oosterbeek, 1992. Optimal investment in human capital under uncertainty. *Economics of Education Review*, 11(1): 41–49.
- Harrison, G. W., Igel Lau, M., Rutström, E. E., and M. B. Sullivan, 2005. *Eliciting risk and time preferences using field experiments: Some methodological issues*. In: Volume 10 - Field experiments in economics', Glenn W. Harrison, Jeffrey Carpenter, John A. List (eds.), 125–218. Emerald Group Publishing Limited.
- Hartlaub, V., and T. Schneider, 2012. Educational choice and risk aversion: How important is structural vs. individual risk aversion?. SOEPPapers on Multidisciplinary Panel Data Research No. 433.
- Hartog, J., Ding, X., and J. Liao, 2014. Is earnings uncertainty relevant for educational choice? An empirical analysis for China. *Education Economics*, 22(5): 471–483.
- Hillmert, S., and M. Jacob, 2003. Social inequality in higher education. Is vocational training a pathway leading to or away from university? *European Sociological Review*, 19(3): 319–334.
- Huebener, M., 2015. The role of paternal risk attitudes in long-run education outcomes and intergenerational mobility. *Economics of Education Review*, 47: 64 – 79.
- Jæger, M. M., and A. Holm, 2012. Conformists or rebels? Relative risk aversion, educational decisions and social class reproduction. *Rationality and Society*, 24(2): 221–253.
- Jonsson, J. O., and R. Erikson, 2000. Understanding educational inequality: the Swedish experience. *L'Année sociologique (1940/1948)*, 50(2): 345–382.
- Levhari, D., and Y. Weiss, 1974. The effect of risk on the investment in human capital. *American Economic Review*, 64(6): 950–963.
- Long, J. S., and J. Freese. 2014. *Regression Models for Categorical Dependent Variables using Stata*. 3rd Edition, Stata Press.
- Middendorff, E., Apolinarski, B., Poskowsky, J., Kandulla, M., and N. Nicolai, 2012. Die

wirtschaftliche Lage der Studierenden in Deutschland 2012, 20. Sozialerhebung des Deutschen Studentenwerks durchgeführt durch das HIS-Institut für Hochschulforschung, HIS-Institut für Hochschulforschung.

Sahm, C. R., 2012. How much does risk tolerance change? *Quarterly Journal of Finance*, 2(4): 1250020.

Tieben, N., and M. H. J. Wolbers, 2010. Transitions to post-secondary and tertiary education in the Netherlands: a trend analysis of unconditional and conditional socio-economic background effects. *Higher Education*, 60(1): 85–100.

Wagner, G. G., Frick, J. R., and J. Schupp, 2007. The German Socio-Economic Panel Study (SOEP)-Evolution, scope and enhancements. *Schmollers Jahrbuch*, 127(1): 139–169.

3.7 Appendix for Chapter 3

Table 3.10 Summary statistics

| | MEAN | SD | MIN | MAX |
|---|-------|------|-----|------------|
| Uni vs. VET | 0.79 | | 0 | 1 |
| Risk tolerance | 4.89 | 2.03 | 0 | 9 |
| Risk tolerance median | 5.00 | 0.00 | 5 | 5 |
| Risk tolerance modus | 5.00 | 0.00 | 5 | 5 |
| Risk median past | 5.09 | 2.02 | 0 | 10 |
| Risk tolerance apprenticeship starter | 4.85 | 1.99 | 5 | 5 |
| Risk tolerance university starter | 5.03 | 2.04 | 5 | 5 |
| Parents with academic background | 0.55 | | 0 | 1 |
| Women | 0.51 | | 0 | 1 |
| Age | 21.02 | 1.18 | 18 | 25 |
| Migration background | 0.13 | | 0 | 1 |
| Urban region | 0.71 | | 0 | 1 |
| West Germany | 0.79 | | 0 | 1 |
| School performance | | | | |
| Grade: German | 2.58 | 0.84 | 1 | 5 |
| Grade: Mathematics | 2.60 | 1.13 | 1 | 5 |
| Grade: Foreign language | 2.59 | 0.88 | 1 | 5 |
| Support during school by parents | | | | |
| No/not much support | 0.27 | | 0 | 1 |
| Pretty strong support | 0.46 | | 0 | 1 |
| Great support | 0.27 | | 0 | 1 |
| N | | | | 419 |

Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Table 3.11 Probability of enrolling at university in detail

| | Probability to enter university | |
|----------------------------------|---------------------------------|-----------------------------|
| | Without robust standard errors | With robust standard errors |
| Risk tolerance | -0.0033 (0.0095) | -0.0033 (0.0091) |
| Women | -0.0003 (0.0403) | -0.0003 (0.0399) |
| Age | 0.0178 (0.0172) | 0.0178 (0.0167) |
| Migration background | 0.0284 (0.0518) | 0.0284 (0.0508) |
| Parents with academic background | 0.1886*** (0.0402) | 0.1886*** (0.0393) |
| Grade: German | -0.0554** (0.0275) | -0.0554** (0.0266) |
| Grade: Mathematics | -0.0438** (0.0182) | -0.0438** (0.0172) |
| Grade: Foreign language | -0.0092 (0.0254) | -0.0092 (0.0266) |
| Pretty strong support | 0.0868* (0.0479) | 0.0868* (0.0496) |
| Great support | 0.0610 (0.0535) | 0.0610 (0.0539) |
| Urban | 0.1024* (0.0542) | 0.1024** (0.0495) |
| Hamburg | -0.0831 (0.1613) | -0.0831 (0.1434) |
| Lower Saxony | -0.0175 (0.1136) | -0.0175 (0.1131) |
| North Rhine-Westphalia | -0.0670 (0.1143) | -0.0670 (0.1097) |
| Hesse | -0.1218 (0.1287) | -0.1218 (0.1243) |
| Rhinel.-Palatinate | -0.1287 (0.1409) | -0.1287 (0.1475) |
| Baden-Wuerttemberg | -0.0220 (0.1165) | -0.0220 (0.1115) |
| Bavaria | 0.0705 (0.1066) | 0.0705 (0.1083) |
| Berlin | -0.1752 (0.1537) | -0.1752 (0.1480) |
| Brandenburg | -0.1707 (0.1595) | -0.1707 (0.1584) |
| Mecklenburg-West Pomerania | -0.0865 (0.1598) | -0.0865 (0.1405) |
| Saxony | -0.0095 (0.1214) | -0.0095 (0.1210) |
| Saxony-Anhalt | -0.0380 (0.1429) | -0.0380 (0.1346) |

| | Probability to enter university | |
|-----------------------|---------------------------------|-----------------------------|
| | Without robust standard errors | With robust standard errors |
| 2009 | 0.0651 (0.0727) | 0.0651 (0.0717) |
| 2010 | 0.1064 (0.0663) | 0.1064 (0.0687) |
| 2011 | 0.1184* (0.0681) | 0.1184* (0.0640) |
| 2012 | 0.1026 (0.0710) | 0.1026 (0.0711) |
| 2013 | 0.0723 (0.0663) | 0.0723 (0.0642) |
| Pseudo R ² | 0.1489 | 0.1489 |
| N | 419 | 419 |

Notes: Average marginal effects and robust standard errors in parentheses.

* p<0.10, ** p<0.05, *** p<0.01. Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Table 3.12 Probability of enrolling at university – Controls for cognitive skills

| | Probability to enter university | |
|---|---------------------------------|------------------------|
| | I | II |
| Risk tolerance | 0.0013 (0.0119) | -0.0001 (.0117) |
| Parents with academic background | 0.2157*** (0.0525) | 0.2100*** (0.0526) |
| School grade: German | -0.0636* (0.0362) | -0.0559 (0.0356) |
| School grade: Mathematics | -0.0970*** (0.0251) | -0.0916*** (0.0251) |
| School grade: First foreign language | -0.0034 (0.0343) | -0.0050 (0.0340) |
| Support during school (ref. category no /not much) | | |
| Pretty much supported | 0.1929*** (0.0607) | 0.1808*** (0.0610) |
| Greatly supported | 0.1471** (0.0673) | 0.1405** (0.0673) |
| Sum index From all given Answers | 0.0042 (0.0038) | |
| Sum index from Answers in Task group No. 2 – Analogies | | 0.0330** (0.0143) |
| Sum index from Answers in Task group No. 6 - Arithmetic Operator | | -0.0001 (0.0075) |
| Sum index from Answers in Task group No. 9 - Figures | | -0.0039 (0.0080) |
| Pseudo R ² | 0.2937 | 0.3097 |
| N | 232 | 232 |

Notes: Average marginal effects and standard errors in parentheses. Controls: Gender, age, migration background, region, federal states and year. Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks. * p<0.10, ** p<0.05, *** p<0.01. Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

Table 3.13 T-test: Probability of enrolling at university by academic background and gender

| | Mean | T-test | N |
|-------------------------------------|-----------|--------|-----|
| Probability to enter university | | | 419 |
| Parents with academic background | 0.6861702 | 0.000 | 231 |
| Parents with no academic background | 0.8787879 | | 188 |
| Men | 0.7922705 | 0.9963 | 212 |
| Women | 0.7924528 | | 207 |

Notes: T-test with equal variances.

Risk tolerance (0: not at all willing to take risks; 10 very willing to take risks).

Data source: Socio-Economic Panel, data 1984-2013, version 30, SOEP, 2015, doi:10.5684/soep.v30.

4 The Intention to Quit Apprenticeships and the Role of Secondary Jobs²⁶

4.1 Introduction

Worldwide, the German dual system of vocational education and training (VET) is seen as the best-practice example for the school-to-work transition. By providing high employment security and low youth unemployment, the Dual VET system contributes to the national economy (OECD, 2013). In recent years, however, the system has been called into doubt regarding its efficiency, dealing with an expected shortage of skilled workers caused by demographic changes and a trend towards more young people choosing to study over Dual VET.

Rates of early contract cancellations have ranged between 20% and 25% since 1990 and have been increasing since 2006; this issue, coupled with more students choosing to study, have challenged the VET system (BIBB, 2017). A cancellation, however, does not necessarily have to be related to poor income and future prospects. A cancellation can be a result of a change of occupation or firm, an upgrade to university or an actual dropout (Bessey and Backes-Gellner, 2015). The latter, however, often ends with the subsequent entry into the labour market without re-entering the VET system and without a vocational degree, which in turn increases the probability of long-term unemployment and low-income prospects in the future. Avoiding early contract cancellation should be of high interest for apprentices, training companies and the German economy itself, as evidenced by federal funding programmes for vocational education. Indeed, 19% of the VET programmes in 2016 aimed to avoid VET dropouts in particular.

²⁶ **Presented at:** Research colloquium at the Institute of Economics at the Leuphana University Lueneburg, Lueneburg (Germany), 2016.

Nutzertagung „Bildung und Beruf: Erwerb und Verwertung in modernen Gesellschaften“, Bonn (Germany), 2015. „19th COPE“, Aachen (Germany), 2016.

Published in: Journal of Vocational Education and Training, 71(4): 556-578. DOI: 10.1080/13636820.2019.1566269

Available at: Working Paper Series in Economics, Leuphana University Lueneburg, 2016, DP No. 361 (earlier Version).

Acknowledgements: I thank the participants of the conferences ”Bildung und Beruf: Erwerb und Verwertung in modernen Gesellschaften“ 2016 in Bonn and “19th COPE” 2016 in Aachen for their comments. Further thanks go to the two reviewers of the Journal of Vocational Education and Training. I also like to thank all my colleagues at the Leuphana Institute of Economics for all their comments, and interesting as well as useful discussions, which helped to improve this research work.

In 2015, 24.9% of apprentices ended their training contract early (BIBB, 2017). Since Germany collects no data on individuals after the cancellation of a training contract, the prediction of real dropouts is difficult. Uhly (2013, 2015), however, suggest that half of the individuals who cancelled a contract early remain in the Dual VET system and 16% actually drop out.

Existing research has noted that income, migration background and the education level are reasons for early contract cancellations. A higher level of previous schooling, for example, is associated with a lower probability of early contract cancellation (e.g. Bednarz, 2014; Beicht and Walden, 2013; Bessey and Backes-Gellner, 2015; Rohrbach-Schmidt and Uhly, 2015). This, for example, could be due to better decision-making abilities (e.g. Cutler and Lleras-Muney, 2008). A negative relationship between early contract cancellation and being in one's chosen occupation is reported by Beicht and Walden (2013) as well as by Stalder and Schmid (2016). Related to this, Beicht and Walden (2013) conclude that individuals with less schooling might be forced to accept a certain training position because of a lack of available options. Hence, this could lead to mismatches and to an increasing propensity to drop out. There is, furthermore, evidence for the importance of migration status (e.g. Beicht and Walden 2013; Dostie, 2010; Schöngen, 2003; Stalder and Schmid, 2016). Stalder and Schmid (2016) are able to show for Switzerland, that apprentices in Switzerland with a migration background terminate their training more often. Additionally, the probability of finding a new training position is twice as high for apprentices born in Switzerland, compared with apprentices with a migration background. Reasons for this are language capabilities, a missing network or prejudices against foreigners. Finally, due to different regional labour and apprenticeship market conditions, the intention to end an apprenticeship can vary across regions. Given a good supply-demand ratio in the regional labour and/or the apprenticeship market, the probability of finding better alternatives increases, as does the intention to end an apprenticeship (Bessey and Backes-Gellner, 2015).

In particular, income seems to be a strong predictor of early contract cancellations (e.g. Beicht and Krewerth, 2010; Bessey and Backes-Gellner, 2015). Surprisingly, that apprentices must hold a secondary job due to low training allowances and possible consequences related to this are absent in the existing research work on early contract cancellation of apprentices. Hence, I do not only consider income itself as a determinant; instead, my contribution to the existing literature is to estimate the effect of a secondary job on the intention to quit. Even if income is one reason to hold a secondary job (e.g. Shisko and Rostker, 1976) and, furthermore, a decisive

determinant to cancel a training contract early (e.g. Bessey and Backes-Gellner, 2015), an additional job might lead to further problems, which could increase quit probabilities even more.

For this study, I have utilised the ‘BIBB Survey Vocational Training from the Trainees Point of View 2008’ conducted by the Federal Institute for Vocational Education and Training (BIBB). It is a representative, German, firm-level study of 5901 apprentices in six German federal states. Using this data set I am able to give new insights into reasons for early contract cancellations by asking whether multiple job holding during apprenticeship affects the intention to quit apprenticeship early. Furthermore, not only holding a secondary job is considered, but also the reason for holding it.

The chapter is organised as follows. Section 4.2 provides a brief overview of the German VET system and work conditions. In section 4.3, relevant literature is summarised and hypotheses are stated. Section 4.4 provides data and variable descriptions. Section 4.5 presents the empirical framework and discusses the results. Section 4.6 concludes Chapter 4.

4.2 The German VET system and working conditions

In Germany, young people can apply to employers after they have at least finished compulsory school. Similar to a work contract, apprentices and the training company establish a formal training relationship by signing the training contract, which regulates training conditions on a legal basis for in-company training in the Dual VET system (e.g. duration of training, vacations, content of training, training allowance, termination of contract). Usually, within 2–3.5 years, apprentices learn occupation specific and general skills at two learning venues. Approximately 70% of the VET takes place in the company itself and provides systematic training under real-life working conditions, and the remaining 30% takes place in vocational schools, providing lessons in vocational and general education subjects. The training contract ends with the successfully passed final examination (GOVET, 2018).

Training allowances in Germany have increased continuously over the last few years. However, they are not subjected to the Minimum Wage Law and are comparatively low. Furthermore, depending on the chosen occupation, training allowances can vary greatly between occupations. In 2017, training allowances in Germany ranged between 500-1100 Euro per month, making

financial distress for some apprentices more likely than for others (BIBB, 2017).²⁷ Although apprentices are allowed to request financial support from the government to cover living costs, quite a high share of apprentices hold a secondary job. In general, German law allows apprentices to hold a secondary job unless they respect the Working Time Act (Arbeitszeitgesetz (ArbZG), §3, §4, §5) and they must inform their training company. According to the Working Time Act, workers are allowed to work up to 48 hours per week, given they are at least 18 years old. Young people, aged between 15-17 years, are subjected to the Youth Health and Safety at Work Act (Jugendarbeitsschutzgesetz (JArbSchG, §8)) and are allowed to work up to 40 hours a week. Furthermore, regulations on resting and breaking time must be observed.

4.3 Literature

Similar to the theory of turnover (e.g. Allen, Bryant, and Vardaman, 2010; LePine, LePine and Jackson, 2004; Podsakoff et al. 2007; Schaubroeck et al., 1989) and like stated in Podsakoff et al. (2007) for workers in general, decision-making of apprentices might be affected by a multitude of work stressors that both increase or decrease their probability of terminating an apprenticeship before completion. According to Schaubroeck et al. (1989) and Podsakoff et al. (2007), work stressors and especially hindrance stressors (e.g. workload, time pressure, role ambiguity, role conflict or job uncertainty) that tend to affect personal growth and personal aims negatively, increase turnover intentions indirectly through their effect on job attitudes, such as job satisfaction, strain or organisational commitment. Thus, these key attitudes can start a withdrawal process including thoughts of quitting, turnover intentions, the evaluation of the current job situation and might result in turnover behaviour (e.g. Allen, Bryant, and Vardaman, 2010).

Considering the existing literature on early contract cancellation in VET, income seems to be a strong predictor (e.g. Beicht and Krewerth, 2010; Bessey and Backes-Gellner, 2015). However, the recognition that apprentices have to hold a secondary job due to low training allowances and possible consequences are absent in the existing research work on early contract cancellations.

²⁷ Among the 20 most chosen occupations.

Income is one decisive factor for holding multiple jobs (e.g. Böheim and Taylor, 2004; Heineck, 2009; Kimmel and Smith Conway, 2001; Shishko and Rostker, 1976) and for early contract cancellation of apprenticeships (e.g. Bessey and Backes-Gellner, 2015; Schöngen, 2003). Shishko and Rostker (1976), for example, associate low earnings with higher probabilities for being a multiple jobholder. Winters (2010), furthermore, finds that US male teachers with a secondary job spend an average of one hour less per week in their primary job, and concludes that teacher moonlighting might have harmful effects on education. Bessey and Backes-Gellner (2015), on the other hand, show how income affects early contract cancellation for apprentices. By analysing three different ways of revising educational choices, namely dropping out, changing and upgrading from apprenticeship, they reveal that the decision to drop out of an apprenticeship is driven by financial considerations. Opportunity costs, defined as the ratio of apprenticeship wage relative to the wage of unskilled workers, as well as financial distress, are associated with higher risks for dropping out of training. Considering time constraints faced by apprentices with a secondary job, they might be forced to spend less time on their apprenticeship (e.g. preparation for exams, homework etc.). This can result in performance pressure because they have less time available to meet the requirements set by their school, training firm and secondary job. Moreover, mental and physical problems and poor work performance can follow (e.g. Ilies, Dimotakis, and De Pater, 2010; Schaufeli and Bakker, 2004; Sliter and Boyd, 2014; Winters, 2010).

Beicht and Krewerth (2010) investigate factors that influence satisfaction with remuneration during apprenticeships. By using logit regressions, they find out that remuneration 20% below the class average and the need for a secondary job decrease satisfaction with remuneration among German apprentices. Relying, furthermore, on Clark (2001), Levy- Garboua, Montmarquette and Simonnet (2007) and Green (2010), who have indicated that a higher level of satisfaction decreases the probability of quitting a job, I have formed Hypothesis 1 as follows:

- 1) A need for a secondary job increases one's intention to quit an apprenticeship.

The quality of apprenticeship (working conditions, contents of training, quality of trainers, problems with trainers, teachers, colleagues or classmates) is a further reason for early contract cancellation (e.g. Beicht and Walden, 2013; Negrini et al., 2016; Schöngen, 2003; Stalder and Schmid, 2016). Overall, existing research suggests that lower rates of early contract cancellations in VET are associated with a higher training quality. Negrini et al. (2016), for example, analyse whether the training quality in VET is linked to premature contract

termination in Switzerland. They conclude that offering a higher quality of training lowers the risk of premature contract termination. However, other factors have the ability to offset low quality, e.g. atmosphere or the resilience of trainees. Seidel (2016), furthermore, investigates subjective job quality characteristics and finds that, on one hand, job security signals increase the perceived training quality, and lower the intention to quit on the other hand. Hence, I state Hypothesis 2 as:

- 2) The lower the quality of the apprenticeship, the higher the intention to quit.

Reported results on differences between male and female apprentices regarding early contract cancellation are ambiguous (e.g. Beicht and Walden, 2013; Bessey and Backes-Gellner, 2015; Schöngen 2003). Bessey and Backes-Gellner (2015) find no differences between female and male apprentices; however, female apprentices who cancelled a contract early are more likely to change occupations or to upgrade. Beicht and Walden (2013), on the other hand, find that female apprentices are more likely to cancel their contract without re-entering the VET system; hence, female apprentices are more likely to drop out. Rohrbach-Schmidt and Uhly (2015), apply multilevel analysis to investigate training contract cancellations in Germany. They conclude that, even when controlling for individual characteristics and regional conditions, there are still differences in the probability of early contract cancellation between occupations. Meaning, individuals do not differ in their cancelling behaviour in general, but certain individuals (e.g. women, men, individuals with and without migration background) might sort more often into occupations with higher cancellation probabilities. Although it is not related to apprentices in particular, Meitzen (1986) suggests a negative relationship between expected wages and the probability to quit the current job. According to this, male workers compare human capital accumulation possibilities between their current job and possible future jobs by considering the start wage and future top wages in all jobs. Hence, I assume that male and female apprentices do not differ in their overall intention to quit, but state the Hypothesis 3 as:

- 3) Men are more likely to be affected by financial distress during apprenticeship.

4.4 Data and descriptive statistics

4.4.1 Data

This empirical analysis is based on the ‘BIBB Survey Vocational Training from the Trainees Point of View 2008’ conducted by the Federal Institute for Vocational Education and Training

(BIBB)²⁸. With this representative²⁹, German, firm-level study, 5901 apprentices located in six federal states (205 schools, 340 classes, 15 common occupations) were interviewed during their second year of their apprenticeship.^{30,31} The survey contains the design, procedures, basic conditions and quality criteria of apprenticeships. Additionally, it includes information about the educational background, gender, age, migration background and the training allowance of apprentices. Since the apprentices were interviewed during their second year of their apprenticeship, apprentices who had already quit within the first year of apprenticeship cannot be considered. However, this research is not interested in mismatch problems, which mostly occur during the first year of apprenticeship. Therefore, observing the apprentices during their second year seems adequate. At this point, the apprentices are already familiar with the training company itself and with their chosen occupation.

For some of the apprentices, the data set contains no information on income or firm size. As a result, the following estimations are based on 4621 observations. It is important to note that even though the original data set was reduced to 4621 observations, the original composition has remained the same. For detailed information on the data set, see Krewerth et al. (2011).

4.4.2 Variables

To capture quit intentions, I use the question: ‘Have you ever seriously thought about dropping out of an apprenticeship?’ as a dummy variable. This dummy variable takes on the value 1, when an individual answered with ‘Yes’, and 0 otherwise. Clearly, the used indicator overestimates the real probability of early contract cancellation and, hence, the real probability of dropping out. Indeed, not every thought of dropping out has to lead to an actual dropout. Four outcomes are possible: an apprentice can finish, upgrade (study), change (occupation or firm) or drop out of an apprenticeship without re-entering the VET system. Due to this data limitation, I will discuss quit intentions rather than dropout probabilities from now on. Although I am not able to identify the real outcome, this does not necessarily translate to a disadvantage. Extensive psychological as well as economic literature shows that quit intentions are good

²⁸ The data set is accessible for the scientific community as scientific use file, free of costs and provided by the Federal Institute for Vocational Education and Training (BIBB) (see, <https://www.bibb.de/de/1394.php>). For more information, see Krewerth et al. (2011).

²⁹ Representivity within the 15 occupations for Germany

³⁰ Occupations: automotive mechatronics technician, banking professional, computer science expert, cook, electronics technician, hair dresser, industrial business management assistant, industrial mechanic, management assistant in retail business, mechatronics technician, medical assistant, office management assistant, painter, plant mechanic, salesperson.

³¹ Federal states: Hamburg, Hesse, North-Rhine-Westphalia, Baden-Württemberg, Brandenburg, Thuringia.

indicators and positively related to the actual quitting behaviour (e.g. Ajzen and Fishbein, 1980; Gordon and Denisi, 1995; Igbaria and Greenhaus, 1992; Shields and Ward, 2001; Steel and Ovalle, 1984). According to Ajzen and Fishbein (1980) or Igbaria and Greenhaus (1992) intentions in general and quit intentions especially seem to be good indicators for the actual behaviour of individuals. Also, the meta-analysis conducted by Steel and Ovalle (1984) reports a positive relationship between intentions and employee turnover. By analysing 34 psychological studies carried out between 1965-1983, they report a correlation coefficient of 0.50 between the intention to quit and the actual turnover. Moreover, observing apprentices' intention to quit might help to identify problems at an earlier stage. Therefore, intentions seem to be the best indicators in order to predict the actual behaviour of individuals.

The main explanatory variable of interest is 'Secondary job'. It contains information about the engagement in a secondary job and states the reason for the secondary job. The outcomes are one of the following: (0) no secondary job (reference category), (1) secondary job, need money for living, (2) secondary job, need money for extra wishes and (3) secondary job, need money for both. A secondary job ranges from babysitting to a job in one's own occupational field. Moreover, it has to follow a regular schedule.

Of great interest as well is the indicator for the quality of the training (VET-Rating), during the interview, the apprentices were asked to evaluate their training by giving a grade from 1 - 6, whereby 1 stands for very good and 6 for very bad.

Unfortunately, this analysis relies on a cross-sectional data set. Possible issues, such as selection into being a multiple jobholder, reverse causality or omitted variables, could cause biased results. However, since a suitable instrument or an experimental design is not available, I rely on a basic set of important control variables to reduce potential bias. Some apprentices might already wish to quit their apprenticeship before they became a multiple jobholder. If so, a problem of reverse causality would arise, if the secondary job were used to orientate anew to execute an existing wish to quit. Nevertheless, by considering the quality of VET, the probability of reverse causality is reduced in this case. Next, if apprentices that are more energetic in particular sort into a secondary job, a selection bias issue could arise as well. The energetic hypothesis, as stated by Jamal, Baba and Riviere (1998), assumes that energetic individuals are able to exert a higher level of effort and, moreover, a secondary job could actually increase performance in the primary job or the well-being of individuals. Hence, my

results would be upward biased. However, assuming that energetic individuals perform better in general, by including their school performance (grade in mathematics and German) and school achievements (school degree) of apprentices, potential bias is reduced. Therefore, six school degree categories are considered.³² School grades in mathematics and in German are ranked from 1 (very good) to 6 (fail). Unfortunately, I have no direct information regarding parent's financial wealth and the support they offered during the apprenticeship. Both aspects might make completion more likely, but considering the apprentice's level of education, which is closely related to parent's level of education and wealth status, helps to address this issue (Black, Devereux and Salvanes, 2005).

Further considered variables are a female apprentice dummy, a migration background dummy, and three age categories (15-19, 20-24, 25-30). I also control for whether someone is in the occupation he/she originally wished for (dream occupation) or if the chosen apprenticeship is, for example, just a compensation because of a lack of opportunities. In the latter case, apprentices might be more open for contract cancellations if better opportunities appear. I further consider firm characteristics, such as the firm size measured in number of employees (1-4, 5-9, 10-49, 50-249, 250-499, 500-999, 1000 and more). Since income is one driving factor for dropping out of apprenticeships and a main factor for taking a secondary job, information on the training allowance per month (net income) are considered by creating three income categories (EUR <401, EUR 401-600 and EUR 601-1500). Dummies for each occupation or the type of occupation are considered (manufacturing, personal-related service, business-related service, IT-service).³³ Types of occupation differ, for example, by income, share of female apprentices or level of schooling, which can influence the quitting intention of apprentices differently. Finally, I include a regional dummy (West Germany). For detailed information see also the summary statistics (Table 4.6 in the Appendix).

4.4.3 Descriptive statistics³⁴

Overall, 35% of the apprentices in the data set considered quitting their apprenticeship. While only 30.7% of male apprentices expressed an intention to quit, 40.9% of female apprentices expressed the same desire (see Table 4.1).

³² School degree dummies: no degree (used as reference category), special needs school, secondary general school, intermediate school, upper secondary school, other.

³³ Classification of occupations is built on the KldB 2010.

³⁴ See, t-tests in Table 4.17 in the Appendix

Table 4.1 Intention to quit by gender

| Intention to quit | Sex | | Total |
|--------------------------|------------|--------------|--------------|
| | Men | Women | |
| No | 69.3% | 59.1% | 65.3% |
| Yes | 30.7% | 40.9% | 34.7% |
| N | 2023 | 1798 | 4621 |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Differences in the intention to quit between the types of occupations (manufacturing, personal-related services, business-related services and IT-services) can be seen in Table 4.2. Only 20.6% of the apprentices from IT-service occupations contemplated quitting, whereas this rate increased to 31.4% for manufacturing apprentices and to 33.8% for apprentices in business-related service occupations. The highest rate was seen in personal-related service occupations at 48.1%.

Table 4.2 Intention to quit by type of occupation

| Intention to quit | Type of occupation | | | | Total |
|--------------------------|---------------------------|-------------------------|---|--------------------|--------------|
| | Manufacturing | Personal-related | Business/Business related services | IT-services | |
| No | 68.6% | 51.9% | 66.2% | 79.4% | 65.3% |
| Yes | 31.4% | 48.1% | 33.8% | 20.6% | 34.7% |
| N | 1766 | 892 | 1619 | 344 | 4621 |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

The differences in the intention to quit can be explained by tougher working conditions (e.g. working time and physical burdens), but also by certain job characteristics. Compared with apprentices in the IT sector, Table 4.3 shows a higher share of females, a lower level of schooling and lower earnings for the other three occupation categories. For these determinants, recent literature indicates higher quitting probabilities and especially higher dropout probabilities among apprentices (Bessey and Backes-Gellner, 2015).

Table 4.3 Characteristics by type of occupation

| | Type of occupation | | | | Total |
|------------------------------|---------------------------|---------------------------|------------------------------------|-------------|-------|
| | Manufacturing | Personal-related services | Business/Business-related services | IT-services | |
| Sex | | | | | |
| Men | 96.0% | 30.0% | 33.0% | 94.5% | 61.1% |
| Women | 4.0% | 70.0% | 67.0% | 5.5% | 38.9% |
| N | 1766 | 892 | 1619 | 344 | 4621 |
| Income | | | | | |
| < 401 Euro | 49.1% | 57.2% | 30.5% | 15.1% | 41.6% |
| 401 - 600 Euro | 36.9% | 41.6% | 52.1% | 66.0% | 45.3% |
| 600 - 1500 Euro | 14.0% | 1.2% | 17.5% | 18.9% | 13.1% |
| N | 1766 | 892 | 1619 | 344 | 4621 |
| Highest school degree | | | | | |
| No degree | 0.8% | 0.8% | 0.4% | 0.0% | 0.6% |
| Special needs school | 0.6% | 0.4% | 0.4% | 0.0% | 0.5% |
| Secondary general school | 27.0% | 26.1% | 14.6% | 1.5% | 20.6% |
| Intermediate school | 60.0% | 60.1% | 40.0% | 24.1% | 50.3% |
| Upper secondary school | 11.2% | 12.3% | 43.9% | 73.0% | 27.5% |
| Other degree | 0.5% | 0.2% | 0.7% | 1.5% | 0.6% |
| N | 1766 | 892 | 1619 | 344 | 4621 |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Focusing on the main explanatory variable of interest, the secondary job, Table 4.4 reveals that 7.5% of all the apprentices have a secondary job to cover their living costs (e.g. rent and food), 8.1% have one to afford extra wishes and 10.2% have a secondary job to have enough money for both. In sum, more than one-quarter of the apprentices hold a secondary job to earn extra money. Considering apprentices with the intention to quit, 12.4% stated they needed money for living, whereas only 6.9% needed money for extra wishes.

Table 4.4 Intention to quit by type of secondary job

| Secondary job | Intention to quit | | Total |
|---------------------------------|--------------------------|-------|-------|
| | No | Yes | |
| No secondary job | 77.0% | 68.7% | 74.2% |
| Secondary job, money for living | 4.9% | 12.4% | 7.5% |
| Secondary job, money for wishes | 8.7% | 6.9% | 8.1% |
| Secondary job, money for both | 9.3% | 11.9% | 10.2% |
| N | 3018 | 1603 | 4621 |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

These descriptive statistics suggest that the need to earn extra money exerts some influence on the intention to quit, in particular, when apprentices need the money to cover their living costs. To confirm these descriptive results, the following section estimates the effect of a secondary job on the intention to quit using multivariate analysis.

4.5 Empirical framework and results

4.5.1 Estimation method

I use a probit regression for the empirical approach:

$$\Pr(y = 1|X) = \Phi(X\beta) \quad (1),$$

where Φ is the cumulative distribution function (cdf) of the standard normal distribution, X a matrix of explanatory variables and β the corresponding parameter values. However, instead of observing the net utility of staying in training directly, I can only observe the actual outcome of whether an apprentice has the intention quit. Therefore, the use of a probit regression approach is suitable.

Similar to Bessey and Backes-Gellner (2015), I assume that an individual chooses the educational pathway that yields the highest net present value. However, there is the possibility to revise an earlier educational choice after obtaining more information. They can conclude that a former choice seems to be unprofitable because of lower expected benefits or higher expected costs, which in turn increases their intention to quit.

The underlying latent model is:

$$y_i = \begin{cases} 0, & y_i^* \geq \tau \\ 1, & y_i^* < \tau \end{cases} \quad (2),$$

τ represents a utility threshold and the individual's utility of apprenticeship (y^*) is displayed

by:

$$y_i^* = \beta_0 + \beta_1 x_{i1} + \dots + \beta_k x_{ik} + \epsilon_i \quad (3),$$

where ϵ is i.i.d. with a standard normal distribution and independent of x_i'

$$\epsilon_i | x_i \sim N(0,1) \quad (4).$$

x_i' contains a vector of individual and firm specific characteristics, β is the corresponding parameter vector.

Finally, an apprentice's intention to quit increases when the utility of staying in the apprenticeship falls below the threshold τ , which follows from equation (2) and (3).

4.5.2 Results³⁵

To analyse whether a secondary job affects the intention to quit an apprenticeship, four probit model specifications (Models A-D) are estimated (see Table 4.5). Each specification uses ‘No secondary job’ as a reference category. Furthermore, specifications A to D rely on the same set of control variables. By including job quality in Model B and D, I am able to examine the close link between holding a secondary job and the perceived training quality. Further, specifications A and B include each occupation as a dummy, whereas specifications C and D use aggregated occupation categories. Because of a low number of observations for each occupation, the aggregated variable might be more effective in capturing differences. Table 4.5 reports average marginal effects and standard errors in parentheses. Having said that, I can turn to the results.

All four models support the Hypothesis 1 by showing that, in particular, the need for a secondary job to cover living costs is associated with a higher intention to quit. In Model A, apprentices have a 19.1 percentage points higher intention to quit (at a 0.1%-level) if the extra money is needed for living costs, and an almost 5 percentage point higher intention to quit when they need money for living and extra wishes (at a 10%-level). The relative marginal effects reveal with 54.45% (0.1906/0.35) and 13.23% (0.0463/0.35) the economic importance as well. Performed Wald tests for equality reveal significant differences (at a 0.1% level) between the reasons for needing a second job. It seems, if the secondary job is urgently needed, apprentices are more likely to quit (see, Appendix Table 4.7 and Table 4.8).

Table 4.5 Probit regression – Intention to quit apprenticeship

| | Model A | Model B | Model C | Model D |
|--|-----------------------|-----------------------|-----------------------|-----------------------|
| No secondary job (reference category) | | | | |
| Secondary Job, money for living | 0.1906*** (0.0266) | 0.1444*** (0.0250) | 0.1990*** (0.0267) | 0.1501*** (0.0251) |
| Secondary Job, money for extra wishes | -0.0031 (0.0242) | 0.0124 (0.0230) | -0.0043 (0.0242) | 0.0111 (0.0231) |
| Secondary Job, money for living and wishes | 0.0463* (0.0220) | 0.0337+ (0.0205) | 0.0505* (0.0221) | 0.0352+ (0.0207) |
| Female apprentices | 0.0549** (0.0205) | 0.0546** (0.0193) | 0.0038 (0.0180) | 0.0057 (0.0169) |
| Migration background | 0.0476* (0.0188) | 0.0441* (0.0176) | 0.0431* (0.0188) | 0.0380* (0.0176) |
| Age: 15-19 (reference category) | | | | |
| Age: 20-24 | -0.0152 (0.0155) | -0.0145 (0.0145) | -0.0135 (0.0155) | -0.0121 (0.0145) |

35 Statistical software: Stata, Version 13.1

| | Model A | Model B | Model C | Model D |
|---|------------------------|------------------------|------------------------|------------------------|
| Age: 25-30 | -0.1404*** (0.0267) | -0.1306*** (0.0254) | -0.1399*** (0.0267) | -0.1316*** (0.0253) |
| Region: East Germany (reference category) | | | | |
| Region: West Germany | 0.0193 (0.0167) | 0.0080 (0.0157) | 0.0198 (0.0164) | 0.0097 (0.0155) |
| Grade: German | -0.0140 (0.0091) | -0.0122 (0.0086) | -0.0105 (0.0091) | -0.0094 (0.0086) |
| Grade: Math | 0.0294*** (0.0071) | 0.0211** (0.0067) | 0.0273*** (0.0071) | 0.0192** (0.0067) |
| Income: < 401 Euro (reference category) | | | | |
| Income: 401 - 600 Euro | -0.0419* (0.0187) | -0.0182 (0.0174) | -0.0532** (0.0167) | -0.0343* (0.0156) |
| Income: 600 - 1500 Euro | -0.1228*** (0.0272) | -0.0814** (0.0261) | -0.1432*** (0.0242) | -0.1008*** (0.0235) |
| Favourite occupation (reference category) | | | | |
| Interesting occupation | 0.1052*** (0.0154) | 0.0661*** (0.0153) | 0.0891*** (0.0154) | 0.0519*** (0.0152) |
| Alternative occupation | 0.2062*** (0.0211) | 0.1297*** (0.0204) | 0.1909*** (0.0208) | 0.1177*** (0.0200) |
| Compensation | 0.3814*** (0.0291) | 0.2271*** (0.0294) | 0.3660*** (0.0285) | 0.2167*** (0.0285) |
| Do not know | 0.3322*** (0.0362) | 0.1817*** (0.0351) | 0.3238*** (0.0364) | 0.1769*** (0.0353) |
| VET-Rating | | 0.1599*** (0.0062) | | 0.1602*** (0.0062) |
| Manufacturing (reference category) | | | | |
| Personal-related services | | | 0.1385*** (0.0227) | 0.1255*** (0.0212) |
| Business/Business-related services | | | 0.0303 (0.0203) | 0.0507** (0.0193) |
| IT-services | | | 0.0700* (0.0310) | 0.0189 (0.0280) |
| Pseudo R ² | 0.1278 | 0.2174 | 0.1278 | 0.2174 |
| N | 4621 | 4621 | 4621 | 4621 |

Notes: Table contains average marginal effects and standard errors in parentheses. Model A-D control for firm, size and highest school degree. Model A and B contain occupation dummies. + p<0.10, * p<0.05, ** p<0.01. *** p<0.001. Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Searching for possible causes, physical and mental burdens apprentices experience by simultaneously trying to meet the expectations set by their school, training firm and secondary job could be one reason for the increasing intention to quit. Apprentices with a secondary job might have less time for preparation to meet the required performance level in school and at the firm, which could result in lower grades and in greater performance pressure, forcing them to quit the apprenticeship. Schaufeli and Bakker (2004) support this supposition. In their research on burnout, a strong and consistent positive relationship between job demands (i.e., work overload) and burnout as well as between burnout and health problems is found, whereby the relationship between job demands and health problems was mediated by burnout. Unfortunately, a suitable indicator to measure secondary job-related burdens is absent. Hence, I can only point out possible secondary job-related causes.

The included training quality (VET-Rating) in specification B, dampens the effect of the secondary job on the quit intention by almost 5 percentage points, but remains significant at a 0.1%-level (relative marginal effect: $0.1444/0.35 = 41.26\%$). Further, a 1-point reduction in quality increases the intention to quit by 16.0 percentage points, revealing the importance of this determinant. Hence, the results confirm the stated Hypothesis 2, according to which a lower training quality increases the intention to quit apprenticeship and are, furthermore, in line with the reviewed literature (e.g. Beicht and Walden, 2013; Negrini et al., 2016; Schöngen, 2003; Stalder and Schmid, 2016).

4.5.2.1 Interaction terms

While models A and B show a higher intention to quit for female apprentices, specifications C and D reveal no significant differences between male and female apprentices. Occupational segregation, similar to that suggested by Rohrbach-Schmidt and Uhly (2015), could be an explanation. Personal-related service occupations have a higher share of female apprentices and are characterised by a lower level of school performance and a lower income. According to the literature (see section *Relevant Literature*), all three factors can lead to a higher intention to quit. If women sort into occupations with lower incomes and tougher working conditions, the intention to quit is probably not affected by differences between sex, but by differences between the occupations.

To test for significant differences between male and female apprentices, I estimate the contrast of margins (see, Appendix Table 4.11 and Table 4.12). The results confirm the stated assumption revealing no overall differences between male and female apprentices, which in turn strengthen the hypothesis of Rohrbach-Schmidt and Uhly (2015). By applying multilevel analysis on training contract cancellations in Germany, they conclude that even when controlling for individual characteristics and regional conditions, there are still differences in the probability of contract cancellation between occupations.

According to the Hypothesis 3 income prospects and financial distress during apprenticeship are more likely to affect male's intention to quit apprenticeship. Hence, I test whether the intention to quit an apprenticeship varies across the different secondary job reasons within each sex group. The results confirm that, in particular, male apprentices are more likely to quit when they hold a secondary job. Figure 4.1 shows a highly significant increase by 25.43 percentage

points if male apprentices earn extra money to cover their living costs. For the same group of female apprentices, this increase is 11.83 percentage points.

Figure 4.1 Predictive margins of secondary jobs with 95% CIs



Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Moreover, if male apprentices earn extra money for living costs and extra wishes, the intention to quit increases significantly by 8.18 percentage points, whereas it is insignificant for female apprentices.

Overall, it seems that for female apprentices, other reasons might be more important. Males, on the other hand, might more often consider occupation-related aspects, such as income prospects, and are more likely to quit if better alternatives appear. For detailed results, see Table 4.9 in the Appendix.

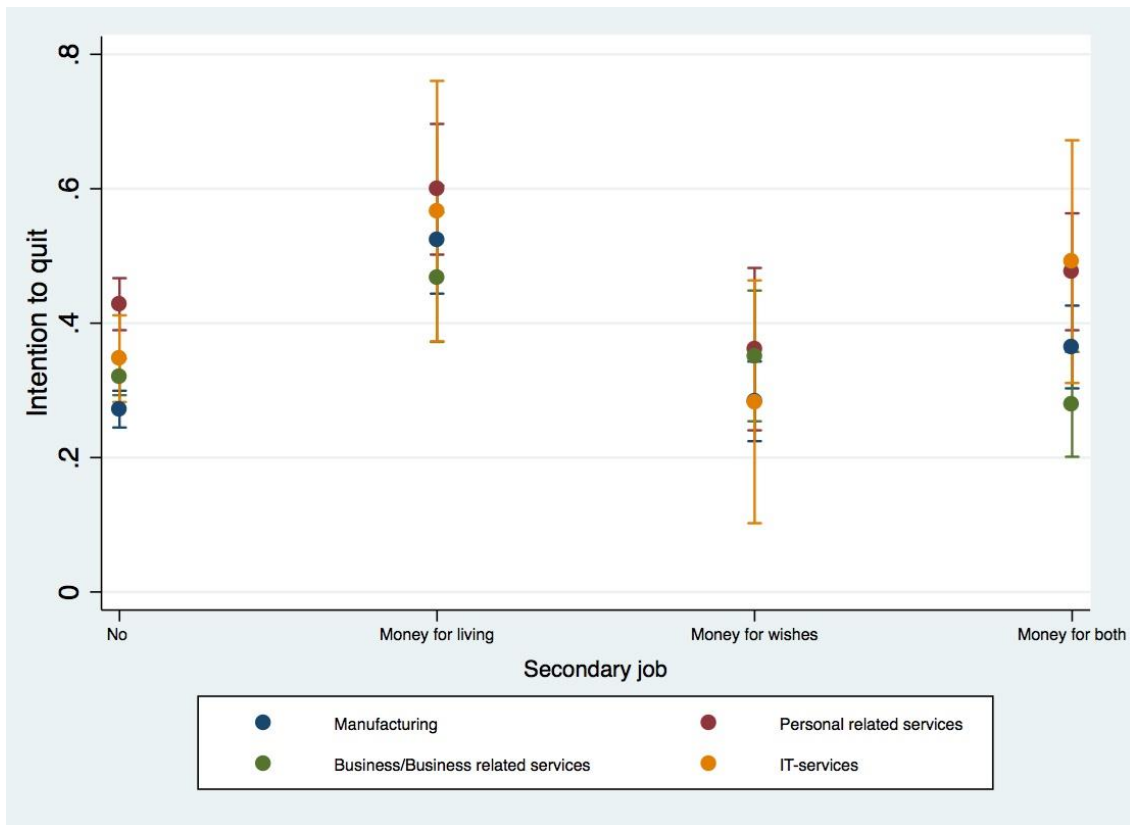
4.5.2.2 Additional results

Since, the included control variables reveal some interesting findings, I will briefly discuss them in addition. First, since holding a secondary job is driven by income related aspects, all four models consider the training allowance. Compared with the lowest income class (EUR < 401), I find, the higher the training allowance, the less likely the intention to quit the apprenticeship.

Thus, while apprentices with a training allowance between EUR 401 - 600 per month have a 4.2 percentage points lower intention to quit, the quit intention of apprentices with a training allowance between EUR 601 - 1500 per month decreases by 12.3 percentage points (see, Model A, Table 4.5).

Second, apprentices with migration background and those with poor maths grades have a higher intention to quit apprenticeship. Third, for older apprentices and those working in their dream occupation, the intention to quit is less likely. Fourth, models C and D reveal differences across the types of occupation. Compared with manufacturing apprentices, apprentices in personal-related service occupations have a higher intention to quit (13-14 percentage points). The other categories show ambiguous results. In Model C, the intention to quit is significantly higher for IT-service apprentices (7.0 percentage points), whereas in Model D, the intention to quit is higher for business-related service apprentices (5.1 percentage points). The ambiguous results could be due to data limitations. Even though the selection of occupations is representative for Germany, each category misses important occupations, which is why statements across the types of occupations can only point out possible relations. Further, assuming that working conditions differ between occupations in terms of effort, an additional job could affect the intention to quit differently within each group of apprentices. However, the estimated contrasts of margins, presented in Figure 4.2, negate this assumption. No significant differences between the types of occupation are revealed. For detailed results, see Table 4.10 in the Appendix.

Figure 4.2 Predictive margins of types of occupation with 95% CIs



Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

4.5.2.3 Robustness

To check the robustness of my estimations, I run all my specifications with and without robust standard errors, but no evidence for misspecification was found. Accounting for possible unobserved differences across school classes (ability, quality of apprenticeship etc.), the results are also robust to clustering on classroom-level (see, Table 4.13 and Table 4.14). Further, I ran four main specifications separately for male and female apprentices as well as for apprentices with and without migration background (see, Appendix Table 4.15 and Table 4.16). The results support that a secondary job that is needed to cover living cost increases the intention to quit among all groups and subgroups. However, male apprentices as well as apprentices with a migration background seem to be more prone to quit apprenticeship if they need a secondary job.

In addition, I estimate heterogeneous probit models to address the problem of heteroskedasticity caused by measurement errors (e.g. ability of apprentices) or by differences between subgroups (e.g. male vs. female apprentices, apprentices with and without migration background, social

background). It might be, for example, that apprentices with a higher level of education make better decisions because of more information on future prospects or women can have a higher tendency to quit, due to family plans, such as having children. The current literature on heteroskedasticity in binary models suggests the use of heterogeneous choice models (Keele and Park, 2006; Williams, 2009). In contrast to ordinary least square regressions, binary models with heteroskedasticity report not only incorrect standard errors, but also biased and inconsistent parameters. I run a variety of heterogeneous probit models, but do not find large differences in the magnitude of the average marginal effects or in the level of the significance level. Furthermore, I follow Keele and Park's (2006) suggestion, which was to use the heterogeneous probit model only if the cause of heteroskedasticity is clear and can be specified correctly. Both authors checked the performance of heterogeneous probit models by using Monte Carlo simulations and find out that (1) any kind of misspecification in the choice or variance equation and (2) any kind of measurement error lead to worse biased estimates than in standard probit models. Even under perfect conditions, they show that a heterogeneous probit model is less efficient than the standard probit model. Hence, I chose to rely on the results from the standard probit model.

4.6 Conclusion

In this paper, I analysed the effect of a secondary job on the intention to quit an apprenticeship. I used data from German apprentices during their second year of apprenticeship provided by the Federal Institute for Vocational Education and Training (BIBB). Three hypotheses are tested.

- 1) A need for a secondary job increases one's intention to quit an apprenticeship.
- 2) The lower the quality of the apprenticeship, the higher the intention to quit.
- 3) Men are more likely to be affected by financial distress during apprenticeship.

First, Hypothesis 1 is confirmed. If apprentices hold a secondary job to earn extra money for living costs, their intention to quit the apprenticeship increases. Even, after controlling for income, which is the main reason to hold a secondary job, a significant effect remains. This enhances the suspicion of extra burdens caused by a secondary job, which might lead to higher quitting rates. However, there is quite a high share of the multiple job holder that did not think about to quit apprenticeship early. A possible explanation could be the energetic hypothesis according to which some individuals are able to exert a higher level of effort and energy (e.g.

Jamal, Baba and Riviere, 1998). Hence, these individuals might benefit from a secondary job being as effective as non-moonlighters.

Second, it has been shown that the perceived training quality is a strong predictor of higher intentions to quit apprenticeship. The results show the lower the perceived training quality of apprentices, the higher the intention to quit. Hence, Hypothesis 2 is confirmed. Allen, Bryant, and Vardaman (2010) report some factors (e.g. work environment, job characteristics, leadership and relationships) that affect key attitudes such as job satisfaction or organizational commitment which in turn can start a withdrawal process including thoughts of quitting, turnover intentions and the evaluation of the current job situation and might result in turnover behaviour. These factors represent, furthermore, components of training quality (e.g. Beicht and Walden, 2013; Negrini et al., 2016; Schöngen, 2003; Stalder and Schmid, 2016), underlining the importance of training quality as a determinant of quit intentions. Hence, increasing the training quality could help apprentices to cope with work stressors. Further research might take a deeper look into the work stressor and job quality relationship.

Hypothesis 3, according to which men are more affected by financial distress during apprenticeship. Overall, female and male apprentices seem not to differ in their intention to quit; however, male apprentices seem to have a higher intention to quit when their training allowance is insufficient to cover their living costs, making a secondary job inevitable. For female apprentices, other determinants, such as family plans, could be more important, whereas men might more often see the secondary job as a better alternative to their current apprenticeship.

All in all, the results can be divided into push and pull factors. High income and being in one's favourite occupation seem to lower the intention to quit apprenticeship. Apprentices with a perceived low training quality, apprentices with a secondary job that is needed to cover living costs, younger apprentices, apprentices with poor grades in school and apprentices with a migration background seem to have higher intentions to quit apprenticeship.

Nevertheless, due to the data limitations, some problems must be noted. Since the survey was conducted in 2008, the question remains as to whether the discussed effect of a secondary job on the intention to quit is still relevant. Even though the average training allowance has increased in Germany since 2008, the net training allowance still remains low (Beicht, 2015).

This supports the relevance of the topic. However, a new survey evaluating the same topics and survey group should be conducted. Another point is the causality of the results shown. Unfortunately, the analysis relies on cross-sectional data. Suitable instruments or an experimental design, which could cope with reverse causality, selection bias or omitted variables, is not available. An instrument should satisfy 3 properties: (1) no correlation with the error term, (2) highly correlated with the endogenous explanatory variable and (3) no direct effect on the dependent variable (intention to quit) (see, Cameron and Trivedi, 2009). In this study apprentices hold a secondary job due to a lack of financial resources. However, income or wealth on the other hand are strongly correlated with the intention to quit. Hence, income or variables closely related to income, are unsuitable as an instrument, making iv regression scarcely possible.

But, potential bias is reduced by controlling for important characteristics. Furthermore, applied sensitivity checks and existing literature support the validity of the results. However, I cannot control for unobserved individual characteristics such as higher demands, resilience and health status, at the beginning of the apprenticeship. A panel analysis would help to control for these individual characteristics. Monthly or yearly conducted interviews of apprentices over the course of their apprenticeship could solve the problem of unobserved variables.

Further, there is a reliability problem (internal consistency) of single-item measures which could lead to bias results using training quality (VET-Rating). Since, scales can be influenced by a variety of factors (e.g. mood, order of the questions, mode of presentation), the results have to be treated with caution. However, due to the data limitations I am not able to test for reliability which is why further research should measure the training quality at different points in time to validate this single-item measure (e.g. Diener, Inglehart and Tay, 2013; Lucas and Donnellan, 2012; Wanous and Reichers, 1996).

Finally, two further shortcomings must be noted. An indicator to measure secondary job-related burdens is absent. Hence, it is unclear which aspect of holding a secondary job affects the intention to quit an apprenticeship. Higher demands (e.g. less time for preparation, more tasks to fulfil, more hours to work per day or less time to rest) that increase the intention to quit an apprenticeship directly or indirectly (through job satisfaction, strain or organisational commitment etc.) are possible. Hence, further research should conduct possible secondary job-related burdens to examine which aspect of holding a secondary job causes higher quit

intentions. The second shortcoming could be interpreted as a problem, but simultaneously could be a key for policy recommendation. Due to the data limitations, I decided to discuss quit intentions rather than early contract cancellation probabilities. An extensive amount of psychological as well as economic literature shows that intentions/quit intentions are good indicators and positively related to actual behaviour (e.g. Ajzen and Fishbein, 1980; Gordon and Denisi, 1995; Igarria and Greenhaus, 1992; Shields and Ward, 2001; Steel and Ovalle, 1984). In particular, for political recommendations, observing an apprentice's intentions to quit could help identify problems at an earlier stage. Indeed, overall, the chosen indicator seems to be suitable to analyse possible determinants of early contract cancellations in VET.

Based on the results, a basic income for apprentices could be one recommendation. This basic income should at least enable apprentices to pay for their rent and food. Moreover, to avoid lower involvement of firms in the training of apprentices, the government could offer incentives to the firms in the form of government subsidies.

4.7 References for Chapter 4

- Ajzen, I., and M. Fishbein, 1980. *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs: Prentice-Hall.
- Allen, D. G., Bryant, P. C., and J. M. Vardaman, 2010. Retaining talent: replacing misconceptions with evidence-based strategies. *The Academy of Management Perspectives*, 24(2): 48-64.
- Bednarz, A., 2014. Understanding the non-completion of apprentices. National Vocational Education and Training Research Program, NCVER. Adelaide.
- Beicht, U., 2015. Tarifliche Ausbildungsvergütungen 2014 - Deutliche Erhöhung in West und Ost. BIBB Bildungsberichterstattung. Bonn.
- Beicht, U., and A. Krewerth, 2010. Geld spielt eine Rolle!: Sind Auszubildende mit ihrer Vergütung zufrieden? BIBB Report 14/10. Bonn.
- Beicht, U., and G. Walden, 2013. Duale Berufsausbildung ohne Abschluss-Ursachen und weiterer bildungsbiografischer Verlauf. BIBB Report 21/13. Bonn.
- Bessey, D., and U. Backes-Gellner, 2015. Staying within or leaving the apprenticeship system? Revisions of educational choices in apprenticeship training. *Journal of Economics and Statistics (Jahrbuecher fuer Nationaloekonomie und Statistik)*, 235(6): 539-552.
- BIBB Bundesinstitut für Berufsbildung, 2017. Datenreport zum Berufsbildungsbericht 2017 - Informationen und Analysen zur Entwicklung der beruflichen Bildung. Bonn.
- Black, S., Devereux, P., and K. G. Salvanes, 2005. Why the apple doesn't fall far: understanding intergenerational transmission of human capital. *American Economic Review*, 95(1): 437-449.
- Böheim, R., and M. P. Taylor, 2004. And in the evening she's a singer with the band - Second jobs, plight or pleasure. IZA Discussion Papers, Institute for the Study of Labor (IZA).
- Clark, A. E., 2001. What really matters in a job? Hedonic measurement using quit data. *Labour Economics*, 8(2): 223-242.
- Colin, C. A., and P.K. Trivedi, 2009. *Microeconometrics using STATA*. Lakeway Drive, TX: Stata Press Books.
- Cutler, D. M., and A. Lleras-Muney, 2008. Education and Health: Evaluating Theories and Evidence. In J. House, R. Schoeni, G. Kaplan, & H. Pollack (Hrsg.). New, York: Russell Sage Foundation.

- Diener, E., Inglehart, R., and L. Tay, 2013. Theory and validity of life satisfaction scales. *Social Indicators Research: An International and Interdisciplinary Journal for Quality-of-Life Measurement*, 112(3): 497-527.
- Dostie, B., 2010. A competing risks analysis of the determinants of low completion rates in the Canadian apprenticeship system. CLSSRN working papers, Vancouver School of Economics.
- GOVET German Office for international Cooperation in VET at BIBB. 2018. "Dual VET: Vocational Education and Training in VET." Presentation on the German Dual System. Accessed 23 January 2019. https://www.bibb.de/dokumente/pdf/govet_praesentation_dual_vet_en.pdf.
- Gordon, M. E., and A. S. Denisi, 1995. A re-examination of the relationship between union membership and job satisfaction. *Industrial & Labor Relations Review*, 48(2): 222-236.
- Heineck, G. 2009. The determinants of secondary jobholding in Germany and the UK. *Zeitschrift für ArbeitsmarktForschung*, 42(2): 107-120.
- Igbaria, M., and J. H. Greenhaus, 1992. Determinants of MIS employees' turnover intentions: a structural equation model. *Communications of the ACM*, 35(2): 34-49.
- Ilies, R., Dimotakis, N., and I. E. De Pater, 2010. Psychological and physiological reactions to high workloads: implications for well-being. *Personnel Psychology*, 63(2): 407-436.
- Jamal, M., Baba, V. V., and R. Riviere, 1998. Job stress and well-being of moonlighters: The perspective of deprivation or aspiration revisited. *Stress and Health*, 14(3): 195-202.
- Keele, L., and D. K. Park, 2006. Difficult choices: an evaluation of heterogeneous choice models. 2004 Meeting of the American Political Science Association.
- Kimmel, J., and K. Smith Conway, 2001. Who moonlights and why? Evidence from the SIPP. *Industrial Relations: A Journal of Economy and Society*, 40(1): 89-120.
- Krewerth, A., Beicht, U., Eberhard, V., Granato, M., and J. Gei, 2011. BIBB-Studie Ausbildung aus Sicht der Auszubildenden 2008, SUF1.1. Bonn: Forschungsdatenzentrum im BIBB (Hrsg., Datenzugang): Bundesinstitut für Berufsbildung (BIBB).
- LePine, J. A., LePine, M. A., and C. L. Jackson, 2004. Challenge and hindrance stress: relationships with exhaustion, motivation to learn, and learning performance. *Journal of Applied Psychology*, 89(5): 883-891.
- Levy-Garboua, L., Montmarquette, C., and V. Simonnet, 2007. Job satisfaction and quits. *Labour Economics*, 14(2): 251-268.

- Lucas, R., and M. Donnellan, 2012. Estimating the reliability of single-item life satisfaction measures: results from four national panel studies. *Social Indicators Research*, 105(3): 323-331.
- Meitzen, M. E., 1986. Differences in male and female job-quitting behavior. *Journal of Labor Economics*, 4(2): 151-167.
- Negrini, L., Forsblom, L., Gurtner, J.-L., and S. Schumann, 2016. Is there a relationship between training quality and premature contract terminations in VET? *Vocations and Learning*, 9(3): 361-378.
- OECD (2013), *Education at a Glance 2013*, Paris.
- Podsakoff, N. P., LePine, J. A., and M. A. LePine, 2007. Differential challenge stressor-hindrance stressor relationships with job attitudes, turnover intentions, turnover, and withdrawal behavior: a meta-analysis. *Journal of Applied Psychology*, 92(2): 438.
- Rohrbach-Schmidt, D., and A. Uhly, 2015. Determinanten vorzeitiger Lösungen von Ausbildungsverträgen und berufliche Segmentierung im dualen System. Eine Mehrebenenanalyse auf Basis der Berufsbildungsstatistik. *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 67(1): 105-135.
- Schaubroeck, J., Cotton, J. L., and K. R. Jennings, 1989. Antecedents and consequences of role stress: a covariance structure analysis. *Journal of Organizational Behavior*, 10(1): 35-58.
- Schaufeli, W. B., and A. B. Bakker. 2004. Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *Journal of Organizational Behavior*, 25(3): 293-315.
- Schöngen, K., 2003. Lösung von Ausbildungsverträgen - Schon Ausbildungsabbruch? Informationen für die Beratungs- und Vermittlungsdienste der Bundesanstalt für Arbeit, 25: 5-19.
- Seidel, K., 2016. Job characteristics and their effect on the intention to quit apprenticeship. Working Paper Series in Economics, 362, University of Lüneburg.
- Shields, M. A., and M. Ward, 2001. Improving nurse retention in the National Health Service in England: the impact of job satisfaction on intentions to quit. *Journal of Health Economics*, 20(5): 677-701.
- Shishko, R., and B. Rostker, 1976. The economics of multiple job holding. *American Economic Review*, 66(3): 298-308.

- Sliter, M. T., and E. M. Boyd, 2014. Two (or three) is not equal to one: multiple jobholding as a neglected topic in organizational research. *Journal of Organizational Behavior*, 35(7): 1042-1046.
- Stalder, B. E., and E. Schmid, 2016. Lehrvertragsauflösung und Ausbildungserfolg - kein Widerspruch. Wege und Umwege zum Berufsabschluss [Cancellation of apprenticeship contracts and educational success - no contradiction. Paths and detours to vocational qualifications]. Bern: Hep-Verlag Bern.
- Steel, R. P., and N. K. Ovalle, 1984. A review and meta-analysis of research on the relationship between behavioral intentions and employee turnover. *Journal of Applied Psychology*, 69(4): 673-686.
- Uhly, A., 2013. Vorzeitige Lösung von Ausbildungsverträgen-Einseitige Perspektive dominiert die öffentliche Diskussion. *Berufsbildung in Wissenschaft und Praxis*, 42(6): 4-5.
- Uhly, A., 2015. Vorzeitige Vertragslösungen und Ausbildungsverlauf in der dualen Berufsausbildung -Forschungsstand, Datenlage und Analysemöglichkeiten auf Basis der Berufsbildungsstatistik. *Wissenschaftliche Diskussionspapiere 157*, BIBB. Bonn.
- Wanous, J. P., and A. E. Reichers, 1996. Estimating the reliability of a single-item measure. *Psychological Reports*. 78(2): 631-634.
- Williams, R., 2009. Using heterogeneous choice models to compare logit and probit coefficients across groups. *Sociological Methods & Research*, 37(4): 531-559.
- Winters, J. V., 2010. Teacher moonlighting: evidence from the US Current Population Survey. *Applied Economics Letters*, 17(11): 1111-1114.
- Arbeitszeitgesetz (ArbZG) vom 6. Juni 1994 (BGBl I S. 1170, 1171), das zuletzt durch Artikel 12a des Gesetzes vom 11. November 2016 (BGBl. I S. 2500) geändert worden ist.
- Gesetz zum Schutz der arbeitenden Jugend (Jugendarbeitsschutzgesetz:JArbSchG) vom 12. April 1976 (BGBl. I S. 965), das zuletzt durch Artikel 13 des Gesetzes vom 10. März 2017 (BGBl. I S. 4200) geändert worden ist.

4.8 Appendix for Chapter 4

Table 4.6 Summary statistics

| Variables | MEAN | SD | MIN | MAX |
|--|-------------|-----------|------------|------------|
| Intention to quit | 0.35 | | 0 | 1 |
| No secondary job | 0.75 | | 0 | 1 |
| Secondary job, need money for living | 0.07 | | 0 | 1 |
| Secondary job, need money for extra wishes | 0.08 | | 0 | 1 |
| Secondary job, need money for both | 0.10 | | 0 | 1 |
| Female apprentices | 0.39 | | 0 | 1 |
| Apprentices with migration background | 0.16 | | 0 | 1 |
| Age: 15-19 | 0.38 | | 0 | 1 |
| Age: 20-24 | 0.56 | | 0 | 1 |
| Age: 25-30 | 0.06 | | 0 | 1 |
| Region: West Germany | 0.75 | | 0 | 1 |
| No school degree | 0.01 | | 0 | 1 |
| Special needs school degree | 0.00 | | 0 | 1 |
| Secondary general school degree | 0.21 | | 0 | 1 |
| Intermediate school degree | 0.50 | | 0 | 1 |
| Upper secondary school degree | 0.27 | | 0 | 1 |
| Other degree | 0.01 | | 0 | 1 |
| Grade: German | 2.73 | 0.76 | 1 | 6 |
| Grade: Math | 2.74 | 0.96 | 1 | 6 |
| Income: <401 Euro | 0.42 | | 0 | 1 |
| Income: 401-600 Euro | 0.45 | | 0 | 1 |
| Income: 601-1500 Euro | 0.13 | | 0 | 1 |
| Evaluation: Favourite occupation | 0.29 | | 0 | 1 |
| Evaluation: Interesting occupation | 0.42 | | 0 | 1 |
| Evaluation: Alternative occupation | 0.17 | | 0 | 1 |
| Evaluation: Compensation | 0.08 | | 0 | 1 |
| Evaluation: Do not know | 0.04 | | 0 | 1 |
| VET-Rating | 2.61 | 0.93 | 1 | 6 |
| Manufacturing | 0.39 | | 0 | 1 |
| Personal-related services | 0.19 | | 0 | 1 |
| Business-related services | 0.35 | | 0 | 1 |
| IT-services | 0.07 | | 0 | 1 |
| Number of observations | | | | 4621 |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 4.7 Wald test for equality - Model C

| | Wald test for equality (Model C) | |
|-------------|---|-----------------------|
| | Money vs. extras wishes | Money vs. both |
| chi2(1) | 31.18 | 19.59 |
| Prob > chi2 | 0.0000 | 0.0000 |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 4.8 Wald test for equality - Model D

| Wald test for equality (Model D) | | |
|----------------------------------|-------------------------|----------------|
| | Money vs. extras wishes | Money vs. both |
| chi2(1) | 16.54 | 13.31 |
| Prob > chi2 | 0.0000 | 0.0003 |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 4.9 Intention to quit apprenticeship by secondary job and gender

| Contrast of margins: Secondary job#Sex (Interaction Terms) | Intention to quit |
|--|--|
| | b/se/ci95 |
| (Secondary job, money for living vs. No secondary job) Men | 0.2543*** (0.0347) [0.1863,0.3224] |
| (Secondary job, money for living vs. No secondary job) Women | 0.1183** (0.0420) [0.0359,0.2007] |
| (Secondary job, money for wishes vs. No secondary job) Men | 0.0209 (0.0275) [-0.0330,0.0748] |
| (Secondary job, money for wishes vs. No secondary job) Women | -0.0662 (0.0485) [-0.1613,0.0289] |
| (Secondary job, money for both vs. No secondary job) Men | 0.0818** (0.0284) [0.0261,0.1375] |
| (Secondary job, money for both vs. No secondary job) Women | 0.0032 (0.0357) [-0.0667,0.0731] |
| Joint | 67.98*** |

Note: Table contains contrasts of margins, (standard errors) and [95% confidence intervals]. Estimation is based on Model C. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.
Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 4.10 Intention to quit apprenticeship by type of occupation and secondary job

| Contrast of margins: Occupation#Secondary job (Interaction Term) | Intention to quit |
|---|--|
| | b/se/ci95 |
| (Personal-related services vs. Manufacturing) No secondary job | 0.1550*** (0.0254) [0.1052,0.2048] |
| (Personal-related services vs. Manufacturing) Secondary job, money for living | 0.0728 (0.0625) [-0.0498,0.1954] |
| (Personal-related services vs. Manufacturing) Secondary job, money for wishes | 0.0772 (0.0688) [-0.0577,0.2121] |
| (Personal-related services vs. Manufacturing) Secondary job, money for both | 0.1143* (0.0562) [0.0042,0.2245] |
| (Business-related services vs. Manufacturing) No secondary job | 0.0475* (0.0215) [0.0054,0.0896] |
| (Business-related services vs. Manufacturing) Secondary job, money for living | -0.0554 (0.0640) |

| | |
|---|---|
| (Business-related services vs. Manufacturing) Secondary job, money for wishes | [-0.1809,0.0701] 0.0671 (0.0584) |
| (Business-related services vs. Manufacturing) Secondary job, money for both | [-0.0474,0.1817] -0.0886 (0.0539) |
| <hr/> | |
| (IT-services vs. Manufacturing) No secondary job | 0.0744* (0.0348) |
| (IT-services vs. Manufacturing) Secondary job, money for living | [0.0063,0.1426] 0.0414 (0.1040) |
| (IT-services vs. Manufacturing) Secondary job, money for wishes | [-0.1623,0.2452] -0.0006 (0.0957) |
| (IT-services vs. Manufacturing) Secondary job, money for both | [-0.1882,0.1870] 0.1296 (0.0985) |
| <hr/> | |
| Joint | 56.93*** |

Note: Table contains contrasts of margins, (standard errors) and [95% confidence intervals]. Estimation is based on Model C. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 4.11 Intention to quit by gender

| Contrast of margins: Overall | Intention to quit |
|------------------------------|--------------------|
| | b/se/ci95 |
| Women vs. Men | 0.0038 (0.0180) |
| | [-0.0315,0.0390] |
| <hr/> | |
| Joint | 0.04 |

Note: Table contains contrasts of margins, (standard errors) and [95% confidence Estimation is based on Model C. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 4.12 Intention to quit by gender and type of occupation

| Contrast of margins: Sex#type of occupation (interaction term) | Intention to |
|--|-----------------------|
| | b/se/ci95 |
| (Women vs Men) (Manufacturing vs Personal-related services) | 0.1754 ** (0.0651) |
| | [0.0478,0.3030] |
| (Women vs Men) (Business/Business-related services vs Personal-related services) | 0.1362** (0.0414) |
| | [0.0550,0.2175] |
| (Women vs Men) (IT-services vs Personal-related services) | 0.2393* (0.1197) |
| | [0.0048,0.4739] |
| <hr/> | |
| Joint | 14.25** |

Table contains contrasts of margins, (standard errors) and [95% confidence intervals].

Estimation is based on Model C. + p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 4.13 The intention to quit (robust standard errors) I

| | Without robust standard errors | With robust standard error | Cluster robust standard errors | Without robust standard errors | With robust standard error | Cluster robust standard errors |
|---|-----------------------------------|-------------------------------|-----------------------------------|-----------------------------------|-------------------------------|-----------------------------------|
| No secondary job (reference category) | | | | | | |
| Secondary job, money for living | 0.1906*** (0.0266) | 0.1906*** (0.0268) | 0.1906*** (0.0279) | 0.1444*** (0.0250) | 0.1444*** (0.0257) | 0.1444*** (0.0259) |
| Secondary job, money for extra wishes | -0.0031 (0.0242) | -0.0031 (0.0240) | -0.0031 (0.0251) | 0.0124 (0.0230) | 0.0124 (0.0227) | 0.0124 (0.0243) |
| Secondary job, money for both | 0.0463* (0.0220) | 0.0463* (0.0220) | 0.0463* (0.0219) | 0.0337 (0.0205) | 0.0337 (0.0202) | 0.0337 (0.0201) |
| Female apprentices | 0.0549** (0.0205) | 0.0549** (0.0205) | 0.0549** (0.0207) | 0.0546** (0.0193) | 0.0546** (0.0194) | 0.0546** (0.0185) |
| Migration background | 0.0476* (0.0188) | 0.0476* (0.0191) | 0.0476* (0.0188) | 0.0441* (0.0176) | 0.0441* (0.0179) | 0.0441* (0.0174) |
| Age: 15-19 (reference category) | | | | | | |
| Age: 20-24 | -0.0152 (0.0155) | -0.0152 (0.0156) | -0.0152 (0.0141) | -0.0145 (0.0145) | -0.0145 (0.0145) | -0.0145 (0.0134) |
| Age: 25-30 | -0.1404*** (0.0267) | -0.1404*** (0.0270) | -0.1404*** (0.0265) | -0.1306*** (0.0254) | -0.1306*** (0.0252) | -0.1306*** (0.0247) |
| Region: East Germany (reference category) | | | | | | |
| Region: West Germany | 0.0193 (0.0167) | 0.0193 (0.0166) | 0.0193 (0.0181) | 0.0080 (0.0157) | 0.0080 (0.0157) | 0.0080 (0.0162) |
| School degree: No (reference category) | | | | | | |
| School degree: Special needs school | 0.0879 (0.1315) | 0.0879 (0.1384) | 0.0879 (0.1247) | 0.0267 (0.1223) | 0.0267 (0.1211) | 0.0267 (0.1118) |
| School degree: Secondary general school | 0.0412 (0.0875) | 0.0412 (0.0862) | 0.0412 (0.0776) | 0.0129 (0.0836) | 0.0129 (0.0764) | 0.0129 (0.0729) |
| School degree: Intermediate school | -0.0207 (0.0871) | -0.0207 (0.0858) | -0.0207 (0.0769) | -0.0199 (0.0831) | -0.0199 (0.0760) | -0.0199 (0.0731) |
| School degree: Upper secondary school | -0.0837 (0.0884) | -0.0837 (0.0873) | -0.0837 (0.0787) | -0.0775 (0.0844) | -0.0775 (0.0777) | -0.0775 (0.0749) |
| School degree: Other | 0.0221 (0.1254) | 0.0221 (0.1192) | 0.0221 (0.1152) | 0.0209 (0.1164) | 0.0209 (0.1085) | 0.0209 (0.1139) |
| Grade: German | -0.0140 (0.0091) | -0.0140 (0.0091) | -0.0140 (0.0092) | -0.0122 (0.0086) | -0.0122 (0.0085) | -0.0122 (0.0085) |
| Grade: Math | 0.0294*** | 0.0294*** | 0.0294*** | 0.0211** | 0.0211** | 0.0211** |

| | | | | | | |
|--|------------|------------|------------|-----------|-----------|-----------|
| | (0.0071) | (0.0071) | (0.0071) | (0.0067) | (0.0066) | (0.0065) |
| Income: < 401 Euro (reference category) | | | | | | |
| Income: 401 - 600 Euro | -0.0419* | -0.0419* | -0.0419* | -0.0182 | -0.0182 | -0.0182 |
| | (0.0187) | (0.0187) | (0.0185) | (0.0174) | (0.0173) | (0.0175) |
| Income: 600 - 1500 Euro | -0.1228*** | -0.1228*** | -0.1228*** | -0.0814** | -0.0814** | -0.0814** |
| | (0.0272) | (0.0268) | (0.0288) | (0.0261) | (0.0257) | (0.0269) |
| Favourite occupation (reference category) | | | | | | |
| Interesting occupation | 0.1052*** | 0.1052*** | 0.1052*** | 0.0661*** | 0.0661*** | 0.0661*** |
| | (0.0154) | (0.0151) | (0.0145) | (0.0153) | (0.0150) | (0.0147) |
| Alternative occupation | 0.2062*** | 0.2062*** | 0.2062*** | 0.1297*** | 0.1297*** | 0.1297*** |
| | (0.0211) | (0.0214) | (0.0209) | (0.0204) | (0.0204) | (0.0200) |
| Compensation | 0.3814*** | 0.3814*** | 0.3814*** | 0.2271*** | 0.2271*** | 0.2271*** |
| | (0.0291) | (0.0297) | (0.0303) | (0.0294) | (0.0304) | (0.0298) |
| Do not know | 0.3322*** | 0.3322*** | 0.3322*** | 0.1817*** | 0.1817*** | 0.1817*** |
| | (0.0362) | (0.0367) | (0.0402) | (0.0351) | (0.0359) | (0.0383) |
| Mechatronics technician (reference category) | | | | | | |
| Banking professional | 0.0062 | 0.0062 | 0.0062 | 0.0435 | 0.0435 | 0.0435 |
| | (0.0430) | (0.0422) | (0.0456) | (0.0419) | (0.0407) | (0.0433) |
| Office management assistant | 0.0018 | 0.0018 | 0.0018 | -0.0043 | -0.0043 | -0.0043 |
| | (0.0378) | (0.0372) | (0.0413) | (0.0361) | (0.0348) | (0.0369) |
| Electronics technician | 0.0346 | 0.0346 | 0.0346 | 0.0093 | 0.0093 | 0.0093 |
| | (0.0364) | (0.0352) | (0.0405) | (0.0345) | (0.0330) | (0.0348) |
| Computer science expert | 0.0746 | 0.0746 | 0.0746 | 0.0057 | 0.0057 | 0.0057 |
| | (0.0407) | (0.0399) | (0.0453) | (0.0381) | (0.0370) | (0.0391) |
| Salesperson | -0.0138 | -0.0138 | -0.0138 | 0.0173 | 0.0173 | 0.0173 |
| | (0.0381) | (0.0379) | (0.0392) | (0.0374) | (0.0371) | (0.0373) |
| Hair dresser | 0.1031* | 0.1031* | 0.1031* | 0.0925* | 0.0925* | 0.0925* |
| | (0.0420) | (0.0417) | (0.0502) | (0.0399) | (0.0400) | (0.0459) |
| Industrial business management assistant | -0.0211 | -0.0211 | -0.0211 | -0.0334 | -0.0334 | -0.0334 |
| | (0.0390) | (0.0384) | (0.0419) | (0.0372) | (0.0356) | (0.0383) |
| Industrial mechanic | -0.0907* | -0.0907* | -0.0907* | -0.0848* | -0.0848* | -0.0848* |
| | (0.0371) | (0.0360) | (0.0386) | (0.0357) | (0.0340) | (0.0337) |
| Management assistant in retail business | 0.0262 | 0.0262 | 0.0262 | 0.0344 | 0.0344 | 0.0344 |
| | (0.0383) | (0.0382) | (0.0411) | (0.0368) | (0.0369) | (0.0382) |
| Cook | 0.2377*** | 0.2377*** | 0.2377*** | 0.2132*** | 0.2132*** | 0.2132*** |
| | (0.0356) | (0.0354) | (0.0455) | (0.0343) | (0.0338) | (0.0389) |
| Automotive mechatronics technician | 0.0846* | 0.0846* | 0.0846* | 0.0574 | 0.0574 | 0.0574 |
| | (0.0356) | (0.0349) | (0.0367) | (0.0339) | (0.0324) | (0.0336) |

| | | | | | | |
|-------------------------------------|---------------------|---------------------|---------------------|-----------------------|-----------------------|-----------------------|
| Painter | -0.0125 (0.0358) | -0.0125 (0.0367) | -0.0125 (0.0386) | 0.0129 (0.0350) | 0.0129 (0.0355) | 0.0129 (0.0359) |
| Mechatronics technician | 0.0178 (0.0388) | 0.0178 (0.0377) | 0.0178 (0.0449) | -0.0195 (0.0363) | -0.0195 (0.0349) | -0.0195 (0.0388) |
| Medical assistant | -0.0015 (0.0394) | -0.0015 (0.0392) | -0.0015 (0.0408) | -0.0227 (0.0372) | -0.0227 (0.0368) | -0.0227 (0.0382) |
| Firm size: 1-4 (reference category) | | | | | | |
| Firm size: 5-9 | 0.0232 (0.0229) | 0.0232 (0.0231) | 0.0232 (0.0227) | 0.0207 (0.0214) | 0.0207 (0.0220) | 0.0207 (0.0223) |
| Firm size: 10-49 | -0.0016 (0.0225) | -0.0016 (0.0228) | -0.0016 (0.0221) | -0.0192 (0.0211) | -0.0192 (0.0214) | -0.0192 (0.0197) |
| Firm size: 50-249 | -0.0163 (0.0263) | -0.0163 (0.0263) | -0.0163 (0.0253) | -0.0245 (0.0247) | -0.0245 (0.0248) | -0.0245 (0.0231) |
| Firm size: 250-499 | -0.0293 (0.0336) | -0.0293 (0.0331) | -0.0293 (0.0342) | -0.0347 (0.0314) | -0.0347 (0.0305) | -0.0347 (0.0300) |
| Firm size: 500-999 | -0.0050 (0.0411) | -0.0050 (0.0406) | -0.0050 (0.0381) | 0.0157 (0.0391) | 0.0157 (0.0381) | 0.0157 (0.0342) |
| Firm size: 1000 or more | -0.0446 (0.0393) | -0.0446 (0.0383) | -0.0446 (0.0420) | -0.0093 (0.0383) | -0.0093 (0.0380) | -0.0093 (0.0410) |
| VET-Rating | | | | 0.1599*** (0.0062) | 0.1599*** (0.0063) | 0.1599*** (0.0064) |
| Pseudo R ² | 0,1278 | 0,1278 | 0,1278 | 0,2174 | 0,2174 | 0,2174 |
| N | 4621 | 4621 | 4621 | 4621 | 4621 | 4621 |

Table contains average marginal effects and standard errors in parenthesis. Significance level: * 0.05 ** 0.01 *** 0.001. Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 4.14 The intention to quit (robust standard errors) II

| | Without robust standard errors | With robust standard error | Cluster robust standard errors | Without robust standard errors | With robust standard error | Cluster robust standard errors |
|--|-----------------------------------|-------------------------------|-----------------------------------|-----------------------------------|-------------------------------|-----------------------------------|
| No secondary job (reference category) | | | | | | |
| Secondary job, money for living | 0.1990*** (0.0267) | 0.1990*** (0.0270) | 0.1990*** (0.0281) | 0.1501*** (0.0251) | 0.1501*** (0.0259) | 0.1501*** (0.0260) |
| Secondary job, money for extra wishes | -0.0043 (0.0242) | -0.0043 (0.0241) | -0.0043 (0.0250) | 0.0111 (0.0231) | 0.0111 (0.0229) | 0.0111 (0.0244) |
| Secondary job, money for both | 0.0505* (0.0221) | 0.0505* (0.0220) | 0.0505* (0.0224) | 0.0352 (0.0207) | 0.0352 (0.0203) | 0.0352 (0.0205) |
| Female apprentices | 0.0038 (0.0180) | 0.0038 (0.0181) | 0.0038 (0.0205) | 0.0057 (0.0169) | 0.0057 (0.0170) | 0.0057 (0.0179) |
| Migration background | 0.0431* (0.0188) | 0.0431* (0.0190) | 0.0431* (0.0186) | 0.0380* (0.0176) | 0.0380* (0.0180) | 0.0380* (0.0175) |
| Age: 15-19 (reference category) | | | | | | |
| Age: 20-24 | -0.0135 (0.0155) | -0.0135 (0.0156) | -0.0135 (0.0143) | -0.0121 (0.0145) | -0.0121 (0.0145) | -0.0121 (0.0137) |
| Age: 25-30 | -0.1399*** (0.0267) | -0.1399*** (0.0268) | -0.1399*** (0.0265) | -0.1316*** (0.0253) | -0.1316*** (0.0252) | -0.1316*** (0.0251) |
| Region: East Germany (reference category) | | | | | | |
| Region: West Germany | 0.0198 (0.0164) | 0.0198 (0.0164) | 0.0198 (0.0189) | 0.0097 (0.0155) | 0.0097 (0.0156) | 0.0097 (0.0172) |
| School degree: No (reference category) | | | | | | |
| School degree: Special needs school | 0.0865 (0.1323) | 0.0865 (0.1346) | 0.0865 (0.1204) | 0.0299 (0.1245) | 0.0299 (0.1196) | 0.0299 (0.1096) |
| School degree: Secondary general school | 0.0497 (0.0873) | 0.0497 (0.0866) | 0.0497 (0.0794) | 0.0177 (0.0848) | 0.0177 (0.0781) | 0.0177 (0.0759) |
| School degree: Intermediate school | -0.0128 (0.0867) | -0.0128 (0.0860) | -0.0128 (0.0791) | -0.0244 (0.0842) | -0.0244 (0.0774) | -0.0244 (0.0761) |

| | | | | | | |
|---|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| School degree: Upper secondary school | -0.0794 (0.0878) | -0.0794 (0.0872) | -0.0794 (0.0805) | -0.0863 (0.0852) | -0.0863 (0.0787) | -0.0863 (0.0775) |
| School degree: Other | 0.0188 (0.1247) | 0.0188 (0.1197) | 0.0188 (0.1175) | -0.0018 (0.1170) | -0.0018 (0.1119) | -0.0018 (0.1196) |
| Grade: German | -0.0105 (0.0091) | -0.0105 (0.0091) | -0.0105 (0.0093) | -0.0094 (0.0086) | -0.0094 (0.0086) | -0.0094 (0.0087) |
| Grade: Math | 0.0273*** (0.0071) | 0.0273*** (0.0071) | 0.0273*** (0.0071) | 0.0192** (0.0067) | 0.0192** (0.0066) | 0.0192** (0.0065) |
| <hr/> | | | | | | |
| Income: < 401 Euro (reference category) | | | | | | |
| Income: 401 - 600 Euro | -0.0532** (0.0167) | -0.0532** (0.0166) | -0.0532** (0.0177) | -0.0343* (0.0156) | -0.0343* (0.0154) | -0.0343* (0.0163) |
| Income: 600 - 1500 Euro | -0.1432*** (0.0242) | -0.1432*** (0.0236) | -0.1432*** (0.0264) | -0.1008*** (0.0235) | -0.1008*** (0.0229) | -0.1008*** (0.0240) |
| Firm size: 1-4 (reference category) | | | | | | |
| Firm size: 5-9 | 0.0273 (0.0229) | 0.0273 (0.0232) | 0.0273 (0.0231) | 0.0259 (0.0216) | 0.0259 (0.0223) | 0.0259 (0.0229) |
| Firm size: 10-49 | 0.0189 (0.0223) | 0.0189 (0.0226) | 0.0189 (0.0223) | -0.0030 (0.0210) | -0.0030 (0.0214) | -0.0030 (0.0203) |
| Firm size: 50-249 | -0.0029 (0.0252) | -0.0029 (0.0252) | -0.0029 (0.0247) | -0.0221 (0.0237) | -0.0221 (0.0239) | -0.0221 (0.0229) |
| Firm size: 250-499 | -0.0320 (0.0320) | -0.0320 (0.0315) | -0.0320 (0.0331) | -0.0443 (0.0300) | -0.0443 (0.0291) | -0.0443 (0.0289) |
| Firm size: 500-999 | -0.0221 (0.0388) | -0.0221 (0.0383) | -0.0221 (0.0382) | -0.0046 (0.0372) | -0.0046 (0.0362) | -0.0046 (0.0341) |
| Firm size: 1000 or more | -0.0541 (0.0364) | -0.0541 (0.0358) | -0.0541 (0.0395) | -0.0252 (0.0357) | -0.0252 (0.0354) | -0.0252 (0.0380) |
| Favourite occupation (reference category) | | | | | | |
| Interesting occupation | 0.0891*** (0.0154) | 0.0891*** (0.0151) | 0.0891*** (0.0151) | 0.0519*** (0.0152) | 0.0519*** (0.0148) | 0.0519*** (0.0152) |
| Alternative occupation | 0.1909*** (0.0208) | 0.1909*** (0.0211) | 0.1909*** (0.0206) | 0.1177*** (0.0200) | 0.1177*** (0.0199) | 0.1177*** (0.0198) |
| Compensation | 0.3660*** (0.0285) | 0.3660*** (0.0289) | 0.3660*** (0.0292) | 0.2167*** (0.0285) | 0.2167*** (0.0292) | 0.2167*** (0.0287) |
| Do not know | 0.3238*** (0.0364) | 0.3238*** (0.0372) | 0.3238*** (0.0402) | 0.1769*** (0.0353) | 0.1769*** (0.0364) | 0.1769*** (0.0387) |

| | | | | | | |
|------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Manufacturing (reference category) | | | | | | |
| Personal-related services | 0.1385*** (0.0227) | 0.1385*** (0.0230) | 0.1385*** (0.0314) | 0.1255*** (0.0212) | 0.1255*** (0.0217) | 0.1255*** (0.0274) |
| Business/Business-related services | 0.0303 (0.0203) | 0.0303 (0.0203) | 0.0303 (0.0227) | 0.0507** (0.0193) | 0.0507** (0.0190) | 0.0507* (0.0201) |
| IT-services | 0.0700* (0.0310) | 0.0700* (0.0307) | 0.0700* (0.0356) | 0.0189 (0.0280) | 0.0189 (0.0279) | 0.0189 (0.0296) |
| VET-Rating | | | | 0.1602*** (0.0062) | 0.1602*** (0.0063) | 0.1602*** (0.0065) |
| Pseudo R ² | 0,1278 | 0,1278 | 0,1278 | 0,2174 | 0,2174 | 0,2174 |
| N | 4621 | 4621 | 4621 | 4621 | 4621 | 4621 |

Table contains average marginal effects and standard errors in parenthesis. Significance level:* 0.05 ** 0.01 *** 0.001.

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 4.15 The intention to quit - separate estimations by gender

| | Men | Women | Men | Women |
|---|------------------------|------------------------|------------------------|-----------------------|
| No secondary job (reference category) | | | | |
| Secondary job, money for living | 0.2184*** (0.0288) | 0.1120** (0.0418) | 0.1792*** (0.0271) | 0.0611 (0.0392) |
| Secondary job, money for wishes | 0.0294 (0.0269) | -0.0716 (0.0519) | 0.0358 (0.0248) | -0.0352 (0.0496) |
| Secondary job, money for both | 0.0801** (0.0258) | 0.0030 (0.0362) | 0.0595* (0.0244) | -0.0010 (0.0339) |
| Migration background | 0.0378 (0.0230) | 0.0454 (0.0298) | 0.0330 (0.0215) | 0.0415 (0.0280) |
| Age: 15-19 (reference category) | | | | |
| Age: 20-24 | 0.0056 (0.0187) | -0.0464+ (0.0256) | -0.0009 (0.0174) | -0.0355 (0.0243) |
| Age: 25-30 | -0.1181** (0.0371) | -0.2149*** (0.0565) | -0.1314*** (0.0351) | -0.1667** (0.0529) |
| Region: East Germany (reference category) | | | | |
| Region: West Germany | 0.0011 (0.0201) | 0.0479+ (0.0286) | -0.0093 (0.0187) | 0.0375 (0.0272) |
| Grade: German | -0.0200+ (0.0110) | 0.0031 (0.0161) | -0.0180+ (0.0103) | 0.0020 (0.0152) |
| Grade: Math | 0.0406*** (0.0087) | 0.0052 (0.0120) | 0.0284*** (0.0082) | 0.0030 (0.0114) |
| Income: < 401 Euro (reference category) | | | | |
| Income: 401 - 600 Euro | -0.0300 (0.0199) | -0.0741** (0.0266) | -0.0138 (0.0185) | -0.0543* (0.0252) |
| Income: 600 - 1500 Euro | -0.1330*** (0.0308) | -0.1382** (0.0465) | -0.0947** (0.0292) | -0.0856+ (0.0443) |
| Favourite occupation (reference category) | | | | |
| Interesting occupation | 0.1065*** (0.0196) | 0.0686* (0.0292) | 0.0702*** (0.0184) | 0.0202 (0.0277) |
| Alternative occupation | 0.1967*** (0.0249) | 0.1709*** (0.0331) | 0.1265*** (0.0237) | 0.0961** (0.0318) |
| Compensation | 0.2940*** (0.0335) | 0.3818*** (0.0403) | 0.1704*** (0.0323) | 0.2262*** (0.0406) |
| Do not know | 0.3512*** (0.0433) | 0.2443*** (0.0513) | 0.2205*** (0.0418) | 0.1020* (0.0499) |
| Manufacturing (reference category) | | | | |
| Personal-related services | 0.1898*** (0.0261) | 0.0425 (0.0597) | 0.1805*** (0.0243) | 0.0095 (0.0558) |
| Business/Business-related services | -0.0027 (0.0247) | -0.0271 (0.0588) | 0.0238 (0.0229) | -0.0261 (0.0549) |
| IT-services | 0.0556+ (0.0313) | 0.1368 (0.1214) | 0.0184 (0.0292) | 0.0372 (0.1181) |
| VET-Rating | | | 0.1536*** (0.0074) | 0.1697*** (0.0109) |
| Pseudo R ² | 0.1395 | 0.0916 | 0.2371 | 0.1724 |
| N | 2823 | 1798 | 2823 | 1798 |

Notes: Table contains average marginal effects and standard errors in parentheses.

Control: Firm size and highest school degree.

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 4.16 The intention to quit - Separate estimations by migration background

| | Migration background | No migration background | Migration background | No migration background |
|---|------------------------|-------------------------|------------------------|-------------------------|
| No secondary job (reference category) | | | | |
| Secondary job, money for living | 0.1598*** (0.0266) | 0.2996*** (0.0552) | 0.1207*** (0.0249) | 0.2323*** (0.0535) |
| Secondary job, money for extra wishes | -0.0173 (0.0268) | 0.0528 (0.0622) | 0.0050 (0.0249) | 0.0317 (0.0594) |
| Secondary job, money for both | 0.0338 (0.0231) | 0.1127* (0.0542) | 0.0164 (0.0217) | 0.1131* (0.0514) |
| Female apprentices | 0.0064 (0.0196) | -0.0119 (0.0446) | 0.0049 (0.0183) | -0.0025 (0.0426) |
| Age: 15-19 (reference category) | | | | |
| Age: 20-24 | -0.0074 (0.0165) | -0.0136 (0.0416) | -0.0074 (0.0154) | -0.0136 (0.0396) |
| Age: 25-30 | -0.1280*** (0.0356) | -0.2082** (0.0687) | -0.1160*** (0.0332) | -0.2161** (0.0669) |
| Region: East Germany (reference category) | | | | |
| Region: West Germany | 0.0218 (0.0169) | -0.0726 (0.0913) | 0.0131 (0.0158) | -0.0838 (0.0843) |
| Grade: German | -0.0093 (0.0100) | -0.0162 (0.0228) | -0.0087 (0.0094) | -0.0165 (0.0219) |
| Grade: Math | 0.0249** (0.0078) | 0.0345* (0.0171) | 0.0167* (0.0073) | 0.0281+ (0.0164) |
| Income: < 401 Euro (reference category) | | | | |
| Income: 401 - 600 Euro | -0.0387* (0.0175) | -0.1158** (0.0388) | -0.0274+ (0.0163) | -0.0704+ (0.0375) |
| Income: 600 - 1500 Euro | -0.1492*** (0.0283) | -0.1320* (0.0635) | -0.1078*** (0.0268) | -0.0764 (0.0621) |
| Favourite occupation (reference category) | | | | |
| Interesting occupation | 0.0835*** (0.0177) | 0.1434*** (0.0434) | 0.0373* (0.0167) | 0.1307** (0.0414) |
| Alternative occupation | 0.1960*** (0.0214) | 0.1496** (0.0514) | 0.1160*** (0.0206) | 0.1074* (0.0493) |
| Compensation | 0.3457*** (0.0285) | 0.3393*** (0.0569) | 0.2035*** (0.0281) | 0.2202*** (0.0567) |
| Do not know | 0.3168*** (0.0347) | 0.2392** (0.0926) | 0.1672*** (0.0334) | 0.1625+ (0.0929) |
| Manufacturing (reference category) | | | | |
| Personal-related services | 0.1351*** (0.0235) | 0.1615** (0.0559) | 0.1293*** (0.0219) | 0.1201* (0.0542) |
| Business/Business-related services | 0.0095 (0.0226) | 0.1485** (0.0533) | 0.0361+ (0.0211) | 0.1375** (0.0507) |
| IT-services | 0.0598+ (0.0316) | 0.1795+ (0.1056) | 0.0100 (0.0297) | 0.1283 (0.1023) |
| VET-Rating | | | 0.1624*** (0.0067) | 0.1494*** (0.0164) |
| Pseudo R ² | 0.1169 | 0.1399 | 0.2114 | 0.2096 |
| N | 3874 | 743 | 3874 | 743 |

Notes: Table contains average marginal effects and standard errors in parentheses.

Controls: Firm size and highest school degree

+ p<0.10, * p<0.05, ** p<0.01, *** p<0.001.

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 4.17 T-test: Intention to quit by gender, migration background and region

| | Mean | T-test | N |
|-------------------------|-----------|--------|------|
| Intention to quit | | | 4621 |
| Men | 0.3071201 | 0.000 | 2823 |
| Women | 0.4093437 | | 1798 |
| No Migration background | 0.3324729 | 0.000 | 3874 |
| Migration background | 0.4216867 | | 747 |
| East Germany | 0.3324764 | 0.2285 | 1167 |
| West Germany | 0.3517661 | | 3454 |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

5 Consequences of holding Multiple Jobs³⁶

5.1 Introduction

Chapter 4 finds a higher intention to cancel a VET-contract early among apprentices with a second job.³⁷ However, the study fails, due to data limitations, to analyse how the second job increases the intention to cancel.

In addition to the research approach in Chapter 4, this study, therefore, includes the burdens related to second jobs in order to analyse the consequences for apprentices of holding multiple jobs. It uses new information on 191 apprentices, located in a northern German federal state. It should be noted that, due to the cross-sectional data structure and the low number of observations, I am not able to claim causality. However, I intend to shed light on a less-explored problem among apprentices. To date, the literature on moonlighting is rather general; a deeper investigation into the consequences of moonlighting while being an apprentice is lacking.

Since the early cancellation of training contracts without re-entering the training system is associated with low income and poor career prospects, as well as with a higher risk of long-term unemployment (e.g. Bessey and Backes-Gellner, 2015) it should be avoided. This research may help to stimulate further research in order to generate policy recommendations with respect to early contract cancellation in VET and, in this way, contributes to the literature.

This chapter is organised as follows. Section 5.2 gives an overview of the relevant literature. Section 5.3 provides data and variable descriptions as well as descriptive results. Section 5.4 presents the empirical framework and discusses the results. Section 5.5 concludes Chapter 5.

5.2 Relevant literature

Since specific literature on moonlighting in VET is lacking, this study relies on the extensive body of research on moonlighting and its consequences. In this respect, two principal motives

³⁶ **Presented at:** Research colloquium at the Institute of Economics at the Leuphana University Lueneburg, Lueneburg (Germany), 2016.

Acknowledgements: I thank all my colleagues at the Leuphana Institute of Economics for all their comments, and interesting and useful discussions. The idea of collecting new data on apprentices emerged from these discussions. I am also very grateful to the school and teachers who declared their willingness and support to make this survey possible. Special thanks go to all the participants of this survey. Without them this research work would never have been possible.

³⁷ The words multiple job holding/holder, moonlighting/moonlighter, secondary job or second job are used synonymously and stand for the fact of working in at least two jobs at the same time.

have been identified behind the decision to hold multiple jobs. Known as the hours' constraint motive, individuals hold a second job in order to maximise their utility. Although these individuals want to work more hours in order to fulfil financial needs, they are not allowed to work more hours in their primary job (e.g. Averett, 2001; Böheim and Taylor, 2004; Heineck, 2009; Kimmel and Smith Conway, 2001; Shishko and Rostker, 1976). The second motive is the heterogeneous job motive (e.g. Kimmel and Smith Conway, 2001; Renna and Oaxaca, 2006; Shisko and Rostker, 1976) in which individuals derive different elements of satisfaction from each job, with amenities or benefits other than wages playing a more important role. Moreover, the jobs are frequently complementary. Heineck (2009), for example, performs a cross-country comparison between Germany and the UK, using panel data from the British Household Panel Survey (BHPS) as well as the German Socio-Economic Panel (SOEP). He finds evidence for the constraint and the heterogeneous job motives, but reveals another important motive as well. According to this, German individuals are more likely to hold multiple jobs if they are employed on a temporary or part-time basis in the primary job. This, in turn, strengthens Böheim and Taylor's (2004) suggestion of the motivation of security. Individuals use the second job as a form of insurance, in case of employment or income uncertainty in the primary job. Panos et al. (2014), in addition, provide evidence for a skill diversity strategy, which also supports the heterogeneous job motive. By using information on UK employees (BHPS from 1991 to 2005), they indicate that some employees might use their second job to change their primary job in the following year. The second job, therefore, is chosen to obtain new skills and expertise in order to prepare for a job transition.

The literature on the consequences of holding multiple jobs (moonlighting) is inconclusive. According to Jamal et al. (1998), two opposing positions can be found in the existing literature. The first concerns the possible time constraints to which multiple job holders are exposed. In essence, time spent on the second job cannot be used for leisure or recovery. Since greater physical and psychological resources are used, and a shorter time is available for physical and psychological recovery, this could lead to negative outcomes such as work-family conflict (e.g. Greenhaus and Beutell, 1985; Jacobshagen et al., 2005), burn-out (Schaufeli and Bakker, 2004), higher job stress, lower levels of well-being and poorer job performance (e.g. Ilies et al., 2010; Maninger, et al., 2011; Parham and Gordon, 2011; Sliter and Boyd, 2014; Winters, 2010). The second hypothesis suggests positive effects, or at least no negative effects, of moonlighting (e.g. Baba and Jamal, 1992; Ballou, 1995; Jamal, 1986; Jamal et al., 1998) arguing that energetic individuals voluntarily fall into the category of holding multiple jobs and remain there, while

less energetic individuals are not capable of managing the higher demands and exit quickly. Thus, moonlighters are as effective as non-moonlighters, due to their higher levels of energy and their ability to exert higher levels of effort. Jamal et al. (1998), for example, examine the consequences of holding multiple jobs among Canadian college teachers and report higher levels of job stress, burn-out symptoms and higher intentions to turnover among the non-moonlighters. Moreover, a second job can lead to better performance if it is used to recover from the primary job, such as the case of the musician who uses the primary job to meet monthly expenses, while the second job contributes to well-being and performance levels (e.g. Jamal, 1998; Sliter and Boyd, 2014). Zickar et al. (2004) discuss the so-called ‘role conflict’ hypothesis: if there is great dissimilarity between the primary and secondary jobs, greater effort is required to fulfil both roles. Hence, the greater the dissimilarities between the jobs, the higher the risk of role conflict and the probability of being less satisfied.

The literature on early cancellations of training contracts in VET finds various influencing determinants, including income, gender and labour market conditions (e.g. Beicht and Krewerth, 2010; Bessey and Backes-Gellner, 2015), level of schooling (e.g. Bednarz, 2014; Cutler and Lleras-Muney, 2008), migration background (e.g. Beicht and Walden, 2013; Dostie, 2010), second jobs (Chapter 4 and Seidel, 2019), subjective job characteristics (Chapter 6 and Seidel, 2016) and region (e.g. Bessey and Backes-Gellner, 2015) as well as the quality of training (e.g. Beicht and Walden, 2013; Negrini et al., 2016; Schöngen, 2003; Stalder and Schmid, 2016). However, the literature lacks a closer look into the possible burdens of holding multiple jobs and their effect on the intention to leave apprenticeships. Beicht and Krewerth (2010) measure the determinants of being satisfied with one’s own remuneration, and find that fewer satisfied apprentices have a second job. Moreover, Seidel (2019)/Chapter 4 finds that apprentices who hold a second job to cover their living costs are more likely to leave an apprenticeship. The results also show different behaviours in this respect between men and women: men are more likely to want to leave when their training allowance is insufficient to cover their living costs and a second job becomes inevitable.

5.3 Data and descriptive statistics

5.3.1 Data

In June 2016, new data were collected on 191 apprentices at the end of the first, second or third years of apprenticeships at the time of interview. All 191 apprentices attend a vocational school

in a northern German federal state and represent 13 common German occupations, aggregated as ‘electrical engineering’, ‘home economics and food’ and ‘craft’.³⁸ The survey design is closely related to the representative ‘BIBB Survey of Vocational Training from the Trainee’s Point of View 2008’.³⁹ Like the original questionnaire, it covers the educational background, training allowance, age, migration background, type of chosen occupation, firm characteristics, information on second jobs and on the intention of apprentices to cancel their training contract. Additionally, it includes information on the consequences of holding multiple jobs (see the questionnaire in the Appendix in Chapter 5.7). The new data differs from the 2008 BIBB survey in the composition of occupations, and contains fewer apprentices with a second job, more apprentices with a lower level of schooling and more apprentices with higher training allowances (see Appendix Table 5.10). Moreover, a higher proportion of apprentices intends to leave their apprenticeship. Nonetheless, it touches on the consequences of holding multiple jobs in VET and is intended to stimulate more research in this area.

5.3.2 Data preparation and variables

The question ‘Have you ever seriously thought about dropping out of your apprenticeship?’ is used as an indicator to measure the intention to leave the apprenticeship. This binary dependent variable equals 1 if the answer is ‘Yes’, and 0 otherwise. I am able to identify only the intention to leave rather than the real dropout rate. However, I am aware of the four possibilities apprentices have during their apprenticeship: they can change occupation or firm, upgrade to university, drop out, or finish the apprenticeship (Bessey and Backes-Gellner, 2015). Therefore, the intention to leave an apprenticeship overestimates the probability of the apprentice dropping out early. Nonetheless, in the absence of more precise information, a wide range of literature justifies the use of indicators as a proxy for real behaviour (e.g. Ajzen and Fishbein, 1980; Igarria and Greenhaus, 1992; Gordon and Denisi, 1995; Shields and Ward, 2001; Steel and Ovalle, 1984). Furthermore, focusing on the intentions of apprentices may help to identify possible causes of leaving at an earlier stage of the apprenticeship.

The explanatory variable ‘second job’ contains information about whether a second job is held and states the reason for holding one. The outcomes are as follows: (0) no secondary job; (1) yes, need money for living costs; (2) yes, need money for extra wishes; (3) yes, need money for both; (4) yes, enjoy it, (5) yes, enjoy it and need money. Further, the second job has to be

³⁸ For detailed information, see Table 5.9 in the Appendix.

³⁹ See Krewerth et al. (2011) for further information on the BIBB survey.

regular. In addition, and in order to capture whether the second job is held voluntarily, I aggregate the second job variables to a dummy variable. Outcomes 1, 2 and 3 capture the involuntary aspects of holding a secondary job (0: secondary job is chosen involuntarily) and outcomes 4 and 5 the voluntary aspects (1: secondary job is chosen voluntarily).

Conditional on holding a second job and intending to leave, the apprentices were asked, ‘Is your second job the reason you wish to drop out of your apprenticeship?’

1. No, other reasons.
2. Yes, I feel high performance pressure.
3. Yes, I feel burnt out, stressed and tired.

This enables the study to capture to what extent a second job affects the intention to leave. For all multiple job holders, I define the second job as a burden (1 = burden) if apprentices stated that they felt high performance pressure, burnt out, stressed and tired and, therefore, wanted to quit. Otherwise, a secondary job is defined as no burden (0 = job + no intention to leave/no burden). Furthermore, in order to measure the intensity of the second job, working hours are also considered. Zero hours denotes holding no second job (0 = no second job). The further two categories capture working 10 hours or less per week (1 = 10 hours or less) and working more than 10 hours per week (2 = more than 10 hours) in addition to the apprenticeship.

The quality of training is also important: working conditions, content of training, quality of trainers, problems with trainers, teachers, colleagues or classmates all affect the perceived quality of training and the probability of early contract cancellation in VET. The existing literature links lower levels of training quality with higher rates of early contract cancellation in VET (e.g. Beicht and Walden, 2013; Negrini et al., 2016; Schöngen, 2003; Stalder and Schmid, 2016). To capture the quality of training, apprentices had to rate their training (school and firm) by giving a grade, ranging from 1 to 6 (1 = very good; 6 = very bad). Note that, to ease the interpretation the outcomes were reversed to 1 for ‘very bad’ and 6 for ‘very good’. In a second step, due primarily to the low number of observations, the original variable was aggregated from six categories to five (1 = very bad/bad apprenticeship; 5 = very good apprenticeship).⁴⁰

⁴⁰ See histogram in the Appendix Figure 5.1.

I further follow the recent literature on early contract cancellations in VET by controlling for schooling level⁴¹, age, gender and migration background, year of apprenticeship, total number of employees at the training location (including the apprentice interviewed) and net income per month, and I consider the type of occupation (electrical engineering, home economics and food and craft) as well as whether the apprentice is in their first-choice occupation. For detailed information, see also the summary statistics (Table 5.4 in the Appendix).

It should be noted that, in preparing the data, one apprentice aged 54 was dropped from the data. Due to missing or inconsistent information on second job, firm-size, income or reasons or leaving, the data set was further reduced to 164 observations.

5.3.3 Descriptive statistics

The sample includes apprentices in the first (50%), second (31%) or third year (19%) of an apprenticeship. Of the total sample, 38% have chosen an occupation in the field of home economics and food, followed by 33% in the field of craft and 29% in electrical engineering occupations. Females comprise 37% of the total apprentices and 24% of the apprentices have a migration background.⁴² Only 2% of the apprentices observed have no school certificate or a special-needs school certificate. Of the total, 42% of the apprentices had obtained an intermediate secondary school certificate, followed by 36% with a secondary general school certificate. Only 20% had an upper secondary school certificate. See the summary statistics in the Appendix Table 5.4 and Table 5.1.

⁴¹ School degree dummies: Special needs school (German: 'Sonderschule'), second general school (German: 'Hauptschule'), intermediate secondary school (German: 'Realschule'), upper secondary school (German: 'Gymnasium').

⁴² T-tests for differences can be seen in Table 5.5 in the Appendix.

Table 5.1 Characteristics by intention to quit

| Job | Intention to quit | | Total |
|--|--------------------------|-----------|--------------|
| | Yes | No | |
| No | 64.2% | 68.1% | 65.9% |
| Yes | 35.8% | 31.9% | 34.1% |
| N | 95 | 69 | 164 |
| Reason for the job | | | |
| No job | 64.2% | 68.1% | 65.9% |
| Yes, need money for living | 5.3% | 7.2% | 6.1% |
| Yes, need money for extra wishes | 7.4% | 8.7% | 7.9% |
| Yes, need money for both | 9.5% | 7.2% | 8.5% |
| Yes, enjoying it | 10.5% | 5.8% | 8.5% |
| Yes, enjoying it and need money for living | 3.2% | 2.9% | 3.0% |
| N | 95 | 69 | 164 |
| Reason for quitting | | | |
| No quit intention | 100.0% | 0.0% | 63.8% |
| Job no reason for quitting | 0.0% | 83.3% | 30.2% |
| Quit intention caused by job | 0.0% | 16.7% | 6.0% |
| N | 95 | 54 | 149 |
| Job burden | | | |
| No burden | 100.0% | 55.0% | 83.3% |
| Burden | 0.0% | 45.0% | 16.7% |
| N | 34 | 20 | 54 |
| Gender | | | |
| Men | 68.4% | 56.5% | 63.4% |
| Women | 31.6% | 43.5% | 36.6% |
| N | 95 | 69 | 164 |
| Type of occupation | | | |
| Electrical engineering | 30.5% | 26.1% | 28.7% |
| Home economics and food | 36.8% | 40.6% | 38.4% |
| Craft | 32.6% | 33.3% | 32.9% |
| N | 95 | 69 | 164 |

Data source: Own Survey Data.

Over one-third of the sample (34.1%) hold multiple jobs. Categorized by reason, 6.1% need the second job to cover living costs, while 7.9% say they want to be able to afford ‘extras’. Moreover, 8.5% describe the second job as a source of enjoyment. It seems, furthermore, important whether the decision to moonlight is voluntary or not. While 7.2% of the group of apprentices who are considering leaving need a second job to earn money for living costs, only 5.8% hold a second job for the enjoyment it brings. In contrast, 10.5% of those apprentices with no intention to leave their apprenticeship hold the secondary job for enjoyment, while only 5.3% need the money to cover living costs. Furthermore, 45% of those apprentices who wished to leave experienced job-related burdens, while 55% report no job-related burdens (see Table 5.1).

To summarise, it seems to be important whether the second job is held voluntarily and holding a second job for financial reasons seems, therefore, to affect the intention to leave. Furthermore, apprentices with a second job and wishing to leave their apprenticeship seem to experience

performance pressure, are stressed, tired or burnt out. To confirm the descriptive results this section is followed by a multivariate analysis.

5.4 Method and results

5.4.1 Empirical methods

Due to lower benefits than expected, or higher costs than expected, apprentices may revise an earlier educational decision (e.g. Bessey and Backes-Gellner, 2015; Stalder and Schmid, 2016). Once apprentices have learnt more about their current apprenticeship and experienced conditions they had not expected, their intention to quit may increase. Hence, I propose the following hypotheses:

1. A second job, held in order to cope with financial distress, increases the intention to leave the apprenticeship.
2. A second job that is held involuntarily increases the probability of experiencing extra burdens, such as performance pressure or higher levels of stress, making early contract cancellation in VET more likely.

To measure the direct effect of the second job on the intention to quit, I use a probit regression:

$$\Pr(y = 1|X) = \Phi(X\beta) \quad (1),$$

where Φ is the cdf of the standard normal distribution, X a matrix of explanatory variables and β the corresponding parameter values. Rather than observing the net utility of staying in training directly, I can only observe whether or not an apprentice wants to leave, making the use of a probit regression approach suitable.

The underlying latent model is:

$$y_i = \begin{cases} 0, & y_i^* \geq \tau \\ 1, & y_i^* < \tau \end{cases} \quad (2).$$

τ represents a utility threshold and the individual's utility of apprenticeship (y^*) is displayed by:

$$y_i^* = \beta_0 + \beta_1 x_{i1} + \dots + \beta_k x_{ik} + \epsilon_i \quad (3)$$

where ϵ is i.i.d. with a standard normal distribution and independent of x'_i :

$$\epsilon_i | x_i \sim N(0,1) \quad (4).$$

x'_i contains a vector of individual and firm-specific characteristics of apprentice i . β is the corresponding parameter vector. Finally, from equations 2 and 3, it follows that apprentices' intention to leave increases if the utility of staying in the apprenticeship falls below the threshold τ .

Since it is suggested that the level of training quality affects the probability of early contract cancellation in VET, I additionally estimate whether holding multiple jobs affects the stated level of training quality. I apply ordered probit regressions, using the variable 'Quality of training' as a dependent variable.⁴³ According to Long and Freese (2014), an ordered probit model estimates the relationship between a dependent, ordered, categorical variable and chosen independent variables. More precisely, it estimates the probability that a certain category of an outcome variable occurs.

The ordered probit model considers a latent variable (s_i^*):

$$s_i^* = x'_i \beta + \mu_i, i = 1, \dots, N \quad (5).$$

By defining:

$$s_i = m \text{ if } \kappa_{m-1} \leq s_i^* \leq \kappa_m, m = 1, \dots, M \quad (6)$$

the conditional probability of observing a certain, stated level of training quality (s_i^*) is:

$$\Pr(s_i = m | x_i) = \Pr(\kappa_{m-1} \leq x'_i \beta + \mu_i \leq \kappa_m) = \Pr(\kappa_{m-1} \leq s_i^* \leq \kappa_m) \quad (7).$$

The coefficients and threshold parameters (β, κ) were estimated together. Further, μ_i is normally distributed, M is the number of possible outcomes and κ_0 is taken as $-\infty$ and κ_m as $+\infty$ (Long and Freese, 2014; Wooldridge, 2002).

⁴³ 1 = very bad/bad apprenticeship; 5 = very good apprenticeship.

5.4.2 Results

Chapter 5.4.2 discusses five different model specifications. Models 1 and 2 estimate whether a second job affects the intention to leave an apprenticeship (probit regressions). Model 3 estimates the effect of a secondary job on the stated level of training quality, using an ordered probit regression. Models 4 and 5 complete the empirical analysis and estimate the probability of burdens related to second jobs (probit regressions). Model 5, in addition, contains the hours worked in the second job. All models are estimated with and without robust standard errors but no noteworthy differences are revealed (see Appendix Table 5.7 and Table 5.8). Hence, Table 5.2 reports estimates without robust standard errors. Furthermore, the ordered probit regression in Model 3 contains coefficients and the four remaining model specifications report average marginal effects.⁴⁴

Model 1 reveals that holding a second job has an insignificant effect on the intention to leave the apprenticeship. However, a significant effect is revealed as soon as the quality of training is considered (Model 2). According to this, apprentices lower their intention to leave by 29.69 percentage points at a 1%-level (relative marginal effect: $-0.2969/0.42 = -70.69\%$). However, when applying a Wald test for equality, only holding a job to afford 'extras' differs significantly from holding a job to cover living costs at a 1%-level (see Table 5.6 in the Appendix). Furthermore, in line with the literature on training quality, Model 2 displays a decreasing intention to leave by 21.06 percentage points (relative average marginal effect: $-0.2106/0.42 = -50.14\%$) at a 1%-level, if apprentices rate the quality of their training higher.

Moreover, the ordered probit regressions in Table 5.2 (Model 3) and Table 5.3 reveal lower ratings of training quality if apprentices are multiple job holders. The finding that apprentices rate the level of training quality lower if the second job is needed to cover living costs supports the suggestion of role conflict by Zickar et al. (2004), according to which individuals frequently accept jobs which differ in their assignment profiles. As a result, more effort is required to fulfil both roles. Moreover, the greater the dissimilarities, the higher the risk of role conflict and the lower the level of satisfaction. Hence, some apprentices may hold a second job regardless of its type, making dissimilarities between the second job and the apprenticeship more likely and, thus, increasing the risk of role conflict.

⁴⁴ Software: Stata, Version 13.1

Table 5.2 Intention to quit and the probability of job-related burdens

| | (1) Probit Intention to quit | (2) Probit Intention to quit | (3) OProbit Quality of training | (4) Probit Job burden | (5) Probit Job burden |
|---|---------------------------------|---------------------------------|------------------------------------|--------------------------|--------------------------|
| Reference category: No secondary job (models 1-3) | | | | | |
| Yes, need money for living | -0.1137 (0.1587) | -0.2969*** (0.0986) | -1.1802*** (0.4210) | | |
| Yes, need money for extra wishes | 0.0601 (0.1451) | 0.0940 (0.1381) | 0.2965 (0.3379) | | |
| Yes, need money for both | -0.1575 (0.1332) | -0.1457 (0.1236) | 0.0957 (0.3560) | | |
| Yes, enjoying it | -0.1377 (0.1323) | -0.1186 (0.1226) | 0.2914 (0.3430) | | |
| Yes, enjoying it and need money | -0.0391 (0.2197) | 0.0106 (0.2123) | 0.4571 (0.5421) | | |
| Quality of training | | -0.2106*** (0.0373) | | -0.1052* (0.0551) | -0.0928* (0.0554) |
| Job chosen voluntarily | | | | -0.0643 (0.1488) | -0.0489 (0.1391) |
| Hours of work > 10 | | | | | 0.3187** (0.1391) |
| Controls | Yes | Yes | Yes | Yes | Yes |
| cut1/constant | | | 0.2813 -11.372 | | |
| cut2/constant | | | 11.924 -11.273 | | |
| cut3/constant | | | 2.4291** -11.345 | | |
| cut4/constant | | | 4.0973*** -11.624 | | |
| Pseudo R ² | 0.1415 | 0.2512 | 0.1426 | 0.2019 | 0.3121 |
| N | 164 | 164 | 164 | 42 | 42 |

Notes: Probit models 1, 2, 4 and 5 contain average marginal effects and standard errors in parentheses. The ordered probit model contains coefficients and standard errors in parentheses. Models 1-3 control for migration background, age, gender, income, level of schooling, firm size, favourite occupation, type of occupation, year of VET. Models 4 and 5 control for age, gender, level of schooling, migration background, year of VET and type of occupation. Quality of training: 1 equals very bad/bad, 5 equals very good.

Data source: Own data survey.

To account for the intensity of moonlighting, the moonlighting hours were included additionally. Surprisingly, this robustness check neither revealed a significant effect on the intention to leave nor increased the explanatory power of the Models 1–3, which is why moonlighting hours were excluded from the final Models 1, 2 and 3.

Models 4 and 5 (Table 5.2) complete the empirical part of the analysis by considering the burdens related to second jobs. For all multiple job holders, I estimate the probability of experiencing job-related burdens. As explained in the data description, for all multiple job holders, a second job is defined as a burden (1 = burden) if apprentices stated that they feel high performance pressure, burnt out, stressed and tired, and therefore wish to leave their apprenticeship. Otherwise, a secondary job is no burden (0 = no burden). Note that, due to the low number of observations, I will talk only of tendencies instead of the magnitude. Models 4 and 5 reveal a lower probability of burdens related to second jobs if the second job is held voluntarily. If the job is not taken out of necessity, but out of choice, apprentices might benefit from higher performance and satisfaction levels (e.g. Jamal et al., 1998; Sliter and Boyd, 2014). However, the effect is insignificant.

Table 5.3 Ordered Probit regression- Quality of training

| Predicted Outcome | Quality of training: Very bad/bad | Quality of training: Unsatisfactory | Quality of training: Improvement needed | Quality of training: Good | Quality of training: Very good |
|----------------------------------|--------------------------------------|--|--|------------------------------|-----------------------------------|
| Yes, need money for living | 0.1924* (0.1016) | 0.1461*** (0.0497) | -0.0177 (0.0586) | -0.2565*** (0.0742) | -0.0643*** (0.0202) |
| Yes, need money for extra wishes | -0.0197 (0.0201) | -0.0361 (0.0386) | -0.0410 (0.0519) | 0.0568 (0.0581) | 0.0399 (0.0518) |
| Yes, need money for both | -0.0073 (0.0259) | -0.0123 (0.0448) | -0.0118 (0.0459) | 0.0198 (0.0720) | 0.0115 (0.0446) |
| Yes, enjoying it | -0.0194 (0.0203) | -0.0355 (0.0394) | -0.0402 (0.0532) | 0.0560 (0.0602) | 0.0391 (0.0518) |
| Yes, enjoying it and need money | -0.0272 (0.0250) | -0.0530 (0.0549) | -0.0678 (0.0927) | 0.0807 (0.0736) | 0.0673 (0.0980) |
| Pseudo R ² | 0.1426 | | | | |
| N | 164 | | | | |

Notes: Ordered probit model contains average marginal effects and standard errors in parentheses.

Controls are migration background, age, gender, income, level of schooling, firm size, favourite occupation, type of occupation, year of VET. Models 4 and 5 control for age, gender, level of schooling, migration background, year of VET and type of occupation. * p<0.10, ** p<0.05, *** p<0.01

Data source: Own data survey.

Hence, hypothesis 2, according to which a second job should increase the probability of experiencing extra burden, cannot be confirmed. In contrast, the number of hours worked on the second job seem to increase the burdens related to it significantly (Model 5) at a 5%-level.

The reduced time available to recover or to prepare for training appears to result in stress-related symptoms.

In summary, surprisingly, the results indicate that a second job held to cover living costs decreases the intention to leave an apprenticeship. However, the interdependencies between the rated quality of training and the need for a second job to cover living costs, in particular, should not be neglected. While those who hold a second job to cover living costs perceive a lower level of training quality, lower levels of training quality are linked with greater intent to leave an apprenticeship. Secondly, a high intensity of moonlighting (measured in hours of work) is associated with a higher level of performance pressure and burn-out symptoms, which could further increase the intention to leave the apprenticeship.

Finally, since this research focuses on the consequences of holding multiple jobs during an apprenticeship, the interpretation of the control variables is omitted; however, Table 5.7 in the Appendix contains detailed estimation results. Moreover, I avoided estimating the effect of a second job on the intention to leave or on the level of training quality within subgroups, such as for men or women, or for apprentices with and without a migration background, as the number of observations within the groups was too low to make any reliable estimate. However, when compared to the estimations in Chapter 4, the control variables reveal the same tendencies, underlining the validity of the new data.

5.4.3 Limitations

With a low number of observations and a cross-sectional data structure, problems such as omitted variables bias, reverse causality and selection bias can arise. Reverse causality could be a problem if the second job is used to re-orientate in order to execute an existing wish to leave the apprenticeship. Assuming that apprentices wishing to leave are less satisfied with the level of training quality, the inclusion of the level of training quality reduces the probability of reverse causality. Selection bias could exist if only those apprentices who have higher levels of energy and initiative have a second job. However, assuming that this type of apprentice performs better on average, considering the level of schooling reduces potential bias. Unobserved characteristics, such as ability or social background, are also captured by level of schooling. Furthermore, I control for whether apprentices are in their first-choice occupation. If they have chosen another occupation due to a lack of opportunities, these apprentices might be more open to move if alternatives appear. In addition, I control for individual characteristics

(gender, migration background, age, chosen type of occupation) and firm characteristics (firm-size, training allowance, VET year). However, I do not claim causality.

5.5 Conclusion

This research was intended to analyse, firstly, whether a second job, and in particular one held to cover living costs, increases the intention to cancel a training contract early and, secondly, whether this effect might be caused by the higher burdens related to the second job. For this attempt, new data on apprentices were collected. Due to data limitations, the study does not claim causality. However, it sheds light on a less-explored research area by investigating burdens related to secondary jobs in VET. Moreover, it addresses the absence of an indicator to measure job-related burdens, as identified in Chapter 4/Seidel (2019).

In contrast to Chapter 4/Seidel (2019), the results reveal a negative correlation between holding a second job in order to cover living costs and the intention to leave an apprenticeship. However, apprentices with a second job report lower levels of training quality. Lower levels of training quality, in turn, are linked to greater intentions to leave an apprenticeship. Moreover, the experience of burdens related to a second job does not depend on whether the second job is held out of choice or necessity: the more important factor is the number of hours worked in the second job. Working more than 10 hours per week in addition to the apprenticeship seems to increase the probability of burdens related to a second job, such as burn-out symptoms or performance pressure.

To date, research has concentrated more on income itself as a determinant of early contract cancellation in VET, but not on the possible implications of low training allowances, including the need for a second job and the burdens this brings. Hence, this research presents new insights into early contract cancellation in VET. However, a higher number of apprentices interviewed across Germany, preferably using a panel analysis or suitable instrument, would help to identify a causal effect.

5.6 References for Chapter 5

- Ajzen, I., and M. Fishbein, 1980. *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs: Prentice-Hall.
- Allen, W. D., 1998. The moonlighting decision of unmarried men and women: family and labor market influences. *Atlantic Economic Journal*, 26(2): 190–205.
- Averett, S. L., 2001. Moonlighting: Multiple motives and gender differences. *Applied Economics*, 33(11): 1391–1410.
- Baba, V. V., and M. Jamal, 1992. How much do we really know about moonlighters? *Public Personnel Management*, 21(1): 65–73.
- Ballou, D., 1995. Causes and consequences of teacher moonlighting. *Education Economics*, 3(1): 3–18.
- Bednarz, A., 2014. Understanding the non-completion of apprentices. National Vocational Education and Training Research Program, NCVET. Adelaide.
- Beicht, U., and A. Krewerth, 2010. *Geld spielt eine Rolle!: Sind Auszubildende mit ihrer Vergütung zufrieden? BIBB Report 14/10*. Bonn.
- Beicht, U., and G. Walden, 2013. *Duale Berufsausbildung ohne Abschluss-Ursachen und weiterer bildungsbiografischer Verlauf*. BIBB Report 21/13. Bonn.
- Bessey, D., and U. Backes-Gellner, 2015. Staying within or leaving the apprenticeship system? Revisions of educational choices in apprenticeship training. *Journal of Economics and Statistics (Jahrbuecher fuer Nationaloekonomie und Statistik)*, 235(6): 539-552.
- Böheim, R., and M.P. Taylor, 2004. And in the evening she's a singer with the band - second jobs, plight or pleasure. IZA Discussion Papers 1081, Institute for the Study of Labor (IZA).
- Cutler, D. M., and A. Lleras-Muney, 2008. *Education and Health: Evaluating Theories and Evidence*. In J. House, R. Schoeni, G. Kaplan, & H. Pollack (Hrsg.). New, York: Russell Sage Foundation.
- Dostie, B., 2010. A competing risks analysis of the determinants of low completion rates in the Canadian apprenticeship system. CLSSRN working papers, Vancouver School of Economics.
- Gordon, M. E., and A. S. Denisi, 1995. A re-examination of the relationship between union membership and job satisfaction. *Industrial & Labor Relations Review*, 48(2): 222-236.

- Greenhaus, J. H., and N.J. Beutell, 1985. Sources of conflict between work and family roles. *Academy of Management Review* 10(1): 76–88.
- Heineck, G., 2009. The determinants of secondary jobholding in Germany and the UK. *Zeitschrift für ArbeitsmarktForschung*, 42(2): 107-120.
- Igarria, M., and J. H. Greenhaus, 1992. Determinants of MIS employees' turnover intentions: a structural equation model. *Communications of the ACM*, 35 (2): 34-49.
- Ilies, R., Dimotakis, N., and I. E. De Pater, 2010. Psychological and physiological reactions to high workloads: implications for well-being. *Personnel Psychology*, 63(2): 407-436.
- Jacobshagen, N., Amstad, F. T., Semmer, N. K., and M. Kuster, 2005. Work-Family-Balance im Topmanagement: Konflikt zwischen Arbeit und Familie als Mediator der Beziehung zwischen Stressoren und Befinden. *Zeitschrift für Arbeits-und Organisationspsychologie A&O* 49(4): 208–219.
- Jamal, M., 1986. Moonlighting: Personal, social, and organizational consequences. *Human Relations*, 39(11): 977–990.
- Jamal, M., Baba, V. V., and R. Riviere, 1998. Job stress and well-being of moonlighters: The perspective of deprivation or aspiration revisited. *Stress and Health*, 14(3): 195-202.
- Kimmel, J., and K. Smith Conway, 2001. Who moonlights and why? Evidence from the SIPP. *Industrial Relations: A Journal of Economy and Society*, 40(1): 89-120.
- Krewerth, A., Beicht, U., Eberhard, V., Granato, M., and J. Gei, 2011. BIBB-Studie Ausbildung aus Sicht der Auszubildenden 2008, SUF1.1. Bonn: Forschungsdatenzentrum im BIBB (Hrsg., Datenzugang): Bundesinstitut für Berufsbildung (BIBB).
- Long, J. S., and J. Freese, 2014. Regression models for categorical dependent variables using Stata, 3rd Edition, Stata Press.
- Maninger, R. M., Edgington, W., Johnson, D., Sullivan, S. S., and M. Rice, 2011. Moonlighting and teacher status: What are the implications for professional practice? *The Texas Forum of Teacher Education*, 1: 63–76.
- Negrini, L., Forsblom, L., Gurtner, J.-L., and S. Schumann, 2016. Is there a relationship between training quality and premature contract terminations in VET? *Vocations and Learning*, 9 (3): 361-378
- Panos, G. A., Pouliakas, K. & Zangelidis, A. (2014), 'Multiple job holding, skill diversification, and mobility', *Industrial Relations: A Journal of Economy and Society*, 53(2): 223–272.
- Parham, J. N., and S.P. Gordon, 2011. Moonlighting: A harsh reality for many teachers: a poor salary and working conditions, taken together, may drive teachers to temporary periods of

- moonlighting followed by a departure from the teaching profession. *Phi Delta Kappan*, 92(5): 47.
- Renna, F., and R.L. Oaxaca, 2006. The economics of dual job holding: a job portfolio model of labor supply. IZA Discussion Papers 1915, Institute for the Study of Labor (IZA).
- Schaufeli, W. B., and A. B. Bakker, 2004. Job demands, job resources, and their relationship with burnout and engagement: a multi-sample study. *Journal of Organizational Behavior*, 25(3): 293–315.
- Schöngen, K., 2003. Lösung von Ausbildungsverträgen - Schon Ausbildungsabbruch? *Informationen für die Beratungs- und Vermittlungsdienste der Bundesanstalt für Arbeit*, 25: 5-19.
- Seidel, K., 2019. The intention to quit apprenticeships and the role of secondary jobs. *Journal of Vocational Education & Training* 71(4): 556-578.
- Seidel, K., 2016. Job characteristics and their effect on the intention to quit apprenticeship. Working Paper Series in Economics 362, University of Lüneburg.
- Shields, M. A., and M. Ward, 2001. Improving nurse retention in the National Health Service in England: the impact of job satisfaction on intentions to quit. *Journal of Health Economics*, 20(5): 677-701.
- Shishko, R., and B. Rostker, 1976. The economics of multiple job holding. *American Economic Review*, 66(3): 298-308.
- Winters, J. V., 2010. Teacher moonlighting: evidence from the US current population survey. *Applied Economics Letters*, 17(11): 1111–1114.
- Wooldridge, J. M., 2002. *Econometric analysis of cross section and panel data*, MIT Press, Cambridge.
- Zickar, M. J., Gibby, R. E., and T. Jenny, 2004. Job attitudes of workers with two jobs. *Journal of Vocational Behavior*, 64(1): 222 – 235. a neglected topic in organizational research', *Journal of Organizational Behavior*, 35(7): 1042 1046.
- Stalder, B. E., and E. Schmid, 2016. Lehrvertragsauflösung und Ausbildungserfolg - kein Widerspruch. Wege und Umwege zum Berufsabschluss [Cancellation of apprenticeship contracts and educational success - no contradiction. Paths and detours to vocational qualifications]. Bern: Hep-Verlag Bern.
- Steel, R. P., and N. K. Ovalle, 1984. A review and meta-analysis of research on the relationship between behavioral intentions and employee turnover. *Journal of Applied Psychology*, 69 (4): 673-686.

5.7 Appendix for Chapter 5

Table 5.4 Summary statistics

| | MEAN | N | SD | MIN | MAX |
|--|-------|-----|------|-----|-----|
| Intention to quit: Yes | 0.42 | 164 | | 0 | 1 |
| Quit reason: No quit intention | 0.63 | 149 | | 0 | 1 |
| Quit reason: Job no reason | 0.30 | 149 | | 0 | 1 |
| Quit reason: Job | 0.06 | 149 | | 0 | 1 |
| Secondary job: Yes | 0.34 | 164 | | 0 | 1 |
| Secondary job reason: No job | 0.65 | 164 | | 0 | 1 |
| Secondary job reason: Money for living | 0.06 | 164 | | 0 | 1 |
| Secondary job reason: Money for wishes | 0.08 | 164 | | 0 | 1 |
| Secondary job reason: Money for both | 0.09 | 164 | | 0 | 1 |
| Secondary job reason: Enjoying it | 0.09 | 164 | | 0 | 1 |
| Secondary job reason: Enjoying it/money | 0.03 | 164 | | 0 | 1 |
| Job chosen voluntarily | 0.34 | 56 | | 0 | 1 |
| Hours of work | 3.17 | 161 | 6.05 | 0 | 40 |
| Job: Burden | 0.17 | 54 | | 1 | 1 |
| Income: < 401Euro | 0.20 | 164 | | 1 | 1 |
| Income: 401 - 600 Euro | 0.60 | 164 | | 1 | 1 |
| Income: 601 - 800 Euro | 0.20 | 164 | | 1 | 1 |
| Age | 20.69 | 164 | 2.92 | 17 | 32 |
| Female apprentices | 0.37 | 164 | | 1 | 1 |
| Migration background | 0.24 | 164 | | 1 | 1 |
| No degree/Special needs school | 0.02 | 164 | | 1 | 1 |
| Second general school | 0.36 | 164 | | 1 | 1 |
| Intermediate secondary school | 0.42 | 164 | | 1 | 1 |
| Upper secondary school | 0.20 | 164 | | 1 | 1 |
| Choice of occupation: I do not know | 0.13 | 164 | | 1 | 1 |
| Choice of occupation: Interesting | 0.23 | 164 | | 1 | 1 |
| Choice of occupation: Favourite | 0.37 | 164 | | 1 | 1 |
| Choice of occupation: Alternative | 0.27 | 164 | | 1 | 1 |
| Choice of occupation: Compensation | 0.09 | 164 | | 1 | 1 |
| Firm size: 1 - 24 | 0.55 | 164 | | 1 | 1 |
| Firm size: 25 - 49 | 0.20 | 164 | | 1 | 1 |
| Firm size: 50-249 | 0.20 | 164 | | 1 | 1 |
| Firm size: 250 and more | 0.05 | 164 | | 1 | 1 |
| Occupation type: Electrical engineering | 0.29 | 164 | | 1 | 1 |
| Occupation type: Home economics and food | 0.38 | 164 | | 1 | 1 |
| Occupation type: Craft | 0.33 | 164 | | 1 | 1 |
| Quality of training | 0.97 | 164 | 0.97 | 1 | 5 |
| VET-Year: 1 | 0.50 | 164 | | 1 | 1 |
| VET-Year: 2 | 0.31 | 164 | | 1 | 1 |
| VET-Year: 3 | 0.19 | 164 | | 1 | 1 |

School degree dummies: Special needs school (German: 'Sonderschule'), second general school (German: 'Hauptschule'), intermediate secondary school (German: 'Realschule'), upper secondary school (German: 'Gymnasium')

Source: Own Survey Data.

Table 5.5 T-test with unequal variances – Probability of job related burdens and the intention to quit

| | Mean | T-test | N |
|--------------------------|--------|--------|-----|
| Burden | | | 54 |
| Men | 0.1818 | 0.4909 | 44 |
| Women | 0.1 | | 10 |
| No Migration background | 0.1628 | 0.8895 | 43 |
| Migration background | 0.1818 | | 11 |
| Intention to quit | | | 164 |
| Men | 0.375 | 0.1240 | 104 |
| Women | 0.5 | | 60 |
| No Migration background | 0.3790 | 0.0645 | 124 |
| Migration background | 0.55 | | 40 |

Data source Own survey.

Table 5.6 Wald test for equality

| | Wald test for equality | | | |
|-------------|-------------------------|----------------------------------|-----------------------|---------------------------------------|
| | Money vs. extras wishes | Money vs. wishes and extra money | Money vs. enjoying it | Money vs. enjoying it and extra money |
| chi2(1) | 6.06 | 1.05 | 1.52 | 1.90 |
| Prob > chi2 | 0.0138 | 0.3052 | 0.2181 | 0.1682 |

Data source Own survey.

Table 5.7 Results in detail without robust standard errors

| | Probit Intention to quit | Oprobit Quality of training | Probit Job burden | Probit Job burden |
|--|--------------------------------|-----------------------------------|-----------------------|-------------------------|
| <hr/> | | | | |
| No secondary job (reference category) | | | | |
| Yes, need money for living | -0.2969*** (0.0986) | -1.1802*** (0.4210) | | |
| Yes, need money for extra wishes | 0.0940 (0.1381) | 0.2965 (0.3379) | | |
| Yes, need money for both | -0.1457 (0.1236) | 0.0957 (0.3560) | | |
| Yes, enjoying it | -0.1186 (0.1226) | 0.2914 (0.3430) | | |
| Yes, enjoying it and need money | 0.0106 (0.2123) | 0.4571 (0.5421) | | |
| Job chosen voluntarily | | | -0.0643 (0.1488) | -0.0489 (0.1391) |
| Hours of work > 10 | | | | 0.3187** (0.1391) |
| <hr/> | | | | |
| Female apprentices | 0.0631 (0.0916) | -0.6316** (0.2459) | -0.0615 (.1858) | -0.0179 (.2116) |
| Migration background | 0.1491* (0.0835) | 0.2436 (0.2177) | .0757 (.1793) | -.0203 (.2114) |
| Age | 0.0091 (0.0142) | 0.0559 (0.0386) | -.0182 (.0245) | -.0158 (.0239) |
| No school degree/special school degree (reference category) | | | | - |
| Modern secondary school | -0.1614 (0.2352) | 0.1577 (0.7052) | -0.5999** (0.2526) | 0.6307*** (0.2369) |
| Intermediate secondary school | -0.1098 (0.2352) | 0.4444 (0.7063) | -0.5317** (0.2609) | -0.4700 (0.2930) |
| Upper secondary school | -0.0866 (0.2427) | 0.7686 (0.7266) | 0.0000 (.) | 0.0000 (.) |
| <hr/> | | | | |
| Income: 0 -400 Euro (reference category) | | | | |
| 401 - 600 Euro | 0.0303 (0.1004) | -0.1539 (0.2531) | | |
| 601 - 800 Euro | -0.2884** (0.1127) | 0.2505 (0.3484) | | |
| Interesting occupation (reference category) | | | | |
| I do not know | 0.3890** (0.1726) | 0.0594 (0.5419) | | |
| Favourite occupation | 0.0962 (0.0981) | 0.4265* (0.2478) | | |
| Alternative | -0.1048 (0.0808) | -0.1813 (0.2274) | | |
| Compensation | 0.0512 (0.1380) | -1.3492*** (0.3526) | | |
| Quality of training | -0.2106*** (0.0373) | | -0.1052* (0.0551) | -0.0928* (0.0554) |
| Type of occup.: Electrical engineering | | | | |
| Type of occup.: Home economics and food | 0.0183 (0.1378) | 1.7261*** (0.3680) | -0.0270 (0.1940) | -0.1076 (0.1548) |
| Type of occup.: Craft | 0.0047 (0.1264) | 1.0119*** (0.3307) | 0.1591 (0.1731) | 0.1814 (0.1483) |
| Firm size: < 25 (reference category) | | | | |
| Firm size: 25-49 | -0.0524 (0.0887) | -0.0466 (0.2440) | | |
| Firm size: 50-249 | 0.1892** | 0.3045 | | |

| | | | | |
|----------------------------------|----------|-----------|----------|-----------|
| Firm size: 250 and more | (0.0954) | (0.2586) | | |
| | -0.2392 | 0.0912 | | |
| | (0.1709) | (0.4631) | | |
| VET-Year: 1 (reference category) | | | | |
| VET-Year: 2 | -0.0896 | 0.0740 | 0.0162 | -0.0987 |
| | (0.0865) | (0.2374) | (0.1997) | (0.1883) |
| VET-Year: 3 | 0.1412 | -0.1346 | -0.2028* | -0.2748** |
| | (0.1036) | (0.2865) | (0.1231) | (0.1267) |
| cut 1/constant | | 0.2813 | | |
| cut2/constant | | 11.924 | | |
| cut3/constant | | 2.4291** | | |
| cut4/constant | | 4.0973*** | | |
| Pseudo R ² | 0.2515 | 0.1426 | 0.2010 | 0.3121 |
| N | 164 | 164 | 42 | 42 |

Notes: Ordered probit model contains coefficients and standard errors in parentheses.

Probit model 1, 3 and 4 contain average marginal effects and standard errors in parentheses.

Quality of training: 1 equals very bad/bad, 5 equals very good. * p<0.10, ** p<0.05, *** p<0.01. Data source: Own Data survey.

Table 5.8 Regressions in detail with robust standard errors

| | Probit Intention to quit | Oprobit Quality of training | Probit Job burden | Probit Job burden |
|--|--------------------------------|-----------------------------------|-----------------------|-------------------------|
| No secondary job (reference category) | | | | |
| Yes, need money for living | -0.2969*** (0.0912) | -1.1802** (0.4841) | | |
| Yes, need money for extra wishes | 0.0940 (0.1313) | 0.2965 (0.4234) | | |
| Yes, need money for both | -0.1457 (0.1065) | 0.0957 (0.3399) | | |
| Yes, enjoying it | -0.1186 (0.1192) | 0.2914 (0.3591) | | |
| Yes, enjoying it and need money | 0.0106 (0.1736) | 0.4571 (0.5564) | | |
| Job chosen voluntarily | | | -0.0643 (0.1172) | -0.0489 (0.1172) |
| Hours of work > 10 | | | | 0.3187** (0.1378) |
| Women | 0.0631 (0.0887) | -0.6316*** (0.2246) | -0.0615 (0.1603) | -0.0179 (0.1793) |
| Migration background | 0.1491* (0.0790) | 0.2436 (0.2033) | 0.0757 (0.1462) | -0.0203 (0.1631) |
| Age | 0.0091 (0.0147) | 0.0559* (0.0319) | -0.0182 (0.0267) | -0.0158 (0.0223) |
| No school degree/special school degree (reference category) | | | | - |
| Modern secondary school | -0.1614 (0.2787) | 0.1577 (0.3732) | -0.5999** (0.2500) | 0.6307** * |
| Intermediate secondary school | -0.1098 (0.2840) | 0.4444 (0.3710) | -0.5317** (0.2385) | 0.4700** (0.2306) |
| Upper secondary school | -0.0866 (0.2954) | 0.7686* (0.3985) | 0.0000 (.) | 0.0000 (.) |
| Income: 0 - 400 Euro (reference category) | | | | |
| 401 - 600 Euro | 0.0303 (0.0921) | -0.1539 (0.2366) | | |
| 601 - 800 Euro | -0.2884*** (0.1066) | 0.2505 (0.3337) | | |
| Interesting occupation (reference category) | | | | |
| I do not know | 0.3890*** (0.1170) | 0.0594 (0.5766) | | |
| Favourite occupation | 0.0962 (0.0884) | 0.4265 (0.2599) | | |
| Alternative | -0.1048 (0.0819) | -0.1813 (0.2227) | | |
| Compensation | 0.0512 (0.1521) | -1.3492*** (0.3598) | | |
| Quality of training | -0.2106*** (0.0371) | | -0.1052** (0.0437) | 0.0928** (0.0457) |
| Type of occup.: Electrical engineering | | | | |
| Type of occup.: Home economics and food | 0.0183 (0.1508) | 1.7261*** (0.3527) | -0.0270 (0.1382) | -0.1076 (0.1121) |
| Type of occup.: Craft | 0.0047 (0.1250) | 1.0119*** (0.3160) | 0.1591 (0.1327) | 0.1814 (0.1232) |
| Firm size: <25 (reference category) | | | | |
| Firm size: 25-49 | -0.0524 | -0.0466 | | |

| | | | | |
|----------------------------------|----------|-----------|----------|----------|
| | (0.0834) | (0.2729) | | |
| Firm size: 50-249 | 0.1892* | 0.3045 | | |
| | (0.0970) | (0.2379) | | |
| Firm size: 250 and more | -0.2392* | 0.0912 | | |
| | (0.1404) | (0.4706) | | |
| VET-Year: 1 (reference category) | | | | |
| VET-Year: 2 | -0.0896 | 0.0740 | 0.0162 | -0.0987 |
| | (0.0876) | (0.2504) | (0.1580) | (0.1573) |
| | | | | - |
| VET-Year: 3 | 0.1412 | -0.1346 | -0.2028* | 0.2748** |
| | (0.1034) | (0.2737) | (0.1179) | (0.1257) |
| cut1/constant | | 0.2813 | | |
| cut2/constant | | 11.924 | | |
| cut3/constant | | 2.4291*** | | |
| cut4/constant | | 4.0973*** | | |
| Pseudo R ² | 0.2515 | 0.1426 | 0.2010 | 0.3121 |
| N | 164 | 164 | 42 | 42 |

Notes: Ordered probit model contains coefficients and robust standard errors in parentheses.

Probit model 1, 3 and 4 contain average marginal effects and robust standard errors in parentheses. Quality of training: 1 equals very bad/bad , 5 equals very good.

* p<0.10, ** p<0.05, *** p<0.01.

Table 5.9 Types of occupation

Electrical engineering:

Computer Science Expert

Electronics Technician

Home economics and food:

Catering Expert

Cook

Food salesperson: Focus bakery

Food salesperson: Focus butchers

Hotel Industry Expert

Restaurant Expert

Craft:

Carpenter

Expert for Furniture, Kitchen and Moving Services

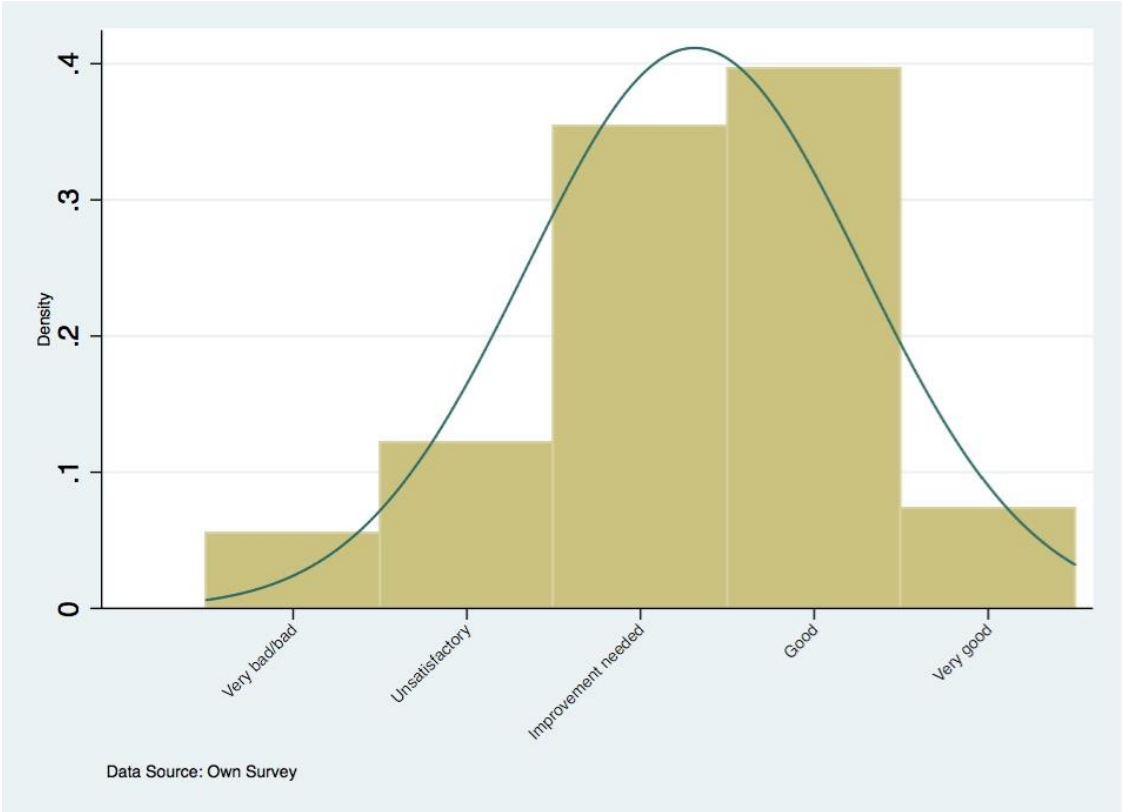
Hairdresser

Painter

Table 5.10 BIBB data vs. own survey data

| BIBB | | Own Survey | |
|--|-------------|--|-------------|
| Variables | MEAN | Variables | MEAN |
| Intention to quit | 0.35 | Intention to quit | 0.42 |
| No secondary job | 0.75 | Secondary job: Yes | 0.34 |
| Secondary job, need money for wishes | 0.07 | Secondary job reason: No job | 0.65 |
| Secondary job, need money for wishes | 0.08 | Secondary job reason: Money for living | 0.06 |
| Secondary job, need money for both | 0.1 | Secondary job reason: Money for wishes | 0.08 |
| / | / | Secondary job reason: Money for both | 0.09 |
| / | / | Secondary job reason: Enjoying it | 0.09 |
| / | / | Secondary job reason: Enjoying it/money | 0.03 |
| Women | 0.39 | Women | 0.37 |
| Migration background | 0.16 | Migration background | 0.24 |
| Age | 20.63 | Age | 20.69 |
| | | / | / |
| | | / | / |
| No school degree | 0.01 | No degree/Special needs school | 0.02 |
| Special needs school degree | 0 | / | / |
| Secondary general school degree | 0.21 | Second general school | 0.36 |
| Intermediate school degree | 0.5 | Intermediate secondary school | 0.42 |
| Upper secondary school degree | 0.27 | Upper secondary school | 0.20 |
| Other degree | 0.01 | / | / |
| Income: <401 Euro | 0.42 | Income: < 401Euro | 0.20 |
| Income: 401-600 Euro | 0.45 | Income: 401 - 600 Euro | 0.60 |
| Income: 601-1500 Euro | 0.13 | Income: 601 - 800 Euro | 0.20 |
| Choice of occupation:: Favourite | 0.29 | Choice of occupation: Favourite | 0.37 |
| Choice of occupation:: Interesting | 0.42 | Choice of occupation: Interesting | 0.23 |
| Choice of occupation:: Alternative | 0.17 | Choice of occupation: Alternative | 0.27 |
| Choice of occupation:: Alternative | 0.08 | Choice of occupation: Compensation | 0.09 |
| Choice of occupation:: Do not know | 0.04 | Choice of occupation: I do not know | 0.13 |
| Quality of training | 2.61 | Quality of training | 0.97 |
| Manufacturing | 0.39 | Occupation type: Electrical engineering | 0.29 |
| Personal-related services | 0.19 | Occupation type: Home economics and food | 0.38 |
| Business-related services | 0.35 | Occupation type: Craft | 0.33 |
| IT-services | 0.07 | / | / |
| Number of observations: 4099 | | Number of observations: 164 | |
| Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008. | | Data source: Own Survey. | |

Figure 5.1 Histogram - Quality of training



Questionnaire

Confidentiality notices!

The questionnaire is completely anonymous. Name and address of the participants will not be collected. None of the collected information can be used to identify individuals. Neither teachers at school nor instructors at the training firm can trace back answers.

Contact: Katja Seidel
 Leuphana Universität Lüneburg
 Scharnhorststr.1
 21335 Lüneburg
 katja.seidel@leuphana.de


Thank you for your participation.

Information on the training profession and firm

(1) Which training profession have you chosen?

- | | | | |
|------------------------------------|--------------------------|---|--------------------------|
| Hair dresser | <input type="checkbox"/> | Painter | <input type="checkbox"/> |
| Carpenter | <input type="checkbox"/> | Expert for furniture, kitchen and moving service | <input type="checkbox"/> |
| Computer Science Expert | <input type="checkbox"/> | Electronics Technician | <input type="checkbox"/> |
| Baker | <input type="checkbox"/> | Food salesperson: Focus bakery | <input type="checkbox"/> |
| Expert in the hospitality industry | <input type="checkbox"/> | Cook | <input type="checkbox"/> |
| Butcher | <input type="checkbox"/> | Food salesperson: Focus butchers | <input type="checkbox"/> |
| Hotel Industry Expert | <input type="checkbox"/> | Restaurant expert | <input type="checkbox"/> |
| Catering Expert | <input type="checkbox"/> | | |
| Other profession _____ | <input type="checkbox"/> | | |

(2) My chosen training profession is

 **Tick only one box.**

- | | |
|---|--------------------------|
| my favourite occupation. | <input type="checkbox"/> |
| an interesting occupation among others. | <input type="checkbox"/> |
| an alternative. | <input type="checkbox"/> |
| an compensation. | <input type="checkbox"/> |
| I don't know. | <input type="checkbox"/> |

(3) How many employees are working at you training location (including you and other apprentices)?

- | | |
|---------|--------------------------|
| 1 – 24 | <input type="checkbox"/> |
| 25 - 49 | <input type="checkbox"/> |

- 50 - 249
- 250 or more
- I don't know

(4) The net training allowance is Euro.

(5) Are you holding a secondary job (e.g. babysitting) to earn some extra money?

No go on with **question 6**

Yes, on average hours per week as a _____.



If answered with Yes: Why do you have a secondary job?



Tick one box only.

- To earn money for living costs (e.g. rent, food etc.) .
- To afford extra wishes.
- For both, extra wishes and living costs.
- I like it.

(6) Have you ever seriously thought about to drop out of apprenticeship?

No go on with **question 7**

Yes



If yes: Is on reason the extra burden caused by holding a secondary job?

Multiple answers possible

- No, other reasons
- Yes a experienced a high performance pressure.
- Yes, I've felt burnt out, stressed and tired.

(7) Please rate your apprenticeship. Please give an overall rating for both parts (school and training at the your firm).

- | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Very good | Good | Satisfactory | sufficient | bad | very bad |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Personal details

(8) What is your gender and year of birth?

male

female

Year of birth

(9) Are you born in Germany?

No

Yes

(10) Is German your first language that you've learned?

No

Yes, but together with a second language

Yes

(11) What is your highest school degree?

No degree

Special school degree

Modern school degree

Secondary school degree

Upper secondary school degree

Others, _____

Thank you!

6 Job Characteristics and their Effect on the Intention to Leave Apprenticeships early⁴⁵

6.1 Introduction

Currently, the German dual system of Vocational Education and Training (VET) faces mismatch problems in demand and supply. While training firms experience difficulties in finding suitable applicants, the applicants face competition in gaining training positions in popular occupations. As a result, both companies and apprentices may choose to conclude a contract early as a result of a poor match and early contract cancellations have become more frequent (BIBB, 2019). Early contract cancellations in VET are the cause not only of a higher likelihood of unemployment and worse income prospects for apprentices, but also of net costs for training firms (e.g. Beicht, Walden and Herget, 2004), and economic loss (e.g. Bessey and Backes-Gellner, 2015; Schöngen, 2003; Ryan, 2001).

To date, research has focused on the objective determinants of early contract cancellations in VET, such as income, age etc. This research, however, contributes by focusing on subjective characteristics, through investigating 10 questions on what apprentices want to achieve. Moreover, the effect of unfulfilled expectations on the intention to leave the apprenticeship early is examined.

This research uses the ‘BIBB Survey Vocational Training from the Trainees Point of View 2008’, conducted by the Federal Institute for Vocational Education and Training (BIBB). This representative, German firm-level study of 5901 apprentices covers the design, procedures, basic conditions and quality criteria of apprenticeships. Additionally, it includes information about the educational background, gender, age, migration background and training allowance of the apprentices.

⁴⁵ **Presented at:** Research colloquium at the Institute of Economics at the Leuphana University Lueneburg, Lueneburg (Germany), 2016.
“20th COPE” in Zurich (Switzerland), 2017.

Available at: Working Paper Series in Economics, Leuphana University Lueneburg, 2016, DP No. 362.

Acknowledgement: I thank all my colleagues at the Leuphana Institute of Economics for all their comments, and interesting and useful discussions, which helped to improve this research work. I thank the participants of the conference “20th COPE” in Zurich for their comments.

The probit regressions show positive effects for job characteristics that represent job security. The expectation that an apprentice will be retained after completing the apprenticeship, and encouragement to train consistently both decrease the intention to leave before the end of the contract. Further, it seems that women are more affected by potential job insecurity, but are also more commonly found in occupations with a lower probability of retention. Consequently, this is an indication of occupational segregation rather than difference between genders. An increased interest in political and economic questions decreases the intention to leave early, while expecting to be capable of running one's own business increases this intention. Learning occupation-specific contents, expecting good examination grades, good grades at vocational degree level, social acceptance and transferability of skills have no effect on the intention to leave early.

This Chapter is organised as follows. Section 6.2 gives an overview of the relevant literature. Section 6.3 provides data and variable descriptions as well as descriptive results. Section 6.4 presents the empirical framework and discusses the results. Section 6.5 concludes the empirical analysis.

6.2 Literature

In the case of early contract cancellation, both parties – training firms as well as apprentices – have to cope with possible consequences.

Training firms pursue either an investment or a substitution strategy. With an investment strategy, they face the net costs of training and depend on the retention of their apprentices to offset these costs. As the productivity of the apprentices is lower than their training costs, the firms depend not only on the apprentices' successful completion of the training, but also on their retention thereafter to cover the costs incurred during the apprenticeship. In contrast, training firms which have a substitution strategy train apprentices whose productivity is higher than their training costs. In addition, the unit labour cost of their apprentices is lower than that of unskilled workers; these companies thus substitute unskilled workers with apprentices (Lindley, 1975).

For Germany, the existing literature agrees on the dominance of the investment strategy (e.g. Beicht, Walden and Herget, 2004; Jansen et al., 2015; Mohrenweiser and Backes-Gellner, 2010; Mohrenweiser and Zwick, 2009). Relying on this, investment in human capital has to achieve

utility gains for the firms in question. Jansen et al. (2015) find that, by retaining graduates, firms are able to save personnel costs, such as recruitment and on-the-job training costs. Furthermore, according to Wolter and Schweri (2002), the decision to retain apprentices depends more on the benefits derived after the apprenticeship than on the net costs incurred during the apprenticeship. Moreover, training firms with an investment strategy seek to avoid matching problems, as well as skill shortages, in times of tight labour markets (e.g. Fougère and Schwerdt, 2002; Zwick, 2007).

Other factors determining whether to substitute or to invest are the size of the firm (e.g. Jansen et al., 2015; Soskice, 1994; Wolter, Mühlemann and Schweri, 2006) and sector (e.g. Büchel and Neubäumer, 2001; Mohrenweiser and Backes-Gellner, 2010). Mohrenweiser and Backes-Gellner (2010) reveal that, compared to training firms in the manufacturing sector, those in the service sector are more likely to pursue a substitution strategy and have lower rates of retention, using a ten-year data panel (IAB Establishment Panel 2003). One explanation may be found in Lazear's (2009) skill weight approach, according to which general skills and higher probabilities of external job offers are more frequent in the service sector. Soskice (1994) finds a higher commitment to training in larger and medium-sized firms, which are more likely to retain their apprentices, due to the presence of internal labour markets.

Apprentices, for their part, may rethink an earlier educational decision (e.g. Bessey and Backes-Gellner, 2015; Schmid and Stalder, 2016). However, Schmid and Stalder (2016) conclude that not every early contract cancellation is followed by negative consequences, using information from a three-year panel analysis on individuals in the Swiss canton of Bern. All apprentices who change company or occupation, downgrade or upgrade are happier with their new educational situation. However, individuals who cancel without re-entering the training system (i.e. who drop out) have particularly poor career prospects. Similar to Schmid and Stalder (2016), Bessey and Backes-Gellner (2015) analyse cancellations by German apprentices by using hazard-rate and competing-risks models. The authors show that financial distress and lower income are important determinants for dropping out, whereas bad matches increase the probability of changing firm or occupation. Further objective determinants that influence the apprentices to cancel training agreements are gender, and labour market conditions (e.g. Beicht and Krewerth, 2010; Bessey and Backes-Gellner, 2015), as well as the level of schooling completed (e.g. Bednarz, 2014; Cutler and Lleras-Muney, 2008), migration background (e.g.

Beicht and Walden, 2013; Dostie, 2010), secondary jobs (Chapter 4 and Seidel, 2019) and region (e.g. Bessey and Backes-Gellner, 2015).

To summarise the relevant literature: on the one hand, training firms face the risk of net costs while, on the other, apprentices are confronted with a higher risk of long-term unemployment and poorer income prospects when a contract is cancelled early. Hence, the question remains as to how early contract cancellation in VET can be avoided. The literature on contract cancellations in VET, naturally finds objective determinants that influence the tendency in apprentices to leave early; however, research on subjective determinants is rather scarce.

One important subjective determinant seems to be the quality of training. According to the recent literature, training quality depends on working conditions, contents of training, quality of trainers, and problems with trainers, teachers, colleagues or classmates (e.g. Beicht and Walden, 2013; Negrini et al., 2016; Schöngen, 2003; Stalder and Schmid, 2016). Training quality can be linked to early contract cancellation in VET: Negrini et al. (2016), for example, conclude that offering a higher quality of training lowers the risk of premature contract termination in Switzerland. However, other factors have the ability to offset low quality, e.g. atmosphere or the resilience of trainees. Schöngen (2003) reports problems with the trainer and insufficient content as reasons for early contract cancellations in VET. Stalder and Schmid (2016) concur that training firms could lower the probability of early contract cancellation in VET if they ensure training quality. Furthermore, Beicht and Krewerth (2010) measure the determinants for being satisfied with remuneration and find that the remuneration of less-satisfied apprentices is 20% below the class average. Moreover, apprentices working overtime hours and with a second job are less satisfied.

In summary, finding job characteristics that increase job quality, and lower the probability of early contract cancellation, could help to maximise the ability of training firms' to cover the net costs incurred during an apprenticeship. Furthermore, this could lower the risk of long-term unemployment and poor income prospects for apprentices. Since, as far as can be discerned, research on 'soft' job characteristics and their effect on early contract cancellation has only been analysed for regular employment, I contribute to the recent literature with my analysis on early contract cancellations in VET.

6.3 Data and descriptive statistics

6.3.1 Data

The empirical analysis is based on the ‘BIBB Survey Vocational Training from the Trainee’s Point of View, 2008’ conducted by the Federal Institute for Vocational Education and Training (BIBB). In this representative, German, firm-level study, 5901 apprentices, located in six German federal states were interviewed during the second year of their apprenticeship. The sample included apprentices in 340 classes, across 205 schools, in 15 common occupations).⁴⁶ The survey covers the design, procedures, basic conditions and quality criteria of apprenticeships. Additionally, it includes information about the educational background, gender, age, migration background and training allowance of apprentices. Since this sample contains apprentices in their second year of apprenticeship, some may already have cancelled their contract early and were not, therefore included. Contract cancellations during the first year are mainly due to mismatches and, therefore, could be avoided by learning more about the occupation, the apprenticeship and its conditions, as well as about the training firm. However, I am interested in the determinants of early contract cancellations that lie beyond mismatch problems, so observing second-year apprentices seems appropriate. See Krewerth et al. (2011) for detailed information on the data set.⁴⁷

6.3.2 Variables

The question, ‘Have you ever seriously thought about dropping out of an apprenticeship?’ captures apprentices’ intention to cancel a contract early. This indicator takes on the value 1 when an individual answered ‘Yes’, and the value 0 otherwise. However, according to Bessey and Backes Gellner (2015) and Stalder and Schmid (2016), apprentices have four choices: an apprentice can finish, upgrade (study), change (occupation or firm) or drop out of an apprenticeship without re-entering the VET system. Since I am not able to identify the real outcome, this research focuses on the intention to leave the apprenticeship or, in other words, the intention to cancel a contract early. The ability to identify only the intention, rather than the decision itself, does not necessarily have to be a drawback. A significant body of literature confirms the reliability of indicators as a proxy for real behaviour (e.g. Ajzen and Fishbein,

⁴⁶ The six federal states are: Hamburg, Hesse, North-Rhine-Westphalia, Baden-Württemberg, Brandenburg, Thuringia

⁴⁷ The data set is accessible for the scientific community as a scientific use file, free of cost and provided by the Federal Institute for Vocational Education and Training (BIBB) (see <https://www.bibb.de/de/1394.php>). For more information, see Krewerth et al. (2011).

1980; Gordon and Denisi, 1995; Igarria and Greenhaus, 1992; Shields and Ward, 2001; Steel and Ovalle, 1984). According to Ajzen and Fishbein (1980) or Igarria and Greenhaus (1992), intentions in general, and intentions to leave especially, seem to be good indicators for the actual behaviour of individuals. Moreover, the meta-analysis conducted by Steel and Ovalle (1984) reports a positive relationship between intentions and employee turnover. Their analysis of 34 psychological studies conducted between 1965 and 1983 reports a correlation coefficient of 0.50 between the intention to leave and the actual turnover and confirms a strong relationship. Moreover, examining the intentions of apprentices to cancel a contract early might help to identify problems at an earlier stage.

This research focuses primarily on 10 questions which capture partial aspects of the training quality and cover performance, personal development, career development and prospects or position in society and their meaning to apprentices. In a first step the apprentices were asked to rate on a scale from 1 to 6 (1 = very important; 6 = not important) how important the following aspects are:

How important is it for you:

- 1) to become independent?
- 2) that your apprenticeship increases your interest in political and economic questions?
- 3) that your training company retains you after your apprenticeship?
- 4) that you learn occupation-specific contents?
- 5) that you can transfer your occupational skills to other firms and work areas within the occupation you studied?
- 6) that you achieve a good vocational degree grade?
- 7) that you achieve a good grade in your final exam?
- 8) that your apprenticeship encourages you to invest constantly in further training?
- 9) that your apprenticeship provides a stable foundation for you to become self-employed?
- 10) that you are socially accepted?

In a second step, the apprentices were asked to rate on a scale from 1 to 6 (1 = will be achieved; 6 = will not be achieved) how likely it is that they will achieve the elements described above. For better interpretation, each scale is aggregated, with 1–3 aggregated to ‘important’ (‘will be achieved’) and 4–6 to ‘not important’ (‘will not be achieved’). To capture the training quality in its entirety, the apprentices were also asked to rate their apprenticeship by giving a grade

from 1–6, whereby 1 stands for a ‘very good’ and 6 for a ‘very bad’ apprenticeship (‘VET-Rating’).

Further, I follow the recent literature on early contract cancellations in VET by controlling for monthly income and considering the type of occupation (categorised as manufacturing, personal-related services, business-related services and IT-services).⁴⁸ Relying on Beicht and Walden (2013), I also control whether an individual is in their first-choice occupation. Given that some apprentices accept particular apprenticeships because of a lack of other opportunities, they may be more prepared to cancel a contract as soon as a better alternative appears. Individual characteristics, such as school performance, age, gender, region and migration background are included, as well as dummies for the number of all employees at the training location (including the apprentice interviewed) and the work atmosphere. Level of school performance is considered in two ways: six school certificate dummies are used and, additionally, grades in mathematics and in German.⁴⁹ For detailed information see also the summary statistics (Table 6.6 in the Appendix).

6.3.3 Descriptive statistics

The sample comprises 4099 observations. Apprentices who were trained externally or inter-company (in German, *außer/überbetriebliche Ausbildung*) are excluded to avoid biased results. Externally and inter-company trained apprentices are often disadvantaged apprentices, who were initially unable to find an apprenticeship and differ from the majority of apprentices. Furthermore, in particular for income and firm-size, the data reveals a lack of information, which led to a reduction in the sample size from 5901 to 4099 observations.

Overall, 34.0% of all apprentices in the sample considered cancelling their apprenticeship contract early (see

Table 6.1 and Appendix Table 6.6). The sample furthermore reveals that apprentices with an intention to cancel early are more often male (54.9%), in manufacturing (35.3%) or business-related service occupations (34.5%) and with lower incomes (49.5%). More demanding working conditions (e.g. working time, physical or mental stress) could explain the differences observed between the types of occupations. Additionally,

⁴⁸ The classification of occupations is built on the KldB 2010.

⁴⁹ School diploma dummies: no diploma (reference category); special needs school (German: ‘*Sonderschule*’) secondary general school (German: ‘*Hauptschule*’), intermediate secondary school (German: ‘*Realschule*’), upper secondary school (German: ‘*Gymnasium*’), other.

Table 6.1 shows a greater intention to cancel early among apprentices with a lower level of schooling, which might be due to poorer decision-making abilities (e.g. Cutler and Lleras-Muney, 2008). See also t-tests in the Appendix: Table 6.11.

Table 6.1 Intention to cancel early by characteristics

| | Intention to cancel early | | Total |
|------------------------------------|----------------------------------|--------|--------|
| | No | Yes | |
| Gender | | | |
| Men | 65.5% | 54.9% | 61.9% |
| Women | 34.5% | 45.1% | 38.1% |
| Total | 100.0% | 100.0% | 100.0% |
| Income | | | |
| 0 - 400 EUR | 32.5% | 49.5% | 38.3% |
| 401- 600 EUR | 49.9% | 43.4% | 47.7% |
| 600 - 1500 EUR | 17.6% | 7.1% | 14.1% |
| Total | 100.0% | 100.0% | 100.0% |
| Type of occupation | | | |
| Manufacturing | 40.6% | 35.3% | 38.8% |
| Personal-related services | 14.2% | 25.2% | 18.0% |
| Business/Business-related services | 35.5% | 34.5% | 35.2% |
| IT-services | 9.6% | 5.0% | 8.0% |
| Total | 100.0% | 100.0% | 100.0% |
| Highest school degree | | | |
| No degree | 0.3% | 0.4% | 0.4% |
| Special needs degree | 0.3% | 0.4% | 0.3% |
| Second general school | 14.5% | 27.2% | 18.8% |
| Intermediate secondary school | 50.3% | 51.8% | 50.8% |
| Upper secondary school | 34.0% | 19.6% | 29.1% |
| Other degree | 0.6% | 0.6% | 0.6% |
| Total | 100.0% | 100.0% | 100.0% |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Further differences are revealed in Table 6.2. Overall, the majority of the apprentices were convinced that they would achieve the 10 stated goals. However, apprentices with an intention to cancel early were more sceptical. In particular, 65.1% did not expect to be more interested in political and economic questions; 45.2% did not believe they would be retained afterwards and 51.7% did not believe they would be able to run their own business. See also t-test in the Appendix: Table 6.10.

Table 6.2 Intention to cancel a contract early by goal

| | Intention to cancel early | | Total |
|--|----------------------------------|-------------|--------------|
| | No | Yes | |
| Goal 1: Acquired independency | | | |
| No | 8.8% | 20.2% | 12.7% |
| Yes | 91.2% | 79.8% | 87.3% |
| Goal 2: Increasing interest in political and economic questions | | | |
| No | 47.0% | 65.1% | 53.1% |
| Yes | 53.0% | 34.9% | 46.9% |
| Goal 3: Taken over | | | |
| No | 24.6% | 45.2% | 31.6% |
| Yes | 75.4% | 54.8% | 68.4% |
| Goal 4: Learning occupational contents | | | |
| No | 11.9% | 32.9% | 19.0% |
| Yes | 88.1% | 67.1% | 81.0% |
| Goal 5: Transferability of skills to other companies/work areas | | | |
| No | 12.2% | 26.3% | 17.0% |
| Yes | 87.8% | 73.7% | 83.0% |
| Goal 6: Good vocational degree grade | | | |
| No | 9.3% | 21.3% | 13.4% |
| Yes | 90.7% | 78.7% | 86.6% |
| Goal 7: Good exam grade | | | |
| No | 6.8% | 18.4% | 10.7% |
| Yes | 93.2% | 81.6% | 89.3% |
| Goal 8: Training further constantly | | | |
| No | 14.2% | 33.4% | 20.7% |
| Yes | 85.8% | 66.6% | 79.3% |
| Goal 9: Be able to get self employed | | | |
| No | 44.0% | 51.7% | 46.6% |
| Yes | 56.0% | 48.3% | 53.4% |
| Goal 10: Social acceptance | | | |
| No | 16.8% | 30.3% | 21.4% |
| Yes | 83.2% | 69.7% | 78.6% |
| Total for each goal | 2711 | 1388 | 4099 |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

6.4 Empirical framework and results

6.4.1 Estimation method

I make the assumption that individuals will choose to invest in human capital if it yields the highest net present value. However, apprentices have the opportunity to revise their earlier decisions if they seem to be unprofitable (e.g. Bessey and Backes-Gellner, 2015; Stalder and Schmid, 2016); thus, unexpectedly high costs or lower than expected benefits can encourage an apprentice to cancel a contract early.

Since I can only observe the intention of apprentices, and not the net utility of staying in an apprenticeship, I use a probit regression as an empirical approach:

$$\Pr(y = 1|X) = \Phi(X\beta) \quad (1)$$

X is the matrix of explanatory variables and β contains the corresponding parameter values. Finally, Φ represents the cdf of a standard normal distribution.

The underlying latent model is:

$$y_i = \begin{cases} 0, & y_i^* \geq \tau \\ 1, & y_i^* < \tau \end{cases} \quad (2)$$

The underlying, dependent, unobserved, continuous variable y^* contains individuals' utility in the apprenticeship

$$y_i^* = \beta_0 + \beta_1 x_{i1} + \dots + \beta_k x_{ik} + \epsilon_i = x_i' \beta + \epsilon_i \quad (3)$$

where ϵ_i is i.i.d. with a standard normal distribution and independent of x_i' ,

$$\epsilon_i | x_i \sim N(0,1) \quad (4).$$

x_i' is a vector of individual and firm-specific characteristics of apprentice i , and β is the corresponding parameter vector.

Finally, assuming that τ represents a utility threshold, it follows from equations 2 and 3 that the intention to cancel early increases when the utility of the apprentice i falls below the threshold τ .

Further, to measure the effect of the 10 achievements on training quality, I also run an ordered probit model.

For this approach, a latent variable s_i^* is considered:

$$s_i^* = x_i' \beta + \mu_i, i = 1, \dots, N \quad (5)$$

By defining:

$$s_i = m \text{ if } \kappa_{m-1} \leq s_i^* \leq \kappa_m, m = 1, \dots, M \quad (6)$$

the conditional probability of observing a certain stated level of training quality (s_i^*) is:

$$\Pr(s_i = m | x_i) = \Pr(\kappa_{m-1} \leq x_i' \beta + \mu_i \leq \kappa_m) = \Pr(\kappa_{m-1} \leq s_i^* \leq \kappa_m) \quad (7).$$

The coefficients and threshold parameters (β, κ) were estimated together. Further, μ_i is normally distributed, M is the number of possible outcomes and κ_0 is taken as $-\infty$ and κ_m as $+\infty$ (Longe and Freese, 2014).

6.4.2 Results

Table 6.3 contains two models. The first estimates the effect of the 10 expected achievements on the intention to cancel a contract, using a standard probit model. Model 2 uses an ordered probit regression, measuring how the 10 expected achievements affect the apprentices' perception of training quality. The standard probit regression reports average marginal effects and standard errors in parentheses.⁵⁰ The ordered probit regression contains coefficients. It should be noted that this research focuses primarily on interpreting the effect of the 10 identified achievements on the intention to cancel. However, I will analyse whether the effects differ between groups, such as men, women or type of occupation. I also control for migration background, age, gender, region, school level, grades in mathematics and German, income, favourite occupation, work atmosphere, firm-size, job satisfaction and holding a second job. I have run all estimations with and without robust standard errors, but found no evidence for misspecification (see Appendix Table 6.8). Hence, this table and all further estimations display results without robust standard errors.

⁵⁰ I use average marginal effects (absolute) to interpret the results, i.e. the average size of the effect of a discrete or partial change of a variable across all observations. According to Long and Freese (2014), while all variables are held constant at their observed values, a marginal effect for a discrete or partial change of a variable for each observation is calculated. Finally, the average overall calculated marginal effect is generated and represents the average marginal effect.

Beginning with the standard probit regression in Table 6.3, statistically and economically significant effects on the intention to cancel a contract are found for: (1) apprenticeships that increase the interest in political and economic questions; (2) apprentices who expect to be retained after completion; (3) apprenticeships which encourage apprentices to invest constantly in further training and (4) apprenticeships that enable apprentices to become self-employed.

Table 6.3 The intention to cancel the contract early

| | Probit | OProbit |
|---|------------------------------|------------------------|
| | Intention to cancel early | VET-Rating |
| 1. Goal: Independency | 0.0050 (0.0199) | -0.2504*** (0.0572) |
| 2. Goal Interest in political/economic questions | -0.0371*** (0.0135) | -0.1325*** (0.0376) |
| 3. Goal: Take over | -0.0374*** (0.0143) | -0.1667*** (0.0400) |
| 4. Goal: Learn occupational content | -0.0207 (0.0185) | -0.6705*** (0.0519) |
| 5. Goal: Transferability to other companies/ work areas | -0.0155 (0.0182) | -0.1550*** (0.0514) |
| 6. Goal: Good vocational degree | -0.0315 (0.0219) | -0.1591*** (0.0611) |
| 7. Goal: Good exam grade | -0.0365 (0.0241) | -0.1335** (0.0669) |
| 8. Goal: Further training | -0.0453** (0.0178) | -0.2703*** (0.0490) |
| 9. Goal: Ability to become self-employed | 0.0299** (0.0136) | -0.0332 (0.0385) |
| 10. Goal: Social acceptance | 0.0187 (0.0161) | -0.1226*** (0.0469) |
| VET-Rating | 0.0951*** (0.0086) | |
| Cut1 | | -2.2964*** (0.3251) |
| Cut2 | | -0.4220 (0.3242) |
| Cut3 | | 1.0339*** (0.3247) |
| Cut4 | | 2.1654*** (0.3263) |
| Cut5 | | 3.3600*** (0.3390) |
| Pseudo R ² | 0.2490 | 0.1971 |
| N | 4099 | 4099 |

Notes: Probit model contains average marginal effects and standard errors in parentheses as well as controls for migration background, age, gender, region, level of education, school performance, income, firm size, favourite occupation, work atmosphere and secondary job. Ordered probit model contains coefficients and standard errors in parentheses and controls for migration background, age, region, gender, level of education, school performance, income, firm size, favourite occupation, work condition and secondary job. Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008. * p<0.10, ** p<0.05, *** p<0.01.

Firstly, the expectation of being retained after completing the apprenticeship lowers the intention to cancel the contract by 3.7 percentage points at a 1%-level (relative average marginal

effect: $-0.0374/0.34 = -11.0\%$). Being informed of such retention may signal job security in terms of good employment, career and income prospects as well as development chances. The results are also in line with Clark's (2001) analysis of individuals in British households. Besides pay, Clark (2001) identifies job security as a powerful measurement in predicting cancelled contracts among British individuals.

Secondly, encouraging apprentices to participate in further training seems also to act as a sign of job security. The intention to cancel a contract decreases by 4.5 percentage points at a 1%-level (relative average marginal effect: $-0.0453/0.34 = -13.3\%$). According to Becker (2009), investment in human capital, especially in specific human capital, has to pay off for companies. It seems that providing further training is due to the need of firms to fill vacancies with higher skill requirements. Hence, the provision of further training signals future career advancement (see Sadowski, 1980). Surprisingly, learning occupation-specific and relevant content is insignificant. However, it will become clear during the probation period, or at least within the first year, whether or not the occupation-specific content matches expectations. This kind of mismatch is likely to lead to an early contract cancellation (change, upgrade or dropout) within the first year.

Thirdly, increasing interest in political and economic questions lowers the intention to leave an apprenticeship by 3.7 percentage points at a 1%-level (relative average marginal effect: $-0.371/0.34 = -10.9\%$). This achievement seems to be strongly related to the type of occupation. Obviously, political and economic questions are of more relevance in business-related service occupations. Here, the ability to recognise certain coherences might improve performance in employment. The contrasts of margins in Table 6.4 confirm this assumption. The results suggest a 4.5 percentage point lower intention to leave for business-related service apprentices (at a 10%-level) but show insignificant effects for the other types of apprentices.

Table 6.4 Contrasts of predictive margins across type of occupation I

| Types of occupation#Interest in political/economic question (Interaction Terms) | Intention to cancel early b/se/ci95 |
|--|---|
| Manufacturing: Political and economic interest - Yes | -0.0341 (0.0210) [-0.0753,0.0070] |
| Personal-related service: Political and economic interest - Yes | -0.0548 (0.0347) [-0.1229,0.0133] |
| Business-related service: Political and economic interest - Yes | -0.0445 * (0.0229) [-0.0894,0.0004] |
| IT-service: Political and economic interest - Yes | 0.0033 (0.0416) [-0.0783,0.0849] |
| Joint | 8.87* |

Notes: Model contains contrast of margins effects and standard errors in parentheses as well as controls for migration background, age, gender, region, level of education, school performance, income, firm size, favourite occupation, work atmosphere, secondary job and VET-Rating.

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

* p<0.10, ** p<0.05, *** p<0.01.

Finally, enabling apprentices to become self-employed is, in contrast, positively related to the intention to cancel a contract. Feeling capable of running one's own business increases the intention to leave an apprenticeship at a 5%-level by 3.0 percentage points (relative average marginal effect: $0.0299/0.34 = 8.8\%$). It seems that as soon as an apprentice feels prepared to become self-employed, the wish to leave the training company increases.

Further, neither the expected final examination grade nor the vocational degree grade has an effect on the intention to leave. Moreover, no evidence for the importance of social acceptance or for the transferability of learned skills is found. Presumably, acceptance in society is decisive during the application phase; as soon as an individual has decided on an occupation, he/she is aware of the level of social acceptance. The same may apply to the transferability of skills to other companies or work areas: within the first year of the apprenticeship, apprentices will usually be aware of the content they will learn during the apprenticeship. Hence, the lack of transferability will probably be obvious within the first year.

The ordered probit regression in Table 6.3 reveals highly significant effects of the 10 achievements on the apprentices' perceptions of training quality. While expecting to be able to run one's own business shows insignificant results, all other potential achievements increase

the perceived quality of training as long as the apprentices expect to achieve them.⁵¹ However, the 10 questions are only able to capture some aspects of the training quality, hence the inclusion of the VET-Rating in the standard probit regression. This inclusion shows that the worse apprentices rate their apprenticeship, the higher the intention to leave the apprenticeship.

As a robustness check, the original job characteristic variables with six categories are also used and the estimations confirm the results previously reported. The more apprentices expect some form of job security or an increasing interest in political and economic questions, the less likely the intention to cancel the contract early, whereas the intention to do so is higher, the more apprentices expect to be able to run their own business. For more details, see Appendix Table 6.9.

Turning briefly to the control variables, the results are in line with the recent literature (see Section 6.2: Literature). Apprentices with a migration background, with low mathematics grades or who have a poor working environment are more likely to quit. Older apprentices and those with a higher income are less likely to do so. Further, holding a second job to cover living costs and working in a second-choice occupation increase the intention to leave an apprenticeship (for detailed information, see Appendix Table 6.8).

6.4.3 Differences across groups

Differences according to gender

The overall results show no differences between gender. However, with respect to job security, the results show some differences between the behaviour patterns of men and women. The contrast of margins reveals a decreasing intention to leave by 5.1 percentage points at a 5%-level as soon as women expect to be retained. Providing further training or encouraging female apprentices to train also leads to a lower intention to leave (- 6.3 percentage points at a 5%-level). Neither aspect has any effect on the behaviour of male apprentices (see Table 6.5).

⁵¹ (1) = ‘very good’ apprenticeship’; (6) = ‘very bad apprenticeship’.

Table 6.5 Contrasts of predictive margins by gender

| Types of occupation#Expectation (Interaction Terms) | Intention to cancel early b/se/ci95 |
|---|---|
| Men: Political and economic interest - Yes | -0.0485*** (0.0165) [-0.0809,-0.0161] |
| Women: Political and economic interest - Yes | -0.0178 (0.0223) [-0.0615,0.0258] |
| Joint | 9.10** |
| Men: Take over - Yes | -0.0290 (0.0177) [-0.0637,0.0057] |
| Women: Take over - Yes | -0.0506** (0.0233) [-0.0964,-0.0049] |
| Joint | 7.19** |
| Men: Content - Yes | -0.0052 (0.0219) [-0.0482,0.0378] |
| Women: Content - Yes | -0.0444 (0.0291) [-0.1014,0.0125] |
| Joint | 2.34 |
| Men: Further training - Yes | -0.0334 (0.0217) [-0.0760,0.0091] |
| Women: Further training - Yes | -0.0627** (0.0279) [-0.1173,-0.0081] |
| Joint | 6.95** |

Notes: Model contains contrast of margins effects and standard errors in parentheses as well as controls for migration background, age, gender, region, level of education, school performance, income, firm size, favourite occupation, work atmosphere, secondary job and VET-Rating.

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

* p<0.10, ** p<0.05, *** p<0.01.

The literature on risk-taking suggests that these differing reactions to signals of job security might be explained by higher risk aversion on the part of women (e.g. Borghans et al., 2009; Powell and Ansic, 1997). However, I suspect the explanation may lie in occupational segregation, in line with Rohrbach-Schmidt and Uhly (2015), who found different cancellation probabilities across occupations even when they controlled for socio-demographic and company-specific characteristics. The descriptive results support this assumption, with a higher share of women in personal and business-related service occupations, whilst more men are found in manufacturing and IT-service occupations. Hence, if a certain group of individuals sort more often into occupations with a lower probability of retention, they might react more strongly to security signals.

Differences across types of occupation

As mentioned before, in business-related service occupations, political and economic questions seem to assume a greater importance. Familiarity with such issues might help apprentices to perform better in employment. For these apprentices, the contrasts of margins in Table 6.4 reveal a lower intention to leave by 4.5 percentage points (at a 10%-level). Furthermore, apprentices in manufacturing occupations who expect a good examination grade have a lower intention to leave. In contrast, apprentices in personal-related service occupations have an increased intention to leave if they expect independence or self-employment. Moreover, IT-service apprentices increase their intention to leave significantly if they expecting self-employment (see Table 6.7 in the Appendix). It should be noted that, although the occupations chosen are common, considering only 15 occupations may lead to bias in the results. Hence, statements comparing types of occupation should be made very cautiously; interpretations can only highlight possible relationships.

Interaction between the importance of a goal and expecting to achieve this goal

As a final step, I checked whether the intention to leave changes if the importance of each goal is also considered individually. The contrasts of margins, surprisingly, show that the preliminary evaluation as to whether a goal is important for an apprentice has little effect on the results. However, the result for the aspect ‘Good examination grade’ show that apprentices’ intention to leave increases if they expect a good examination grade but rated this factor as unimportant in advance; and decreases if it was rated as important in advance (see Appendix Table 6.12).

6.4.4 Limitations

Unfortunately, the data set used has some drawbacks: I use a cross-sectional data set and, moreover, I observe the intention to leave apprenticeship early. Not every intention inevitably leads to an early contract cancellation (dropout, upgrade or change); apprentices can also finish their apprenticeship successfully. However, an extensive amount of psychological literature confirms a positive relationship between intention to leave and doing so (e.g. Ajzen and Fishbein, 1980; Igbaria and Greenhaus, 1992). Further, due to the cross-sectional structure of the data set, I have to address the problem of unobserved characteristics, such as ability, family support and family background. However, I control for a range of important characteristics to avoid biased results. For example, by using apprentices’ level of schooling and their performance at school, I am able to capture their abilities as well as their parents’ level of

education and, partially, their wealth (Black, Devereux and Salvanes, 2005). I further control for firm as well as individual characteristics to reduce potential bias.

6.5 Conclusion

This Chapter investigates the effect of ‘soft’ job characteristics on the intention to cancel an apprenticeship contract early. By focusing on subjective characteristics, I contribute to the recent literature on early contract cancellations in VET. To date, the literature has focused on objective determinants with respect to different types of cancellation, while I use job characteristics that are closely related to the quality of the training and, hence, to the intention to leave. This research is intended to identify determinants related to the quality of training that can be adapted by training firms in order to avoid costly early contract cancellation.

I use the data set ‘BIBB Survey Vocational Training from the Trainee’s Point of View, 2008’, conducted by the Federal Institute for Vocational Education and Training (BIBB). In this representative, German, firm-level study, 5901 apprentices (in 340 classes and at 205 schools) from 15 common training occupations in Germany were interviewed during the second year of their apprenticeship.

The results show statistically significant effects for job characteristics that represent job security. In particular, expecting to be retained after the apprenticeship and constantly encouraging apprentices to train decrease the intention to leave significantly. Being told that one will be retained might signal job security in terms of good employment, career and income prospects as well as development opportunities. The encouragement towards continual professional development further acts as a sign of job security. Here the investment in specific human capital is linked to job vacancies with higher skill requirements or career advancement (Sadowski, 1980). Further, it seems that women, in particular, react to job security signals, but are also more likely to be found in occupations with a lower probability of retention. This is, consequently, an indication of occupational segregation rather than a difference between genders. Surprisingly, apprentices who expect to be able to run their own business have a higher intention to leave. In occupations with high rates of self-employment rates, this could reduce the willingness of firms to train apprentices. For business-related service occupations, political and economic questions have greater importance. Here, greater familiarity with such issues may help an apprentice to perform better in employment. Learning occupation-specific content, good examination and vocational degree grades, transferability and social acceptance have no

effect on the intention to quit. Surprisingly, it is of no great importance whether the achievement of a certain goal was rated as important in advance.

I have already mentioned the possibility of biased results caused by unobserved characteristics and an incomplete set of considered occupations. Hence, for further research, a comparison across occupations would be of great interest; preferably, this survey should be conducted again with a wider selection of occupations. Overall, a panel analysis would help to control for unobserved individual and firm characteristics. However, there are few data sets available that focus specifically on apprentices and the number of observations here is very high compared to other data sets. Furthermore, this data set contains a rich set of ‘soft’ job characteristics closely related to the quality of training and the aims of apprentices. This allows a deeper look into the reasons for early contract cancellations in VET and reveals some interesting results which might induce more specific research in this area.

6.6 References for Chapter 6

- Ajzen, I., and M. Fishbein, 1980. *Understanding attitudes and predicting social behavior*. Englewood Cliffs: Prentice-Hall.
- Becker, G. S., 2009. *Human capital: a theoretical and empirical analysis, with special reference to education*, 3rd Edition, University of Chicago Press.
- Bednarz, A., 2014. Understanding the non-completion of apprentices. National Vocational Education and Training Research Program, NCVET. Adelaide.
- Beicht, U., and A. Krewerth, 2010. *Geld spielt eine Rolle!: Sind Auszubildende mit ihrer Vergütung zufrieden?* BIBB Report 14/10. Bonn.
- Beicht, U., and G. Walden, 2013. *Duale Berufsausbildung ohne Abschluss-Ursachen und weiterer bildungsbiografischer Verlauf*. BIBB Report 21/13. Bonn.
- Beicht, U., Walden, G., and H. Herget, 2004. *Kosten und Nutzen der betrieblichen Berufsausbildung in Deutschland*. Bertelsmann, Bielefeld.
- Bessey, D., and U. Backes-Gellner, 2015. Staying within or leaving the apprenticeship system? Revisions of educational choices in apprenticeship training. *Journal of Economics and Statistics (Jahrbuecher fuer Nationaloekonomie und Statistik)*, 235(6): 539-552.
- BIBB Bundesinstitut für Berufsbildung, 2019. Datenreport zum Berufsbildungsbericht 2019- Informationen und Analysen zur Entwicklung der beruflichen Bildung. Bonn.
- Black, S., Devereux, P., and K. G. Salvanes, 2005. Why the apple doesn't fall far: understanding intergenerational transmission of human capital. *American Economic Review*, 95(1): 437-449.
- Borghans, L., Golsteyn, B. H. H., Heckman, J. J., and H. Meijers, 2009. Gender differences in risk aversion and ambiguity aversion. *Journal of the European Economic Association*, 7(2-3): 649–658.
- Büchel, F., and R. Neubäumer, 2001. Ausbildungsinadäquate Beschäftigung als Folge branchenspezifischer Ausbildungsstrategien. *Mitteilungen aus der Arbeitsmarkt-und Berufsforschung*, 34(3): 269–285.
- Clark, A. E., 2001. What really matters in a job? Hedonic measurement using quit data. *Labour Economics*, 8(2): 223-242.

- Cutler, D. M., and A. Lleras-Muney, 2008. *Education and Health: Evaluating Theories and Evidence*. In J. House, R. Schoeni, G. Kaplan, & H. Pollack (Hrsg.). New, York: Russell Sage Foundation.
- Dostie, B., 2010. A competing risks analysis of the determinants of low completion rates in the Canadian apprenticeship system. CLSSRN working papers, Vancouver School of Economics.
- Fougère, D., and W. Schwerdt, 2002. Are apprentices productive?'. *Konjunkturpolitik*, 48: 317–346.
- Gordon, M. E., and A. S. Denisi, 1995. A re-examination of the relationship between union membership and job satisfaction. *Industrial & Labor Relations Review*, 48(2): 222-236.
- Igbaria, M., and J. H. Greenhaus, 1992. Determinants of MIS employees' turnover intentions: a structural equation model. *Communications of the ACM*, 35(2): 34-49.
- Jansen, A., Pfeifer, H., Schönfeld, G., and F. Wenzelmann, 2015. *Ausbildung in Deutschland weiterhin investitionsorientiert - Ergebnisse der BIBB-Kosten-Nutzen-Erhebung 2012/2013*. BIBB Report 1/2015, Bonn.
- Krewerth, A., Beicht, U., Eberhard, V., Granato, M., and J. Gei, 2011. BIBB-Studie Ausbildung aus Sicht der Auszubildenden 2008, SUF1.1. Bonn: Forschungsdatenzentrum im BIBB (Hrsg., Datenzugang): Bundesinsitut für Berufsbildung (BIBB).
- Lazear, E. P., 2009. Firm-specific human capital: a skill-weights approach. *Journal of Political Economy*, 117(5): 914–940.
- Lindley, R. M., 1975. The demand for apprentice recruits by the engineering industry, 1951-71. *Scottish Journal of Political Economy*, 22(1): 1–24.
- Long, J. S., and J. Freese, 2014. *Regression models for categorical dependent variables using Stata*, 3rd Edition, Stata Press.
- Mohrenweiser, J., and U. Backes-Gellner, 2010. Apprenticeship training: for investment or substitution? *International Journal of Manpower*, 31(5): 545–562.
- Mohrenweiser, J. and T. Zwick, 2009. Why do firms train apprentices? The net cost puzzle reconsidered. *Labour Economics*, 16(6): 631–637.
- Negrini, L., Forsblom, L., Gurtner, J.-L., and S. Schumann, 2016. Is there a relationship between training quality and premature contract terminations in VET? *Vocations and Learning*, 9(3): 361-378.

- Powell, M., and D. Ansic, 1997. Gender differences in risk behaviour in financial decision-making: an experimental analysis. *Journal of Economic Psychology*, 18(6): 605–628.
- Rohrbach-Schmidt, D., and A. Uhly, 2015. Determinanten vorzeitiger Lösungen von Ausbildungsverträgen und berufliche Segmentierung im dualen System. Eine Mehrebenenanalyse auf Basis der Berufsbildungsstatistik. *KZfSS Kölner Zeitschrift für Soziologie und Sozialpsychologie*, 67(1): 105-135.
- Ryan, P, 2001. The school-to-work transition: a cross-national perspective. *Journal of Economic Literature*, 39(1): 34–92.
- Sadowski, D, 1980. *Berufliche Bildung und betriebliches Bildungsbudget: Zur ökonomischen Theorie der Personalbeschaffungs- und Bildungsplanung im Unternehmen*. Poeschel.
- Schöngen, K., 2003. Lösung von Ausbildungsverträgen - Schon Ausbildungsabbruch? *Informationen für die Beratungs- und Vermittlungsdienste der Bundesanstalt für Arbeit*, 25: 5-19.
- Seidel, K., 2019. The intention to quit apprenticeships and the role of secondary jobs. *Journal of Vocational Education & Training*, 71(4): 556-578.
- Shields, M. A., and M. Ward, 2001. Improving nurse retention in the National Health Service in England: the impact of job satisfaction on intentions to quit. *Journal of Health Economics*, 20(5): 677-701.
- Soskice, D., 1994. *Reconciling markets and institutions: the German apprenticeship system*. In *Training and the private sector: International comparisons*, NBER & University of Chicago Press.
- Stalder, B. E., and E. Schmid, 2016. Lehrvertragsauflösung und Ausbildungserfolg - kein Widerspruch. Wege und Umwege zum Berufsabschluss [Cancellation of apprenticeship contracts and educational success - no contradiction. Paths and detours to vocational qualifications]. Bern: Hep-Verlag Bern.
- Steel, R. P., and N. K. Ovalle, 1984. A review and meta-analysis of research on the relationship between behavioral intentions and employee turnover. *Journal of Applied Psychology*, 69(4): 673-686.
- Wolter, S. C., Mühlemann, S., and J. Schweri, 2006. Why some firms train apprentices and many others do not. *German Economic Review*, 7(3): 249–264.
- Wolter, S. C., and J. Schweri, 2002. The cost and benefit of apprenticeship training: the Swiss case. *KONJUNKTURPOLITIK-BERLIN* 48(3/4): 347–367.

Zwick, T., 2007. Apprenticeship training in Germany -investment or productivity driven?
Zeitschrift für Arbeitsmarktforschung, 40(2/3): 193–204.

6.7 Appendix for Chapter 6

Table 6.6 Summary statistics

| Variables | MEAN | SD | MIN | MAX |
|-------------------------------------|-------------|-----------|------------|------------|
| Intention to cancel early | 0.34 | | 0 | 1 |
| Importance of goal | | | | |
| Independency | 0.97 | | 0 | 1 |
| Political/economic interest | 0.57 | | 0 | 1 |
| Take over | 0.80 | | 0 | 1 |
| Content | 0.98 | | 0 | 1 |
| Transferability | 0.96 | | 0 | 1 |
| Good vocational degree | 0.97 | | 0 | 1 |
| Good exam grade | 0.99 | | 0 | 1 |
| Further training | 0.93 | | 0 | 1 |
| Self-employment | 0.75 | | 0 | 1 |
| Social acceptance | 0.88 | | 0 | 1 |
| Expecting the achievement of a goal | | | | |
| Independency | 0.87 | | 0 | 1 |
| Political/economic interest | 0.47 | | 0 | 1 |
| Take over | 0.68 | | 0 | 1 |
| Content | 0.81 | | 0 | 1 |
| Transferability | 0.83 | | 0 | 1 |
| Good vocational degree | 0.87 | | 0 | 1 |
| Good exam grade | 0.89 | | 0 | 1 |
| Further training | 0.79 | | 0 | 1 |
| Self-employment | 0.53 | | 0 | 1 |
| Social acceptance | 0.79 | | 0 | 1 |
| VET-Rating | 2.59 | 0.92 | 1 | 6 |
| Work atmosphere | 2.38 | 1.13 | 1 | 6 |
| Income | | | | |
| Income: < 401 Euro | 0.38 | | 0 | 1 |
| Income 401-600 EUR | 0.48 | | 0 | 1 |
| Income: 601-1500 EUR | 0.14 | | 0 | 1 |
| Type of occupation | | | | |
| Manufacturing | 0.39 | | 0 | 1 |
| Personal-related service | 0.18 | | 0 | 1 |
| Business-related service | 0.35 | | 0 | 1 |
| IT-service | 0.08 | | 0 | 1 |
| Women | 0.38 | | 0 | 1 |
| Migration background | 0.16 | | 0 | 1 |
| Age | | | | |
| Age: 15-19 | 0.38 | | 0 | 1 |
| Age: 20-24 | 0.56 | | 0 | 1 |
| Age: 25-30 | 0.06 | | 0 | 1 |
| Region | | | | |
| West | 0.76 | | 0 | 1 |
| Highest school degree | | | | |
| No degree | 0.00 | | 0 | 1 |
| Special needs degree | 0.00 | | 0 | 1 |
| Second general school | 0.19 | | 0 | 1 |
| Intermediate secondary school | 0.51 | | 0 | 1 |
| Upper secondary school | 0.29 | | 0 | 1 |
| Other degree | 0.01 | | 0 | 1 |
| Grade: German | 2.71 | 0.76 | 1 | 6 |
| Grade: math | 2.71 | 0.95 | 1 | 6 |
| Evaluation of the chosen occupation | | | | |
| Dream occupation | 0.30 | | 0 | 1 |

| | | | |
|------------------------|------|---|---|
| Interesting occupation | 0.43 | 0 | 1 |
| Alternative occupation | 0.16 | 0 | 1 |
| Compensation | 0.07 | 0 | 1 |
| Do not know | 0.04 | 0 | 1 |

Number of observations 4099

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 6.7 Contrasts of predictive margins across types of occupation II

| Types of occupation#Expectation (Interaction Terms) | Intention to cancel early b/se/ci95 |
|---|--|
| Manufacturing: Independency - Yes | -0.0457 (0.0352) [-0.1147,0.0233] |
| Personal-related service: Independency - Yes | 0.1203*** (0.0463) [0.0295,0.2110] |
| Business-related service: Independency - Yes | -0.0121 (0.0343) [-0.0794,0.05526] |
| IT-service: Independency - Yes | 0.0132 (0.0516) [-0.0878,0.1143] |
| Joint | 8.65 * |
| Manufacturing: Political and economic interest - Yes | -0.0341 (0.0210) [-0.0753,0.0070] |
| Personal-related service: Political and economic interest - Yes | -0.0548 (0.0347) [-0.1229,0.0133] |
| Business-related service: Political and economic interest - Yes | -0.0445* (0.0229) [-0.0894,0.0004] |
| IT-service: Political and economic interest - Yes | 0.0033 (0.0416) [-0.0783,0.0849] |
| Joint | 8.87 * |
| Manufacturing: Take over - Yes | -0.0209 (0.0222) [-0.0645,0.0226] |
| Personal-related service: Take over - Yes | -0.0707** (0.0336) [-0.1366,-0.0047] |
| Business-related service: Take over - Yes | -0.0560** (0.0248) [-0.1047,-0.0074] |
| IT-service: Take over - Yes | 0.0517 (0.0410) [-0.0286,0.1321] |
| Joint | 11.89** |
| Manufacturing: Content - Yes | -0.0008 (0.0278) [-0.0554,0.0538] |
| Personal-related service: Content - Yes | -0.0245 (0.0470) [-0.1167,0.0677] |
| Business-related service: Content - Yes | -0.0365 (0.0306) [-0.0965,0.0235] |
| IT-service: Content - Yes | -0.0256 (0.0519) [-0.1274,0.0762] |
| Joint | 1.88 |
| Manufacturing: Transferability - Yes | -0.0122 (0.0275) [-0.0662,0.0417] |
| Personal-related service: Transferability - Yes | -0.0426 |

| | |
|--|---|
| | (0.0487) |
| Business-related service: Transferability - Yes | [-0.1381,0.0529] 0.0157 (0.0304) |
| IT-service: Transferability - Yes | [-0.0440,0.0754] -0.0482 (0.0559) |
| Joint | [-0.1578,0.0613] 1.97 |
| Manufacturing: Good vocational degree - Yes | -0.0078 (0.0306) |
| Personal-related service: Good vocational degree - Yes | [-0.0678,0.0522] -0.0086 (0.0557) |
| Business-related service: Good vocational degree - Yes | [-0.1178,0.1006] -0.0614 (0.0422) |
| IT-service: Good vocational degree - Yes | [-0.1441,0.0214] -0.1336 (0.0861) |
| Joint | [-0.3024,0.0352] 4.56 |
| IT-service: Good exam grade - Yes | -0.0659* (0.0365) |
| Personal-related service: Good exam grade - Yes | [-0.1375,0.0058] -0.0937 (0.0599) |
| Business-related service: Good exam grade - Yes | [-0.2111,0.0238] 0.0365 (0.0411) |
| IT-service: Good exam grade - Yes | [-0.0440,0.1170] -0.0358 (0.0796) |
| Joint | [-0.1918,0.1203] 6.69 |
| Manufacturing: Further training - Yes | -0.0090 (0.0265) |
| Personal-related service: Further training - Yes | [-0.0611,0.0430] -0.1017** (0.0467) |
| Business-related service: Further training - Yes | [-0.1932,-0.0103] -0.0484* (0.0285) |
| IT-service: Further training - Yes | [-0.1043,0.0076] -0.1019 (0.0786) |
| Joint | [-0.2560,0.0521] 9.35* |
| Manufacturing: Self-employment - Yes | -0.0003 (0.0216) |
| Personal-related service: Self-employment - Yes | [-0.0427,0.0421] 0.1370*** (0.0342) |
| Business -related service: Self-employment - Yes | [0.0699,0.2041] 0.0053 (0.0219) |
| IT-service: Self-employment - Yes | [-0.0376,0.0483] 0.0726* (0.0401) |
| Joint | [-0.0061,0.1512] 19.36*** |

| | |
|---|---|
| Manufacturing: Social acceptance - Yes | -0.0035 (0.0261) [-0.0547,0.0477] |
| Personal-related service: Social acceptance - Yes | 0.0175 (0.0392) [-0.0594,0.0944] |
| Business-related service: Social acceptance - Yes | 0.0317 (0.0263) [-0.0199,0.0833] |
| IT-service: Social acceptance - Yes | 0.0496 (0.0497) [-0.0478,0.1470] |
| Joint | 2.66 |

Notes: Model contains contrast of margins effects and standard errors in parentheses as well as controls for migration background, age, gender, region, level of education, school performance, income, firm size, favorite occupation, work atmosphere, secondary job and VET-Rating.

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

* p<0.10, ** p<0.05, *** p<0.01.

Table 6.8 Intention to cancel a contract early - Results in detail

| | Intention to quit | |
|---|--------------------------|------------------------|
| | Probit | Probit (Robust) |
| 1. Goal: Independency | 0.0050 (0.0199) | 0.0050 (0.0205) |
| 2. Goal Interest in political/economic questions | -0.0371*** (0.0135) | -0.0371*** (0.0134) |
| 3. Goal: Take over | -0.0374*** (0.0143) | -0.0374*** (0.0144) |
| 4. Goal: Learn occupational content | -0.0207 (0.0185) | -0.0207 (0.0186) |
| 5. Goal: Transferability to other companies/ work areas | -0.0155 (0.0182) | -0.0155 (0.0185) |
| 6. Goal: Good vocational degree | -0.0315 (0.0219) | -0.0315 (0.0221) |
| 7. Goal: Good exam grade | -0.0365 (0.0241) | -0.0365 (0.0243) |
| 8. Goal: Further training | -0.0453** (0.0178) | -0.0453** (0.0177) |
| 9. Goal: Ability to become self-employed | 0.0299** (0.0136) | 0.0299** (0.0135) |
| 10. Goal: Social acceptance | 0.0187 (0.0161) | 0.0187 (0.0164) |
| Women | 0.0023 (0.0175) | 0.0023 (0.0177) |
| Migration background | 0.0375** (0.0183) | 0.0375** (0.0185) |
| Age: 15-19 (reference category) | | 0.0000 |
| Age: 20-24 | -0.0018 (0.0149) | -0.0018 (0.0149) |
| Age: 25-30 | -0.1039*** (0.0271) | -0.1039*** (0.0263) |
| Region: East (reference category) | | |
| Region West | 0.0077 (0.0161) | 0.0077 (0.0164) |
| No degree (reference category) | | |
| Special needs school | 0.0647 (0.1671) | 0.0647 (0.1423) |
| Second general school | -0.0010 (0.1091) | -0.0010 (0.1047) |
| Intermediate secondary school | -0.0470 (0.1087) | -0.0470 (0.1042) |
| Upper secondary school | -0.1029 (0.1096) | -0.1029 (0.1054) |
| Other | -0.0340 (0.1369) | -0.0340 (0.1305) |
| Grade: German | -0.0144 (0.0089) | -0.0144 (0.0089) |
| Grade: Math | 0.0133* (0.0069) | 0.0133* (0.0069) |
| Income: <401 EUR (reference category) | | 0.0000 |
| Income: 401 - 600 EUR | -0.0301* (0.0160) | -0.0301* (0.0156) |
| Income: 601 -600 EUR | -0.0774*** (0.0245) | -0.0774*** (0.0234) |
| Firm size < 5 (reference category) | | |
| Firm size: 5-9 | 0.0273 (0.0222) | 0.0273 (0.0231) |
| Firm size: 10-49 | 0.0035 | 0.0035 |

| | | |
|---|-----------|-----------|
| | (0.0216) | (0.0221) |
| Firm size: 50-249 | -0.0092 | -0.0092 |
| | (0.0243) | (0.0245) |
| Firm size: 250-499 | -0.0183 | -0.0183 |
| | (0.0312) | (0.0306) |
| Firm size: 500-999 | 0.0196 | 0.0196 |
| | (0.0379) | (0.0363) |
| Firm size: 1000 or more | -0.0176 | -0.0176 |
| | (0.0357) | (0.0354) |
| <hr/> | | |
| Evaluation: Dream occupation (reference category) | | |
| Evaluation: Interesting occupation | 0.0458*** | 0.0458*** |
| | (0.0156) | (0.0151) |
| Evaluation: Alternative occupation | 0.0950*** | 0.0950*** |
| | (0.0208) | (0.0207) |
| Evaluation: Compensation | 0.1835*** | 0.1835*** |
| | (0.0307) | (0.0318) |
| Evaluation: Do not know | 0.1541*** | 0.1541*** |
| | (0.0365) | (0.0375) |
| <hr/> | | |
| Manufacturing (reference category) | | |
| Personal-related services | 0.1109*** | 0.1109*** |
| | (0.0224) | (0.0231) |
| Business/Business-related services | 0.0517*** | 0.0517*** |
| | (0.0199) | (0.0198) |
| IT-services | 0.0559* | 0.0559* |
| | (0.0289) | (0.0290) |
| <hr/> | | |
| VET-Rating | 0.0951*** | 0.0951*** |
| | (0.0086) | (0.0086) |
| <hr/> | | |
| Work atmosphere | 0.0736*** | 0.0736*** |
| | (0.0063) | (0.0065) |
| <hr/> | | |
| No secondary job (reference category) | | |
| Secondary job, money for living | 0.1289*** | 0.1289*** |
| | (0.0265) | (0.0274) |
| Secondary job, money for wishes | 0.0139 | 0.0139 |
| | (0.0236) | (0.0233) |
| Secondary job, money for both | 0.0260 | 0.0260 |
| | (0.0207) | (0.0209) |
| <hr/> | | |
| Pseudo R ² | 0.2490 | 0.1971 |
| N | 4099 | 4099 |

Notes: Both models contain average marginal effects and standard errors in parentheses.
Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

* p<0.10, ** p<0.05, *** p<0.01.

Table 6.9 Intention to cancel a contract early- Original categories

| | Intention to cancel early |
|---|---------------------------|
| | Probit |
| 1. Goal: Independency | -0.0043 (0.0070) |
| 2. Goal: Interest in political/economic questions | 0.0195*** (0.0050) |
| 3. Goal: Take over | 0.0132*** (0.0041) |
| 4. Goal: Learn occupational content | 0.0029 (0.0071) |
| 5. Goal: Transferability to other companies/ work areas | -0.0010 (0.0063) |
| 6. Goal: Good vocational degree | 0.0088 (0.0081) |
| 7. Goal: Good exam grade | 0.0104 (0.0090) |
| 8. Goal: Further training | 0.0144** (0.0062) |
| 9. Goal: Ability to become self-employed | -0.0138*** (0.0050) |
| 10. Goal: Social acceptance | -0.0068 (0.0059) |
| Controls | Yes |
| Pseudo R ² | 0.2493 |
| N | 4099 |

Notes: Both models contain average marginal effects and standard errors in parentheses. Explanatory variables contain 6 categories: From 1 (will be achieved completely) to 6 (won't be achieved). controls for migration background, age, gender, region, level of education, school performance, income, firm size, favourite occupation, work atmosphere and secondary job. Ordered probit model contains coefficients and standard errors in parentheses and controls for migration background, age, region, gender, level of education, school performance, income, firm size, favorite occupation, work condition and secondary job. Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 6.10 T-test: Intention to cancel a contract early by expected goal

| | Mean | T-test | N |
|-----------------------------|-----------|--------|-------|
| Intention to cancel early | | | 4099 |
| Independency | | | |
| No | 0.5414258 | 0.000 | 519 |
| Yes | 0.3092179 | | 3580 |
| Political/economic interest | | | |
| No | 0.414791 | 0.000 | 2177 |
| Yes | 0.2523413 | | 1922 |
| Take over | | | |
| No | 0.4849421 | 0.000 | 1.295 |
| Yes | 0.2710414 | | 2804 |
| Content | | | |
| No | 0.5866496 | 0.000 | 779 |
| Yes | 0.2804217 | | 3320 |
| Transferability | | | |
| No | 0.5244253 | 0.000 | 696 |
| Yes | 0.3006171 | | 3403 |
| Good vocational degree | | | |
| No | 0.5383212 | 0.000 | 548 |
| Yes | 0.3078006 | | 3551 |
| Good exam grade | | | |
| No | 0.5818182 | 0.000 | 440 |
| Yes | 0.3093741 | | 3659 |
| Further training | | | |
| No | 0.5465253 | 0.000 | 849 |
| Yes | 0.2843077 | | 3250 |
| Self-employment | | | |
| No | 0.3753927 | 0.000 | 1.910 |
| Yes | 0.3065327 | | 2189 |
| Social acceptance | | | |
| No | 0.4800456 | 0.000 | 877 |
| Yes | 0.3001241 | | 3222 |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 6.11 T-test: Intention to cancel a contract early by gender, migration background and region

| | Mean | T-test | N |
|---------------------------|-----------|--------|------|
| Intention to cancel early | | | 4099 |
| Men | 0.3001182 | 0.0000 | 2539 |
| Women | 0.4012821 | | 1560 |
| No Migration background | 0.3244727 | 0.0000 | 3461 |
| Migration background | 0.4153605 | | 638 |
| East Germany | 0.3193018 | 0.1408 | 974 |
| West Germany | 0.34464 | | 3125 |

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008.

Table 6.12 Contrasts of predictive margins across the in advance rated importance of a goal

| | Intention to cancel early |
|---|--------------------------------------|
| | b/se/ci95 |
| Not important: Independency – Expected | 0.0342 (0.0667) |
| | -0.0965,0.1649 |
| Important: Independency - Expected | -0.0014 (0.0213) |
| | [-0.0432,0.0405] |
| Joint | 0.27 |
| Not important: Political and economic interest - Expected | -0.0523* (0.0279) |
| | -0.1070,0.0023 |
| Important: Political and economic interest - Expected | -0.0261 (0.0185) |
| | [-0.0623,0.0101] |
| Joint | 5.42* |
| Not important: Take over - Expected | 0.0155 (0.0301) |
| | -0.0435,0.0745 |
| Important: Take over - Expected | -0.0241 (0.0163) |
| | [-0.0561,0.0078] |
| Joint | 2.47 |
| Not important: Content - Expected | 0.1572 (0.1014) |
| | -0.0415,0.3559 |
| Important: Content - Expected | -0.0267 (0.0192) |
| | [-0.0643,0.0108] |
| Joint | 4.40 |
| Not important: Transferability - Expected | -0.0649 (0.0644) |
| | -0.1911,0.0613 |
| Important: Transferability - Expected | -0.0041 (0.0194) |
| | [-0.0420,0.0339] |
| Joint | 1.06 |
| Not important: Good vocational degree - Expected | 0.0398 (0.0732) |
| | -0.1037,0.1834 |
| Important: Good vocational degree - Expected | -0.0362 (0.0230) |
| | [-0.0813,0.0088] |
| Joint | 2.85 |
| Not important: Good exam degree - Expected | 0.2349* (0.1325) |
| | -0.0248,0.4947 |
| Important: Good exam degree - Expected | -0.0536** (0.0251) |
| | [-0.1027,- 0.0044] |
| Joint | 7.87** |
| Not important: Further training - Expected | -0.0517 (0.0622) |
| | -0.1736,0.0702 |
| Important: Further training - Expected | -0.0334* |

| | |
|---|------------------|
| | (0.0190) |
| | [-0.0707,0.0039] |
| Joint | 3.66 |
| <hr/> | |
| Not important: Self-employment - Expected | 0.0629* |
| | (0.0374) |
| | -0.0104,0.1361 |
| Important: Self-employment - Expected | 0.0184 |
| | (0.0160) |
| | [-0.0130,0.0498] |
| Joint | 4.03 |
| <hr/> | |
| Not important: Social acceptance - Expected | 0.0646* |
| | (0.0348) |
| | -0.0037,0.1329 |
| Important: Social acceptance - Expected | 0.0033* |
| | (0.0185) |
| | [-0.0330,0.0396] |
| Joint | 3.45 |

Notes: Model contains contrasts of margins and standard errors in parentheses as well as controls for migration background, age, gender, region, level of education, school performance, income, firm size, favourite occupation, work atmosphere, secondary job and VET-Rating.

Data source: BIBB Survey Vocational Training from the Trainees Point of View 2008. * p<0.10, ** p<0.05, *** p<0.01.