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Study or Work? The Impact of Social Background and Unemployment Rates on the Decision of Vocational High School Graduates in Austria

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Abstract

Vocational high schools (BHS) constitute a popular school type in Austria and are particularly appealing to students from lower socio-economic backgrounds. These five-year schools provide an alternative pathway to a general higher education entrance qualification, combining academic schooling with the "safety net" of school-based vocational training. Although BHS represent an important route into higher education, with approximately half of graduates entering higher education within three years, the other half do not, with many opting to enter the labour market directly. Drawing on rational action theory, this study examines the relationship between students' social backgrounds (measured by parental education level), labour market prospects following graduation from BHS, and higher education enrolment. We analyse the further educational and labour market pathways of the entire 2016/17 cohort of Austrian BHS graduates, using unique data that combines several high-quality administrative registers. Descriptive analysis shows that transition rates to higher education vary considerably according to parental education. We employ logistic regression models to demonstrate that higher regional unemployment rates for the particular vocational qualification of BHS are associated with increased transition rates to higher education. In contrast with the assumptions of the "diversion thesis," findings indicate that this effect does not vary according to the education of students' parents. Consequently, BHS graduates with lower levels of parental education are equally likely to be deterred from pursuing higher education by the prospect of employment as those with higher parental education.

Keywords

educational transitions; first-generation students; higher education access; intergenerational inequality; labour market; opportunity costs; register data; vocational education

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1. Introduction

The structure of national school systems can have implications for the number and social composition of students pursuing higher education (HE). Most countries provide a single "royal road" through the school system to HE. Nevertheless, an increasing number of countries upgrade vocational education and training (VET) tracks or offer alternative pathways into HE, specifically addressing students from less privileged social backgrounds (Bernhard, 2017; Murdoch et al., 2017). Austria's education system offers several VET tracks at the upper secondary level, including apprenticeships, intermediate schools of vocational education, and vocational high schools (*Berufsbildende Höhere Schulen*, henceforth BHS). BHS, which are the focus of this article, prepare students for direct labour market entry while also granting full eligibility for access to HE. This dual focus of BHS creates a unique tension. For many students, the promise of an immediately available job can overshadow the prospect of pursuing HE, leading to challenges in realising the inclusive aims of these institutions. It is therefore important to investigate the conditions under which BHS graduates actually enter HE.

As BHS graduates possess qualifications demanded by the labour market, labour market prospects may play a significant role in this decision-making process. Previous research has demonstrated that transition rates to HE increase during economic downturns (e.g., B. T. Long, 2014; Mandl & Haag, 2025; Witteveen, 2021). High school graduates who grew up in regions with limited employment prospects tend to exhibit higher transition rates (e.g., Hartung & Weßling, 2025; Meschi et al., 2019). The extant literature has focused on the general student population and general (youth) unemployment rates. The present study contributes to the literature by focusing on a group that is structurally positioned between the labour market and HE. The ambivalent role of BHS in preparing students for both the labour market and HE in Austria raises the following research question: How do qualification-specific regional unemployment rates impact the probability of transitioning to HE among BHS graduates?

In early tracking systems, which are known to reinforce existing social stratification (Terrin & Triventi, 2023), options of social mobility within an education system, such as BHS in Austria, are particularly important for students from less privileged backgrounds and have the potential to reduce social inequalities (Schindler, 2017). Consequently, understanding the Austrian case and how BHS serve as a vocational pathway to HE is of high relevance for other countries, as it offers valuable insights for other differentiated education systems, in which widening access to HE for students from vocational backgrounds remains an ongoing challenge. In this context, it is essential to understand the selectivity of the transition from BHS to HE and the factors that prevent BHS graduates from entering HE. We investigate whether working-class students are more likely to be diverted by good labour market prospects than their counterparts from the upper service class (R. Becker & Hecken, 2009), as this could explain different transition rates to HE. The most important social background variable for educational transitions is the educational level of the parents (Bukodi et al., 2021). We aim to investigate whether the impact of qualification-specific regional unemployment rates on the likelihood of transitioning to HE varies by parental education.

The article is structured as follows: The next section provides a brief introduction to the Austrian education system, followed by the underpinning theoretical background with a focus on rational action theories and a review of recent studies. Then we provide an overview of the high-quality administrative registers on educational and labour market careers used in this study, and the analytic strategy. The empirical results,

consisting of descriptive statistics and logistic regressions, are then presented and discussed. The article concludes with implications of the findings for policy and practice.

2. Institutional Context: The Austrian Education System and Access to HE

In the Austrian education system, the first between-school tracking is ability-based and takes place at the age of 10. Given sufficient educational success in primary school, students can choose between the lower cycle of academic secondary school (AHS) and compulsory secondary school. The second between-school tracking occurs for upper secondary school at the age of 14 and is based on a combination of ability and vocational interests. The upper secondary level is characterised by a high degree of diversity with a wide range of school types. These include the upper cycle of AHS and several competing options (Lassnigg, 2011) for vocational education and training, encompassing apprenticeships (2–4 years), vocational middle schools (1–4 years), and/or BHS (5 years). While the distinction between VET and academic education at the upper secondary level is generally clear in most educational systems (Schmees et al., 2025), this is not the case for BHS in Austria. They combine VET in fields such as business, engineering, tourism, and pre-school pedagogy and end with a general HE entrance qualification (*Matura*). The main types of BHS (e.g., business, engineering) are relatively widespread across Austria, predominantly teaching skills applicable to all regions. However, certain schools with specific focuses are linked to the local industries, e.g., viticulture and fruit growing (Klosterneuburg, wine area) and weapon and security technology (Ferlach, gun manufacturing site). Among Austrian 9th graders (age 15), 35% attend a BHS, 29% attend an AHS, and 36% attend other schools (Statistik Austria, 2024, p. 29). In comparison to the upper track of AHS, which have a dropout rate of 22%, the dropout rates at BHS are comparatively high, with one-third of students dropping out (Statistik Austria, 2024, p. 63). Figure 1 depicts the main pathways from the lower secondary level to HE. Empirically, a considerable proportion of students who attended compulsory secondary school subsequently enrol in BHS, thereby keeping the opportunity for later access to HE open (Statistik Austria, 2024, p. 55).

Austrian HE consists of (public) universities, which represent the largest sector, universities of applied sciences, university colleges of teacher education, and a small sector of private universities. Individuals with a general entrance qualification, such as the *Matura*, can enter any field of study at these institutions, irrespective of the vocational orientation of their prior school. While in some fields of study, such as medicine, psychology, and veterinary medicine, prospective students are confronted with selective admission procedures, in many other fields, access is unrestricted, or admission procedures are not or only mildly selective (Haag et al., 2020). However, these admission procedures are identical for all prospective students and are independent of any prior access qualification. Except for the small sector of private universities, at which 5% of entrants in Austria enrol (Zucha et al., 2024, p. 18), tuition fees are comparatively low, with a maximum of EUR 727 per academic year for EU students.

With a vast majority of AHS graduates entering HE (Statistik Austria, 2024, p. 65) and a vast majority of other (non-BHS) VET graduates entering the labour market (Statistik Austria, 2024, p. 115), the BHS-specific combination of academic and vocational qualifications leaves the decision on subsequent pathways to their graduates. Thus, the role of the BHS as a gateway to HE is ambivalent. On one hand, BHS represent a popular alternative pathway to HE, offering a distinctive option alongside the more traditional route via AHS. Almost four out of ten students entering HE in Austria graduated from a BHS (Zucha et al., 2024, p. 31). In contrast to Switzerland, for example, where the legitimacy of upper-secondary specialised schools has been contested

and their graduates only have access to universities of applied sciences (Esposito et al., 2019), in Austria, full access to all HE sectors for BHS graduates is undisputed. This is also reflected in the fact that BHS graduates are not less successful in HE than graduates from AHS (Thaler, 2025).

On the other hand, BHS provide good labour market prospects and wage levels comparable to those of individuals with a bachelor's degree (OECD, 2024, p. 114). Historically, BHS fulfilled—and still partly fulfil—a coexisting function within the Austrian education system, similar to the later introduced universities of applied sciences (Graf, 2013, p. 131). While BHS are initial vocational education and training (iVET), these schools are, nevertheless, considered a short-term tertiary education according to the ISCED level classification. More specifically, the first three years of BHS are classified as ISCED level 3, while the fourth and fifth years, as well as the *Matura*, are classified as ISCED level 5 (Federal Ministry of Education, Science and Research, 2022).

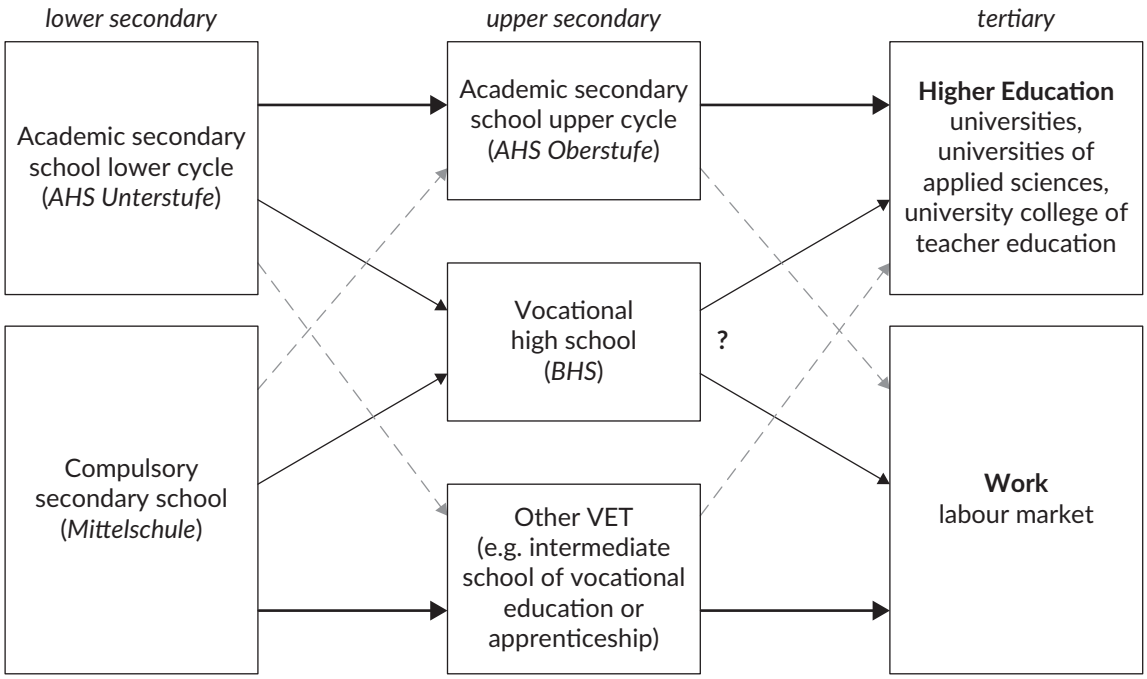


Figure 1. Main pathways through secondary and tertiary levels in the Austrian education system (schematic visualization). Note: The question mark indicates the focus and research question of this article.

3. Theoretical Considerations and Literature Review

3.1. Opportunity Costs in Educational Decisions

Rational action theories provide a robust framework for explaining educational decision-making, particularly in transition phases such as the decision to pursue HE or enter the labour market. These theories conceptualise individuals as actors who make decisions by assessing the expected utility of available options, based on subjective evaluations of costs, benefits, and probability of success (G. S. Becker, 1993; Boudon, 1974; Breen & Goldthorpe, 1997). These decisions are shaped by subjective rationality and situated within broader structural contexts. The theoretical model proposed by Hillmert and Jacob (2003) places a particular emphasis on opportunity costs. In the context of our study, this implies that individuals completing BHS

assess whether pursuing a university degree offers greater long-term benefits than entering the labour market, based on financial considerations, time investment, and perceived chances of success. Building on this framework, we incorporate regional unemployment rates as an additional factor. Higher unemployment may reduce the perceived opportunity costs of studying, making HE more attractive.

3.2. Labour Market Prospects and HE

In accordance with the rational action approach, adverse labour market conditions are anticipated to result in an increasing number of individuals pursuing HE, due to the reduction in opportunity costs. The "discouraged worker thesis" posits that students may elect to pursue HE if no viable alternatives are available. Several studies have shown increased enrolment rates during periods of economic downturn, particularly during the recession around 2008, in various countries, including the US (B. T. Long, 2014; Taylor & Rampino, 2014), the UK (Clark, 2011), Canada (Alessandrini, 2018), Denmark (Sievertsen, 2016), and Germany and Sweden (Witteveen, 2021). Students at both the lower (Weßling et al., 2023) and upper (Hartung & Weßling, 2025) secondary levels are more likely to prolong their general school careers in socio-economically deprived regions in Germany, where labour market alternatives are worse. In Austria, enrolment numbers increased during the financial crisis of 2008 (Eichmann & Nowak, 2020) and in the initial year of the Covid-19 pandemic (Mandl & Haag, 2025).

During periods of economic prosperity and in regions with good labour market chances, the opportunity costs of staying in education increase, as individuals perceive higher immediate returns from entering the labour market. The prospect of earning competitive wages or securing stable employment outweighs the perceived benefits of continuing education (G. S. Becker, 1993). In Austria, this dynamic could play a significant role in shaping the decisions of BHS graduates, as these schools combine general and vocational education. The strong labour market demand for many skills of BHS graduates can create an environment in which students may choose to enter the labour market after *Matura* without pursuing HE.

We expect transition rates to HE to be lower for graduates with favourable labour market prospects. This concerns the differences between AHS and BHS. In countries with a strong linkage between education and occupation and with specific training opportunities for the jobs (DiPrete et al., 2017), upper secondary schools that do not offer specific vocational training have less favourable labour market outcomes. As BHS offer vocational training for specific occupations, graduates are more likely to gain employment and transition to HE at a lower rate than those from AHS (around 50% vs. 85%; Statistik Austria, 2024, p. 65). However, less is known about the role that labour market prospects play in the decision of BHS graduates to pursue HE. Therefore, this study focuses on the differences within this group. It is hypothesised that BHS graduates are more likely to enrol in HE if the regional unemployment rate for their particular vocational qualification is higher (hypothesis 1).

3.3. Social Background and the Effect of Labour Market Prospects on HE

Opportunity costs can provide an explanation for social inequalities in educational decisions through direct and indirect costs associated with pursuing HE. Engelhardt and Lörz (2021), for example, have demonstrated that the change from a student grant to a student loan system in Germany in 1983 deterred students with lower parental education from pursuing HE. In addition to these direct costs, indirect costs such as attractive

opportunities of an early entry into the labour market could divert working-class children from HE (Müller & Pollak, 2007). The "diversion thesis" (Hillmert & Jacob, 2003; Müller & Pollak, 2007) states that students from lower socio-economic backgrounds tend to estimate their prospective educational achievements more negatively and calculate with higher subjectively expected costs. Cost pressure enforces shorter time horizons for calculating the benefits and costs of further education (R. Becker & Hecken, 2009). Thus, children from less educated family backgrounds will typically avoid pursuing academic education to avoid the associated costs, given that suitable labour market alternatives are available (Hillmert & Jacob, 2003). While students from higher socio-economic backgrounds tend to pursue HE regardless of external factors, students from lower socio-economic backgrounds are more responsive to labour market conditions when making educational decisions (Pöyliö, 2020). Consequently, in periods of unfavourable labour market conditions, opportunity costs decline and students from lower socio-economic backgrounds are more likely to enrol in HE. Thus, under this assumption, favourable labour market conditions widen the gap in HE enrolment between individuals from different social backgrounds, whereas unfavourable conditions tend to reduce it. From a social equity perspective, this implies that worse labour market conditions may have a positive effect on HE enrolment.

Most empirical findings support this hypothesis, showing higher HE enrolment rates for students from lower socio-economic backgrounds in times of economic crises (Berggren, 2006; Pöyliö, 2020; Sievertsen, 2016; Tumino & Taylor, 2015). Moreover, Hartung et al. (2022) suggest that students from families with limited socio-economic resources are more aware of regional labour market conditions when evaluating their occupational expectations. In contrast, Alessandrini (2018) finds that high unemployment levels lead to an increase in enrolment rates primarily among students with highly educated parents in Canada. These patterns may partly reflect financial barriers, as students from lower socio-economic backgrounds may be less able to afford the direct and indirect costs of HE. Economic downturns lower educational expectations among this group (Salazar et al., 2020) while strengthening pro-education attitudes among children whose parents hold higher educational degrees (Taylor & Rampino, 2014). Educational transitions may thus involve complex diversion mechanisms. In Germany, in economically disadvantaged regions, students from lower-status families may initially aim for general HE eligibility to avoid the highly competitive apprenticeship market, yet later opt for VET, using their *Abitur* strategically to secure training positions (Hartung & Weßling, 2025).

Although the results concerning the impact of labour market conditions on the relationship between social background and participation in HE are not entirely consistent, the majority of studies support the assumptions of the "diversion thesis." In the context of our research question, this thesis suggests that BHS graduates from lower socio-economic backgrounds are more likely to enrol when unemployment rates are higher, while the decisions of BHS graduates from higher socio-economic backgrounds are less affected by labour market conditions. Therefore, we expect that the positive effect of the qualification-specific regional unemployment rate on the likelihood of enrolling in HE is stronger for BHS graduates whose parents have lower levels of education than for those whose parents have higher levels of education (hypothesis 2).

4. Data, Variables, and Analytic Strategy

4.1. Data and Variables

This study uses data from the Austrian Micro Data Center (AMDC). The AMDC is a research data infrastructure facility of Statistics Austria that enables research on microdata processed in compliance with data protection regulations (Fuchs et al., 2024). For the present study, a novel dataset is created by merging school statistics, HE statistics, educational attainment register, register-based employment labour market statistics, migration statistics, and the monitoring of education and related employment behaviour data on an individual level. The data contains the full cohort of first-time BHS graduates from the academic year 2016–2017, which is a total of 19,933 graduates from 317 BHS schools. Individuals with incomplete information on parental education, who moved abroad (and did not enter HE in Austria) or for whom the research question is not applicable (e.g., graduated from extra-occupational schools or started a non-tertiary education) are excluded from the analysis (see Table 1). After excluding these cases, the valid number of graduates for the analysis is 17,619, and there are no missing values in any variables included in the further analysis.

Table 1. Cases excluded from the analysis.

	Not entering HE	Entering HE	Total
No parental education information	733	599	1,332
Age > 25 years	395	48	443
Moving abroad	124	0	124
Further non-tertiary education	461	106	567
Extra-occupational school	488	89	577
Total cases excluded	1,539	775	2,314
Total cases included	8,308	9,311	17,619
Total cases (included + excluded)	9,847	10,086	19,933

Notes: A person may be excluded for more than one reason; the total number of excluded cases includes each person only once.

A second database used in the analysis was created by Vogtenhuber et al. (2024) and contains regional, qualification-specific labour market data for the general population (aged 15–64) from 2010 to 2021. In Austria, the 84 labour market areas are designated as labour market districts and bear a close resemblance, though not an exact match, to the country's political districts. The available labour market data is differentiated not only regionally, but also by educational level and vocational specialisation. For BHS graduates, data is available for 10 fields of education (based on the ISCED Fields of Education and Training 2013; see Table 2). For further analysis, we merge the unemployment rates with the individual-level data of BHS graduates. Each graduate is assigned the unemployment rate in their field of education in their home district.

The dependent variable is transition to HE in Austria within the first two years following graduation from BHS (direct transition; see Hauschildt et al., 2024, p. 19). In contrast, for students with delayed transition, who typically work prior to entering HE or work during their studies (Zucha et al., 2024, p. 56), the decision-making processes are likely to be different, and therefore an alternative theoretical framework would be required. Hence, delayed transitions are not covered in our analysis.

Table 2. Classification of fields of education.

Variable: Fields of education	ISCED Fields of Education and Training 2013
Education (primarily elementary education)	1 Education
Business	4 Business, administration, and law
Mechanics	715 Mechanics and metal trades 788 Engineering interdisciplinary
Electricity	713 Electricity and energy
Other engineering	711 Chemical engineering and processes 714 Electronics and automation 716 Motor vehicles, ships, and aircrafts
Manufacturing	72 Manufacturing and processing
Construction	73 Architecture and construction
Agriculture	08 Agriculture, forestry, fisheries and veterinary
Services (primarily tourism)	10 Services 712 Environmental protection technology
Other	02 Arts and humanities 03 Social sciences, journalism, and information 05 Natural sciences, mathematics, and statistics 06 Information and communication technologies 09 Health and welfare 9999 Unknown

Note: Classification according to Vogtenhuber et al. (2024).

We operationalise social background using parental education, a commonly used indicator that is closely linked to educational decision-making not only in general (Bukodi et al., 2021), but also under conditions of economic uncertainty, where its relevance tends to increase while the influence of parental income declines (Pöyliö, 2020). This is reflected in several recent studies (e.g., Alessandrini, 2018; Engelhardt & Lörz, 2021; Hillmert & Jacob, 2003; Taylor & Rampino, 2014). The independent variable parental education is coded as a three-categorical variable based on the highest parental degree (lower = compulsory school, apprenticeship, or vocational middle school; medium = general qualification for university entrance; higher = HE or academy). If the education of one parent is unknown, the education of the other parent, if known, is used.

The second explanatory variable of interest is the qualification-specific regional unemployment rate. This refers to the unemployment rate among individuals with a given vocational qualification in each labour market district. According to the national definition in Austria, individuals are considered unemployed if they are registered with the labour market administration, not enrolled in education or training, and immediately available to take up work (Vogtenhuber et al., 2024, p. 17). The unemployment rates we use are calculated by dividing the number of unemployed individuals (according to the national definition) by the sum of unemployed and employed individuals. We use data from 2017, which marks the graduation year for most of the analysed cohort. A high regional unemployment rate for certain qualifications may indicate an oversupply of graduates with these vocational qualifications. Conversely, low unemployment rates can indicate a good matching of qualifications to occupations and thus, good labour market prospects for BHS graduates with this qualification (Vogtenhuber et al., 2024, p. 17). As BHS graduates have a specific

vocational qualification, it would be too simplistic to use the general (youth) unemployment rate of a region. The unemployment rate of the workforce with the same qualification is a more appropriate measure for their labour market prospects.

Several potentially confounding factors are controlled for, including gender, age, and everyday language. As a measurement of academic performance, we use success in the *Matura*. However, no direct measures are available to control for potential regional-level confounders, such as a region's status as a traditional student city, the proportion of university students in the population, or the diversity of available fields of study (Weßling & Bechler, 2019). Regional differences between urban and rural areas can serve as a proxy for variation in educational opportunities, as suggested by structural differences in school accessibility and school types (Federal Ministry of Education, Science and Research, 2024). In Austria, the urbanity of an area is highly correlated with regional study opportunities. The variable place of residence distinguishes between large urban centres (with >100,000 inhabitants and full universities, such as in Vienna, Graz, Linz, Salzburg, Innsbruck and Klagenfurt; SR 101 based on Statistik Austria, 2021), small urban centres (most of which host universities of applied sciences; SR 102 + SR 103), central rural areas (RZ 210 + LR 310), and peripheral rural areas (other RZ and LR).

4.2. Analytic Strategy

To gain insight into the relationships between BHS graduates' enrolment in HE, their labour market prospects, and several covariates, descriptive statistics are presented in Section 5.1. These include boxplots to show how HE enrolment rates and the main explanatory variable, the qualification-specific regional unemployment rate, differ by field of education and labour market area.

We estimate logistic regression models with enrolment in HE as the binary dependent variable. We first present results from a baseline model including parental education and control variables. In a second step, we introduce the qualification-specific regional unemployment rate. All results are reported as average marginal effects (AMEs), which represent the average change in the probability of enrolment in HE associated with a one-unit increase in continuous variables or the average difference between categories for categorical variables. AMEs have the advantage of being directly interpretable as effect measures, unlike log odds and odds ratios, and facilitate comparisons across models and groups (Mood, 2010). They are also easier to interpret because they are expressed on the probability scale of the outcome (J. S. Long & Mustillo, 2021). As our data is clustered by labour market district and field of education, we compute clustered standard errors (Abadie et al., 2023).

In the next step, we include an interaction to test whether the negative effect of regional unemployment rates on transitions into HE varies by parental education. However, interaction coefficients of logistic models can not be interpreted straightforwardly (Mize, 2019). To test whether there is a relevant interaction effect, we compare the fit of the models with and without the interaction effect by the following criteria (Best & Wolf, 2015). The McFadden pseudo-R^2 indicates the improvement of the fitted model relative to a model containing only the intercept. The Bayesian Information Criterion (BIC) is used to compare models, with lower values indicating a better fit. Finally, a likelihood ratio test assesses whether the more complex model fits significantly better than the less complex model. Furthermore, we report conditional AMEs and graphically present the interaction between the categorical variable parental education and the continuous variable qualification-specific regional unemployment rate as a predicted probability plot (Mize, 2019).

We fitted the models in R (version 4.1.3; R Core Team, 2022), using the "margins" (Leeper et al., 2024) and the "marginaleffects" (Arel-Bundock et al., 2024) packages to compute AMEs and the "sandwich" package (Zieleis et al., 2024) to estimate clustered standard errors.

5. Empirical Findings

5.1. Descriptive Statistics

In total, 53% of BHS graduates enrol in HE within two years after graduation (Table 3). Less than half of BHS graduates have parents with a lower educational degree (9,135 of a total of 17,619 graduates), while approximately one quarter each have parents with medium or HE. HE entry rates vary by parental education, ranging from 44% among BHS graduates with parents with lower education to 68% for those with highly educated parents. In line with the literature, enrolment rates are higher among women than men (Statistik Austria, 2024, p. 67), higher among graduates with other everyday language (= mostly immigrants) in comparison to German speakers (Neumeyer & Will, 2024), higher among graduates with a higher level of success in the *Matura*, and higher among those living in more urban areas (Weßling & Bechler, 2019).

Table 3. Descriptive statistics of the 2016–2017 BHS graduates (row percentages).

	Not entering HE	Entering HE	Total
Parental education			
Lower	5,088 (56%)	4,047 (44%)	9,135
Medium	1,878 (43%)	2,444 (57%)	4,322
Higher	1,342 (32%)	2,820 (68%)	4,162
Gender			
Male	4,055 (50%)	4,040 (50%)	8,095
Female	4,253 (45%)	5,271 (55%)	9,524
Everyday language			
German	7,608 (47%)	8,428 (53%)	16,036
Other	700 (44%)	883 (56%)	1,583
Success in the *Matura*			
Passed	6,462 (54%)	5,598 (46%)	12,060
Good success	1,204 (37%)	2,019 (63%)	3,223
With distinction	642 (27%)	1,694 (73%)	2,336
Place of residence			
Large urban centres	1,812 (35%)	3,360 (65%)	5,172
Small urban centres	911 (44%)	1,175 (56%)	2,086
Central rural areas	1,792 (49%)	1,862 (51%)	3,654
Peripheral rural areas	3,793 (57%)	2,914 (43%)	6,707
Age (mean/median/min/max)	19.64/19.49/17.87/24.97	19.52/19.40/17.84/24.27	19.57/19.44/17.84/24.97
Total	8,308 (47%)	9,311 (53%)	17,619

Boxplots illustrate the differences in HE enrolment (Figure 2) and unemployment rates (Figure 3) by field of education and labour market district. The HE enrolment rates of BHS graduates vary greatly by field of education. The median enrolment rates by district exceed 50% in business, tourism, other engineering, and the "other fields" category, while they are approximately 37.5% or less in education, electricity, and mechanics (Figure 2). However, substantial regional disparities in HE participation persist, highlighting uneven access to HE across districts. For instance, in agriculture, the enrolment rate in the district at the 75th percentile is approximately 25 percentage points higher than at the 25th percentile. In other fields of education, this interquartile range is much smaller, with, for example, approximately 10 percentage points in electricity.

Qualification-specific regional unemployment rates also vary widely between and within fields of education (Figure 3). Median district-level unemployment ranges from 2% in agriculture, education, electricity, and other engineering to over 4% in construction. The lowest unemployment rate among the population with a BHS qualification is 0.25%, while the highest is observed in a single district in the field of construction, reaching almost 15%.

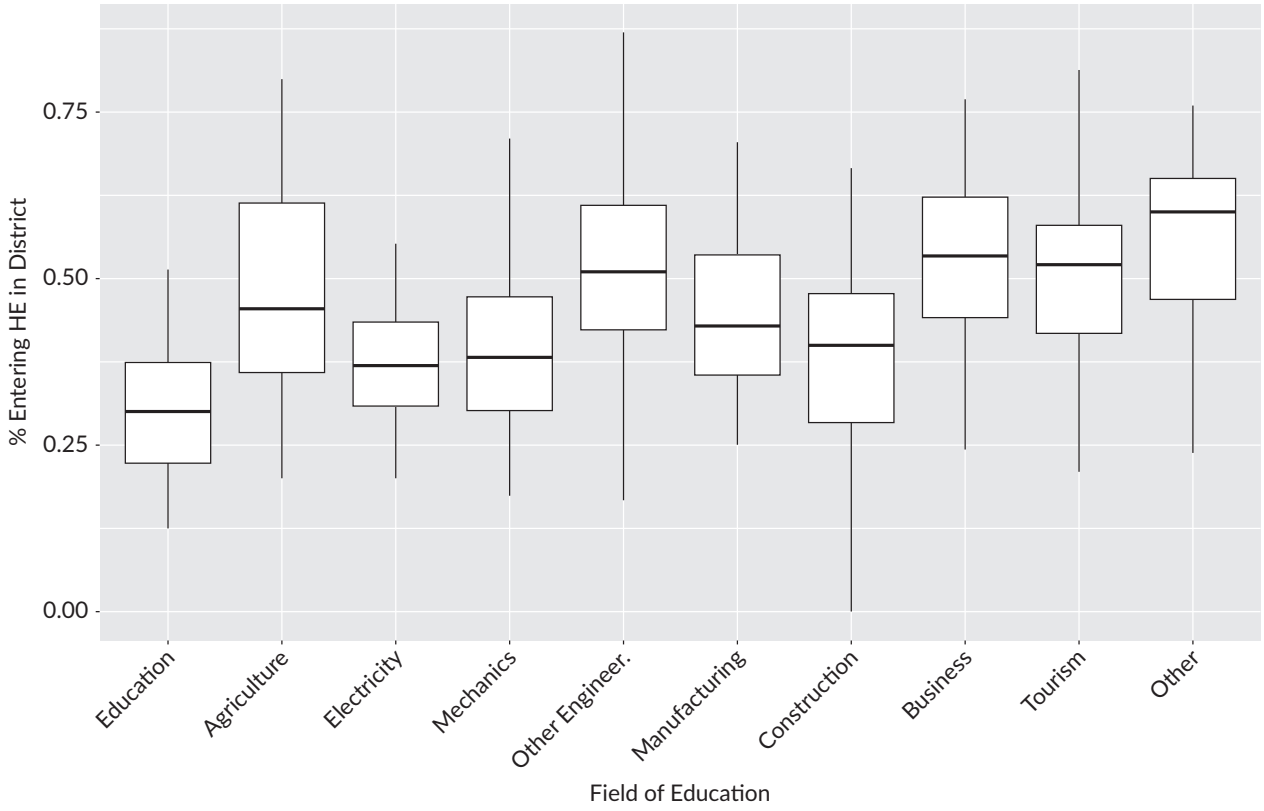


Figure 2. District-specific HE enrolment rates of 2016–2017 BHS graduates by field of education. Notes: The box represents the interquartile range (IQR; 75th percentile minus the 25th percentile), with the line inside the box indicating the median. Whiskers extend to the smallest and largest values within 1.5 times the IQR from the lower and upper quartiles. Outliers beyond this range are excluded for data protection reasons. For data protection reasons, only districts with more than 10 graduates in the respective fields are included in this boxplot.

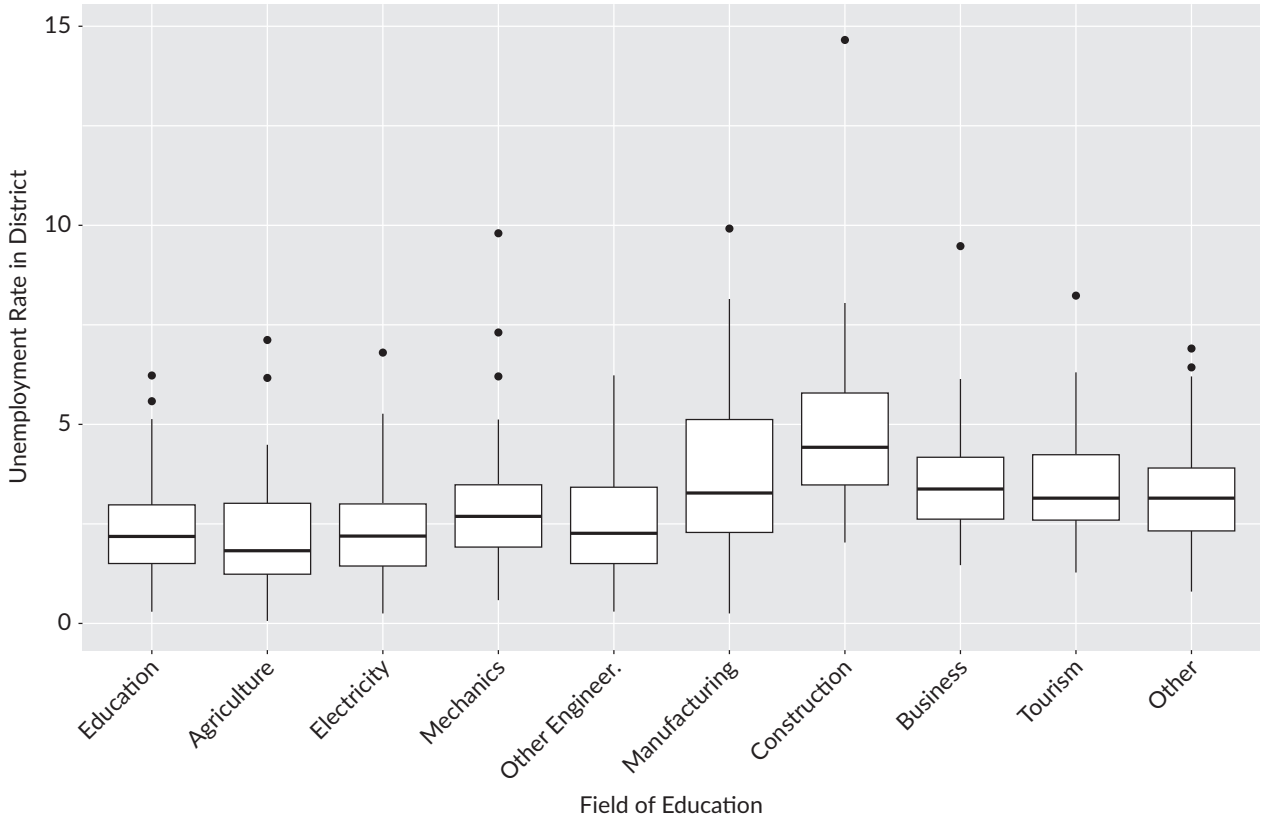


Figure 3. District-specific unemployment rates in 2017 among the population aged 15–64 years by field of education. Notes: The box represents the interquartile range (IQR; 75th percentile minus the 25th percentile), with the line inside the box indicating the median. Whiskers extend to the smallest and largest values within 1.5 times the IQR from the lower and upper quartiles.

5.2. Logistic Regression

Table 4 presents three logistic regression models predicting enrolment in HE. Model (1) shows that parental education and most control variables have a significant effect on entering HE. The likelihood of entering HE increases by 19 percentage points for BHS graduates whose parents have a HE degree and by 10 percentage points for those with parents with *Matura* when compared to BHS graduates whose parents do not have *Matura*. Other variables with a strong impact on enrolling in HE are *success in the Matura* and living in rural areas (place of residence).

To test if the probability of enrolling in HE is higher for vocational qualifications with higher regional unemployment rates, we include the qualification-specific regional unemployment rates in model (2). This considerably improves the model fit (McFadden R^2, BIC, LR test), and the coefficient of the variable is statistically significant ($p < 0.001$). A one percentage point increase in the regional unemployment rate for a given qualification is associated with a 2.5 percentage point higher likelihood of a BHS graduate enrolling in HE. This finding supports hypothesis 1.

The next step investigates whether the effect of regional unemployment rates on HE enrolment differs by parental education by including an interaction term between qualification-specific regional unemployment

Table 4. Logistic regression models on enrolling in HE for BHS graduates.

	Model (1)	Model (2)	Model (3)
Parental education (Ref.: without *Matura*)			
Matura	0.098 (0.010)***	0.093 (0.009)***	0.094 (0.009)***
HE degree	0.190 (0.010)***	0.188 (0.009)***	0.187 (0.010)***
Gender (Ref.: male)			
Female	0.064 (0.010)***	0.062 (0.009)***	0.062 (0.009)***
Age	−0.040 (0.010)***	−0.040 (0.010)***	−0.040 (0.010)***
Everyday language (Ref.: German)			
Other	0.049 (0.014)***	0.020 (0.017)	0.021 (0.017)
Success in the *Matura* (Ref.: passed)			
Good success	0.143 (0.010)***	0.144 (0.010)***	0.144 (0.010)***
With distinction	0.232 (0.011)***	0.232 (0.011)***	0.233 (0.011)***
Place of residence (Ref.: large urban centres)			
Small urban centres	−0.069 (0.022)***	−0.026 (0.018)	−0.026 (0.018)
Central rural areas	−0.129 (0.020)***	−0.085 (0.016)***	−0.085 (0.016)***
Peripheral rural areas	−0.191 (0.020)***	−0.139 (0.017)***	−0.139 (0.017)***
Qualification-specific regional unemployment rate		0.025 (0.005)***	0.025 (0.005)***
Interaction: parental education × qualification-specific regional unemployment rate			See Table 5 and Figure 4
McFadden R2	0.077	0.083	0.083
BIC	22,594	22,454	22,472
LR-Test (p-value)		0.00***	0.35
N	17,619	17,619	17,619

Notes: Presented are AMEs; clustered S.E. in parentheses; significance level: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

rates and parental education in the logistic regression models. However, the fit of model (3) does not improve compared to model (2): McFadden Pseudo R^2 remains stable, the BIC increases (indicating worse fit), and the likelihood ratio test is not statistically significant. Furthermore, changes of the AMEs are only present in the trailing decimal places. This finding indicates that qualification-specific regional unemployment rates are similarly important for students' decisions on entering HE, irrespective of parental education.

Table 5 shows the interaction effects as conditional AMEs. The first part of the table shows the CAMEs of the regional unemployment rates specific to the level of qualification for the three categories of parental education. These are 0.025 for graduates whose parents do not have a *Matura* qualification, 0.026 for those whose parents have a *Matura* qualification, and 0.034 for those whose parents have a HE degree. The effect of the unemployment rate is significant for all parental education groups. Nonetheless, there is little variation between the groups, suggesting that the interaction effect is negligible.

A comparison of the effects of parental education on specific levels of qualification-specific regional unemployment rates reveals only slight variations in these effects. Regardless of whether the rate is 2%, 3.5% or 5% (these values present approximately the median and the median +/− one standard deviation), graduates whose parents have a *Matura* are 9.4 to 10 percentage points more likely to enter HE than those whose parents do not have a *Matura*. For graduates whose parents have a HE degree, this contrast is between 18.8 and 21.5 percentage points. Again, the statistical significance of the coefficients indicates that the effect of parental education is important at all unemployment levels, and the small differences indicate that the interaction effect is negligible.

Table 5. Conditional AMEs for model (3).

Effect	Group	Conditional AME
Effect of qualification-specific regional unemployment rate for parental education:	without *Matura*	0.025 (0.006)***
	with *Matura*	0.026 (0.005)***
	with HE degree	0.034 (0.006)***
Effect of parental education *Matura* (Ref.: without *Matura*) at unemployment level:	2%	0.094 (0.012)***
	3.5%	0.098 (0.010)***
	5%	0.100 (0.013)***
Effect of parental education HE degree (Ref.: without *Matura*) at unemployment level:	2%	0.188 (0.013)***
	3.5%	0.203 (0.010)***
	5%	0.215 (0.013)***

Notes: Presented are conditional AMEs; clustered S.E. in parentheses; significance level: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Figure 4 illustrates this finding in more detail. It shows the enrolment probability in HE predicted by model (3) by the combination of parental education and qualification-specific regional unemployment rates. At an unemployment rate of 5%, for example, the predicted probability of entering HE is 47% for BHS graduates whose parents have no *Matura*, 57% for BHS graduates whose parents have *Matura* and 68% for BHS graduates whose parents have a HE degree. For all three groups, the predicted probability of enrolling in HE increases almost linearly with the qualification-specific regional unemployment rate. For BHS graduates whose parents do not have *Matura*, for example, the predicted probability of attending HE is 41% at an unemployment rate of 2.5% for their qualification and 54%, for an unemployment rate of 7.5%, resulting in an increase of 13 percentage points. The slope from 2.5% to 7.5% unemployment rate is nearly identical to the slope of those with parents with a *Matura* (51% to 64% = +13 percentage points) and those with a HE degree (60% to 75% = +15 percentage points). The three lines are almost parallel, thereby visually indicating that the positive effect of the unemployment rate on the likelihood of entering HE does not differ by parental education. Therefore, we reject hypothesis 2.

Despite some concerns regarding the use of linear probability models for analysing binary outcome variables, such as predicted values below zero, heteroscedasticity, and non-normally distributed residuals, they are a popular alternative to logistic regression analysis (Best & Wolf, 2015). This is due to their more straightforward interpretation, especially when interaction effects are taken into account. Robustness checks with linear probability models instead of logistic regression models yield very similar results, indicating robust findings. The models presented do not suffer from multicollinearity or influential outliers.

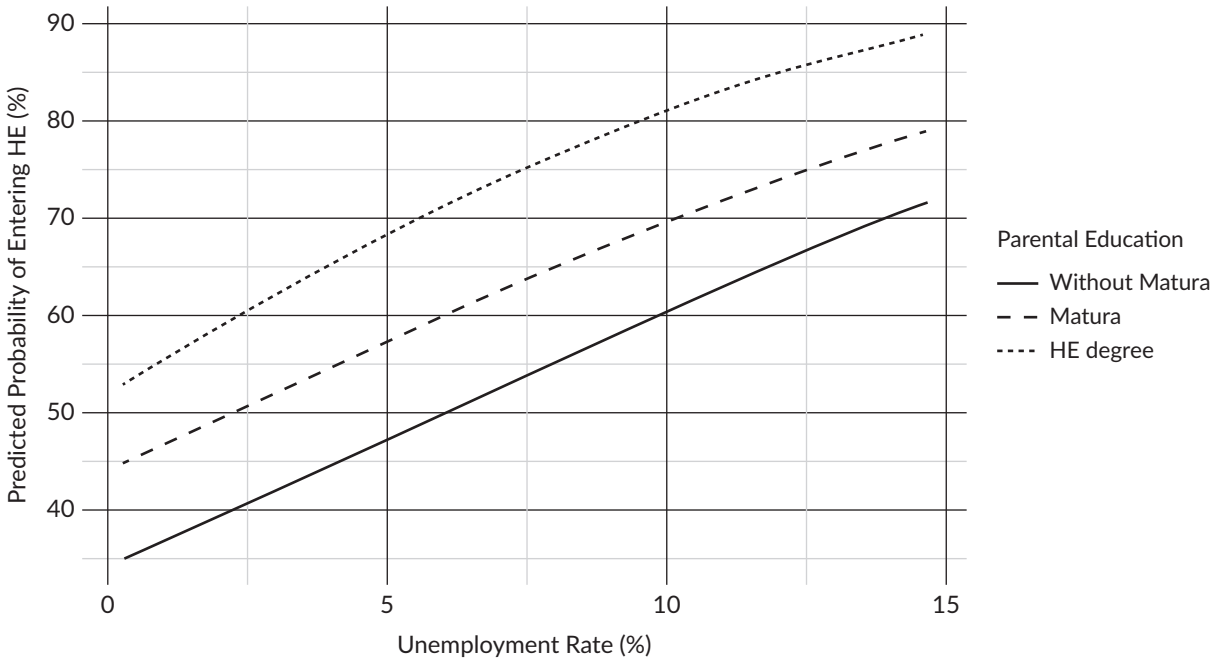


Figure 4. Probability of BHS graduates entering HE by qualification-specific regional unemployment rate and parental education: Interaction effect. Notes: Predicted values calculated by model (3).

6. Discussion

Our findings confirm that qualification-specific regional unemployment rates significantly influence the decision of BHS graduates to pursue HE. Graduates facing difficult labour market prospects with their educational qualification in their home region are more likely to enrol in HE. This empirical pattern is theoretically consistent with rational action theories, which posit that reduced opportunity costs increase the likelihood of educational investment (e.g., Hillmert & Jacob, 2003). However, regarding opportunity structures, our analysis is limited to the qualification-specific regional unemployment rates. Characteristics such as gender and parental education are controlled for, but expected lifetime income or the probability of graduating from HE could not be included due to data limitations. Future research could further explore whether forgoing HE in favour of immediate employment has lasting effects on career development and social mobility. Another limitation of our study is that its perspective is focused purely on the labour market, excluding most non-labour market-related factors that influence enrolment in HE (except for the control variables).

Our analysis shows a discernible impact of parental education on the transition of BHS graduates to HE in Austria. However, once this obstacle has been overcome, the chances of success in HE (Posch et al., 2021) and the chances of success of HE graduates entering the labour market (Binder, 2024) are rather similar, regardless of parental education. One possible explanation for the strong social origin effect on HE enrolment among BHS graduates could be their labour market prospects. Nevertheless, our analysis suggests that, while qualification-specific regional unemployment rates are a crucial factor, they do not exacerbate the social disparities observed in HE enrolment. Both BHS graduates with high and low parental education are similarly influenced by the labour market demand for their qualifications when deciding whether to enter HE. This finding is theoretically interesting, as it challenges the "diversion thesis" (R. Becker

& Hecken, 2009; Müller & Pollak, 2007), which posits that graduates from less educated backgrounds are more likely to be diverted from further academic education because they evaluate costs and benefits more pessimistically and apply shorter time horizons in their decision making.

Focusing on BHS graduates and qualification-specific regional unemployment rates, the present study adds another perspective on the interaction between social origin and labour market perspectives, which has been focused mainly on economic cycles thus far (Alessandrini, 2018; Berggren, 2006; Sievertsen, 2016; Tumino & Taylor, 2015). However, unobserved characteristics of graduates that vary by parental education may conceal significant differences. In particular, it is unclear how students select themselves into BHS and whether the mechanisms by which they do so differ according to their parents' level of education. The fact that BHS graduates are selected based on their choice of BHS and dropout rates during their schooling may influence their subsequent transition into HE and how easily they are deterred by the labour market. The strong effects of parental education may be attributed to other mechanisms. These include unobserved variation in academic performance beyond our three-category measure of *Matura* success, motives of status maintenance, varying degrees of risk aversion (e.g., Breen & Goldthorpe, 1997), and mechanisms related to cultural capital and habitus (Bourdieu & Passeron, 1990). Such mechanisms, which have been repeatedly confirmed (e.g., Puzić et al., 2022), are crucial to consider when striving for greater social equality regarding access to HE. At this point, the effect of different labour market prospects can be considered to be negligible, at least for BHS graduates in Austria.

Future research should investigate how current findings can be applied to other national contexts through comparative studies. Institutional frameworks, such as Austria's study grant system for adults returning to education and the role of vocational qualifications as a "safety net" when dropping out of HE (Scholten & Tieben, 2017; Zucha et al., 2024, p. 127), may shape not only access and dropout patterns in HE but also influence students' motivations for enrolling. In this context, it would be valuable to explore whether individuals whose decision is driven by reduced opportunity costs differ in academic outcomes from those motivated intrinsically. So far, findings on the effect of economic cycles on the dropout rates of students who otherwise would not enter HE are mixed (Bičáková et al., 2021; Reiling & Strøm, 2015).

7. Conclusion

In the pursuit of making access to HE more inclusive, vocational schools can play a significant role (e.g., Bernhard, 2017). In this regard, Austria is an interesting example in which BHS constitute an established gateway to HE, occupying an intermediate position between the dual apprenticeship system, which typically leads directly into the labour market, and AHS, after which most graduates pursue HE. BHS occupy a somewhat ambivalent position in Austria in the context of HE, as they offer a combination of vocational and general education, with graduates enjoying favourable labour market prospects as well as access to all HE sectors. The objective of this study was to investigate the impact of labour market perspectives, particularly the qualification-specific regional unemployment rates, on the decision of BHS graduates to pursue HE. Recent studies have shown that the likelihood of enrolling in HE is higher during economic downturns and for those from economically deprived regions (e.g., Hartung & Weßling, 2025; Meschi et al., 2019; Sievertsen, 2016; Witteveen, 2021). The present study contributes to the literature by focusing on secondary school graduates with vocational qualifications (BHS) and the specific labour markets for their qualification, thus highlighting the importance of the field of education. Our findings indicate that

immediate labour market opportunities exert a considerable influence on the decision of BHS graduates to pursue HE.

While BHS are an important pathway for many students with parents without an academic background, parental education is a crucial factor for entering HE among BHS graduates, with those whose parents have a lower level of education entering HE with a lower probability. The "diversion thesis" suggests that the deterring effect of the labour market could be an explanation for the lower transition rates of BHS graduates from lower socio-economic backgrounds (e.g., R. Becker & Hecken, 2009; Müller & Pollak, 2007). However, the findings of this study illustrate that for BHS graduates, the effect of good labour market perspectives is consistent across parental education levels.

From a systemic perspective, this sensitivity of BHS graduates to labour market prospects has important implications. If the skills acquired at a BHS are urgently required by the labour market, they can be deployed immediately with higher remuneration. Conversely, if there is no immediate demand for such skills, the BHS *Matura* provides the opportunity to attain a higher qualification, thereby reducing the risk of a high number of unemployed BHS graduates. However, this should not distract from the necessity of setting policy goals and taking action in reaching these goals regarding HE participation and social equity. This can be achieved by finding a balance between the potential divergence of goals, such as the enhancement of tertiary attainment rates in a nation and meeting immediate labour market demand for skilled workers. Should a greater number of students be desired, this objective could be realised through the implementation of early academic orientation at BHS and the enhancement of communication regarding the long-term benefits of tertiary education. From an institutional perspective, the flexibility of BHS graduates is advantageous for employers, but makes it difficult for HE institutions to plan their resources. In the case of Austria, funding of public universities and universities of applied sciences is directly related to the number of students. As changes in labour market conditions affect enrolment decisions, HE institutions face uncertainty regarding the number of BHS graduates who will enter tertiary education in the following year. This uncertainty is particularly relevant in disciplines without entrance examinations, which is the case for many degree programmes at Austrian public universities. From an individual perspective, having the possibility to choose between two viable options is a valuable resource for those who manage to graduate from a BHS.

Many of these implications may also be relevant to policymakers in other countries that have or are planning to introduce routes into HE for vocationally trained students. Our analysis showed that access to HE is not just a question of formal qualifications but is significantly influenced by contextual opportunity structures. In particular, favourable labour market conditions may lead vocationally qualified graduates to choose not to pursue HE, even when access is fully granted. While the ideal transition rate from such schools to HE depends on the specific education and vocational training systems of each country, Austrian BHS serve as an example of schools that prepare their graduates well for both HE and direct entry into the labour market. The design and evaluation of such transition pathways must take into account that labour market prospects influence the likelihood of enrolment in HE. Hence, in order to meet both the labour market demands and the qualification requirements of HE institutions, it is crucial to find the right balance between general and vocational education in schools such as BHS.

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Conflict of Interests

The authors declare no conflict of interests.

Data Availability

The data used in this article are register-based microdata provided by Statistics Austria and accessed through the Austrian Micro Data Center (AMDC). Due to legal and privacy restrictions, these data are not publicly available. The AMDC provides microdata for accredited research institutions via remote access. More information about the AMDC and access conditions can be found in Fuchs et al. (2024) and on the website of Statistics Austria: https://www.statistik.at/en/services/tools/services/center-for-science/austrian-micro-data-center-amdc (last accessed on 25.6.2025). Information about the database on unemployment rates by district and field of education can be found in Vogtenhuber et al. (2024). Requests for access to this database should be directed to the authors of the aforementioned report.

LLMs Disclosure

The AI tools DeepL and ChatGPT were used to implement improvements in grammar and style.

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