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Accounting for Investment Risk in Educational Decisions:
New Evidence for Lifetime Returns in Germany[1]

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Abstract

We analyse the economic returns in lifetime labour income of different educational paths in Germany, especially the difference between university studies and vocational training. New data allows us to calculate cumulative labour earnings at different ages and to compare not only the highest educational degree, but also which educational paths have been taken, as well as the educational background of individuals. We find that lifetime labour income is higher for individuals with a university degree, but only late in life. When considering the failure risk of educational degrees and the possibility of educational upgrading, we find that individuals who start with a vocational training after their highest school degree do not earn less than individuals who start with university studies, once we control for covariates such as socio-demographics and educational background.

Keywords: returns to education, lifetime income, educational upgrading, college dropout, apprenticeship training, NEPS-SC6-ADIAB

JEL Codes: I21, I26, J17, J24

1 Introduction

The proportion of individuals with tertiary education has steadily increased over the past years in almost all OECD countries. In the OECD average, this share rose from 35 % in 2008 to over 44 % in 2018 (OECD, 2019). In Germany, the rising demand for tertiary education is accompanied by a decline in vocational degrees.[3] When precisely such skilled workers are increasingly in demand, it might become unclear whether tertiary education is (economically) desirable for such a large proportion of the population. Using newly available data for lifetime labour income and applying a new approach to account for risk in educational decisions, this study analyses the educational returns for individuals with different educational paths in Germany and shows that existing studies systematically overestimate educational returns.

Comparing different studies of educational returns and their results in various industrialised countries, most researchers agree that education has a positive impact on individual income and other outcomes such as satisfaction, prestige or happiness. Studies in the US find major causal effects of education on earnings and non-monetary outcomes such as health, and health relevant behaviours as smoking (Heckman et al., 2016). An overview of different studies in the US shows that higher education leads to better economic outcomes, which is due to higher wages and lower likelihood of unemployment (Hout, 2012). The annual earnings of individuals during their prime working age rise by roughly 20 % for each educational level. A comparison of different studies on returns to education in Europe shows that all considered countries have at least an economic return of 4 % per year of education (Woessmann, 2014).[4] An excellent and up-to-date overview on educational returns in Germany is provided by the Autorengruppe Bildungsberichterstattung (2018, pp. 218ff).

Whilst a large number of studies have found a positive impact of education on earnings and income, the range of estimated returns to education varies greatly, not only between countries with different educational systems, but also within countries. For Germany, Pfeiffer and Pohlmeier (2012) find an average return of 8.7 % per year of education. However, they find negative returns for 20-30 % of the observations, which is a clear indication of heterogeneity in educational returns. It occurs between different educational qualifications, but also within them. Saniter (2012) finds that the number of years of schooling increases wages for those who completed the basic school track only by 2.3 % per year of schooling, whereas people who attained the higher school tracks had an estimated return of 11 % per year of schooling. For individuals without an occupational degree, new estimations vary between 3 % and 34 % less income, compared to individuals with a degree. A similar wide range of estimations appears in the economic returns of a university degree. It is estimated that people with a university degree earn 13 % to 75 % more than people with an occupational degree only (Friedrich and Horn, 2018).

The literature has found that returns to education can vary for various reasons, which include the type of educational attainment (e.g. Backes-Gellner and Geel, 2014; Piopiunik et al., 2017); the field of study (e.g. Altonji et al., 2012; Grave and Goerlitz, 2012); personal characteristics (e.g. Biewen and Tapalaga, 2017a; Henderson et al., 2011); and the supply and demand for graduates on the job market (e.g. Altonji et al., 2016; Glocker and Storck, 2014). However, the estimated returns to education can also vary with the data sets used and the methods applied, which might cause a systematic overestimation,

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[3]   https://www.bertelsmann-stiftung.de/de/presse/pressemitteilungen/pressemitteilung/pid/volle-hoersaele-leere-werkbaenke-studium-laeuft-ausbildung-den-rang-ab [24.03.2020].

[4]   Poland has the highest value with an economic return close to 10 % per year of education, whereas Sweden has the lowest return with a value just above 4 %. Germany is among the countries with the high returns, with a value of 9.5 %.

as shown in the following. A comparison of different educational qualifications reveals some particularities, first, due to different durations of educational attainment and therefore different ages at labour market entry, and second, because attaining educational qualifications may be achieved later in life or may be aspired unsuccessfully. Concerning the first point, in Germany, individuals with vocational training have shorter educational periods and therefore enter the labour market at an earlier age (for an overview of the educational system in Germany see Autorengruppe Bildungsberichterstattung, 2018, p. XIV; or a simplified version in Figure A.1 in the Appendix). This might give them a head start, at least in terms of cumulative labour income.

So far, the literature lacks an in-depth analysis of lifetime earnings, because most existing studies on educational returns use survey data. These allow for the distinction of heterogeneous returns, but have to rely on the calculation of contemporaneous income, for example gross (hourly) wages of employed individuals (Ammermüller and Weber, 2005; Anger et al., 2010; Göggel, 2007; Pfeiffer and Stichnoth, 2015). On the one hand, these studies cannot consider opportunity costs of longer educational paths and systematically ignore foregone income during periods of education. On the other hand, as shown by e.g. Hanushek et al. (2017), returns to different educational paths can differ over the working life. Individuals with higher general education earn less than individuals with vocational training in early stages and more in later stages of life.[5] Consequently, estimated returns to education based on contemporaneous income depend on the specific age at which individuals are compared, i.e. questioned in the survey data.[6]

There are only a few studies in Germany that use (mostly administrative) data to analyse lifetime labour returns to education. The study by Piopiunik et al. (2017), using Microcensus data, aggregates contemporaneous earnings by the highest educational attainment, and calculates differences in the projected net living income. Across the entire working life, individuals with vocational training earn 143,000 EUR or 31 % more than individuals without a vocational qualification. In turn, craftsmen and technicians[7] have a lifetime labour income of 129,000 EUR or 22 % more than individuals whose highest degree is vocational training; for university of applied sciences graduates it is 267,000 EUR (44 %) higher, for university graduates it is 387,000 EUR (64 %) higher.[8] Their approach does not allow them to calculate causal effects in any way, since they aggregate their data. Penny (2019) uses an early NEPS-SC6-ADIAB sample for West Germany to describe the differences of three broad levels of education on work-life earnings. He finds that high-skilled individuals earn 0.8 million EUR (57 %) more than low-skilled individuals and 0.4 million EUR (29 %) more than medium-skilled individuals. High skilled men earn 2.3 million EUR if they are continuously employed throughout their career and 1.6 million EUR (30.5 % less) if periods without employment are included as zero earnings.[9]

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[5] Piopiunik et al. (2017) have replicated these findings for Germany.

[6] Furthermore, most of the literature relies on individuals with positive (labour) incomes, therefore ignoring the low labour force attachment of highly educated individuals in their early stages of life.

[7] This encompasses German *Meister* and *Techniker* and includes masters, master craftsmen, foremen, engineers, tradesmen and other further degrees without college education.

[8] A similar approach has been performed by Schmillen and Stüber (2014) using the Sample of Integrated Labour Market Biographies (SIAB) for the years 2008 to 2010 and Stüber (2016) using the Employment Histories (BeH) for the years 2012 to 2014. They find higher lifetime income values by building synthetic cohorts and assuming full labour force attachment.

[9] Penny (2019) also finds that women earn about only 50 % to 70 % of what men earn in work-life earnings. He also analyses ages of intersections between skill levels, which will be similar to our descriptive results.

Alda et al. (2019) and Rzepka (2018) are the only studies known to us that analyse lifetime labour incomes for Germany using some form of regression analysis. Alda et al. (2019) use the Sample of Integrated Labour Market Biographies (SIAB) to analyse the educational premiums of young male employees in West Germany from 1976 to 2010. They find negative effects of educational expansion for some groups of workers, but attribute the decreasing premiums to routine-biased technological change. Rzepka (2018) also uses an early version of the NEPS-SC6-ADIAB data to analyse the effect of college enrolment for a small group of individuals who hold only a vocational degree. These enrolees face high opportunity costs, but tend to obtain higher cumulative earnings and jobs with a higher reputation in society. Hence, concerning the first point, the evidence on lifetime labour returns to education in Germany is sparse and mostly descriptive or very selective for specific groups of individuals, such that we do not know enough about the actual returns.

Concerning the second point, studies based on both administrative and survey data often ignore the increasing complexity of the education system in Germany. As Figure A.1 in the Appendix shows, the education system not only allows educational upgrading or heterogeneous paths to higher education, but also educational dropout. Biewen and Tapalaga (2017b) use data from the National Educational Panel Study (NEPS) to show that analyses that only look at the highest educational degree might not be appropriate. Moreover, Biewen and Tapalaga (2017a) have shown that a high proportion of the population exercises 'second chance' options to revise earlier track choices. Other studies also show that the educational path has a high impact on the returns to education for similar educational qualifications (e.g. Heigle and Pfeiffer, 2019; Heublein et al., 2017; Müller and Schneider, 2013). The returns to education differ, on the one hand, because of the educational path itself. Heigle and Pfeiffer (2019) assess the long-term impacts of studying without graduating and find that individuals who start university studies, but never complete them, have higher occupational prestige and higher life satisfaction, but not higher wages than individuals who have never been enrolled in university studies (but could have). The effects of graduating, on the contrary, are positive and substantial on all outcomes relative to studying without graduating or not studying at all. On the other hand, different educational paths have different risks of dropout, which makes pursuing them more or less uncertain. Patnaik et al. (2020) estimate a rich model of college major choice using a panel of experimentally-derived data for the US. They can separate perceptions about the degree of risk or about the current versus future payoffs. They find that ignoring heterogeneity in risk and time preferences overstate the importance of earnings to major choice. Heublein et al. (2017) show that educational background determines college dropout in Germany. Individuals mostly drop out because of intractable study requirements and a lack of prerequisites for the field of study, the inability to identify with the chosen subject of study, and the desire to focus more on practical activities. Müller and Schneider (2013) find that the dropout rate in the tertiary education is significantly lower when the pre-tertiary pathway is a direct pathway via a Gymnasium[10] compared to an upwardly mobile educational biography or students who obtained a vocational degree first. Dropout rates at universities are lower for students with a stronger social background. Hence, concerning the second point, recent studies have shown that analyses based on the highest educational qualification only are not appropriate to reflect the permeability of the German educational system and might bias results in favour of high educational qualifications if parental background or individual ability is not correctly controlled for.

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[10] Similar to high school, as a conclusion one acquires the Abitur, the prerequisite to be able to study.

We contribute to the literature by answering the following two research questions: How do economic returns in lifetime labour earnings vary across different stages of life when controlling for personal characteristics and parental background? How do the returns to education change when investment risk is included in educational decisions? We find the underlying cause of these questions to be a lack of data that combines high-quality income information from administrative sources and representative (survey) data that offers insights into detailed educational paths. Our study is one of the first to use the newly available NEPS-SC6-ADIAB data to systematically answer the questions above. To identify the returns to education, we rely on the assumption of selection on observables, because we have access to educational background variables and ability proxy variables. We use entropy balancing to balance covariate distributions of the treatment and control group, i.e. of individuals with different educational paths. The advantage over propensity score methods is that entropy balancing balances covariate distributions more efficiently (Hainmueller, 2012).

The results show positive educational returns on lifetime labour earnings, especially from completing higher education. Higher educational qualifications especially pay off later in life. Most notably, individuals with additional education after vocational training, such as craftsmen or technicians, earn more than individuals who have completed university studies for a long period of life. Furthermore, we show that individuals who start with vocational training and study afterwards do not fare worse than individuals who started university studies right away. Additionally, we show that, with respect to cumulative labour income, it is not worth to begin university studies for everyone due to a rather high risk to drop out. On average, it is only worth for those who graduate. Overall, our results show the importance of taking the risks of dropout in higher education and of educational upgrading from lower educational tracks into account when analysing returns to education.

The remainder of the paper is structured as follows: We introduce the NEPS-SC6-ADIAB data and the entropy balancing method in detail in Section 2, followed by descriptive results in Section 3. In Section 4, we present the results of the multivariate analysis. Finally, we discuss the results and the strengths and weaknesses in Section 5.

2 Data and Methods

In this section, we will first describe our data, how it is generated and what its advantages are over data used in the literature. We will then shortly describe the empirical methods we use, how we generate the descriptive results and the multivariate analyses.

For our study, we use a combined dataset from both administrative sources and a representative survey on individuals born between 1944 and 1986 in Germany, namely the NEPS-SC6-ADIAB (Antoni et al. 2018). It links the social security records from the administrative data of the Institute for Employment Research of the Federal Employment Agency (IAB) to the individuals in the NEPS Starting Cohort 6 adult survey (NEPS-SC6, Blossfeld et al., 2011). In particular, we have access to the Integrated Employment Biographies (IEB) for up to 12,660 of the 17,000 individuals sampled in the NEPS-SC6. Hence, the data combines the advantages of survey data with the advantages of administrative data. From the administrative side, we have access to exact income information from the full employment history of employment episodes that are subject to social security notification as well as unemployment episodes for individuals over the period between 1975 and 2014 in West Germany and between 1991 and 2014 in East Germany. We can observe the gross daily income, which is calculated from social

security contributions and therefore of very high quality. From the survey side, we have access to detailed information of the full educational history and on employment episodes which are not subject to social security notification, including income information for all individuals since 2006. The only disadvantages the data still have are the relatively low sample size of the NEPS-SC6 in comparison to other purely administrative data sources and missing income information on civil servants and self-employed before 2006 due to the nature of the IEB.

In the combined dataset, we can use the employment biographies from the NEPS-SC6 to fill-in "blind spots" in the administrative data, which only tracks employment episodes subject to social security and unemployment episodes. The NEPS-SC6 allows us to calculate income during educational phases, military service, and parental leave, which we all set to zero; and employment outside social security, namely civil servants and self-employed (at least since 2006). Using this approach, we can increase the average maximum time span we can track an individual from only 28 years in the IEB only to 38 years in the combined data. We can also increase the actual time of observation for each individual from 18 years in the IEB only to 38 years in the combined data, having income information in over 90 % of the episodes. The majority of the increase in observation time comes from including time spent in education.[11] This is an important advantage over analyses using administrative data only, such as Alda et al (2019), or Schmillen and Stüber (2014) and Stüber (2016), and has already been stressed by Penny (2019).

As the NEPS-SC6 surveys the complete educational history of each individual, we can look at educational processes and decisions over the lifetime, instead of only being able to look at the highest educational degree. This is especially important since educational decisions can be made at different stages of life, with different results and different implications for lifetime labour income (see section above). For this purpose, we distinguish individuals' first educational choices after (high) school, namely to study, to begin a vocational training, or to work; and where these choices have led them in terms of their highest educational degree obtained later in life. We distinguish whether the first educational episode after high school (excluding short work episodes) is vocational training or university study.[12] For the highest educational degree, we only look at completed degrees before the age of 35.[13]

Hence, we can use the NEPS-SC6-ADIAB data to analyse individuals' integrated employment and educational biographies. We analyse the returns to education with respect to cumulative labour income deflated in 2014 Euro prices earned between the age of 16 and 65. For the descriptive analysis, we follow the literature in constructing a synthetic cohort. We start by using the information of all individuals at a certain age in a certain educational group and estimate the average labour income, including zeros for that age.[14] We then summarize the yearly averages to gain cumulative labour incomes for each age and finally lifetime labour income. We use this method also for estimating the "break-even points", which indicate which educational decisions lead to the highest returns at different stages in life. We restrict our sample to individuals with a certain amount of labour force attachment, but can

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[11] For a more detailed quality analysis of the NEPS-SC6-ADIAB data, see Brändle et al. (2019), p. 9ff.

[12] We still observe a number of individuals who never start any educational episode (according to our definition and the one by the NEPS-SC6).

[13] We also have to cleanse the data from some inconsistent educational biographies as well as from some degrees obtained abroad.

[14] Other studies, which descriptively analyse lifetime labour income for Germany, mostly ignore episodes with zero income (Piopiunik et al., 2017; Schmillen and Stüber, 2014; Stüber, 2016). Their estimates are therefore upward biased by looking at positive labour incomes only.

be less strict than the literature because of the additional survey information from the NEPS biographies. We lose observations mainly because individuals exit the labour market at a certain point in time and because we cannot track the full lifecycle for early and late birth cohorts.

For the multivariate analysis, we look at each individual's (log.) cumulative labour incomes at different stages in life (*up-to-age-X-income)*, similar to other studies investigating lifetime labour income in Germany (Bönke et al., 2015; Seckler, 2019). This literature has shown that earnings inequality is mostly determined up to an age of 40 years. We will look at whether this also holds true for returns to education, i.e. whether "break even points" happen before or after that age. For this purpose, we have to exclude some individuals with low labour force attachment, where we cannot calculate an up-to-age-X-income with sufficient years of income information.[15] Naturally, we cannot observe the full lifetime labour income for later born cohorts, such that the estimations get noisier and rely on earlier born cohorts for the cumulative labour incomes beyond age 40 or 45.[16]

For the multivariate analysis, we assume that individuals $i: 1, \dots, N$ can choose between two educational alternatives $E \in \{0,1\}$, for example either to start vocational training or to go to university after graduating high school. Denote $Y_{i,s}(E)$ as the potential realized labour income in stage s in life for the ith individual. Then, we identify the returns to education at a certain stage s in life by the average treatment effect on the treated:

$$\tau_{s,att} = E[Y_s(E = 1) \,|\, E = 1] - E[Y_s(E = 0) \,|\, E = 1].$$

In other words, we calculate the difference between income earned with the chosen education and income which would have been earned with an alternative educational choice. Comparing individuals solely based on their educational choices attributes all income differences to differences in education. However, these income differentials could be due to other factors, which simultaneously affect both educational choices and income (e.g. gender, birth year, or ability). To interpret the returns to education as causal, we rely on the selection of observables $(Y(0), Y(1)) \perp D|X$ using a matching approach. This means we compare individuals with similar observed variables X, so that the remaining differences in income can be attributed to educational choices and a hopefully small and random unobserved part. One way to estimate the causal returns to education under this condition would be to use propensity score matching. This approach calculates the probability of choosing educational alternative $E = 1$ (treatment) over $E = 0$ (control) based on the observable variables X and compares the incomes of individuals with very similar treatment probabilities. This process assumes that once observable characteristics are balanced, unobserved differences should be balanced, as well. Propensity score matching requires an iterative process in the propensity score model until a model is found that balances the covariates in treatment and control group well enough. In the worst case, propensity score matching may even counteract bias reduction when improving balance in some covariates decreases the balance on others.

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[15] We exclude, for example, individuals who enter the labour market very late or leave it very early in life, and individuals with a low absolute and relative number of non-zero income episodes. In contrast to e.g. Seckler (2019) who works with SIAB data only, this affects few people, to be precise only 1,105 out of 11,467 observations.

[16] Note also that we cannot observe some early cohorts in the IEB before 1975 for West Germany and most cohorts before 1991 for East Germany. We can, however, observe their educational biographies in the NEPS-SC6.

To avoid this iterative process, methods that balance covariates by construction have been proposed (Athey et al. 2019; Imai and Ratkovic, 2014). In this paper, we use entropy balancing, a method developed by Hainmueller (2012) that has proven to work well in practice (see, e.g., Zhao and Percival, 2017; Amusa et al. 2019). Entropy balancing searches weights such that the covariate distributions in the control and treatment group, i.e. of individuals with different educational paths, are the same. The main advantage compared to conventional matching estimators based on the propensity score is that entropy balancing improves the covariate balance in treatment and control group for all covariates because it is constructed to do that. To achieve covariate balance, we search for weights, such that the covariate distribution of the treated and the untreated is equal in the sense that the prespecified moments, in the following the mean, are the same. We tolerate a difference of 0.015 in the mean (tolerance level) for the algorithm to converge. Additionally, entropy balancing chooses the weights such that they are as close as possible to a set of uniform weights to retain information and efficiency to subsequent analysis (see Hainmueller, 2012 for more details). Similar to inverse probability weighting, where the propensity score is used to weight observations, the weights w_j that are computed by entropy balancing are used in a weighted least squares regression. We estimate an average effect on the treated by:

$$\tau_{s,att} = \frac{1}{N} \sum_{i \in I(1)} Y_{i,s}(1) - \sum_{j \in I(0)} \frac{w_j}{\sum_{k \in I(0)} w_k} Y_{j,s}(0),$$

where $I(1)$ and $I(0)$ denote the set of treated and controlled, respectively. That is, we compute the difference between the average of the outcome of those who are treated and some reweighted average of the outcome of those in the control group. The weights are chosen in a way that the control group resembles the treatment group with respect to their observed characteristics as closely as possible.

In the analysis, we show results of weighted least squares regressions, where we additionally control for all variables used in the weighting process. This regression adjustment does not alter the coefficients, since the weights already contain the covariates' information, but it lowers the standard errors because it decreases the unexplained variance in lifetime labour income.

Besides assuming selection on observables, we need to assume that the common support of treatment and control group is sufficient. This ensures that observations are comparable in terms of their observed characteristics. We impose this by excluding those observations that have especially low and high propensity scores. More precisely, we exclude treated observations with a higher probability to get treated than the highest probability of a control person and we exclude control observations with a lower probability to get treated than the lowest probability of a treated observation. However, robustness analysis shows that results are not sensitive to the exclusion of those observations.

Although common support is ensured, it might be *thin*. That is, only a few numbers of control persons are comparable to many observations in the treatment group. If this happens, a small number of observations in the control group have relatively large weights, while the remaining observations have relatively small weights. As a consequence, weights are highly variant and thus estimated effects also have a high variance. To see how sensitive our estimates are to highly variant weights, (1) we allow higher bias of estimates to decreases variance of weights by increasing the tolerance level from 0.015 to 2, (2) we decrease variance of weights by trimming the largest 5% weights to the 95%-quantile of the weight distribution, and (3) we impose a stricter common support by excluding those observations with the 5% lowest and highest propensities to get treated. We find that results are not sensitive to these changes.

To assess the quality of the covariate balancing, we compare the mean, variance, and skewness of the covariate distribution before and after weighting. More precisely, we report the differences in mean, variance and skewness of the covariate distribution of the treatment and control group before and after weighting the sample. A value of zero would indicate that no differences in treatment and control group remains. The results are depicted in Tables A.3 to A.14 in the Appendix. As can be seen, the means are perfectly balanced in the treatment and the control group. Even though we did not specify to balance the variance and skewness of the covariate distribution, differences are small as well, mostly even zero. Only in rare cases higher moments are not balanced very well. However, the improvement compared to the case without weighting is still remarkable.

To satisfy selection on observables, we control a large set of covariates that are mostly exogenous, which affect lifetime labour income and educational decisions, but which are not themselves influenced by educational decisions. We control the gender, age in four birth cohorts, birthplace in Germany, the federal state of residence at schooling age, and three broad economic sectors (manufacturing, services, crafts). In addition to these standard socio-demographic control variables, the NEPS-SC6 offers information on the parental background: the highest ISEI-score of parents' jobs and the highest education of the parents.[17] Furthermore, we can control for individual ability using the grade of the final school certificate.[18] An overview of the control variables used can be found in Table A.2 in the Appendix. We further provide an overview how the observable characteristics are distributed between individuals with different educational decisions together with the respective mean lifetime income in Table A.1. Note that in contrast to other studies that analyse returns to education, we do not control for experience, since this is systematically linked to lifetime earnings, where we count years without experience as zero labour income.

Overall, we are confident that potential bias from unobservable variables should not be too large by using both the parental background and proxy variables for individual ability and by using a method that achieves almost perfect balance in observable characteristics.

3 Lifetime Labour Income for Different Educational Paths

In this section, we will first present the individuals' educational paths and explain how we distinguish between their highest completed degrees and their first educational choices. We will then describe the lifetime labour income for different groups of individuals, differentiated by their educational paths and over their entire working life span, similar to the few papers that already have (descriptively) analysed lifetime labour income in Germany.

As the literature shows, it is not sufficient to look at the highest qualification only when analysing returns to education. It is necessary to account for different educational paths, either because it matters how an individual has achieved his or her highest degree, or because we would misclassify certain groups of individuals into categories which do not reflect the risks bound to an educational decision.

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[17] International Socio-Economic Index of Occupational Status (ISEI) Score based on occupational codes by the method of Ganzeboom et al. (1992).

[18] For technical reasons, we also control for the number of years we can observe each individual in the data and for old birth cohorts, for whom we do not have non-zero income information at the beginning of their working life.

Table 3.1 shows the numbers of observations in our data according to their highest educational degree, the classical categorisation used in the majority of the literature, and according to their first educational decision after high school, as described in Section 2.

Table 3.1: Case Numbers for Different Groups of Educational Attainments.

Highest Educational Degree / First Educational Choice	No Degree	Vocational Training	Craftsmen or Technicians	University studies	**Total**
No Degree	429	0	0	0	**429**
Vocational training	337	5,661	721	1,118	**7,837**
University studies	263	154	15	1,664	**2,096**
Total	**1,029**	**5,815**	**736**	**2,782**	**10,362**

Source: Own calculations based on NEPS-SC6-ADIAB7515. Based on the sample used in the multivariate analysis, but the relative rations are very similar in the full sample.

We can see that the majority of individuals have vocational training as their highest degree (56 %), followed by a completed university degree (27 %), no vocational degree at all (10 %), and craftsmen and technicians (7 %). Among those with no vocational degree at all, large shares have either started vocational training (33 %) or university studies (26 %), but with no success. Among all individuals with a university degree, more than a third (40 %) have first started or accomplished a vocational training. While the first groups have experienced negative risks, i.e. permanent dropout from university or vocational training, the latter group has experienced positive risks, i.e. educational upward mobility.

Figure 3.1 presents the descriptive results for different groups of educational attainment. We calculate the mean cumulative labour income for each group for age 16 to 65. Similar to the literature, we first present the results according to the highest educational degree attained. We distinguish (1) no degree, (2) vocational training, (3) craftsmen or technicians, and (4) university studies. Individuals without any degree almost constantly earn the least, making an average of 820,000 EUR at the end of their lives. They outperform individuals with a university degree until the age of 30, but fall below all other groups right away. Individuals with a vocational training degree make an average of 960,000 EUR and outperform individuals with a university degree until the age of 37 and individuals without any degree throughout the entire lifetime (on average). Individuals who are craftsmen or technicians and individuals with a college or university degree earn almost the same at the end of their lives, on average 1,400,000 EUR and 1,450,000 EUR, respectively. However, individuals with a college or university degree earn less than craftsmen or technicians for most of their lives up until the age of 60.

Changing the educational classification to the first educational choice after high school rather than the highest educational degree changes the results. Individuals without any degree still earn the least with just about 730,000 EUR on average at the end of their lives, but they outperform individuals who start studying at a college or university until the age of 32. Individuals who start vocational training after high school earn 1,070,000 EUR on average and outperform individuals who start studying at a college or university until the age of 40. The latter individuals still make the most among all groups,

1,400,000 EUR on average. Differences emerge from the fact that not all individuals who start a vocational training or start studying at a college or university finish with a degree. Furthermore, individuals who start a vocational degree can start studying or become a craftsman or technician.

Figure 3.1: Lifetime Labour Income of Educational Paths, Descriptive Results (Full Sample).
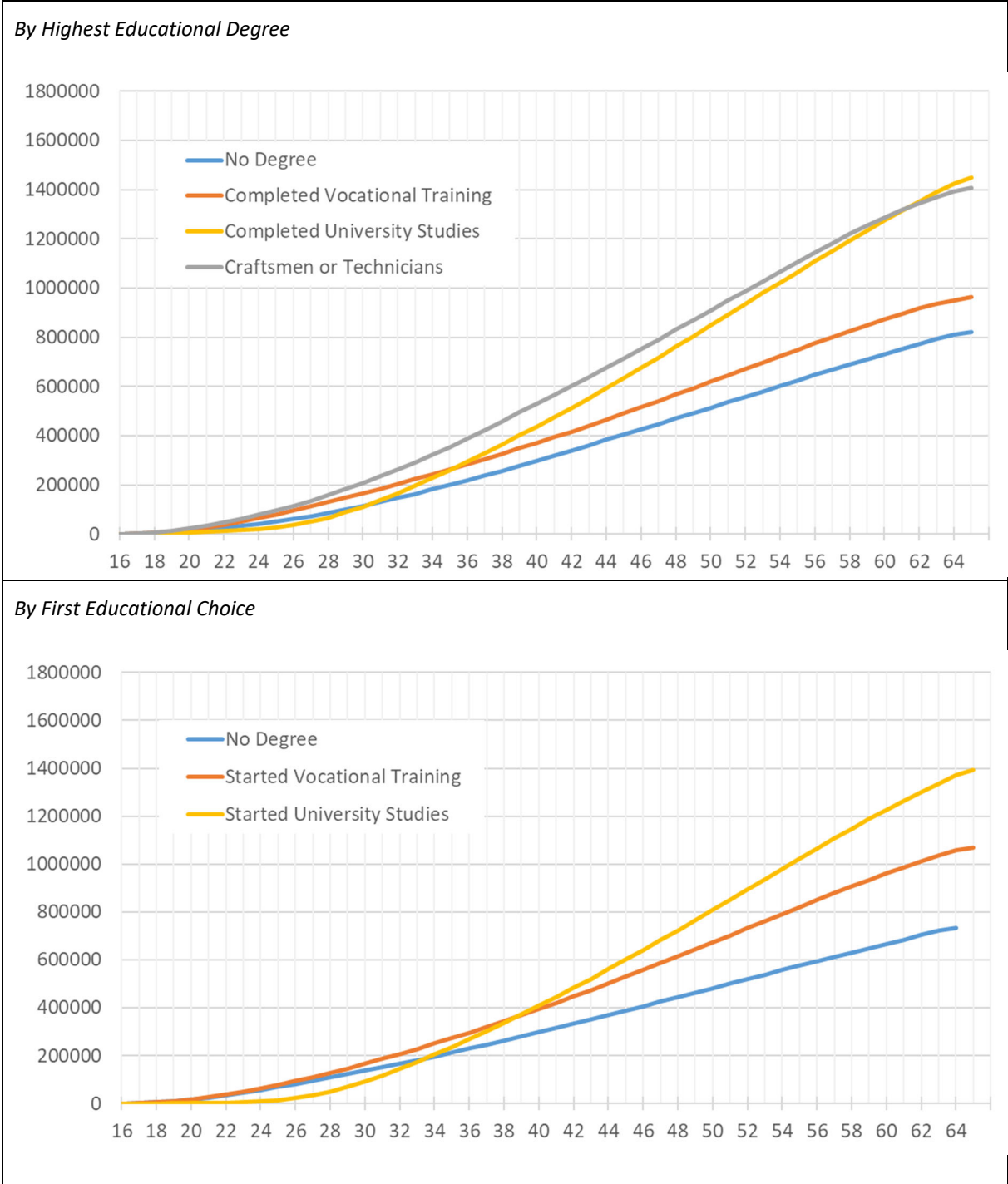
Source: Own calculations based on NEPS-SC6-ADIAB7515; Dependent Variable: Mean Cumulative Labour Income. Based on the full sample in comparison to the literature (Piopiunik et al., 2017; Schmillen and Stüber, 2014; Stüber, 2016). Results for the regression sample are very similar and shown in Figure A.2.

Differences between the two graphs emerge from various sources. Individuals with no vocational degree attained outperform those who have not started any vocational training. The first group contains individuals who have started a vocational training or university studies, but have dropped out. These individuals have somewhat higher lifetime labour income, for example because they have acquired some skills during their educational episodes (but of course less than if they had completed it).

Individuals who have started vocational training perform somewhat better than those who have completed vocational training only. The first group also contains craftsmen and technicians as well as those who have also completed a university degree after their vocational training. They might also perform somewhat worse because the group also contains those who have started a vocational training, but who have not completed it.

Individuals who have started university studies contain also those who have dropped out. Therefore, they perform somewhat worse than the individuals who have a university degree as their highest education. This is also why the break-even-point between university studies and vocational training shifts a couple of years back. It is to note that individuals who start a vocational training and later complete a university degree earn almost exactly the same as individuals who start their university studies right away. If anything, the first group has a higher lifetime labour income in their 30s and 40s.

In addition to the general results, we have calculated the lifetime labour incomes for three different subgroups, split by (1) gender, (2) sectors and (3) age cohorts.[19] A breakdown by gender shows that women earn overall less than men do. However, the differences between the various educational groups remain quite similar in relative terms. A look at three broad economic sectors (manufacturing, services, crafts) shows that individuals earn most in manufacturing, especially people with a university degree or craftsmen and technicians. With regard to the age cohorts, the differences between the educational groups are particularly evident in the youngest age cohort. In comparison to earlier cohorts, individuals without a degree earn less, and individuals with a university degree earn a lot more.

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[19] The results can be found in Figures A.3-A.5b in the appendix.

4 Risk-Adjusted Economic Returns to Education

In this section, we present the results of our multivariate analyses based on the entropy balancing estimations described in Section 2. In contrast to Section 3, we only compare two alternative educational paths each and leave out individuals with no degree earned or started. Our main outcomes are differences between completing vocational training, being a craftsman or technician or graduating from university, and starting vocational training or starting university studies after high school. These main results will be followed by additional results explaining the differences found.

Table 4.1 depicts the results for our main empirical analysis. We present the results for differences in lifetime labour incomes up until ages 25 to 60 in steps of five years, each in one column. Negative (positive) coefficients can be interpreted in such a way that the second comparison group has a β-log points lower (higher) cumulative labour income up to the certain age. We start with the comparison for the highest degree obtained in life for an easier comparability to the literature.

The returns to the highest educational degree obtained show that higher education pays off, but only relatively late in life. Comparing a vocational degree with graduating from university, we observe that the educational returns of university studies are strongly negative until the age of 40. Having completed a university degree starts paying off between the age of 45 and the age of 50. With higher age, the returns from a university degree further increase up until 30 log points at the end of the working life. Compared to our descriptive results, the break-even-point shifts backwards and the returns are relatively smaller. This suggests positive selection on observables by university graduates, as suggested by the literature. The positive selection on observables can also be observed in Table A.1, where it can be seen that university graduates are more often male and have a higher educational background.

We then compare the cumulative labour income of those who completed a vocational training with craftsmen and technicians. We see that the cumulative labour income of craftsmen and technicians is never lower than for those who completed vocational training only. This is a result we would expect, since, in contrast to those who study at a university, craftsmen and technicians also enter the labour market early in life and often obtain an income during (further and shorter) education. Becoming a craftsman or technician pays of starting from age 50, where the coefficients become significantly different from zero. On average, craftsmen and technicians earn 21 log points more throughout their life than individuals with vocational training as their highest educational degree only. When compared to the descriptive results, the findings from the multivariate analysis suggest a strong positive selection on observables. Especially, more men are craftsmen and technicians and fewer are born outside Germany.

We also compare the cumulative labour income of craftsmen and technicians to the one of graduates from a university. We find that craftsmen and technicians never perform worse than graduates from a university, with respect to cumulative labour income. Until the age of 45, craftsmen and technicians even have a higher cumulative labour income. Only from the age of 50 onwards the returns on graduating from university are not significantly different from zero anymore. The point estimates remain negative, however.[20]

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[20] An interesting note is that craftsmen and technicians have a lower educational background compared to university graduates. They are, however positively selection on other observable characteristics, such as gender and nationality.

The lower part of Table 4.1 shows the results for the first educational choice after graduation from high school. Here, individuals can choose between starting vocational training and going to a university. In young ages, the returns to education for beginning to study at a university on cumulative labour income are strongly negative and significantly different from zero. This is an expected result, since those who start studying at a university enter the labour market much later. With increasing age, the returns to university education increase, and the negative effects diminish after the age of 45. However, in contrast to the results above for the highest educational degree, the cumulative labour income of those who start studying at a university is never significantly higher than for those who start vocational training. We can observe an insignificantly positive point estimate of 14 log points at the age of 60. Even if this were to be significant, individuals starting university studies after high school suffer lower cumulative labour income until they are almost 50 years old. These results differ from the descriptive results, suggesting that individuals starting at a university after high school are highly positive selected, as can also be seen from the sample means in Table A.1.

We further investigate the differences in the results for vocational training versus university studies in Table 4.2. We compare different subgroups to analyse possible mechanism for the differences in estimated returns to cumulative labour income, mainly the effects of educational advancement and dropouts.

The returns to education on cumulative labour income are higher for individuals who have begun a vocational training in early stages of life. This may be because of higher dropout rates from individuals starting university studies. We first differentiate the latter group into successful students and dropouts. On the one hand, university dropouts fare worse than the individuals who started vocational training in terms of cumulative labour income for almost their entire life. They clearly show that pursuing higher education unsuccessfully does not pay off very well. On the other hand, we can see that successful students fare better than the whole group of starting students; they start having a similar cumulative labour income as individuals who started a vocational training do in their 40s, as seen by the coefficients being insignificantly different from zero. However, they still do not overtake individuals, who started a vocational training. This may be because the latter group now also contains individuals who have studied later in life or pursued additional qualifications equivalent to university studies, i.e. those who have gained educational upward mobility.

Subsequently we look at these individuals in specific: Those who became craftsmen and technicians and those who completed university studies after beginning a vocational training. We can see that craftsmen and technicians have a higher cumulative labour income than individuals who started university studies over the entire observation period. We can also observe that individuals who completed a university degree after starting a vocational degree do not fare worse than individuals who started university studies at the end of their life, but fare better in the beginning. They have a small head start compared to those who start university studies right away after high school. As we can see, individuals, who have pursued educational upward mobility after their vocational degrees, fare better for almost their entire life than individuals who started university studies right after high school.

Next, we look at those individuals who explicitly have not pursued educational upward mobility after a vocational training. We can see that these individuals still have a higher cumulative lifetime labour income than individuals who started university studies until they are 40 years old. In contrast to the results above, the latter group now has a higher cumulative lifetime labour income after the age of 50 years. When considering individuals with completed university studies as a control group, the threshold falls to the age of 45 years. When we look at the unsuccessful students, the results change. These

individuals never have a higher cumulative lifetime labour income in comparison to individuals who started a vocational training and kept at it. Their income is even lower for most of their lives, up until the age of 60 years. So, we can see that university dropouts fare especially bad in early years when compared to individuals who started a vocational training, even if these did not pursue educational upward mobility. Without these unsuccessful students, starting university studies pays off by a large margin and pays off earlier in life, even in the late 40s. Hence, dropout risk is a key determinant of lower returns to education from starting university studies.

In effect, we can see that, in addition to positive selection on socio-demographic variables, parental background and ability, both the high rate of university dropout was well as educational upward mobility by individuals who started vocational training after high school can explain the non-existent returns to starting a university education.

Table 4.1: Lifetime Labour Income and Educational Decisions: Results of a Weighted Least Squares Regression with Entropy Balancing.

	Log. lifetime labour income until Age …							
	25	30	35	40	45	50	55	60
By highest educational attainment								
Vocational Training vs. University Studies	-2.8787***	-1.1363***	-0.4405***	-0.1982**	0.0032	0.1879***	0.2336***	0.3356***
	(0.1155)	(0.0926)	(0.0814)	(0.0700)	(0.0552)	(0.0467)	(0.0584)	(0.0894)
	N=8,520	N=8,514	N=7,985	N=7,186	N=6,384	N=5,125	N=3,454	N=1,934
Vocational Training vs. Craftsmen and Technicians	0.0926	-0.1030	-0.0785	0.0105	0.0588	0.1505**	0.1754***	0.2092***
	(0.1433)	(0.1238)	(0.1028)	(0.0927)	(0.0663)	(0.0489)	(0.0532)	(0.0514)
	N=6,417	N=6,413	N=6,096	N=5,608	N=5,041	N=4,072	N=2,745	N=1,583
Craftsmen and Technicians vs. University Studies	-3.1129***	-1.1687***	-0.3835+	-0.3146+	-0.2403**	-0.0937	-0.0676	-0.1386
	(0.2680)	(0.2236)	(0.2081)	(0.1859)	(0.0881)	(0.0702)	(0.0697)	(0.0843)
	N=3,326	N=3,324	N=3,106	N=2,781	N=2,488	N=2,003	N=1,364	N=786
By first educational choice								
Vocational Training vs. University Studies	-3.7434***	-1.2745***	-0.3969***	-0.1910*	-0.1330*	-0.0120	0.0547	0.1432
	(0.1226)	(0.1018)	(0.0876)	(0.0791)	(0.0533)	(0.0470)	(0.0555)	(0.0926)
	N=9,773	N=9,766	N=9,119	N=8,183	N=7,270	N=5,837	N=3,934	N=2,221

*Source: Own calculations based on NEPS-SC6-ADIAB7515; Dependent Variables: Cumulative labour income until a certain age; Standard errors in parentheses; + p<0.1, * p<0.05, ** p<0.01, *** p<0.001; N denotes the number of observations; Further control variables: gender (male or female), birth cohort (1944-1954, 1955-1964, 1965-1974, 1975-1986), born in Germany (yes or no), federal state indicators, ISEI score of parental role model, final grade of school-leaving qualification, economic sector (industry, services, or craft), indicator that marks if not observed since the age of 16 and the number of years observed.*

Table 4.2: Lifetime Labour Income and Educational Decisions for Subgroups: Results of a Weighted Least Squares Regression with Entropy Balancing

	Log. lifetime labour income until Age …							
	25	30	35	40	45	50	55	60
Started Vocational Training vs. Started *but not Completed* University Studies								
	-2.9206***	-1.4012***	-0.5839***	-0.4491***	-0.3778***	-0.3418***	-0.2287**	0.0065
	(0.2135)	(0.1811)	(0.1481)	(0.1303)	(0.0970)	(0.0990)	(0.0849)	(0.1178)
	N=7817	N=7812	N=7324	N=6592	N=5866	N=4697	N=3139	N=1786
Started Vocational Training vs. Started *and Completed* University Studies								
	-3.9531***	-1.2441***	-0.3517***	-0.1317	-0.0746	0.0583	0.1122+	0.1716+
	(0.1324)	(0.1114)	(0.0949)	(0.0853)	(0.0589)	(0.0495)	(0.0601)	(0.1007)
	N=9314	N=9308	N=8728	N=7858	N=6984	N=5628	N=3800	N=2151
Started Vocational Training and Craftsmen and Technicians vs. Started University Studies								
	-4.3856***	-1.5579***	-0.5370*	-0.4666**	-0.3717***	-0.2766***	-0.2059**	
	(0.2910)	(0.2549)	(0.2163)	(0.1745)	(0.0854)	(0.0712)	(0.0782)	
	N=2689	N=2686	N=2456	N=2173	N=1930	N=1532	N=1031	
Started Vocational Training and Completed *University Studies* vs. Started University Studies								
	-2.8724***	-0.6587***	-0.0818	0.0740	-0.1598*	-0.1260*	-0.1003+	-0.0740
	(0.1630)	(0.1456)	(0.1347)	(0.1470)	(0.0656)	(0.0548)	(0.0589)	(0.0858)
	N=3179	N=3176	N=2898	N=2512	N=2207	N=1738	N=1169	N=636
Started Vocational Training and Completed University Studies vs. *Started and Completed* University Studies								
	-3.0606***	-0.6113***	-0.0078	0.1414	-0.0983	-0.0523	-0.0424	-0.0507
	(0.1718)	(0.1532)	(0.1389)	(0.1507)	(0.0696)	(0.0569)	(0.0618)	(0.0907)
	N=2756	N=2754	N=2540	N=2218	N=1946	N=1549	N=1049	N=576
Started Vocational Training, Completed No Degree or Vocational Training vs. *Started* University Studies								
	-4.0083***	-1.4834***	-0.5048***	-0.2717***	-0,0881	0,0541	0.1360+	0.2511*
	(0,1388)	(0,1056)	(0,0940)	(0,0737)	(0,0618)	(0,0574)	(0,0739)	(0,1245)
	N=7914	N=7907	N=7348	N=6582	N=5805	N=4651	N=3113	N=1707
Started Vocational Training, Completed No Degree or Vocational Training vs. *Completed* University Studies								
	-3.0269***	-1.2021***	-0.4491***	-0.2182**	-0.0161	0.1804***	0.2429***	0.3439***
	(0.1153)	(0.0910)	(0.0839)	(0.0700)	(0.0560)	(0.0473)	(0.0615)	(0.0912)
	N=8684	N=8677	N=8126	N=7296	N=6462	N=5209	N=3518	N=1975
Started Vocational Training, Completed No Degree or Vocational Training vs. *Started but not Completed* University Studies								
	-3.1519***	-1.5725***	-0.6606***	-0.5104***	-0.3341***	-0.2847**	-0.1687+	0.0910
	(0.2228)	(0.1841)	(0.1526)	(0.1272)	(0.1000)	(0.1016)	(0.0907)	(0.1242)
	N=6198	N=6193	N=5792	N=5225	N=4631	N=3714	N=2482	N=1390

Source: Own calculations based on NEPS-SC6-ADIAB7515; Dependent Variables: Cumulative labour income until a certain age; Standard errors in parentheses; + p<0.10, * p<0.05, ** p<0.01, *** p<0.001; N denotes the number of observations; Further control variables: as in Table 4.1. Empty cells indicate no convergence of the algorithm to the prespecified allowed difference in moments of treatment and control group (tolerance level: 0.015).

5 Discussion

Similar to the literature, our results have shown that returns to education are positive for completed degrees, even when looking at lifetime labour income. Especially in later stages of life, individuals with a university degree earn significantly more than individuals with a vocational degree or individuals with no educational degree at all. However, the *break-even points* may occur later in life than one might have thought. Some of the positive returns on university education also stem from positive selection on socio-demographics, parental background, and ability. In other words, the average individual who holds a university degree might have earned more than the average individual with a vocational degree, even without a degree.

Furthermore, we find that, on average, beginning to study at a university may not be worthwhile as it performs worse in terms of cumulative labour income than beginning a vocational training in earlier stages of life and not necessarily better in later stages of life. These results make clear that, with respect to cumulative labour income, it may not be worth to begin studying at a university for everyone due to rather high risk of dropout, on the one hand. These dropouts cannot make up for the lost income because of the time spent in the educational system. This underlines the necessity to include dropout risk into analyses of returns to education, similar to calculating the failure risk before undertaking an investment in other areas, such as finance. In addition, even graduating from university might not be worth it for those with high preferences for higher cumulative labour income in earlier stages of life. On the other hand, our results show the importance of educational upward mobility. Individuals who become a craftsman or technician earn more than university graduates for most of their life in terms of cumulative labour income, mainly because they have head start and spend less (unpaid) time in the educational system. Similarly, completing a university degree after already having started a vocational degree pays off very well. It is even the case that the cumulative labour income of those individuals does not fall behind the ones that have started university studies right after high school.

The traditional classification of educational returns into the highest educational degree ignores those risks, both the negative dropout risk as well as the positive risk of educational upward mobility. It is clear, however, that these risks are real at the beginning of an individual's educational biography, i.e. when deciding what to do after high school. In other words, the educational returns of having completed a university are different from those of having started university studies (and maybe complete it), and the educational returns of having completed vocational training (only) are different from having started vocational training (and potentially follow it up a craftsmen or technician or even university studies).[21]

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[21] For vocational training, there exist both positive and negative risks, i.e. upward mobility and dropout. The dropout risk is, however, much smaller than for university studies. Only one in twenty (5 %) of individuals who have started vocational training end up without any degree at all, whereas this figure is almost threefold higher (13 %) for university studies, while almost an additional one in ten (8 %) does not gain a university degree, but only a vocational degree.

If we ignore these differences, the educational returns of university studies will include only positive risks, i.e. successful students, even if these have started their careers with a vocational degree. The educational returns of lower degrees will, in contrast, also include the negative risks, for example university dropouts who complete a vocational degree later in life. This means that the potential returns from studying at a university degree are overestimated, while the potential returns from vocational training are underestimated, if we look at the ex-ante decision-making.

The strength of this study is that both detailed educational background and lifetime labour incomes can be considered. Thus, educational progression and dropouts can be identified and considered when analysing risk-accounted returns to education over the lifespan. We can also identify indirect costs of education by calculating forgone income during educational periods. Furthermore, by looking at lifetime labour income, the risk of unemployment and non-employment can be included, since phases with no labour income are valued at zero EUR. The data allows a more differentiated approach than usual in the literature, when, as shown, the majority of studies analyse the highest degree or qualification of individuals only.

Some topics are left for further research. First, the results presented so far assume no time preference in lifetime earnings, meaning that (contingent on correction for inflation) one EUR earned at the age of 60 is valued the same as one EUR earned at the age of 30. Uncertainty and time preference might lead individuals to value income earned in later stages of life less than income in early stages. We have only very roughly used different discount rates to descriptively compare lifetime labour incomes and could see the overall patterns of economic returns to remain stable up until an internal interest rate of 6 % per year. However, at face value, we have to state that education becomes indeed less preferable when individuals have strong time preferences.

Second, the calculation of economic *returns* of education is still mostly limited to the *earnings* side since information on direct education *costs* is hard to find, at least for Germany.

Third, even with the high-quality data at hand, our analysis is limited in terms of the income we can measure. Both information on labour income for non-social security jobs and information on non-labour income is not available. The exclusion of civil servants might not be much of a problem here, since the public sector offers similar educational returns for employees subject to social security than it does for civil servants. A weak point of the data might be the lack of information on labour income of self-employed individuals. These could be craftsmen owning a small construction company, as well as physicians or lawyers who do not work for hospitals or large law firms, respectively. In other words, we have less than sufficient information on the top earners in each educational category. The lack of information on non-labour income is especially frustrating, albeit this is a phenomenon present in most empirical analyses not only on educational returns but also on income inequality. Since our results have shown that individuals starting a vocational degree have a head start in lifetime labour income, it seems logical that they could use this advantage to generate other sources of income, be it capital gains or rents. Hence, the educational returns on lifetime labour income might be an upper bound estimate of lifetime total income.

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Appendix

Figure A.1: Overview of the German education system.


```
Low Secondary Track          → Drop out
(Hauptschule)                → Degree

                     Vocational Training    → Drop out
                     (Ausbildung)           → Degree

Medium Secondary Track       → Drop out           Craftsmen/Technician    → Drop out
(Realschule)                 → Degree             (Meister/Techniker)     → Degree

High Secondary Track         → Drop out
(Gymnasium)                  → Degree

                                                  University studies              → Drop out
                                                  (Studium an der Universität     → Degree
                                                   oder Fachhochschule)

Minimum Age          16              19      22              24
```

Source: Own presentation based on Eckhardt, 2017. Some educational paths are restricted. For example, only individuals with a completed university entry qualification can start studying at a university. This might be achieved, among others, through vocational training plus one or two years of additional schooling (Abendgymnasium). Early dropouts from medium secondary track may start vocational training only if they have a completed low secondary track degree, etc.

Figure A.2: Lifetime Labour Income of Educational Paths, Descriptive Results (Regression Sample).
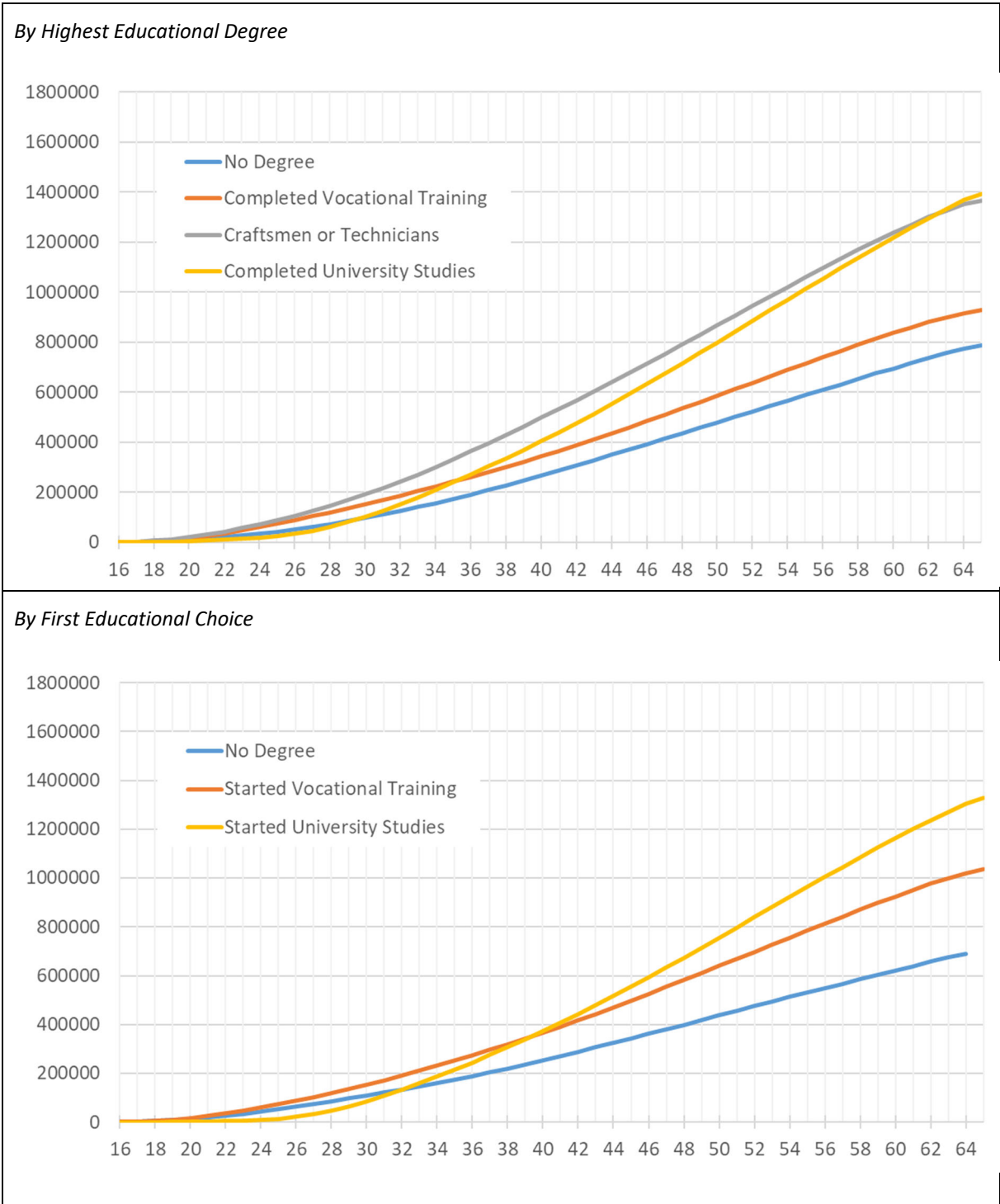
Source: Own calculations based on NEPS-SC6-ADIAB7515; Dependent Variable: Mean Cumulative Labour Income.

Figure A.3: Lifetime Labour Income of Educational Paths separately by Gender, Descriptive Results (Full Sample).
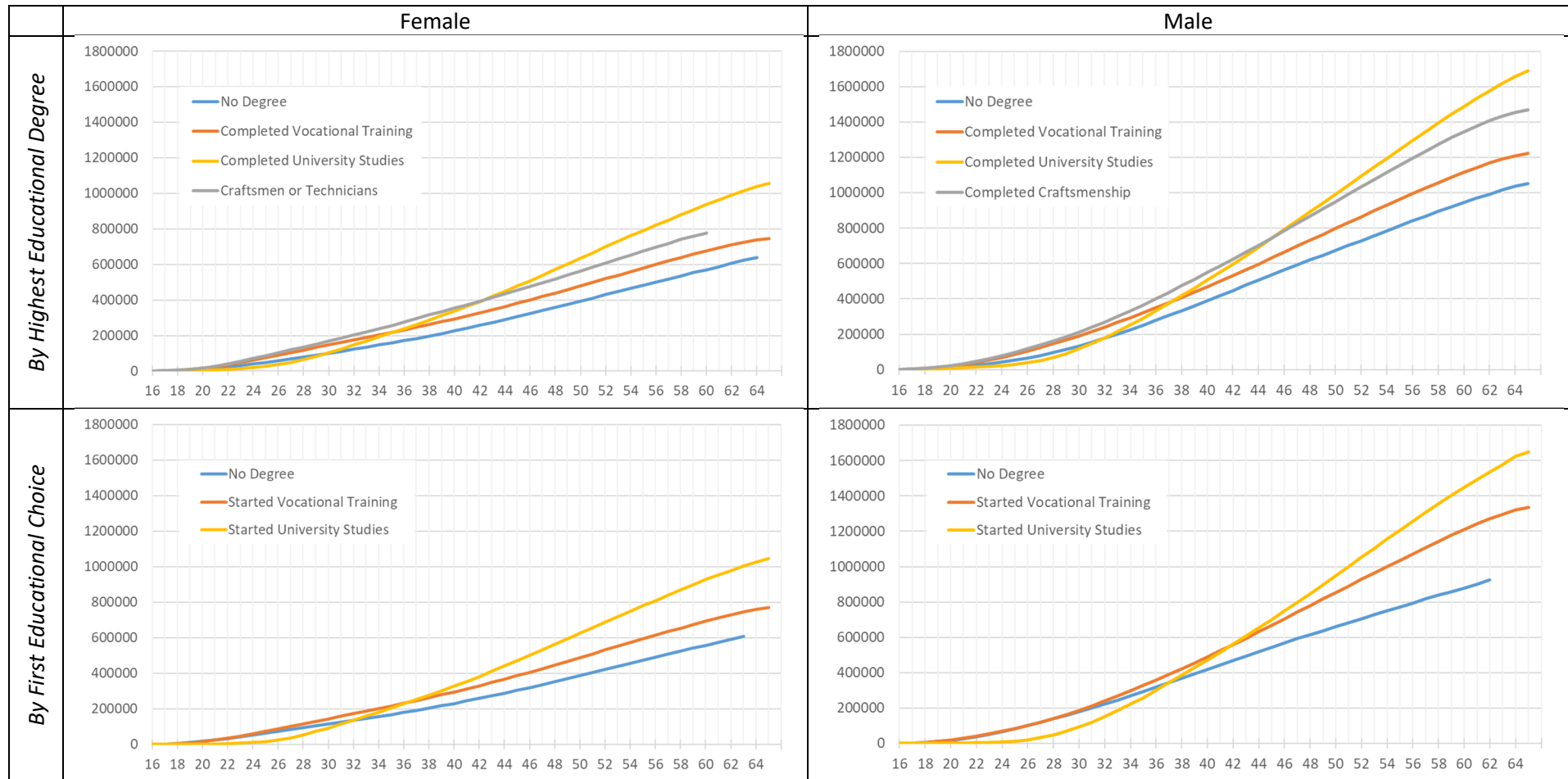
Source: Own calculations based on NEPS-SC6-ADIAB7515; Dependent Variable: Mean Cumulative Labour Income.

Figure A.4: Lifetime Labour Income of Educational Paths separately by Sectors, Descriptive Results (Full Sample).
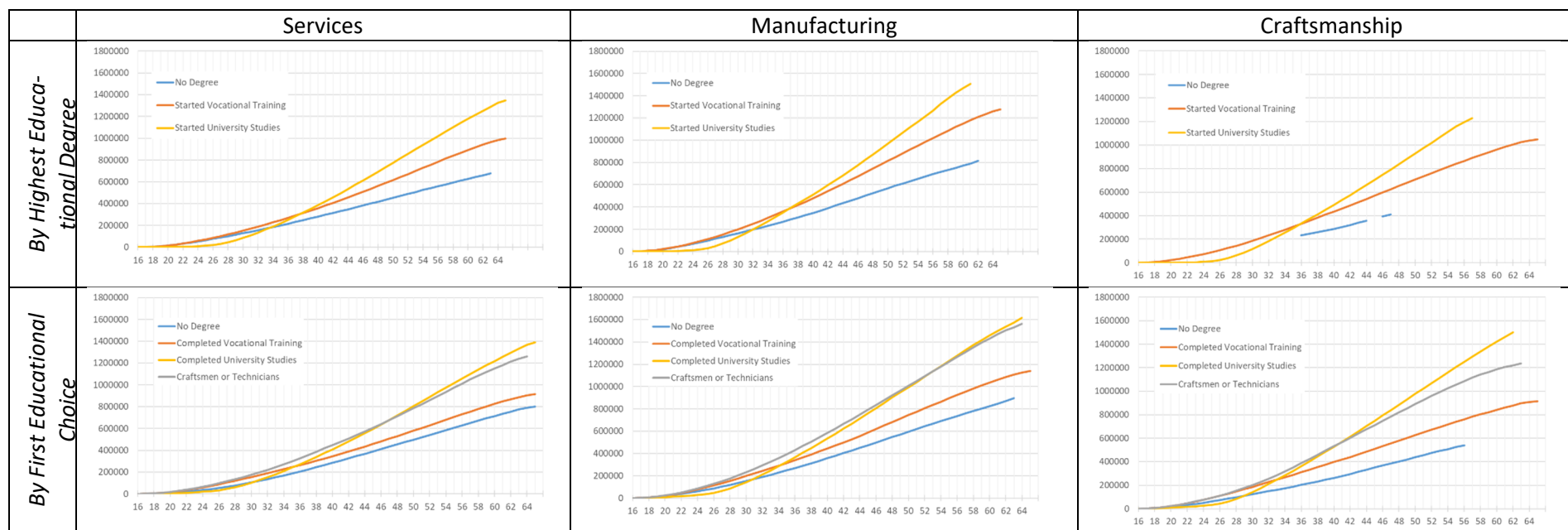
Source: Own calculations based on NEPS-SC6-ADIAB7515; Dependent Variable: Mean Cumulative Labour Income.

Figure A.5a: Lifetime Labour Income of Educational Paths separately by Age Cohorts, Descriptive Results (Full Sample), By Highest Educational Degree.
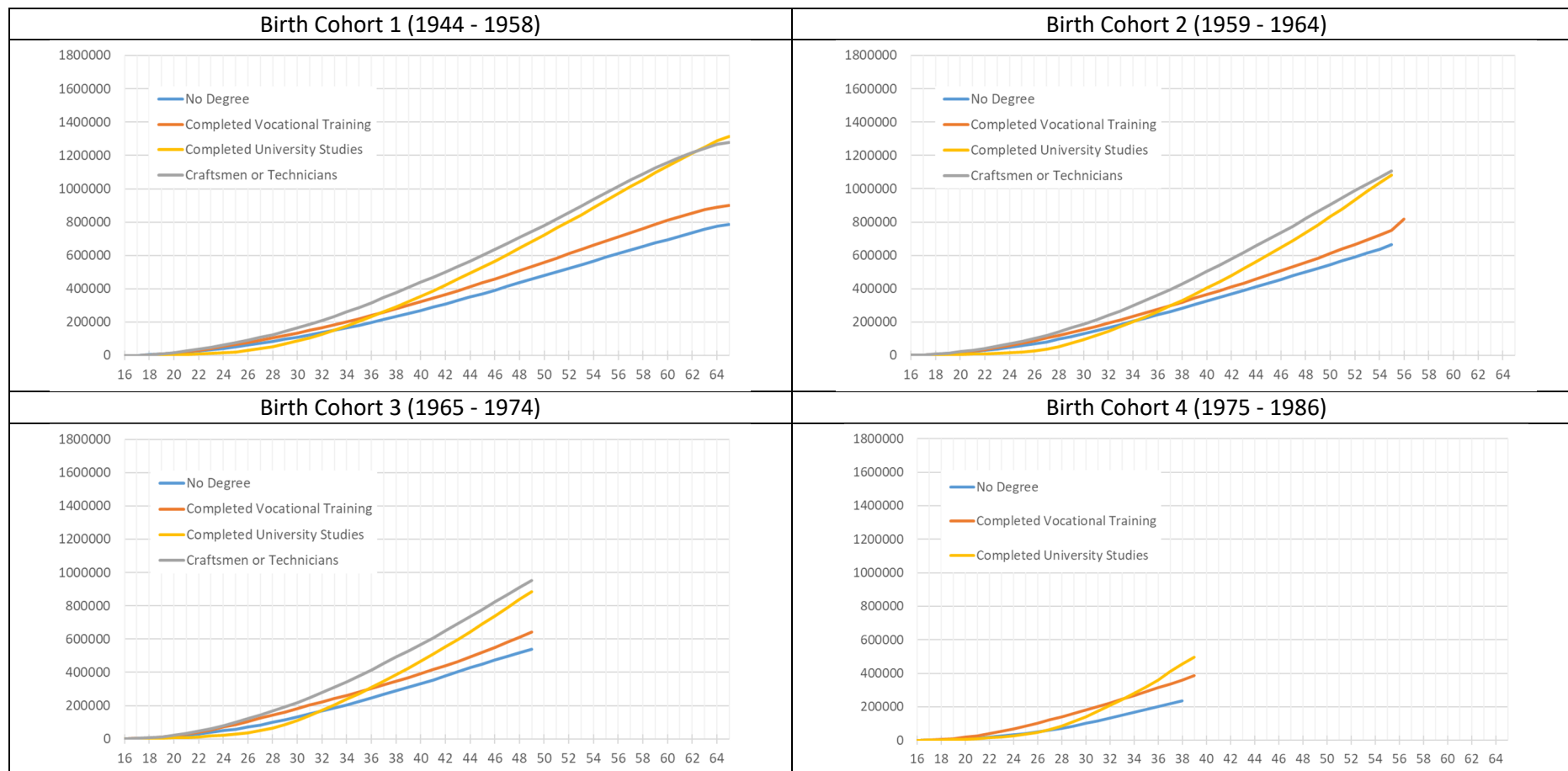
Source: Own calculations based on NEPS-SC6-ADIAB7515; Dependent Variable: Mean Cumulative Labour Income.

Figure A.5b: Lifetime Labour Income of Educational Paths separately by Age Cohorts, Descriptive Results (Full Sample), By First Educational Choice.
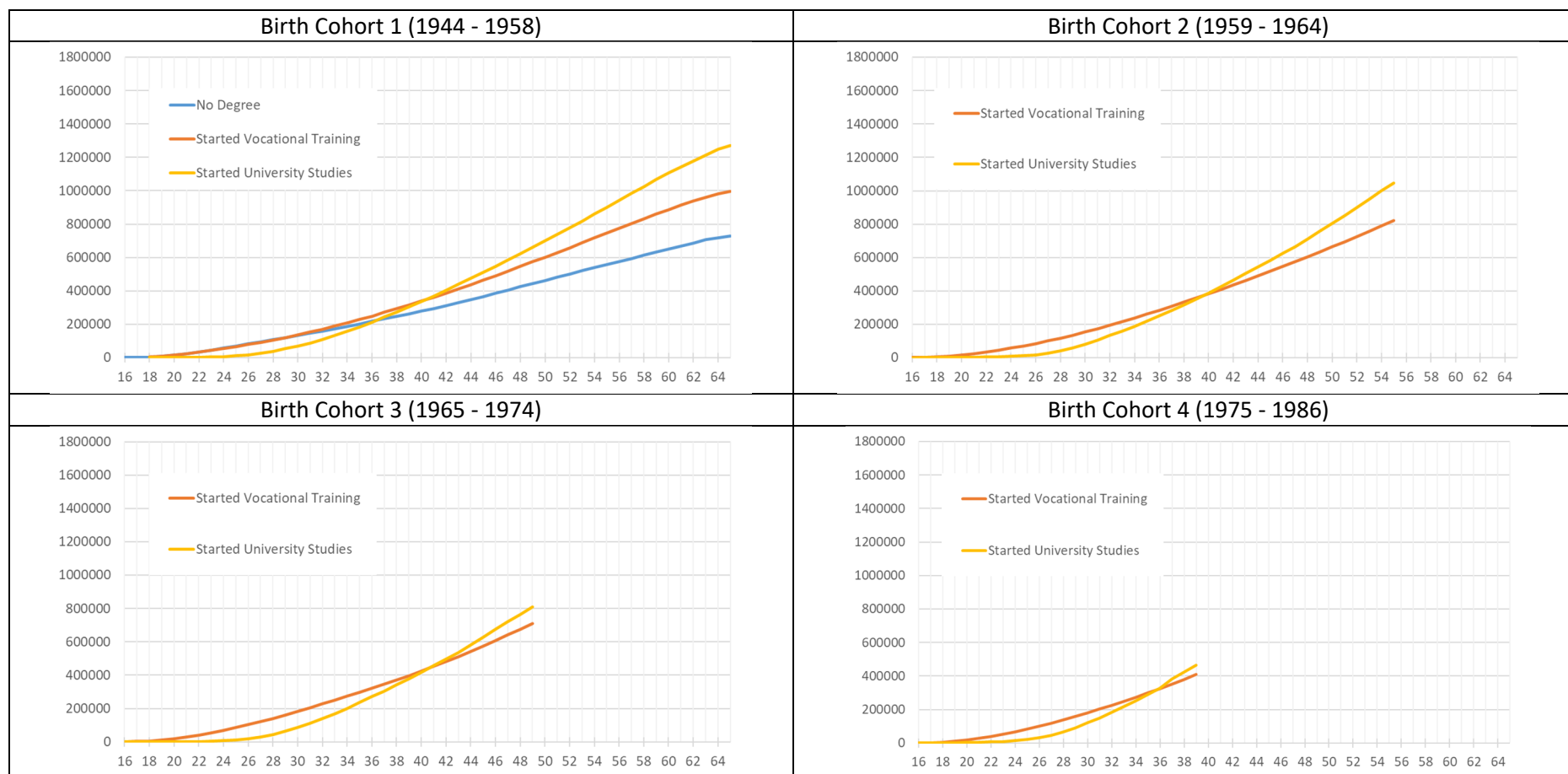
Source: Own calculations based on NEPS-SC6-ADIAB7515; Dependent Variable: Mean Cumulative Labour Income.

Table A.1: Overview on Observable Characteristics across Educational Decisions and Mean Lifetime Labour Income

	By First Educational Choice			By Highest Educational Degree				Mean Lifetime Income
	No Degree	Started Vocational Training	Started University Studies	No Degree	Completed Vocational Training	Craftsman or Technician	Completed University Studies	
Gender								
Female	0.64	0.50	0.46	0.55	0.57	0.12	0.43	602,056
Male	0.36	0.50	0.54	0.45	0.43	0.88	0.57	1,044,595
Birth Cohort								
1944 - 1958	0.44	0.33	0.24	0.34	0.33	0.37	0.28	
1959 - 1964	0.17	0.22	0.22	0.17	0.23	0.21	0.22	
1965 - 1974	0.22	0.28	0.27	0.23	0.28	0.30	0.27	
1975 - 1986	0.17	0.16	0.27	0.27	0.16	0.12	0.23	
Born in Germany								
Yes	0.66	0.94	0.88	0.79	0.93	0.96	0.91	903,904
No	0.34	0.06	0.12	0.21	0.07	0.04	0.09	620,658
Economic Sector								
Services	0.36	0.33	0.54	0.40	0.36	0.10	0.47	906,682
Manufacturing	0.58	0.56	0.42	0.54	0.54	0.67	0.48	888,564
Craftsmanship	0.05	0.11	0.04	0.06	0.10	0.23	0.05	781,842
Max. ISEI Parents	37.17	42.65	56.50	42.29	42.29	41.31	53.48	
Parental Education								
No Degree	0.29	0.11	0.03	0.21	0.11	0.07	0.04	761,848
Vocational Training	0.59	0.73	0.44	0.56	0.74	0.78	0.52	890,113
HEEQ*	0.05	0.06	0.10	0.07	0.05	0.06	0.09	939,392
University Degree	0.07	0.11	0.42	0.16	0.10	0.09	0.35	941,992
Categorized Grade Averages								
Grade Very Good (1)	0.00	0.03	0.06	0.01	0.02	0.02	0.07	1,081,262
Grade Good (2)	0.12	0.22	0.21	0.13	0.21	0.24	0.24	950,494
Grade Satisfactory (3)	0.24	0.24	0.12	0.24	0.25	0.24	0.14	893,050
Grade Unsatisfactory (4)	0.04	0.02	0.01	0.04	0.02	0.01	0.01	776,750
Grade Missing	0.61	0.49	0.60	0.59	0.50	0.49	0.55	708,481
Observation period	41.18	39.34	35.46	37.76	39.28	40.64	37.05	
Too old **	0.46	0.44	0.33	0.39	0.43	0.49	0.38	

Source: Own calculations based on NEPS-SC6-ADIAB 7515. *Further Controls: German Federal States.* Note: Shares of different values of the control variables, by category of first educational choice and highest educational degree. *Max. ISEI Parents* and *Observation Period* are not given as percentages but as averages, because they have too many discrete values. * HEEQ = Higher Education Entrance Qualification. ** Too old = born before 1958/1975. *Mean Lifetime Income* refers to the cumulative labour income up to the age of 65. No lifetime income is given for categories of birth cohorts, as late cohorts have not yet reached the age of 65.

Table A.2: Summary Statistics for all Variables used in the Multivariate Analyses.

Variable	Observations	Mean	Std. Dev.	Min.	Max.
Mean Cumulative Labour Income at the age of …					
20	10,362	9,264	16,045	1	360,000
25	10,361	46,162	55,488	1	1,260,000
30	10,353	114,211	107,268	1	2,160,000
35	9,680	206,943	183,457	1	4,806,610
40	8,707	314,911	280,888	1	10,500,000
45	7,749	437,655	378,174	1	14,900,000
50	6,243	555,508	422,001	1	9,647,006
55	4,255	663,111	484,966	1	11,400,000
60	2,439	753,593	555,936	1	13,800,000
65	867	881,258	757,497	4,805	15,800,000
First Educational Choice					
No Degree	10,362	0.04	0.20	0	1
Started Vocational Training	10,362	0.76	0.43	0	1
Started University Studies	10,362	0.20	0.40	0	1
Highest Educational Degree					
No Degree	10,362	0.10	0.30	0	1
Completed Vocational Training	10,362	0.56	0.50	0	1
Craftsman or Technician	10,362	0.07	0.26	0	1
Completed University Studies	10,362	0.27	0.44	0	1
Gender: Female	10,362	0.50	0.50	0	1
Birth Cohort					
1944 - 1958	10,362	0.32	0.47	0	1
1959 - 1964	10,362	0.22	0.42	0	1
1965 - 1974	10,362	0.27	0.45	0	1
1975 - 1986	10,362	0.19	0.39	0	1
Born in Germany	10,360	0.91	0.28	0	1
Economic Sector					
Services	10,362	0.38	0.48	0	1
Manufacturing	10,362	0.53	0.50	0	1
Craftsmanship	10,362	0.09	0.29	0	1
Max. ISEI Parents	10,362	45.22	16.93	16	90
Parental Education					
No Degree	10,362	0.10	0.30	0	1
Vocational Training	10,362	0.66	0.47	0	1
Higher Education Entrance Qualification	10,362	0.07	0.25	0	1
University Degree	10,362	0.17	0.38	0	1
Categorized Grade Averages					
Grade Very Good (1)	10,362	0.03	0.18	0	1
Grade Good (2)	10,362	0.21	0.41	0	1
Grade Satisfactory (3)	10,362	0.22	0.41	0	1
Grade Unsatisfactory (4)	10,362	0.02	0.13	0	1
Grade Missing	10,362	0.52	0.50	0	1
Observation period	10,362	38.63	11.10	16	64
Too old (born before 1958/1975)	10,362	0.42	0.49	0	1

Source: Own calculations based on NEPS-SC6-ADIAB 7515. Further Controls: German Federal States.

Table A.3: Balancing of Moments, by highest educational attainment: Completed Vocational Training vs. Completed University Studies.

		25			30			35			40			45			50			55			60		
		m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s
Female	before	-0,13	0,00	0,52	-0,13	0,00	0,52	-0,14	0,00	0,55	-0,15	0,00	0,60	-0,16	0,00	0,64	-0,16	-0,01	0,65	-0,16	-0,01	0,66	-0,18	-0,02	0,73
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	-0,01	0,00	0,06	-0,01	0,00	0,06	0,00	0,00	0,03	0,01	0,00	-0,04	0,01	0,01	-0,07	0,03	0,01	-0,12	0,03	0,01	-0,18			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	-0,01	-0,01	0,08	-0,01	-0,01	0,08	-0,01	0,00	0,05	0,00	0,00	-0,01	0,01	0,00	-0,05	-0,01	0,00	0,07						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	0,07	0,04	-0,55	0,07	0,04	-0,55	0,05	0,04	-0,64	0,02	0,02	-1,13												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	-0,02	0,02	0,52	-0,02	0,02	0,52	-0,02	0,02	0,61	-0,03	0,02	0,78	-0,03	0,02	0,82	-0,03	0,02	0,90	-0,03	0,02	0,82	-0,03	0,03	0,82
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Economic sector (reference category: services)																									
Manufacturing	before	-0,06	0,00	0,24	-0,06	0,00	0,24	-0,06	0,00	0,26	-0,07	0,00	0,28	-0,07	0,00	0,26	-0,06	0,00	0,26	-0,05	0,00	0,21	-0,07	0,01	0,28
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Craftsmanship	before	-0,04	-0,04	1,24	-0,04	-0,04	1,24	-0,04	-0,03	1,16	-0,04	-0,03	1,06	-0,03	-0,03	0,95	-0,03	-0,03	0,88	-0,04	-0,03	0,96	-0,05	-0,04	1,12
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01
Parents ISEI	before	10,91	65,33	-0,58	10,90	65,49	-0,58	10,90	70,12	-0,58	10,76	76,03	-0,57	10,36	73,62	-0,57	10,00	73,07	-0,57	9,80	76,50	-0,58	9,36	74,40	-0,57
	after	0,00	14,21	-0,01	0,00	14,56	-0,01	0,00	15,61	0,01	0,00	19,34	0,03	0,00	16,34	0,01	0,02	8,20	-0,01	0,00	-2,88	-0,01	0,02	-6,44	0,00
Parental education (reference category: no education)																									
Vocational training	before	-0,22	0,06	1,03	-0,22	0,06	1,03	-0,22	0,06	1,02	-0,21	0,06	0,99	-0,19	0,06	0,93	-0,17	0,06	0,83	-0,15	0,05	0,76	-0,14	0,05	0,70
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HEEQ*	before	0,04	0,03	-1,13	0,04	0,03	-1,13	0,04	0,03	-1,15	0,04	0,03	-1,32	0,04	0,04	-1,36	0,04	0,04	-1,45	0,05	0,04	-1,74	0,04	0,04	-1,41
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
University degree	before	0,25	0,14	-2,03	0,25	0,14	-2,03	0,25	0,14	-2,11	0,23	0,14	-2,17	0,22	0,13	-2,12	0,20	0,13	-2,30	0,19	0,13	-2,38	0,16	0,12	-2,16
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Categorized grades (reference category: Grade 1)																									
Grade 2	before	0,03	0,01	-0,19	0,03	0,02	-0,19	0,03	0,02	-0,21	0,03	0,02	-0,23	0,03	0,02	-0,23	0,05	0,02	-0,30	0,06	0,03	-0,32	0,10	0,02	-0,44
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 3	before	-0,10	-0,06	0,88	-0,10	-0,06	0,88	-0,10	-0,06	0,86	-0,10	-0,06	0,87	-0,10	-0,06	0,86	-0,11	-0,06	0,82	-0,12	-0,06	0,76	-0,11	-0,04	0,53
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 4	before	-0,01	-0,01	5,98	-0,01	-0,01	5,98	-0,01	-0,01	5,26	-0,01	-0,01	4,44	-0,01	-0,01	4,30	-0,01	-0,01	3,24	-0,01	-0,01	3,30	-0,02	-0,02	3,27
	after	0,00	0,00	0,02	0,00	0,00	0,02	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,03	0,00	0,00	0,01	0,00	0,00	0,05
Grade Missing	before	0,04	0,00	-0,18	0,04	0,00	-0,18	0,04	0,00	-0,15	0,03	0,00	-0,12	0,03	0,00	-0,12	0,03	0,00	-0,11	0,02	0,00	-0,10	-0,04	-0,02	0,26
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
observation period	before	-2,13	9,56	0,20	-2,12	9,60	0,20	-1,94	13,30	0,12	-1,38	11,43	0,04	-1,15	9,97	0,03	-0,91	7,89	0,04	-0,97	10,04	-0,04	-0,71	8,75	-0,07
	after	0,00	0,96	0,07	0,00	1,01	0,07	0,00	5,39	0,03	0,00	7,55	-0,01	0,00	6,94	-0,01	0,00	7,05	-0,02	0,00	9,20	-0,12	0,00	8,12	-0,13
too old	before	-0,04	-0,01	0,19	-0,04	-0,01	0,19	-0,04	0,00	0,15	-0,02	0,00	0,08	-0,01	0,00	0,04	0,00	0,00	0,01	-0,03	0,01	0,18			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

*Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.*

Table A.4: Balancing of Moments, by highest educational attainment: Completed Vocational Training vs. Completed Craftsman/Technician.

		25 m	25 v	25 s	30 m	30 v	30 s	35 m	35 v	35 s	40 m	40 v	40 s	45 m	45 v	45 s	50 m	50 v	50 s	55 m	55 v	55 s	60 m	60 v	60 s
Female	before	-0,44	-0,14	2,56	-0,44	-0,14	2,56	-0,44	-0,14	2,57	-0,44	-0,13	2,52	-0,45	-0,14	2,58	-0,43	-0,13	2,47	-0,44	-0,15	2,76	-0,40	-0,14	2,38
	after	0,00	0,00	0,02	0,00	0,00	0,02	0,00	0,00	0,02	0,00	0,00	0,01	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	-0,02	-0,01	0,15	-0,02	-0,01	0,15	-0,03	-0,01	0,17	-0,03	-0,02	0,20	-0,04	-0,02	0,25	-0,05	-0,02	0,26	-0,04	-0,02	0,25			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	0,01	0,00	-0,06	0,01	0,00	-0,06	0,01	0,00	-0,03	0,00	0,00	0,01	0,02	0,01	-0,08	0,02	0,02	-0,26						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	-0,03	-0,02	0,43	-0,03	-0,02	0,43	-0,02	-0,02	0,47	0,00	0,00	0,47												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	0,02	-0,02	-0,80	0,02	-0,02	-0,80	0,02	-0,02	-0,94	0,02	-0,01	-0,83	0,01	-0,01	-0,69	0,02	-0,01	-0,94	0,02	-0,02	-1,18	0,02	-0,01	-0,68
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Economic sector (reference category: services)																									
Manufacturing	before	0,12	-0,03	-0,51	0,12	-0,03	-0,51	0,11	-0,03	-0,49	0,11	-0,03	-0,49	0,11	-0,03	-0,48	0,11	-0,03	-0,49	0,13	-0,03	-0,58	0,16	-0,05	-0,76
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Craftsmanship	before	0,13	0,09	-1,38	0,13	0,09	-1,38	0,13	0,09	-1,37	0,13	0,09	-1,38	0,13	0,09	-1,41	0,12	0,08	-1,29	0,11	0,08	-1,16	0,09	0,06	-0,88
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Parents ISEI	before	-1,06	-3,43	0,15	-1,07	-3,49	0,15	-0,93	-4,67	0,13	-0,67	1,73	0,12	-0,71	-1,13	0,11	-0,94	-11,07	0,12	-1,52	-37,00	0,08	-2,34	-53,48	0,10
	after	0,00	8,51	0,01	0,00	8,40	0,01	0,00	5,56	-0,01	0,00	6,11	-0,02	0,00	3,44	-0,04	0,00	-3,08	-0,05	0,00	-16,04	-0,13	0,00	-16,55	-0,19
Parental education (reference category: no education)																									
Vocational training	before	0,03	-0,02	-0,22	0,03	-0,02	-0,22	0,03	-0,02	-0,19	0,02	-0,01	-0,13	0,02	-0,01	-0,14	0,02	-0,01	-0,16	0,06	-0,03	-0,41	0,07	-0,04	-0,52
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HEEQ*	before	0,01	0,01	-0,24	0,01	0,01	-0,23	0,01	0,01	-0,25	0,01	0,00	-0,25	0,00	0,00	-0,23	0,00	0,00	0,01	-0,01	-0,01	0,65	-0,02	-0,02	2,02
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
University degree	before	-0,01	-0,01	0,15	-0,01	-0,01	0,15	0,00	0,00	0,05	0,01	0,01	-0,16	0,00	0,00	-0,10	0,01	0,01	-0,32	-0,01	-0,01	0,37	-0,03	-0,02	1,17
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Categorized grades (reference category: Grade 1)																									
Grade 2	before	0,03	0,01	-0,18	0,03	0,01	-0,18	0,02	0,01	-0,16	0,03	0,02	-0,19	0,03	0,02	-0,23	0,04	0,02	-0,29	0,05	0,02	-0,26	0,06	0,02	-0,27
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 3	before	-0,01	0,00	0,05	-0,01	0,00	0,04	0,00	0,00	0,01	0,00	0,00	0,01	0,00	0,00	0,01	0,00	0,00	0,02	0,00	0,00	0,01	0,00	0,00	0,02
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 4	before	-0,01	-0,01	1,69	-0,01	-0,01	1,69	0,00	0,00	1,36	-0,01	-0,01	1,69	-0,01	-0,01	1,62	-0,01	0,00	1,03	0,00	0,00	0,54	-0,01	-0,01	2,71
	after	0,00	0,00	-0,01	0,00	0,00	-0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade Missing	before	-0,01	0,00	0,06	-0,01	0,00	0,06	-0,02	0,00	0,08	-0,02	0,00	0,09	-0,03	0,00	0,10	-0,04	0,00	0,16	-0,04	-0,01	0,16	-0,03	-0,02	0,23
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
observation period	before	1,22	-5,47	-0,01	1,22	-5,37	-0,01	1,08	-5,06	0,04	0,79	-1,91	0,05	0,38	2,17	0,04	0,29	3,82	0,02	0,45	1,29	0,05	0,03	2,43	0,18
	after	0,00	-3,44	0,02	0,00	-3,33	0,02	0,00	-4,37	0,05	0,00	-4,84	0,08	0,00	-1,87	0,05	0,00	1,93	0,03	0,00	1,15	0,07	0,00	3,24	0,12
too old	before	0,05	0,00	-0,20	0,05	0,00	-0,20	0,05	0,00	-0,19	0,04	0,00	-0,16	0,03	0,00	-0,12	0,05	-0,02	-0,25	0,06	-0,04	-0,55			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

*Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.*

Table A.5: Balancing of Moments, by highest educational attainment: Completed Craftsman/Technician vs. Completed University Studies.

		25			30			35			40			45			50			55			60		
		m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s
Female	before	0,28	0,13	-1,90	0,28	0,13	-1,90	0,27	0,13	-1,88	0,27	0,13	-1,79	0,27	0,13	-1,84	0,25	0,12	-1,72	0,26	0,14	-2,00	0,20	0,11	-1,54
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	0,02	0,01	-0,13	0,02	0,01	-0,13	0,03	0,01	-0,18	0,04	0,02	-0,27	0,06	0,03	-0,33	0,08	0,02	-0,38	0,07	0,03	-0,42			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	-0,02	-0,01	0,13	-0,02	-0,01	0,12	-0,01	-0,01	0,06	0,01	0,00	-0,03	-0,01	0,00	0,04	-0,02	-0,02	0,29						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	0,09	0,06	-0,94	0,09	0,06	-0,93	0,07	0,05	-1,03	0,01	0,01	-1,32												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	-0,04	0,03	1,30	-0,04	0,03	1,30	-0,04	0,03	1,53	-0,04	0,04	1,57	-0,04	0,03	1,51	-0,04	0,04	1,83	-0,05	0,04	2,01	-0,05	0,04	1,52
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Economic sector (reference category: services)																									
Manufacturing	before	-0,16	0,03	0,68	-0,16	0,03	0,69	-0,16	0,03	0,68	-0,17	0,03	0,72	-0,17	0,03	0,71	-0,17	0,03	0,72	-0,17	0,04	0,75	-0,22	0,05	1,01
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Craftsmanship	before	-0,17	-0,12	2,55	-0,17	-0,12	2,55	-0,17	-0,12	2,46	-0,16	-0,12	2,40	-0,16	-0,12	2,34	-0,15	-0,11	2,16	-0,15	-0,11	2,13	-0,14	-0,10	2,01
	after	0,00	0,00	0,02	0,00	0,00	0,02	0,00	0,00	0,02	0,00	0,00	0,01	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,03	0,00	0,00	0,00
Parents ISEI	before	10,59	49,25	-0,72	10,59	49,46	-0,72	10,48	53,46	-0,70	10,29	53,91	-0,70	10,13	55,37	-0,68	10,18	68,00	-0,69	10,54	92,79	-0,67	11,20	108,31	-0,70
	after	0,01	-9,24	0,01	0,01	-8,96	0,01	0,01	10,69	0,08	0,00	10,97	0,07	0,00	24,30	0,14	0,00	39,65	0,20	0,03	73,70	0,28	0,00	61,81	0,23
Parental education (reference category: no education)																									
Vocational training	before	-0,22	0,07	1,12	-0,22	0,07	1,12	-0,21	0,07	1,08	-0,20	0,07	1,01	-0,19	0,07	0,96	-0,17	0,07	0,90	-0,19	0,08	1,07	-0,19	0,08	1,10
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HEEQ*	before	0,04	0,03	-0,92	0,04	0,03	-0,93	0,03	0,03	-0,93	0,04	0,03	-1,10	0,04	0,03	-1,17	0,04	0,04	-1,50	0,06	0,05	-2,44	0,07	0,06	-3,48
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
University degree	before	0,21	0,13	-1,99	0,21	0,13	-1,99	0,21	0,13	-1,96	0,19	0,12	-1,84	0,18	0,12	-1,86	0,16	0,11	-1,83	0,17	0,12	-2,57	0,17	0,13	-3,20
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Categorized grades (reference category: Grade 1)																									
Grade 2	before	0,00	0,00	-0,01	0,00	0,00	-0,01	0,01	0,00	-0,05	0,01	0,00	-0,04	0,00	0,00	-0,01	0,00	0,00	-0,01	0,02	0,01	-0,08	0,05	0,01	-0,19
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 3	before	-0,09	-0,05	0,74	-0,09	-0,05	0,74	-0,09	-0,06	0,77	-0,10	-0,06	0,79	-0,10	-0,06	0,80	-0,10	-0,06	0,76	-0,11	-0,06	0,72	-0,11	-0,04	0,51
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 4	before	-0,01	-0,01	3,76	-0,01	-0,01	3,76	-0,01	-0,01	3,46	0,00	0,00	2,47	-0,01	-0,01	2,51	-0,01	-0,01	2,18	-0,01	-0,01	2,68	0,00	0,00	0,47
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,00	0,00	0,00
Grade Missing	before	0,06	0,00	-0,23	0,06	0,00	-0,23	0,06	0,00	-0,23	0,06	0,00	-0,22	0,06	0,00	-0,23	0,07	0,00	-0,28	0,06	0,01	-0,27	0,00	0,00	0,00
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
observation period	before	-3,13	14,44	0,19	-3,11	14,38	0,19	-2,77	16,95	0,05	-1,98	11,55	-0,03	-1,44	6,60	-0,02	-1,17	3,18	0,01	-1,36	7,68	-0,08	-0,78	6,57	-0,23
	after	0,00	4,37	0,16	0,00	4,39	0,16	0,00	19,62	-0,05	0,00	16,97	-0,11	0,00	14,36	-0,11	0,00	5,71	-0,10	-0,01	9,77	-0,03	0,00	4,11	-0,40
too old	before	-0,09	-0,01	0,36	-0,09	-0,01	0,36	-0,08	-0,01	0,31	-0,05	0,00	0,22	-0,04	0,00	0,15	-0,06	0,02	0,25	-0,08	0,05	0,74			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

*Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.*

Table A.6: Balancing of Moments, by first educational choice: Started Vocational Training vs. Started University Studies.

		25			30			35			40			45			50			55			60		
		m	v	s	m	V	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s
Female	before	-0,03	0,00	0,14	-0,04	0,00	0,14	-0,04	0,00	0,16	-0,05	0,00	0,19	-0,05	0,00	0,22	-0,06	0,00	0,23	-0,04	0,00	0,18	-0,03	0,00	0,13
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	0,00	0,00	0,03	0,00	0,00	0,03	0,01	0,00	-0,05	0,02	0,01	-0,14	0,04	0,02	-0,20	0,07	0,02	-0,30	0,07	0,03	-0,39			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	-0,01	0,00	0,05	-0,01	0,00	0,05	0,01	0,00	-0,04	0,02	0,01	-0,12	0,03	0,01	-0,14	0,00	0,00	0,05						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	0,10	0,06	-0,75	0,10	0,06	-0,74	0,07	0,05	-0,72	0,02	0,02	-1,34												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	-0,05	0,04	1,17	-0,05	0,04	1,15	-0,06	0,05	1,25	-0,06	0,05	1,36	-0,05	0,04	1,37	-0,05	0,04	1,33	-0,05	0,04	1,29	-0,08	0,06	1,54
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Economic sector (reference category: services)																									
Manufacturing	before	-0,15	0,00	0,60	-0,15	0,00	0,60	-0,15	0,00	0,60	-0,16	0,00	0,66	-0,16	0,00	0,64	-0,16	0,00	0,65	-0,16	0,00	0,67	-0,21	0,00	0,87
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Craftsmanship	before	-0,06	-0,05	2,13	-0,06	-0,05	2,12	-0,06	-0,05	2,05	-0,06	-0,05	1,93	-0,05	-0,05	1,77	-0,05	-0,04	1,60	-0,05	-0,05	1,60	-0,07	-0,06	2,22
	after	0,00	0,00	0,02	0,00	0,00	0,02	0,00	0,00	0,01	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,00	0,00
Parents ISEI	before	13,48	46,70	-0,68	13,47	47,00	-0,68	13,49	54,60	-0,67	13,50	59,80	-0,69	13,14	57,40	-0,69	12,67	61,61	-0,66	12,69	83,53	-0,65	12,51	83,43	-0,65
	after	0,02	11,92	0,05	0,02	12,30	0,05	0,02	18,48	0,09	0,01	19,44	0,09	0,01	13,77	0,07	0,00	8,87	0,08	0,03	21,43	0,13	0,00	18,20	0,09
Parental education (reference category: no education)																									
Vocational training	before	-0,29	0,05	1,30	-0,29	0,05	1,29	-0,29	0,05	1,28	-0,28	0,06	1,25	-0,26	0,06	1,18	-0,23	0,06	1,09	-0,24	0,06	1,12	-0,24	0,06	1,09
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HEEQ*	before	0,05	0,04	-1,17	0,05	0,04	-1,17	0,05	0,04	-1,24	0,05	0,04	-1,41	0,05	0,04	-1,45	0,06	0,05	-1,75	0,08	0,06	-2,24	0,08	0,07	-2,23
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
University degree	before	0,31	0,15	-2,15	0,31	0,14	-2,15	0,31	0,15	-2,19	0,30	0,15	-2,24	0,28	0,15	-2,21	0,26	0,15	-2,31	0,25	0,15	-2,50	0,24	0,15	-2,44
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Categorized grades (reference category: Grade 1)																									
Grade 2	before	-0,01	0,00	0,04	-0,01	0,00	0,04	0,00	0,00	-0,01	0,00	0,00	0,02	-0,01	0,00	0,06	-0,01	0,00	0,06	-0,02	-0,01	0,11	-0,02	-0,01	0,09
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 3	before	-0,11	-0,07	1,04	-0,11	-0,07	1,04	-0,11	-0,07	1,02	-0,11	-0,07	1,00	-0,10	-0,07	0,94	-0,10	-0,06	0,83	-0,11	-0,06	0,72	-0,10	-0,04	0,51
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 4	before	-0,01	-0,01	6,29	-0,01	-0,01	6,28	-0,01	-0,01	5,31	-0,01	-0,01	4,35	-0,01	-0,01	3,58	-0,01	-0,01	2,53	-0,01	-0,01	1,91	0,00	0,00	0,34
	after	0,00	0,00	0,10	0,00	0,00	0,10	0,00	0,00	0,05	0,00	0,00	0,02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade Missing	before	0,09	-0,01	-0,39	0,09	-0,01	-0,39	0,08	-0,01	-0,35	0,08	-0,01	-0,33	0,08	-0,01	-0,34	0,09	0,00	-0,35	0,10	0,01	-0,40	0,08	0,04	-0,46
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
observation period	before	-3,70	2,21	0,33	-3,69	2,30	0,33	-3,22	6,86	0,20	-2,68	8,38	0,11	-2,35	8,00	0,09	-2,10	8,40	0,10	-2,11	12,40	0,02	-1,85	14,60	-0,07
	after	-0,01	-2,42	0,08	-0,01	-2,30	0,07	0,00	2,25	0,02	0,00	6,84	-0,04	0,00	8,09	-0,09	0,00	8,11	-0,09	0,00	9,65	-0,13	0,00	13,57	-0,27
too old	before	-0,10	-0,02	0,45	-0,10	-0,02	0,45	-0,09	-0,02	0,37	-0,07	-0,01	0,29	-0,07	0,00	0,26	-0,06	0,01	0,27	-0,09	0,05	0,57			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

*Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.*

Table A.7: Balancing of Moments: Started Vocational Training vs. Started but not Completed University Studies.

		25			30			35			40			45			50			55			60		
		m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s
Female	before	-0,05	0,00	0,18	-0,05	0,00	0,19	-0,04	0,00	0,15	-0,04	0,00	0,17	-0,05	0,00	0,20	-0,05	0,00	0,21	-0,11	-0,02	0,47	-0,07	-0,01	0,30
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	-0,04	-0,02	0,26	-0,03	-0,02	0,26	-0,01	-0,01	0,10	0,01	0,00	-0,04	0,01	0,01	-0,06	0,06	0,01	-0,26	0,04	0,02	-0,25			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	-0,01	0,00	0,05	-0,01	0,00	0,04	0,02	0,01	-0,12	0,06	0,02	-0,26	0,07	0,03	-0,35	0,00	0,00	0,06						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	0,15	0,08	-0,99	0,15	0,08	-0,99	0,08	0,06	-0,84	0,01	0,01	-0,80												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	-0,06	0,05	1,21	-0,06	0,05	1,18	-0,06	0,05	1,25	-0,05	0,04	1,21	-0,05	0,04	1,29	-0,03	0,03	0,93	-0,03	0,02	0,77	-0,09	0,07	1,57
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Economic sector (reference category: services)																									
Manufacturing	before	-0,13	0,00	0,53	-0,13	0,00	0,53	-0,12	0,00	0,50	-0,13	0,01	0,54	-0,12	0,01	0,48	-0,14	0,01	0,58	-0,09	0,01	0,38	-0,15	0,02	0,60
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Craftsmanship	before	-0,05	-0,04	2,26	-0,05	-0,04	2,25	-0,05	-0,05	3,29	-0,05	-0,04	2,56	-0,04	-0,04	2,11	-0,03	-0,03	1,55	-0,03	-0,02	1,22	-0,02	-0,02	0,95
	after	0,00	0,00	0,01	0,00	0,00	0,01	0,00	0,00	0,04	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Parents ISEI	before	12,68	21,77	-0,61	12,64	21,95	-0,60	12,98	30,47	-0,58	13,66	37,06	-0,67	13,53	36,23	-0,72	13,23	37,75	-0,60	13,41	88,72	-0,58	11,93	109,77	-0,54
	after	0,01	-10,36	0,08	0,01	-10,46	0,08	0,01	-2,83	0,16	0,01	4,85	0,12	0,01	4,39	0,06	0,01	0,78	0,15	0,00	45,91	0,23	0,03	57,69	0,17
Parental education (reference category: no education)																									
Vocational training	before	-0,30	0,04	1,33	-0,30	0,04	1,33	-0,31	0,05	1,36	-0,30	0,05	1,32	-0,28	0,06	1,25	-0,24	0,06	1,11	-0,26	0,06	1,16	-0,27	0,06	1,20
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HEEQ*	before	0,07	0,06	-1,48	0,07	0,05	-1,45	0,07	0,06	-1,55	0,07	0,06	-1,66	0,07	0,06	-1,66	0,09	0,07	-2,09	0,12	0,09	-2,64	0,15	0,12	-2,78
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
University degree	before	0,29	0,14	-2,02	0,29	0,14	-2,02	0,30	0,14	-2,10	0,29	0,15	-2,16	0,28	0,15	-2,17	0,26	0,15	-2,22	0,24	0,15	-2,35	0,24	0,15	-2,32
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Categorized grades (reference category: Grade 1)																									
Grade 2	before	-0,05	-0,03	0,42	-0,05	-0,03	0,41	-0,04	-0,03	0,34	-0,06	-0,04	0,51	-0,06	-0,04	0,55	-0,07	-0,04	0,57	-0,08	-0,05	0,63	-0,19	-0,09	1,24
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 3	before	-0,07	-0,04	0,57	-0,07	-0,04	0,56	-0,07	-0,04	0,53	-0,05	-0,03	0,38	-0,03	-0,02	0,24	0,00	0,00	-0,01	0,00	0,00	-0,02	0,02	0,01	-0,10
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 4	before	-0,01	-0,01	2,04	-0,01	-0,01	2,03	0,00	0,00	1,12	0,00	0,00	0,34	0,00	0,00	-0,04	0,01	0,01	-0,87	0,01	0,01	-1,09	0,04	0,03	-2,36
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade Missing	before	0,12	-0,02	-0,52	0,12	-0,02	-0,51	0,10	-0,01	-0,43	0,09	-0,01	-0,38	0,09	-0,01	-0,35	0,06	0,00	-0,23	0,08	0,01	-0,33	0,13	0,06	-0,69
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
observation period	before	-4,84	1,75	0,45	-4,84	2,06	0,45	-3,81	5,67	0,27	-2,95	7,06	0,17	-2,96	8,84	0,18	-2,51	14,01	0,11	-2,33	15,79	0,12	-2,70	19,37	0,08
	after	-0,01	-2,01	0,07	-0,01	-1,67	0,07	0,00	-0,08	0,04	0,00	6,28	-0,04	0,00	7,62	-0,08	0,00	13,23	-0,14	0,00	12,03	-0,10	0,00	18,87	-0,30
too old	before	-0,11	-0,03	0,50	-0,11	-0,03	0,49	-0,08	-0,01	0,34	-0,05	0,00	0,20	-0,06	0,00	0,22	-0,06	0,01	0,27	-0,08	0,04	0,54			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

*Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.*

Table A.8: Balancing of Moments: Started Vocational Training vs. Started and Completed University Studies.

		25			30			35			40			45			50			55			60		
		m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s
Female	before	-0,03	0,00	0,13	-0,03	0,00	0,13	-0,04	0,00	0,17	-0,05	0,00	0,20	-0,05	0,00	0,22	-0,06	0,00	0,24	-0,03	0,00	0,12	-0,02	0,00	0,09
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	0,00	0,00	-0,02	0,00	0,00	-0,02	0,01	0,01	-0,08	0,03	0,01	-0,15	0,05	0,02	-0,23	0,07	0,02	-0,30	0,08	0,03	-0,42			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	-0,01	0,00	0,04	-0,01	0,00	0,04	0,00	0,00	-0,03	0,02	0,01	-0,08	0,02	0,01	-0,09	0,00	0,00	0,04						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	0,09	0,05	-0,65	0,09	0,05	-0,64	0,06	0,04	-0,66	0,02	0,02	-1,38												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	-0,05	0,04	1,09	-0,05	0,04	1,08	-0,05	0,04	1,20	-0,06	0,05	1,37	-0,05	0,04	1,36	-0,05	0,04	1,38	-0,06	0,05	1,35	-0,07	0,06	1,50
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Economic sector (reference category: services)																									
Manufacturing	before	-0,15	0,00	0,62	-0,15	0,00	0,62	-0,16	0,00	0,63	-0,17	0,00	0,69	-0,17	0,00	0,68	-0,16	0,00	0,66	-0,18	0,00	0,73	-0,23	0,00	0,94
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Craftsmanship	before	-0,06	-0,05	2,00	-0,06	-0,05	2,00	-0,06	-0,05	1,81	-0,05	-0,05	1,75	-0,05	-0,04	1,62	-0,05	-0,04	1,52	-0,05	-0,05	1,57	-0,07	-0,06	2,38
	after	0,00	0,00	0,02	0,00	0,00	0,01	0,00	0,00	0,01	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,00	0,00
Parents ISEI	before	13,44	52,93	-0,69	13,44	53,25	-0,69	13,38	59,98	-0,68	13,25	64,34	-0,69	12,84	61,55	-0,67	12,33	65,47	-0,66	12,34	82,15	-0,65	12,41	77,86	-0,66
	after	0,02	17,20	0,04	0,02	17,71	0,04	0,02	23,09	0,07	0,01	22,40	0,08	0,00	15,82	0,08	0,00	10,19	0,06	0,03	17,78	0,11	0,00	10,92	0,07
Parental education (reference category: no education)																									
Vocational training	before	-0,29	0,05	1,27	-0,29	0,05	1,27	-0,28	0,06	1,26	-0,27	0,06	1,23	-0,25	0,06	1,16	-0,23	0,06	1,08	-0,24	0,06	1,11	-0,23	0,06	1,06
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HEEQ*	before	0,04	0,03	-1,06	0,04	0,03	-1,06	0,04	0,03	-1,13	0,04	0,04	-1,32	0,05	0,04	-1,36	0,05	0,04	-1,63	0,07	0,06	-2,08	0,07	0,06	-1,99
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
University degree	before	0,31	0,15	-2,16	0,31	0,14	-2,15	0,31	0,15	-2,18	0,29	0,15	-2,22	0,27	0,15	-2,19	0,26	0,15	-2,30	0,25	0,15	-2,50	0,24	0,15	-2,43
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Categorized grades (reference category: Grade 1)																									
Grade 2	before	0,01	0,00	-0,05	0,01	0,00	-0,05	0,01	0,01	-0,09	0,01	0,01	-0,07	0,01	0,00	-0,04	0,00	0,00	-0,03	0,00	0,00	0,03	0,02	0,01	-0,08
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 3	before	-0,12	-0,08	1,18	-0,12	-0,08	1,18	-0,12	-0,08	1,16	-0,12	-0,08	1,18	-0,12	-0,08	1,17	-0,12	-0,08	1,09	-0,13	-0,07	0,93	-0,13	-0,05	0,68
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 4	before	-0,01	-0,01	8,40	-0,01	-0,01	8,39	-0,01	-0,01	7,29	-0,01	-0,01	6,15	-0,01	-0,01	5,06	-0,01	-0,01	3,94	-0,01	-0,01	3,14	-0,01	-0,01	2,54
	after	0,00	0,00	0,21	0,00	0,00	0,21	0,00	0,00	0,10	0,00	0,00	0,04	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,00	0,00
Grade Missing	before	0,08	-0,01	-0,33	0,08	-0,01	-0,33	0,08	-0,01	-0,31	0,07	-0,01	-0,30	0,08	-0,01	-0,32	0,09	0,00	-0,35	0,10	0,01	-0,40	0,06	0,03	-0,38
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
observation period	before	-3,27	1,65	0,29	-3,26	1,67	0,29	-2,96	6,81	0,17	-2,53	8,51	0,09	-2,14	7,69	0,07	-1,95	7,10	0,09	-2,03	11,75	0,00	-1,63	13,49	-0,10
	after	-0,01	-2,62	0,08	-0,01	-2,56	0,08	0,00	2,72	0,02	0,00	6,86	-0,04	0,00	8,11	-0,10	0,00	6,98	-0,08	0,00	9,23	-0,13	0,00	12,41	-0,27
too old	before	-0,09	-0,02	0,42	-0,09	-0,02	0,41	-0,09	-0,01	0,36	-0,07	-0,01	0,30	-0,06	0,00	0,26	-0,06	0,01	0,25	-0,09	0,05	0,57			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.

Table A.9: Balancing of Moments: Started Vocational Training and Completed Craftsmen/Technician vs. Started University Studies.

		25			30			35			40			45			50			55			60		
		m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s
Female	before	0,31	0,14	-2,03	0,31	0,14	-2,03	0,31	0,14	-2,02	0,30	0,13	-1,93	0,30	0,14	-1,98	0,29	0,13	-1,87	0,31	0,15	-2,18			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	0,01	0,01	-0,10	0,01	0,01	-0,10	0,03	0,02	-0,20	0,05	0,03	-0,33	0,08	0,03	-0,43	0,12	0,03	-0,52	0,10	0,05	-0,63			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	-0,02	-0,01	0,11	-0,02	-0,01	0,10	0,00	0,00	-0,01	0,03	0,01	-0,13	0,01	0,01	-0,07	-0,02	-0,01	0,26						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	0,14	0,09	-1,26	0,14	0,09	-1,26	0,09	0,07	-1,30	0,02	0,02	-1,76												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	-0,07	0,06	2,09	-0,07	0,06	2,08	-0,07	0,06	2,27	-0,07	0,06	2,32	-0,06	0,05	2,32	-0,06	0,06	2,50	-0,07	0,06	2,61			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
Economic sector (reference category: services)																									
Manufacturing	before	-0,24	0,03	1,00	-0,24	0,03	1,00	-0,23	0,03	0,99	-0,25	0,03	1,05	-0,25	0,03	1,05	-0,25	0,03	1,07	-0,27	0,04	1,16			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
Craftsmanship	before	-0,18	-0,13	3,34	-0,18	-0,13	3,34	-0,18	-0,13	3,26	-0,17	-0,13	3,14	-0,17	-0,13	3,01	-0,16	-0,12	2,78	-0,16	-0,12	2,75			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,05	0,00	0,00	0,04	0,00	0,00	0,01	0,00	0,00	0,00			
Parents ISEI	before	14,13	47,03	-0,87	14,13	47,32	-0,87	14,07	54,37	-0,84	13,94	55,35	-0,85	13,86	57,55	-0,83	13,73	72,53	-0,84	14,35	116,45	-0,79			
	after	0,00	-4,23	0,08	0,00	-4,24	0,08	0,00	21,88	0,22	0,03	25,53	0,20	0,02	42,35	0,30	0,00	65,36	0,38	0,00	131,54	0,48			
Parental education (reference category: no education)																									
Vocational training	before	-0,32	0,08	1,54	-0,32	0,08	1,54	-0,31	0,08	1,50	-0,29	0,08	1,41	-0,28	0,08	1,35	-0,26	0,08	1,27	-0,29	0,10	1,55			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
HEEQ*	before	0,05	0,04	-1,18	0,05	0,04	-1,18	0,04	0,04	-1,18	0,05	0,04	-1,35	0,05	0,04	-1,42	0,06	0,05	-1,93	0,08	0,07	-2,87			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
University degree	before	0,30	0,16	-2,43	0,30	0,16	-2,42	0,30	0,16	-2,41	0,28	0,15	-2,28	0,27	0,15	-2,29	0,24	0,14	-2,24	0,26	0,16	-3,14			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
Categorized grades (reference category: Grade 1)																									
Grade 2	before	-0,02	-0,01	0,17	-0,03	-0,01	0,17	-0,02	-0,01	0,11	-0,02	-0,01	0,16	-0,03	-0,02	0,22	-0,04	-0,02	0,25	-0,04	-0,02	0,22			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
Grade 3	before	-0,10	-0,07	0,94	-0,10	-0,07	0,94	-0,11	-0,07	0,97	-0,11	-0,07	0,97	-0,11	-0,07	0,93	-0,10	-0,06	0,82	-0,12	-0,06	0,77			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
Grade 4	before	-0,01	-0,01	4,60	-0,01	-0,01	4,59	-0,01	-0,01	4,06	-0,01	-0,01	2,91	-0,01	-0,01	2,48	-0,01	-0,01	2,04	-0,01	-0,01	1,92			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
Grade Missing	before	0,10	-0,01	-0,42	0,10	-0,01	-0,42	0,10	-0,01	-0,40	0,10	-0,01	-0,41	0,11	-0,01	-0,43	0,12	0,00	-0,48	0,13	0,02	-0,54			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
observation period	before	-4,78	10,42	0,34	-4,76	10,42	0,34	-4,11	13,91	0,15	-3,15	10,28	0,04	-2,52	6,24	0,03	-2,22	5,13	0,05	-2,47	12,28	-0,04			
	after	0,00	-6,88	0,21	0,00	-6,73	0,21	0,00	18,45	-0,07	0,00	16,73	-0,16	0,00	14,46	-0,16	0,00	6,63	-0,13	0,00	11,61	0,18			
too old	before	-0,14	-0,03	0,60	-0,14	-0,03	0,60	-0,12	-0,01	0,50	-0,09	0,00	0,38	-0,08	0,00	0,32	-0,10	0,02	0,44	-0,13	0,08	1,04			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

*Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.*

Table A.10: Balancing of Moments: Started Vocational Training and Completed University Studies vs. Started University Studies.

		25			30			35			40			45			50			55			60		
		m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s
Female	before	0,07	0,01	-0,29	0,07	0,01	-0,29	0,06	0,01	-0,26	0,07	0,01	-0,30	0,07	0,01	-0,29	0,07	0,01	-0,28	0,11	0,03	-0,47	0,13	0,04	-0,61
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	0,00	0,00	-0,03	0,00	0,00	-0,03	0,02	0,01	-0,12	0,03	0,01	-0,15	0,05	0,02	-0,23	0,07	0,02	-0,30	0,07	0,03	-0,41			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	0,00	0,00	-0,03	0,00	0,00	-0,03	0,02	0,01	-0,12	0,03	0,01	-0,14	0,02	0,01	-0,11	0,00	0,00	-0,03						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	0,07	0,04	-0,48	0,07	0,04	-0,48	0,03	0,02	-0,30	0,02	0,01	-0,93												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	-0,06	0,05	1,56	-0,06	0,05	1,55	-0,06	0,05	1,54	-0,06	0,05	1,60	-0,05	0,04	1,43	-0,04	0,04	1,24	-0,05	0,04	1,35	-0,08	0,06	1,70
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Economic sector (reference category: services)																									
Manufacturing	before	-0,16	0,00	0,64	-0,16	0,00	0,64	-0,15	0,00	0,62	-0,17	0,00	0,70	-0,17	0,00	0,68	-0,17	0,00	0,67	-0,20	0,01	0,80	-0,22	0,00	0,91
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Craftsmanship	before	-0,03	-0,03	1,42	-0,03	-0,03	1,41	-0,03	-0,03	1,33	-0,03	-0,03	1,29	-0,03	-0,03	1,17	-0,03	-0,03	1,13	-0,03	-0,03	1,11	-0,05	-0,04	1,79
	after	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Parents ISEI	before	7,11	12,20	-0,28	7,10	12,50	-0,28	7,03	17,60	-0,27	7,21	17,36	-0,31	7,03	14,42	-0,29	6,70	20,72	-0,26	6,82	45,78	-0,22	6,55	39,52	-0,22
	after	0,01	13,56	0,05	0,01	13,80	0,05	0,00	14,10	0,06	0,00	-1,45	0,01	0,00	-7,00	0,02	0,00	-5,64	0,05	0,01	7,25	0,11	0,01	10,10	-0,04
Parental education (reference category: no education)																									
Vocational training	before	-0,18	0,01	0,74	-0,18	0,01	0,73	-0,17	0,01	0,71	-0,18	0,02	0,73	-0,16	0,02	0,68	-0,15	0,03	0,66	-0,18	0,04	0,78	-0,16	0,03	0,71
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HEEQ*	before	0,02	0,01	-0,34	0,02	0,01	-0,33	0,02	0,02	-0,42	0,02	0,02	-0,54	0,02	0,02	-0,51	0,04	0,03	-0,81	0,05	0,04	-1,13	0,06	0,05	-1,33
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
University degree	before	0,18	0,06	-0,90	0,18	0,06	-0,90	0,17	0,06	-0,86	0,17	0,07	-0,90	0,16	0,07	-0,88	0,15	0,07	-0,91	0,16	0,08	-1,06	0,16	0,08	-1,08
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Categorized grades (reference category: Grade 1)																									
Grade 2	before	-0,04	-0,02	0,27	-0,04	-0,02	0,27	-0,04	-0,02	0,23	-0,05	-0,02	0,30	-0,06	-0,03	0,35	-0,07	-0,04	0,44	-0,11	-0,04	0,57	-0,14	-0,03	0,62
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 3	before	-0,05	-0,03	0,55	-0,05	-0,03	0,55	-0,05	-0,03	0,53	-0,04	-0,03	0,50	-0,04	-0,03	0,43	-0,03	-0,02	0,33	-0,02	-0,01	0,19	-0,03	-0,01	0,14
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 4	before	0,00	0,00	3,25	0,00	0,00	3,24	0,00	0,00	2,78	0,00	0,00	2,48	0,00	0,00	1,62	0,00	0,00	1,33	0,00	0,00	0,15	0,01	0,01	-1,24
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-0,01	0,00	0,00	0,00
Grade Missing	before	0,10	-0,01	-0,40	0,10	-0,01	-0,40	0,09	-0,01	-0,36	0,10	-0,01	-0,40	0,10	-0,01	-0,41	0,12	0,00	-0,47	0,14	0,02	-0,59	0,17	0,10	-1,39
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
observation period	before	-3,01	-7,43	0,26	-3,00	-7,42	0,26	-2,46	-5,67	0,16	-2,42	0,15	0,11	-2,07	0,25	0,09	-2,11	3,73	0,10	-2,09	8,03	0,08	-1,87	12,69	-0,08
	after	0,00	-4,93	0,04	0,00	-4,81	0,04	0,00	-4,08	0,00	0,00	1,25	-0,06	0,00	2,56	-0,11	0,00	6,08	-0,14	0,00	2,47	-0,10	0,00	8,83	-0,16
too old	before	-0,11	-0,03	0,50	-0,11	-0,03	0,49	-0,10	-0,02	0,42	-0,10	0,00	0,42	-0,10	0,01	0,40	-0,10	0,02	0,44	-0,11	0,06	0,76			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

*Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.*

Table A.11: Balancing of Moments: Started Vocational Training and Completed University Studies vs. Started and Completed University Studies.

		25			30			35			40			45			50			55			60		
		m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s
Female	before	0,07	0,01	-0,31	0,07	0,01	-0,31	0,06	0,01	-0,26	0,07	0,01	-0,30	0,07	0,01	-0,29	0,07	0,01	-0,28	0,12	0,03	-0,53	0,14	0,04	-0,67
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	0,01	0,01	-0,10	0,01	0,01	-0,10	0,02	0,01	-0,16	0,03	0,01	-0,18	0,05	0,02	-0,27	0,07	0,02	-0,32	0,08	0,04	-0,47			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	0,01	0,00	-0,04	0,01	0,00	-0,04	0,02	0,01	-0,11	0,02	0,01	-0,12	0,01	0,01	-0,07	0,00	0,00	-0,06						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	0,06	0,03	-0,40	0,06	0,03	-0,39	0,03	0,02	-0,25	0,02	0,02	-1,05												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	-0,05	0,05	1,48	-0,05	0,05	1,47	-0,05	0,05	1,47	-0,06	0,05	1,60	-0,05	0,04	1,38	-0,04	0,04	1,25	-0,05	0,04	1,37	-0,07	0,06	1,63
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Economic sector (reference category: services)																									
Manufacturing	before	-0,16	0,00	0,66	-0,16	0,00	0,67	-0,16	0,00	0,66	-0,18	0,00	0,74	-0,18	0,00	0,73	-0,17	0,00	0,69	-0,21	0,01	0,88	-0,24	0,00	0,99
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Craftsmanship	before	-0,03	-0,03	1,32	-0,03	-0,03	1,32	-0,03	-0,02	1,10	-0,03	-0,02	1,14	-0,03	-0,02	1,04	-0,03	-0,03	1,06	-0,03	-0,03	1,09	-0,05	-0,05	1,99
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Parents ISEI	before	7,18	17,14	-0,30	7,18	17,47	-0,30	7,02	21,72	-0,29	7,08	21,26	-0,31	6,83	18,11	-0,28	6,48	24,14	-0,27	6,60	43,43	-0,24	6,68	33,04	-0,26
	after	0,01	14,79	0,03	0,01	15,21	0,03	0,00	15,02	0,03	0,00	-1,49	0,00	0,00	-8,79	0,02	0,00	-6,63	0,03	0,01	-3,56	0,07	0,00	-12,75	-0,08
Parental education (reference category: no education)																									
Vocational training	before	-0,17	0,01	0,71	-0,17	0,01	0,71	-0,17	0,02	0,68	-0,17	0,02	0,70	-0,15	0,02	0,65	-0,15	0,03	0,63	-0,17	0,04	0,75	-0,15	0,03	0,65
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HEEQ*	before	0,01	0,01	-0,24	0,01	0,01	-0,25	0,01	0,01	-0,33	0,02	0,02	-0,47	0,02	0,02	-0,45	0,03	0,03	-0,73	0,04	0,04	-1,02	0,05	0,04	-1,17
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
University degree	before	0,18	0,06	-0,92	0,18	0,06	-0,91	0,17	0,06	-0,86	0,17	0,07	-0,90	0,15	0,07	-0,86	0,15	0,07	-0,91	0,16	0,08	-1,07	0,15	0,08	-1,08
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Categorized grades (reference category: Grade 1)																									
Grade 2	before	-0,03	-0,01	0,17	-0,03	-0,01	0,18	-0,02	-0,01	0,15	-0,03	-0,02	0,20	-0,04	-0,02	0,25	-0,06	-0,03	0,34	-0,10	-0,03	0,47	-0,10	-0,01	0,43
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 3	before	-0,06	-0,04	0,70	-0,06	-0,04	0,71	-0,06	-0,04	0,68	-0,06	-0,04	0,70	-0,06	-0,04	0,67	-0,06	-0,04	0,61	-0,05	-0,03	0,43	-0,06	-0,03	0,32
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 4	before	-0,01	-0,01	6,06	-0,01	-0,01	6,05	-0,01	-0,01	5,53	-0,01	-0,01	5,11	-0,01	-0,01	4,01	-0,01	-0,01	3,53	0,00	0,00	2,04	0,00	0,00	1,40
	after	0,00	0,00	0,03	0,00	0,00	0,03	0,00	0,00	0,02	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade Missing	before	0,09	-0,01	-0,36	0,09	-0,01	-0,36	0,08	-0,01	-0,34	0,10	-0,01	-0,38	0,10	0,00	-0,41	0,12	0,00	-0,49	0,14	0,02	-0,60	0,15	0,09	-1,33
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
observation period	before	-2,75	-9,69	0,23	-2,74	-9,75	0,22	-2,36	-7,26	0,14	-2,44	-0,91	0,09	-2,00	-1,40	0,06	-2,11	1,32	0,10	-2,16	6,57	0,06	-1,79	11,01	-0,11
	after	0,00	-4,93	0,03	0,00	-4,87	0,03	0,00	-3,61	-0,01	0,00	1,15	-0,07	0,00	2,31	-0,12	0,00	4,42	-0,13	0,00	1,65	-0,12	0,00	7,29	-0,17
too old	before	-0,11	-0,02	0,49	-0,11	-0,02	0,49	-0,10	-0,02	0,43	-0,11	0,00	0,45	-0,10	0,01	0,42	-0,10	0,02	0,45	-0,11	0,06	0,78			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

*Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.*

Table A.12: Balancing of Moments: Started Vocational Training, Completed No Degree or Vocational Training vs. Started University Studies.

		25			30			35			40			45			50			55			60		
		m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s
Female	before	-0,10	0,00	0,39	-0,10	0,00	0,40	-0,11	0,00	0,43	-0,11	0,00	0,46	-0,12	0,00	0,50	-0,13	0,00	0,51	-0,12	0,00	0,48	-0,11	-0,01	0,44
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	-0,01	0,00	0,06	-0,01	0,00	0,06	0,00	0,00	-0,02	0,02	0,01	-0,11	0,03	0,01	-0,16	0,06	0,01	-0,26	0,06	0,03	-0,35			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	-0,01	0,00	0,05	-0,01	0,00	0,05	0,01	0,00	-0,03	0,02	0,01	-0,11	0,03	0,01	-0,16	0,00	0,00	0,02						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	0,10	0,06	-0,74	0,10	0,06	-0,73	0,07	0,05	-0,74	0,02	0,02	-1,29												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	-0,05	0,04	0,98	-0,05	0,04	0,97	-0,05	0,04	1,08	-0,05	0,04	1,19	-0,05	0,04	1,22	-0,05	0,04	1,19	-0,05	0,04	1,11	-0,07	0,06	1,37
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Economic sector (reference category: services)																									
Manufacturing	before	-0,13	0,00	0,52	-0,13	0,00	0,52	-0,13	0,00	0,53	-0,14	0,00	0,59	-0,14	0,00	0,56	-0,14	0,00	0,57	-0,14	0,00	0,56	-0,18	-0,01	0,74
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Craftsmanship	before	-0,05	-0,04	1,96	-0,05	-0,04	1,95	-0,05	-0,04	1,89	-0,05	-0,04	1,74	-0,04	-0,04	1,56	-0,04	-0,04	1,40	-0,05	-0,04	1,45	-0,06	-0,05	2,12
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Parents ISEI	before	14,32	60,66	-0,72	14,31	60,95	-0,72	14,37	69,13	-0,71	14,30	74,47	-0,72	13,91	71,58	-0,72	13,34	73,43	-0,70	13,31	92,56	-0,69	13,05	92,29	-0,70
	after	0,01	16,30	0,05	0,01	16,72	0,05	0,01	23,87	0,10	0,00	31,67	0,13	0,00	21,42	0,09	0,00	10,10	0,07	0,01	16,45	0,11	0,00	12,95	0,10
Parental education (reference category: no education)																									
Vocational training	before	-0,31	0,06	1,39	-0,31	0,06	1,39	-0,30	0,06	1,39	-0,29	0,07	1,35	-0,27	0,07	1,28	-0,25	0,07	1,17	-0,25	0,07	1,16	-0,24	0,06	1,12
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HEEQ*	before	0,05	0,04	-1,39	0,05	0,04	-1,39	0,05	0,04	-1,46	0,05	0,05	-1,64	0,06	0,05	-1,69	0,06	0,05	-1,95	0,08	0,07	-2,44	0,08	0,07	-2,24
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
University degree	before	0,33	0,16	-2,53	0,33	0,16	-2,52	0,33	0,16	-2,61	0,32	0,17	-2,67	0,30	0,16	-2,65	0,28	0,16	-2,80	0,27	0,16	-2,92	0,25	0,16	-2,78
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Categorized grades (reference category: Grade 1)																									
Grade 2	before	0,00	0,00	-0,03	0,00	0,00	-0,03	0,01	0,01	-0,07	0,01	0,00	-0,05	0,00	0,00	-0,02	0,01	0,00	-0,05	0,00	0,00	0,00	0,01	0,00	-0,04
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 3	before	-0,12	-0,08	1,10	-0,12	-0,08	1,10	-0,12	-0,08	1,08	-0,12	-0,07	1,05	-0,11	-0,07	0,99	-0,11	-0,06	0,87	-0,12	-0,06	0,77	-0,11	-0,04	0,55
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 4	before	-0,01	-0,01	6,41	-0,01	-0,01	6,41	-0,01	-0,01	5,31	-0,01	-0,01	4,31	-0,01	-0,01	3,50	-0,01	-0,01	2,30	-0,01	-0,01	1,64	0,00	0,00	0,46
	after	0,00	0,00	0,04	0,00	0,00	0,04	0,00	0,00	0,02	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade Missing	before	0,09	-0,01	-0,37	0,09	-0,01	-0,37	0,08	-0,01	-0,32	0,07	-0,01	-0,30	0,07	-0,01	-0,30	0,07	0,00	-0,29	0,08	0,01	-0,34	0,05	0,02	-0,29
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
observation period	before	-3,59	3,30	0,33	-3,58	3,41	0,32	-3,15	8,47	0,20	-2,56	9,27	0,11	-2,31	9,36	0,09	-2,03	9,36	0,10	-2,04	13,15	0,03	-1,85	15,49	-0,04
	after	0,00	-2,62	0,08	0,00	-2,49	0,08	0,00	3,93	0,01	0,00	7,72	-0,04	0,00	8,38	-0,09	0,00	7,80	-0,06	0,00	11,95	-0,16	0,00	15,00	-0,30
too old	before	-0,09	-0,02	0,40	-0,09	-0,02	0,40	-0,08	-0,01	0,33	-0,06	0,00	0,25	-0,06	0,00	0,22	-0,05	0,01	0,20	-0,07	0,04	0,48			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

*Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.*

Table A.13: Balancing of Moments: Started Vocational Training, Completed No Degree or Vocational Training vs. Completed University Studies.

		25			30			35			40			45			50			55			60		
		m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s
Female	before	-0,13	0,00	0,51	-0,13	0,00	0,52	-0,14	0,00	0,55	-0,15	0,00	0,59	-0,16	0,00	0,63	-0,16	-0,01	0,64	-0,16	-0,01	0,65	-0,17	-0,02	0,72
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	-0,01	0,00	0,03	-0,01	0,00	0,04	0,00	0,00	0,01	0,01	0,00	-0,06	0,02	0,01	-0,08	0,03	0,01	-0,13	0,03	0,02	-0,19			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	-0,01	-0,01	0,07	-0,01	-0,01	0,06	-0,01	0,00	0,03	0,01	0,00	-0,03	0,01	0,01	-0,07	0,00	0,00	0,06						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	0,06	0,04	-0,50	0,06	0,04	-0,50	0,05	0,04	-0,58	0,01	0,01	-0,98												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	-0,02	0,02	0,48	-0,02	0,02	0,48	-0,02	0,02	0,59	-0,03	0,02	0,73	-0,02	0,02	0,78	-0,03	0,02	0,84	-0,03	0,02	0,73	-0,03	0,03	0,77
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Economic sector (reference category: services)																									
Manufacturing	before	-0,07	0,00	0,26	-0,07	0,00	0,26	-0,07	0,00	0,28	-0,07	0,00	0,30	-0,07	0,00	0,29	-0,07	0,00	0,28	-0,06	0,00	0,23	-0,07	0,01	0,30
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Craftsmanship	before	-0,04	-0,04	1,25	-0,04	-0,04	1,25	-0,04	-0,04	1,17	-0,04	-0,03	1,08	-0,04	-0,03	0,97	-0,03	-0,03	0,89	-0,04	-0,03	0,96	-0,05	-0,04	1,10
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Parents ISEI	before	11,49	71,27	-0,60	11,48	71,45	-0,60	11,46	76,52	-0,59	11,23	81,80	-0,58	10,82	79,31	-0,58	10,39	77,73	-0,58	10,18	82,95	-0,58	9,71	82,74	-0,58
	after	0,00	19,13	0,02	0,00	19,49	0,02	0,00	23,98	0,05	0,00	28,88	0,08	0,00	21,83	0,05	0,03	12,31	0,02	0,00	8,44	0,04	0,00	4,67	0,02
Parental education (reference category: no education)																									
Vocational training	before	-0,23	0,06	1,05	-0,23	0,06	1,05	-0,22	0,06	1,05	-0,21	0,06	1,01	-0,19	0,06	0,95	-0,17	0,06	0,84	-0,16	0,05	0,77	-0,14	0,05	0,70
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HEEQ*	before	0,04	0,04	-1,23	0,04	0,04	-1,23	0,04	0,03	-1,27	0,04	0,04	-1,42	0,04	0,04	-1,48	0,04	0,04	-1,61	0,05	0,04	-1,99	0,04	0,04	-1,61
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
University degree	before	0,26	0,14	-2,23	0,26	0,14	-2,22	0,25	0,15	-2,31	0,24	0,15	-2,36	0,22	0,14	-2,33	0,21	0,14	-2,49	0,19	0,13	-2,57	0,17	0,12	-2,37
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Categorized grades (reference category: Grade 1)																									
Grade 2	before	0,03	0,02	-0,21	0,03	0,02	-0,21	0,03	0,02	-0,23	0,04	0,02	-0,25	0,04	0,02	-0,25	0,05	0,03	-0,31	0,06	0,03	-0,33	0,10	0,02	-0,45
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 3	before	-0,11	-0,07	0,92	-0,11	-0,07	0,92	-0,11	-0,07	0,89	-0,11	-0,07	0,90	-0,11	-0,07	0,89	-0,11	-0,06	0,84	-0,12	-0,06	0,77	-0,11	-0,04	0,55
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 4	before	-0,01	-0,01	6,04	-0,01	-0,01	6,04	-0,01	-0,01	5,24	-0,01	-0,01	4,35	-0,01	-0,01	4,05	-0,01	-0,01	2,94	-0,01	-0,01	3,01	-0,01	-0,01	2,72
	after	0,00	0,00	0,03	0,00	0,00	0,03	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,02	0,00	0,00	0,00	0,00	0,00	0,00
Grade Missing	before	0,05	0,00	-0,19	0,05	0,00	-0,19	0,04	0,00	-0,16	0,03	0,00	-0,13	0,03	0,00	-0,12	0,03	0,00	-0,11	0,02	0,00	-0,09	-0,04	-0,02	0,27
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
observation period	before	-2,10	8,52	0,21	-2,09	8,58	0,21	-1,95	12,83	0,12	-1,43	11,26	0,05	-1,28	10,82	0,04	-1,00	8,71	0,04	-1,01	10,73	-0,05	-0,73	9,40	-0,10
	after	0,00	1,10	0,07	0,00	1,16	0,07	0,00	6,52	0,02	0,00	8,80	-0,02	0,00	8,84	-0,04	0,00	7,42	-0,02	0,00	9,61	-0,11	0,00	9,29	-0,19
too old	before	-0,04	-0,01	0,18	-0,04	-0,01	0,18	-0,04	0,00	0,15	-0,02	0,00	0,08	-0,01	0,00	0,05	0,00	0,00	0,01	-0,03	0,02	0,20			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

*Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.*

Table A.14: Balancing of Moments: Started Vocational Training, Completed No Degree or Vocational Training vs. Started but not Completed University Studies.

		25			30			35			40			45			50			55			60		
		m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s	m	v	s
Female	before	-0,11	0,00	0,43	-0,11	0,00	0,43	-0,10	0,01	0,39	-0,11	0,00	0,44	-0,12	0,00	0,48	-0,12	0,00	0,49	-0,19	-0,01	0,77	-0,15	-0,01	0,63
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Birth cohort (reference category: 1944 - 1958)																									
1959 - 1964	before	-0,04	-0,02	0,28	-0,04	-0,02	0,28	-0,02	-0,01	0,12	0,01	0,00	-0,03	0,01	0,00	-0,04	0,06	0,01	-0,25	0,04	0,02	-0,23			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			
1965 - 1974	before	-0,01	0,00	0,04	-0,01	0,00	0,04	0,02	0,01	-0,12	0,06	0,02	-0,27	0,08	0,03	-0,38	0,00	0,00	0,03						
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00						
1975 - 1986	before	0,16	0,08	-1,02	0,16	0,08	-1,01	0,09	0,06	-0,90	0,01	0,01	-0,84												
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00												
Born in Germany	before	-0,06	0,05	1,11	-0,06	0,05	1,08	-0,06	0,05	1,17	-0,05	0,04	1,10	-0,05	0,04	1,23	-0,03	0,03	0,88	-0,03	0,02	0,70	-0,09	0,07	1,52
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Economic sector (reference category: services)																									
Manufacturing	before	-0,11	0,00	0,46	-0,11	0,00	0,46	-0,11	0,00	0,44	-0,11	0,00	0,45	-0,10	0,01	0,39	-0,12	0,01	0,49	-0,06	0,01	0,26	-0,12	0,01	0,47
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Craftsmanship	before	-0,05	-0,04	2,30	-0,05	-0,04	2,29	-0,06	-0,05	3,35	-0,05	-0,04	2,62	-0,04	-0,04	2,17	-0,04	-0,03	1,63	-0,03	-0,03	1,41	-0,03	-0,03	1,23
	after	0,00	0,00	0,01	0,00	0,00	0,01	0,00	0,00	0,02	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,00	0,00
Parents ISEI	before	13,92	32,38	-0,67	13,88	32,54	-0,67	14,26	41,44	-0,65	14,97	51,08	-0,72	14,83	49,87	-0,78	14,46	49,84	-0,66	14,64	97,82	-0,67	13,21	119,62	-0,62
	after	0,01	-10,18	0,07	0,01	-10,15	0,08	0,00	-2,75	0,16	0,00	14,17	0,17	0,00	9,86	0,08	0,00	2,11	0,17	0,03	32,54	0,19	0,02	42,32	0,16
Parental education (reference category: no education)																									
Vocational training	before	-0,32	0,05	1,43	-0,32	0,05	1,42	-0,33	0,06	1,46	-0,31	0,06	1,41	-0,30	0,06	1,34	-0,26	0,06	1,19	-0,26	0,06	1,19	-0,27	0,06	1,22
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HEEQ*	before	0,08	0,06	-1,75	0,07	0,06	-1,73	0,07	0,06	-1,84	0,07	0,06	-1,95	0,07	0,06	-1,97	0,09	0,08	-2,37	0,12	0,10	-2,95	0,16	0,12	-2,92
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
University degree	before	0,31	0,16	-2,44	0,31	0,16	-2,44	0,32	0,16	-2,58	0,32	0,17	-2,66	0,31	0,17	-2,68	0,28	0,16	-2,79	0,26	0,16	-2,86	0,26	0,16	-2,78
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Categorized grades (reference category: Grade 1)																									
Grade 2	before	-0,04	-0,03	0,37	-0,04	-0,03	0,36	-0,03	-0,02	0,30	-0,05	-0,03	0,45	-0,05	-0,03	0,49	-0,05	-0,03	0,48	-0,07	-0,04	0,52	-0,16	-0,08	1,12
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 3	before	-0,09	-0,05	0,67	-0,09	-0,05	0,66	-0,08	-0,05	0,62	-0,06	-0,04	0,47	-0,05	-0,03	0,33	-0,01	-0,01	0,08	-0,01	0,00	0,07	0,01	0,00	-0,03
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade 4	before	-0,01	-0,01	2,49	-0,01	-0,01	2,49	-0,01	-0,01	1,54	0,00	0,00	0,73	0,00	0,00	0,35	0,00	0,00	-0,59	0,01	0,01	-0,84	0,03	0,03	-2,08
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Grade Missing	before	0,13	-0,02	-0,53	0,13	-0,02	-0,53	0,11	-0,01	-0,44	0,09	-0,01	-0,39	0,09	-0,01	-0,35	0,05	0,00	-0,22	0,08	0,01	-0,31	0,11	0,05	-0,59
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
observation period	before	-4,98	2,40	0,46	-4,97	2,74	0,46	-3,97	7,00	0,28	-3,04	7,55	0,18	-3,11	9,92	0,19	-2,61	14,86	0,13	-2,39	16,37	0,12	-2,78	19,94	0,10
	after	0,00	-1,96	0,05	0,00	-1,62	0,05	0,00	1,40	0,02	0,00	6,12	-0,04	0,00	7,08	-0,09	0,00	12,05	-0,12	0,00	15,09	-0,16	0,00	19,74	-0,33
too old	before	-0,11	-0,03	0,50	-0,11	-0,03	0,49	-0,08	-0,01	0,34	-0,05	0,00	0,19	-0,06	0,00	0,22	-0,06	0,01	0,25	-0,08	0,04	0,50			
	after	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00			

*Note: Displayed are the differences of the moments (m = mean, v = variance, s = skewness) between the treatment and control group, once before and once after balancing, by age. * HEEQ = Higher education entry qualification. Empty cells indicate exclusion of covariate due to collinearity.*

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