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Unemployment Scarring in the Early Career: Do Skills and Labour Demand Matter?

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Abstract

Rocky school-to-work transition processes, characterized by spells of unemployment and education–job mismatch, can have long-lasting scarring effects on young people and often lead to a loss of income and occupational status. However, the mechanisms that either foster or prevent unemployment scarring are underinvestigated. Our article thus asks whether vocational education and training (VET) diploma holders' unemployment duration and the probability of status loss at labour market re-entry are affected by the interplay between occupation-specific labour demand and young workers' skill sets acquired in VET. Our theoretical approach combines job search, human capital, and signalling theory with arguments from structural segmentation approaches. Our analyses use complete national register data on VET diploma holders who became unemployed during their early careers. We combine national register data on unemployment spells with register data on education trajectories in Switzerland and occupation-specific labour demand data. Results from event-history analyses indicate that unemployment episodes are associated with lower employment chances and higher risk of status loss of VET diploma holders. These general patterns are attenuated by occupation-specific labour demand and the skills taught in vocational training programmes. Re-employment chances are higher and the risk of status loss lower when occupation-specific labour demand is high and few of the accessible job opportunities offer lower status than the job before unemployment. Additionally, we find that workers who trained in occupations imparting large proportions of occupation-specific skills have a higher re-employment probability but also face a higher risk of status loss than those who trained in occupations imparting larger proportions of general skills. Our findings indicate a trade-off between occupation-specific skills and general skills.

Keywords
downward mobility; labour demand; occupational status; skills; unemployment duration; vocational education and training

1. Introduction

Rocky school-to-work transition processes, characterized by spells of unemployment and education–job mismatch, can have long-lasting scarring effects on the career of young people (Bühlmann et al., 2023; Kriesi & Schweri, 2020). Such effects include long-term loss of income, repeated unemployment episodes, occupational status loss at re-entry, and generally worse employment chances (Brand, 2015; Buchs et al., 2017; Gangl, 2006; Kopycka, 2023; Sacchi & Samuel, 2024; Shi & Wang, 2022). Income and status loss due to unemployment early in their career are problematic because they are difficult to recoup. Moreover, unemployment spells may lead to lower self-efficacy and motivation, which in turn impacts young people's job search behaviour negatively (Helbling & Sacchi, 2014). Unemployment early in a career path thus increases the risk of long-term disadvantages in the labour market (Buchs et al., 2015; Helbling & Sacchi, 2014) and in other life domains, including poorer health and higher divorce rates (Brandt & Hank, 2014).

Research has shown that young people's risk of becoming unemployed after completing education is linked to a country's educational system and labour market structure. Youth unemployment is generally lower in countries such as Switzerland and Germany, which maintain a strong company-based dual vocational education and training (VET) sector that is linked to an occupationally segmented labour market (Blommaert et al., 2020; Bolli et al., 2021; Kriesi et al., 2024). This is partly because dual VET combines vocational school with practical training in a firm. It imparts many practical occupation-specific skills that are sought by employers and thus facilitates VET diploma holders' transition into jobs that match the vocational training (Gangl, 2003; Kriesi et al., 2024; Shi & Wang, 2022; Zimmermann et al., 2013). However, despite low youth unemployment rates in such countries, some VET graduates experience unemployment at labour market entry and in their early careers. Our article focusses on this group, which is affected by lower employment chances and wages after labour market re-entry and a higher risk of occupational status loss and downward mobility due to their prior unemployment (Buchs et al., 2017; Helbling & Sacchi, 2014).

Studies have found that unemployment duration and the extent of unemployment scarring depend on meso-level contextual factors, such as the local labour demand and the type and transferability of skills. Unemployment episodes last longer at times of low local labour demand (Morris, 2023). Furthermore, Buchs et al. (2017) show that in the Swiss labour market, which is occupationally segmented, the risk of downward mobility after unemployment depends on the status composition of the jobs available and is lower when matching job vacancies are abundant.

The literature on the relationship between skills and unemployment outcomes is mainly concerned with wage scarring. A few studies investigate the role of skill mismatch between pre- and post-unemployment jobs and show that workers who manage to find a new job that requires similar skills to the job before unemployment suffer less from wage scarring than workers who are not able to transfer their skills to the new job (Martins-Neto et al., 2023; Nawakitphaitoon & Ormiston, 2015; Neffke et al., 2024; Ormiston, 2014). Rinawi and Backes-Gellner (2021) find that workers with highly occupation-specific skills, which are

difficult to transfer between occupations, are less affected by wage scarring upon labour market re-entry. Eggenberger and Backes-Gellner (2023) show that generic ICT skills reduce the probability of wage scarring for workers with highly specific skill bundles. Work is very scarce on other outcomes than wages, such as employment chances, unemployment duration, and downward mobility. Shi and Di Stasio (2022) use the level of education as a measure of skills to show that unemployment spells have a stronger detrimental effect on VET diploma holders' later employment chances than on tertiary graduates'. Some evidence indicates that unemployed VET diploma holders with highly specific skills suffer from longer spells of unemployment (Rinawi & Backes-Gellner, 2021). On occupational status loss, the only study of which we are aware is the one by Rose and Stier (2019), which shows that unemployed workers with high levels of education have a higher risk of occupational status loss at labour market re-entry than workers with low levels of education.

In summary, research has documented the relevance of labour demand to the duration of unemployment and provided evidence that wage scarring due to unemployment is related to skill endowment. However, to the best of our knowledge, hardly any research has investigated the relationship between skill endowment and other aspects of unemployment scarring, such as unemployment duration and status loss. Furthermore, whether the relationship between skills and scarring may be moderated by labour demand remains unknown. The aim of our article is thus to shed light on these two research gaps:

Firstly, we investigate the hitherto neglected potential impact of skill endowment and ask whether the proportion of occupation-specific and general skills imparted in Swiss upper-secondary VET programmes are related to unemployed diploma holders' unemployment duration and status loss at labour market re-entry. Secondly, we are interested in the moderating role of labour demand. We thus analyse whether the relationship between unemployment duration, status loss and the skills workers were taught in VET depends on the occupation-specific demand for labour.

We investigate these two questions with complete national register data on unemployed Swiss VET diploma holders who graduated between 2011 and 2018. VET is suited to investigate our research question for several reasons. Firstly, VET curricula are the only curricula in Switzerland that are nationally standardized and allow reliable comparisons between programmes. Secondly, VET is by far the most prevalent type of upper-secondary education. It is chosen by approximately two-thirds of all compulsory school leavers, thus allowing us to include a sizeable proportion of all upper-secondary graduates in our analyses. Thirdly, the proportion and type of skills imparted differ considerably between the numerous programmes (Grønning et al., 2020b). Fourthly, we avoid confounding the effects of level and type of skills.

2. Theory and Hypotheses

To formulate hypotheses, we combine theoretical arguments from job search and human capital theory (Becker, 1975a; Halaby, 1988) with arguments from structural segmentation approaches that take the structure of national labour markets and educational systems into account (e.g., Bol et al., 2019; Cheng & Park, 2020; Kalleberg & Mouw, 2018). We begin by introducing the characteristics of Swiss VET (2.1), discuss the basic mechanisms of job search in occupationally segmented labour markets (2.2), and theorize the role of skills in re-employment and downward mobility (2.3) and the interaction between skill endowment and labour demand (2.4).

2.1. Significance and Characteristics of Swiss Upper-Secondary VET

In Switzerland, two-thirds of compulsory school leavers enrol in mostly dual VET in one of approximately 250 different training occupations at the upper secondary level. During the observed period of 2011–2019, a stable proportion of about two-thirds of all upper-secondary diplomas awarded were earned after completing an occupation-specific VET programme (Dionisius et al., 2023).

The majority of VET diploma holders entered the labour market within six months of graduating, although there are some differences between occupational fields (Rudin et al., 2018). Average youth unemployment levels over the studied period fluctuated only slightly and at a low level, between approximately 2.4% and 3.4%, and were comparable between young VET diploma holders and university graduates (Rudin et al., 2018; SECO, 2019). Furthermore, most VET diploma holders manage to find first jobs within the occupational fields for which they trained (Buchs & Helbling, 2016; Müller & Schweri, 2015; Rudin et al., 2018), and VET diplomas offer employment chances that are similar to those of higher education degrees (Aepli et al., 2021).

Swiss VET is characterized by its mostly dual form, by large between-programme heterogeneity in imparted skills and high within-programme standardization. All dual VET programmes combine practical training with some theoretical education. Apprentices typically spend three to four days in their companies and one or two days in vocational schools. Swiss VET thus imparts both occupation-specific skills and various types of general knowledge and skills. However, the programmes differ in the proportion of occupation-specific and general skills taught. Whereas some programmes teach a minimum of general skills, others include a broader range of general skills that are transferable across all labour market segments. Furthermore, all VET programmes are standardized so that all apprentices within a particular occupation follow the same curriculum. They lead to nationwide-recognized federal diplomas that have a high signalling power to employers and provide reliable indicators of young diploma holders' basic skill endowment (Gangl, 2003; Grønning et al., 2020a).

2.2. Basic Mechanisms of Job Search in Occupationally Segmented Labour Markets

Leaving unemployment depends chiefly on the probability that job seekers receive job offers that are acceptable to them. According to job search theory, receiving a job offer depends both on job seekers' search efforts and on employers' willingness to make such an offer (Gebel, 2009). Job seekers aim to find a job where they can use all their skills and abilities to maximize their earnings (Halaby, 1988). Young VET diploma holders ideally find a job in their training occupation. They stop their search if they are offered a job whose benefits (i.e., wages, status) exceed the value of remaining unemployed and searching for a better job (Gebel, 2009).

The pressure of accepting a new job is alleviated by unemployment benefits, which increase the reservation wage. Unemployment benefits may be received up to a maximum of 24 months after becoming unemployed, although the majority of Swiss labour market entrants are entitled to only 18 months (Cottier et al., 2020). Unemployment benefits lower the opportunity costs of being unemployed (Lopes, 2022; Mortensen, 1977). However, skills and abilities depreciate with increasing duration of unemployment (Becker, 1975b; Gangl, 2004; Schmelzer, 2011). Furthermore, prolonged unemployment episodes might be interpreted as negative signals of low productivity and motivation by employers (Becker, 1975b; Gangl, 2004; Schmelzer, 2011). This holds particularly for the Swiss labour market, which has generally low unemployment rates and where

longer unemployment spells bear a strong stigma and are associated with individual deficiencies, such as a lack of motivation, social skills, or reliability (Sacchi & Samuel, 2024). Difficulties in finding a suitable job will increase the probability that workers lower their reservation wage and expected gains (Gebel, 2009; Groot, 1990) and accept a job that does not fully match their training. This probability will increase shortly before unemployment benefits run out (Buchs et al., 2017). Consequently, our first basic hypotheses are that the re-employment probability of job seekers decreases (H1a) and that the probability for downward mobility at re-entry increases with increasing unemployment duration (H1b).

Relying on job search and human capital theory, we argue that job seekers' search efforts and employers' willingness to make a job offer depend on the interplay between VET diploma holders' skills acquired in their VET programme and employers' occupation-specific demand for labour, both of which shape unemployed workers' accessible job opportunities and thus their risk of downward mobility. To theorize this interrelation, we take into account that the Swiss labour market is occupationally segmented and tightly linked with the educational system, including the Swiss VET system. As described above, Swiss VET imparts occupation-specific and some general skills that differ between VET programs. Only a small and dwindling proportion of jobs are accessible solely with compulsory schooling. Most jobs belong to occupational subsegments that require specific educational credentials. Whereas a few occupational subsegments are fully closed off to workers who do not hold particular credentials (e.g., jobs for medical doctors or electricians), the vast majority accept several related credentials. Some of these permeable subsegments are linked and enable vertical status mobility if the occupational status of the subsegments differs (Sacchi et al., 2016). Consequently, individual employment opportunities depend on the labour demand within the occupational subsegments to which workers have access due to their occupation-specific credentials (Kriesi et al., 2010). Furthermore, the probability of downward (or upward) mobility depends on the status composition of the accessible job opportunities. The risk of downward mobility increases with an increasing proportion of accessible job opportunities with lower status than the job before becoming unemployed.

Due to structural changes to the economy and fluctuating business cycles, labour demand differs both between occupational subsegments and across time. In growing occupation-specific segments, employers seek more skilled workers than are available. Furthermore, labour demand is generally lower during economic downswings, although these do not affect labour demand uniformly across labour market segments (Foote & Ryan, 2015; Mortensen & Pissarides, 1994). The prospects of finding a new job that matches one's skills thus depend on the labour demand within the occupational subsegments for which an unemployed worker has suitable skills at the time of the job search (Devereux, 2002; Neffke et al., 2024). When the occupation-specific labour demand is high, many job options are available to job seekers, which makes finding a job easier for unemployed individuals (Gangl, 2004). When labour demand is low, fewer jobs are available, and more people are looking for a jobs. Thus, low occupation-specific labour demand makes finding a job more difficult for unemployed individuals (Pissarides, 2000) and might oblige workers to accept jobs offering lower status and income than the last job. Consequently, we assume that the probability of re-employment is higher at times of high labour demand within a worker's occupational subsegment (H2a). Furthermore, the probability of status loss and downward mobility at re-employment increases if a large proportion of jobs have lower status than the job before unemployment (H2b).

2.3. The Role of Training Skills in Re-Employment Prospects

Within occupationally segmented labour markets, unemployed workers ideally find re-employment in an occupation that matches the skills acquired in education and subsequent work experience. A mismatch between workers' skills and the skill requirements of new jobs increases the probability of income and status loss (e.g., Kambourov & Manovskii, 2009; Neffke et al., 2024; Rose & Stier, 2019; Wolbers, 2003). In dual VET, practical training endows learners with occupation-specific skills. Vocational school teaches occupation-specific and general knowledge, the latter including language skills and subjects such as history, economics, and civics. Furthermore, all learning sites teach general transferable skills, such as ICT literacy, communication, and teamwork skills (Eggenberger & Backes-Gellner, 2023; Scharnhorst & Kaiser, 2018). However, between-programme heterogeneity is substantial. Some training occupations teach predominantly occupation-specific skills and only a minimum of general skills whereas others teach larger proportions of general skills. We argue that these differences in skill bundles have implications for unemployed workers' job search strategies and employers' willingness to make matching job offers, which in turn impact unemployed workers' re-employment prospects and the risk of downward mobility at labour market re-entry.

High proportions of occupation-specific skills increase workers' immediate productivity and lower training costs for employers at the start of a new job in the training occupation (Gangl, 2004; Rose & Stier, 2019). At the beginning of an unemployment spell and before skill depreciation has begun, occupation-specific skills may increase employers' willingness to make a matching job offer and thus lower the initial probability of downward mobility. However, occupation-specific skills are of limited transferability to other occupational fields and have thus been found to reduce occupational mobility (e.g., Lamo et al., 2011; Martins-Neto et al., 2023; Rinawi & Backes-Gellner, 2021). Furthermore, occupation-specific skills depreciate faster than general skills due to rapid technological advances, changing work routines, and new regulations and require constant use and updating to secure employability (Schultheiss & Backes-Gellner, 2023). Unemployed workers with a high proportion of occupation-specific skills thus have to decide how quickly they are willing to accept a job of lower quality where some of their skills are obsolete rather than wait for a job that offers matching status and wage benefits. Against this background, we hypothesize that large proportions of occupation-specific skills facilitate labour market re-entry (H3a) and decrease the risk of downward mobility in the early phase of unemployment while increasing the risk of downward mobility with increasing unemployment duration (H3b).

Large proportions of general skills signal lower productivity at the start of a new job because they may not immediately align with job-specific tasks. Therefore, they require workers to adapt to job-specific contexts and acquire specific skills. This may hamper fast re-employment. However, general skills are also transferable and retain their usefulness when workers change occupation (Becker, 1975b; Wasmer, 2006). Furthermore, general skills have lower depreciation rates than occupation-specific skills (Cohen et al., 2023; Gangl, 2004). They are associated with high trainability, how easily and quickly a worker learns new skills (Korpi et al., 2003), and with more successful job search strategies. For example, McQuaid (2006) shows that unemployed individuals with high verbal skills are more successful in finding a new job. Results from Korpi et al. (2003) imply that general education facilitates unemployment exits. Evidence is growing that generic ICT skills have become important for labour market outcomes and are associated with higher employment rates of Swiss VET graduates (Kiener et al., 2022) and higher wages after involuntary job separations (Eggenberger & Backes-Gellner, 2023). We thus hypothesize that high proportions of general skills may hamper fast re-entry (H4a) but protect unemployed workers from downward mobility (H4b).

2.4. The Moderating Role of Labour Demand

Human capital considerations suggest that labour market outcomes depend on an interplay between skills and labour demand. For example, Lamo et al. (2011) show that countries in which a large proportion of workers have specific skills have more difficulties in adapting to macro-economic turbulence and have thus higher unemployment rates than countries in which general skills are dominant. Adopting a micro-level perspective, Eggenberger et al. (2022) find that wages of workers with highly specific skill sets depend more strongly on labour demand than those of workers with less specific skill sets. The former experience larger earning losses when demand decreases but larger earning gains when demand increases. These findings imply that the usefulness of occupation-specific skills is more sensitive to labour demand than that of general skills. At times of high occupation-specific labour demand, finding a matching new job should be comparatively easy. When the occupation-specific labour demand is low, job seekers are forced to look for jobs beyond their occupational field. However, occupational mobility is hampered by high proportions of occupation-specific skills but facilitated by transferable general skills, which are also useful in many different jobs (Gangl, 2004; Rinawi & Backes-Gellner, 2021). Consequently, workers with a lot of occupation-specific skills are likely to have more difficulties in finding a new job than those with more general skills and are more at risk of experiencing downward mobility at labour market re-entry when labour demand is low "due to [their] inability to locate employment in more prospering sectors of the economy" (Gangl, 2004, p. 190). This leads to the fifth hypothesis, which postulates a moderating effect of labour demand on the relation between skills and re-employment prospects: When the occupation-specific labour demand is low, more general skills increase the probability of re-employment (H5a) and decrease the probability of status loss (H5b).

3. Data and Measures

3.1. Data and Sample

We combine national register data on unemployment spells from the information system for public employment services (PLASTA/AVAM) with register data on education trajectories in Switzerland (LABB) from the Swiss Statistical Office, including precise information on an individual's training occupation and his/her formal education pathway during the early career. The analyses are based on complete national register data on Swiss workers who earned a federal upper-secondary VET diploma from a three- or four-year programme between 2011 and 2018 (N = 516,425) and were registered as unemployed at least once after the completion of their VET training. We restrict our sample to unemployed Swiss residents without further formal education after the completion of VET. We measure the duration of unemployment in days from the date of registering as unemployed until deregistration from unemployment services or the date of finding a job. We follow individuals' trajectories for a maximum of 24 months, the maximum period of unemployment benefits in Switzerland. Only the first unemployment spell per person is considered in the sample. We exclude individuals registering with the employment service without becoming unemployed, for instance, because they found a job before their previous job ended (3% of the sample). The resulting sample consists of 107,911 unemployed VET graduates, which indicates that approximately a fifth of all VET graduates became unemployed during the first years of their career. About a third of the sample registered as unemployed within the first three months after graduation. On average, individuals had 16 months of work experience and were 22 years old when registering as unemployed. They received their

diplomas for 158 training occupations. Most graduates worked in their training occupation at the time of unemployment (76%). About 10% worked in a job of lower status than their training occupation before becoming unemployed.

We combine this register data with occupation-level measures of skills derived from occupation-specific training ordinances and curricula in force when the individuals in our sample trained. The documents contain detailed information on the time spent in the various training locations and the skills provided during VET (for an overview of the collected data see Grønning et al., 2018). This data allows comparison of training characteristics across all three- and four-year VET programmes leading to a VET diploma in Switzerland. We linked the individual-level register data with occupation-level data on the institutional characteristics of training occupations, including skills and time spent in training locations using the 6-digit statistical code used by the Federal Statistical Office.

3.2. Measures

3.2.1. Dependent Variables

Our dependent variables are *time until re-employment* and *status loss at re-employment*. We measure the time until re-employment by counting the number of days from registering with employment services to finding a job. Individuals who do not find a job are right-censored, because they lost their unemployment benefits, are considered as not looking for a job by employment services (see above), deregistered from employment services without finding a job, or did not find a job during the first 24 months of being unemployed. Status loss at re-employment captures vertical job mismatch and thus a quality aspect of the job found at re-employment. Status loss is measured by comparing the status of the occupational groups of the pre- and post-unemployment jobs in the four-digit international standard classification of occupations (ISCO). We consider a post-unemployment job to be lower in status if it is more than 10% lower than the pre-unemployment job on Ganzeboom's occupational status scale (Ganzeboom et al., 1992). With individuals who became unemployed immediately after graduation, we compare the occupational status of the training occupation with the job after unemployment. The unemployment services did not record the exact jobs found after unemployment for some individuals, and we dropped these cases from the analyses on status loss.

3.2.2. Training Skills

We measure the type of training skills at the occupation level by analysing the content of occupation-specific training ordinances and curricula. VET is standardized across Switzerland, and apprentices within a particular occupation follow the same curriculum, which leads to a nationally recognized federal diploma of VET. Despite this high within-occupation standardization, heterogeneity between training occupations is broad (see Figure 1). We exploit this heterogeneity to measure differences in the proportion of occupation-specific and general skills taught between occupations and distinguish several skill indicators.

Practical *workplace training* captures the proportion of time VET learners spend in occupation-specific training in the training firm and intercompany courses (Grønning et al., 2020b). *General knowledge* assesses the proportion of general education in vocational school to the overall work and school time per week.

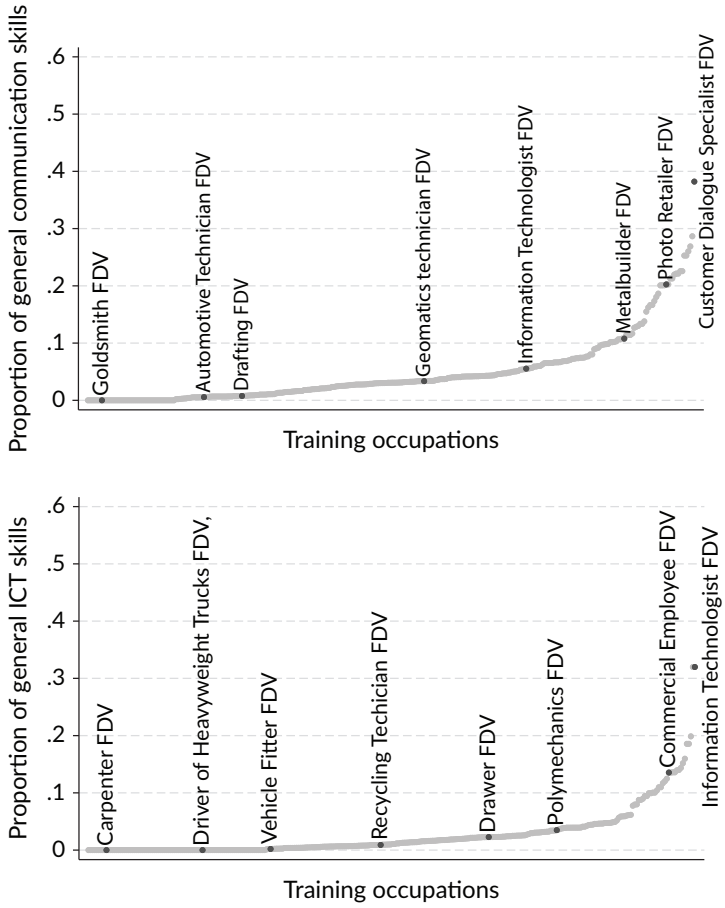

Figure 1. Heterogeneity of ICT skills (top) and communication skills (bottom) across training occupations (n = 303, occupations sorted by skill proportion). The occupations specified here are examples.

To measure *general communication* and *ICT skills*, we calculated the proportion of learning objectives covering these two skills in each occupation-specific curriculum using automatic content analyses of 425 current and repealed curricula in force at the time of training (for details, see Grønning et al., 2018). We matched the skill measures with our individual-level unemployment data using the VET ordinance that was in force at the time of an individual's VET training. To illustrate the heterogeneity of skills provided in Swiss VET between occupations, Figure 1 depicts differences between training occupations in the proportion of learning objectives referring to general ICT skills (bottom) and general communication skills (top).

3.2.3. Labour Demand

To assess occupation-specific labour demand, we use information about occupation-specific job opportunities. We measure *occupation-specific labour demand* with three indicators using representative yearly job advertisement data from the Swiss job market monitor (Buchmann et al., 2022): the total number of vacancies per occupational field and year (in 1000 jobs, using the 3-digit level of the Swiss standard classification of occupations (SCO); see Federal Statistical Office FSO, 2019), the number of job vacancies with more than 10% lower ISEI scores, and the number of job vacancies with equal (≈10%) or higher (>10%) ISEI scores compared to the job held before unemployment (in 1000 jobs, using the 3-digit level of the Swiss SCO). The number of advertised positions was weighted in each case by the probability that a "worker with

occupation *x* was able to access jobs in other occupations" (see Grønning & Kriesi, 2022). For all variables, we use a two-months lag and match the labour demand variables to the individuals half-yearly depending on the month they registered as unemployed.

3.2.4. Control Variables

At the individual level, we controlled for age, gender, citizenship, work experience in months since graduation, and pre-unemployment horizontal job match using a comparison of the two-digit level of the Swiss SCO of the VET occupation and the pre-unemployment occupation (Federal Statistical Office FSO, 2019). At the occupation level, we controlled for the occupation group of the job held prior to unemployment (two-digit level of the Swiss SCO), for the occupation-specific unemployment rate, and for the intellectual requirement profile of the VET occupation (Stalder, 2011). At the macro level, we controlled for general economic trends by including the total number of job vacancies per year in 1000 (Buchmann et al., 2022) and for the geographic region of residence at time of unemployment (NUTS-2 regions). Table A1 in the Supplementary File presents a descriptive overview of all the variables used in this article.

3.3. Analytical Strategy

We first look at the employment status of young VET graduates descriptively. In a second step, we run piecewise constant exponential models to explicitly model the time-varying effect of our skills variables. We use three-monthly time splits but control for the robustness of the results with various time intervals (see Supplementary File, Tables A4 and A5). Piecewise constant exponential models with period-specific effects of covariates are particularly well suited to model events such as re-employment when it is likely that the roles of predictors change as the spell continues (cf. Blossfeld et al., 2019, p. 134). We calculate the hazard of exiting via re-employment and status loss with time in months treated as continuous. We specify the events of interest, re-employment and status loss, as *failure* (1), with all other states coded as *censored* (0). Our model is therefore similar to a competing risk model but treats exits to status-equivalent jobs as right-censored without explicitly modelling them (for a similar approach see Buchs et al., 2017). We estimate frailty models to account for unobserved heterogeneity between occupations.

4. Results

4.1. Descriptive Results

Table 1 illustrates that 85% of all unemployed VET graduates successfully found a job within the observation period, 50% with status-equivalent and 19% with lower-status re-employment.

Table 1. Employment status of unemployed VET graduates during the observation period.

Employment status	
Lower-status re-employment	17,120 (19%)
Status-equivalent re-employment	45,161 (50%)
Re-employment, unknown status	14,955 (17%)
No re-employment	13,330 (15%)

The probability (i.e., hazard) of exiting unemployment and of status loss varies over time, as Figure 2 indicates. The probability of re-employment is highest directly after registering with unemployment services. Roughly 60% find a new job within the first three months. After approximately three months of unemployment, the probability of re-employment sharply and steadily declines with increasing unemployment duration in line with H1a (left panel in Figure 2). The probability of exiting unemployment increases again shortly before unemployment benefits expire. The likely reason is that the impending end of unemployment benefits lowers the reservation wage and pushes job seekers to accept jobs of lower quality or jobs that do not fit their skills profile well (Akın & Platt, 2012). If we further analyse the quality of the job found at re-employment, we see that the hazard of status loss increases over time in comparison to the probability of matching status re-employment. The increase is particularly pronounced after approximately 19 months of unemployment and thus towards the end of the period of entitlement to unemployment benefits. In line with H1b, unemployed workers are thus more likely to accept a job of lower status with increasing unemployment duration (right panel in Figure 2). These descriptive results are derived from regressions without control variables and monthly time splits but are generally in line with the multivariate results provided in Table A2 in the Supplementary File.

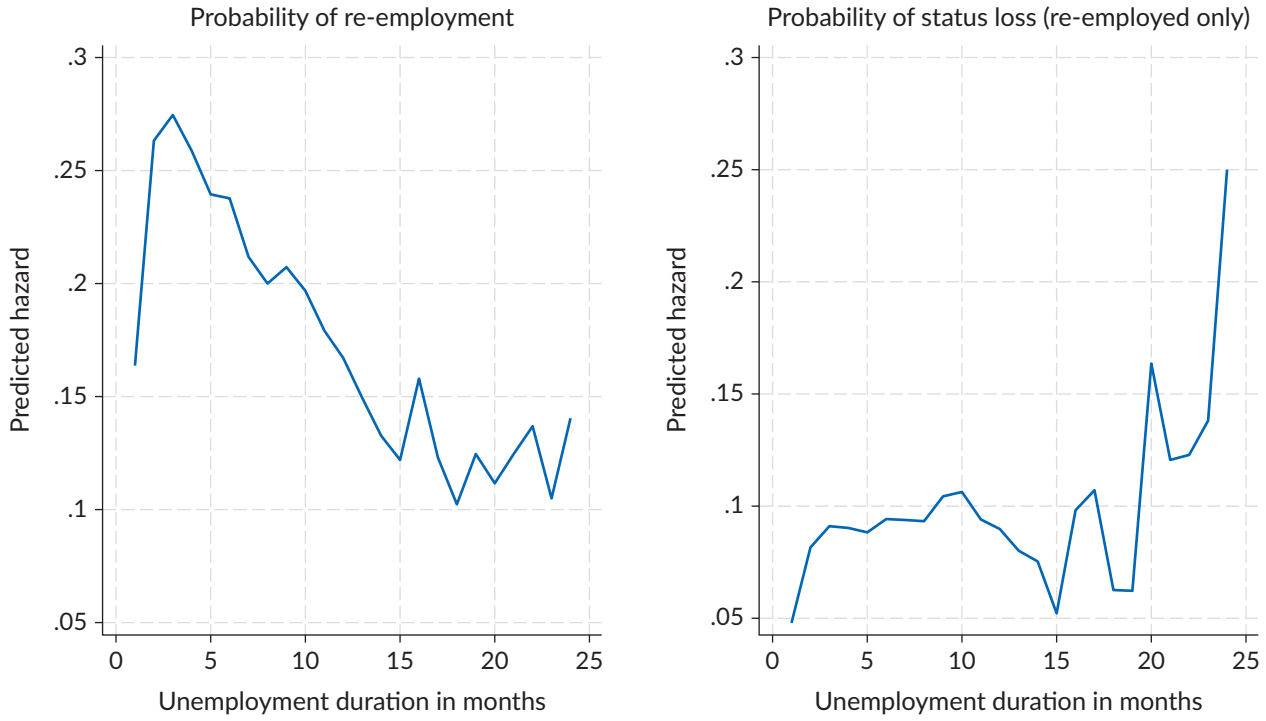

Figure 2. Predicted probability (i.e., hazard) of re-employment and status loss. Notes: Results derived from a piecewise constant exponential model with monthly intervals and no control variables; the survival function, which is the inverse of the hazard function, is provided in the Supplementary File, Figures A1 and A2.

4.2. Multivariate Results

Our main multivariate results are provided in Table 2. In line with H2a and H2b, model 1 firstly shows that the probability of re-employment increases when occupation-specific labour demand is higher. Secondly, the risk of status loss at re-employment rises if many of the accessible jobs are of lower status than the job before unemployment. In substantive terms and based on the predicted median time, the predicted unemployment duration between occupations with low and high labour demand at a given time differs by about half a

month. Furthermore, the risk of status loss is approximately four times higher in occupations offering many lower-status vacancies at a given time than in occupations offering few lower-status vacancies.

Models 2–5 reveal opposing relations between the skills taught during training and the probability of re-employment and status loss at re-entry. Supporting H3a, we find that large proportions of workplace training increase the probability of re-employment. To illustrate the role of workplace training for re-employment, Figure 3 (left panel) plots the survival function for three levels of workplace training (minimum, mean, maximum), depicting the probability that re-employment (i.e., failure) has occurred by time *t*. The predictions in Figure 3 clearly show that individuals who trained in occupations providing more workplace training (green, short-dashed line) exit unemployment faster than those who trained in occupations providing less workplace training (blue, solid line). This difference holds particularly during the first six to nine months after becoming unemployed, as also the results in Table 2 illustrate. After longer periods of unemployment, the quantity of workplace training has no consistently significant influence on the probability of re-employment. The model predicts a median unemployment time of less than two months for individuals who trained in occupations with large proportions of workplace training and a median unemployment duration of almost three months for individuals with low proportions of workplace training. By contrast, and partly in line with H3b, unemployed VET diploma holders who trained in occupations imparting larger proportions of workplace training have a higher risk of status loss at re-entry from the start of the unemployment phase (right panel). This is also supported by Figure 3 (right panel), which shows that individuals who trained in occupations imparting the largest proportions of workplace training consistently have the highest probability of exiting into status loss. In line with H3b and clearly depicted by the increasing difference between the slopes of the predictions in Figure 3, this effect becomes stronger with ongoing unemployment duration. Large proportions of workplace training thus disadvantage job seekers compared to counterparts whose training programmes included comparatively smaller proportions of

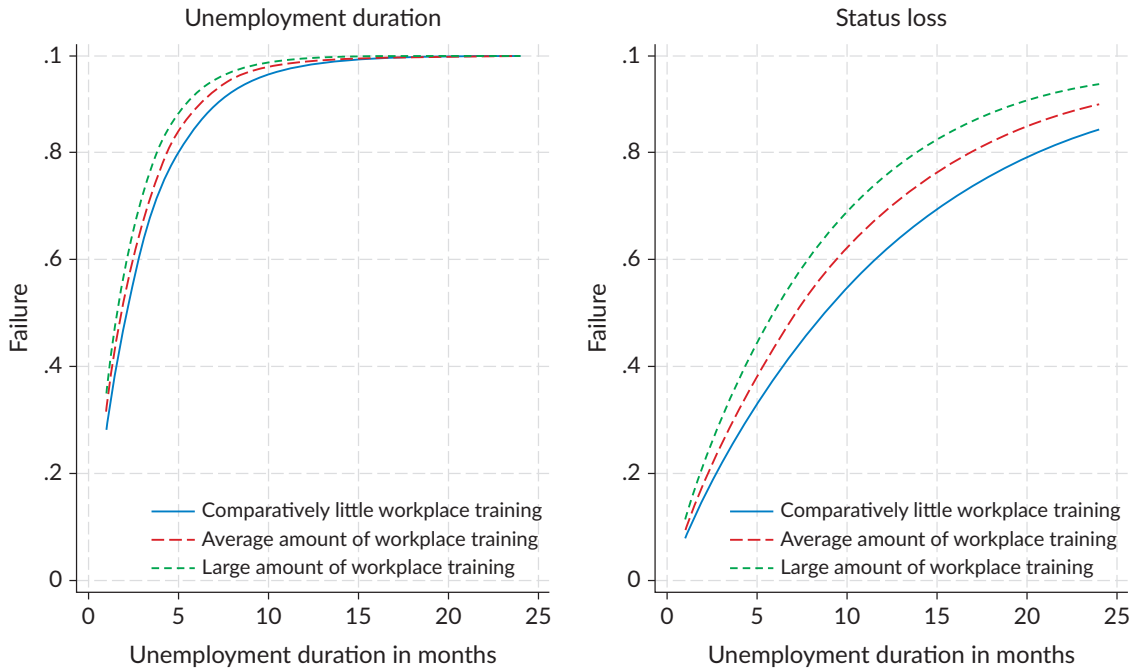

Figure 3. Predicted failure function of unemployment and status loss by levels of workplace training (minimum, mean, maximum).

workplace training and more general knowledge. For example, the predicted median time until a job seeker accepts a job of lower status is about four months earlier in occupations with large proportions of workplace training than in occupations with comparatively low proportions of workplace training.

In line with H4a, comparatively large proportions of general skills lower the probability of re-employment, particularly during the first six to 12 months of the job search. This holds for general knowledge, general ICT skills, and general communication skills, all of which reduce the likelihood of exiting unemployment quickly (see Table 2, models 3–5). Figure 4 (left panel) shows the survival function at three levels of general ICT skills (minimum, mean, maximum). The results indicate that unemployed workers who trained in occupations imparting comparatively large quantities of general ICT skills have a lower probability of exiting unemployment and need longer to find a job than individuals who trained in occupations imparting an average or low amount of general ICT skills. For instance, more general ICT skills increase the median unemployment time at the beginning of an unemployment spell from approximately 2.8 months to 4.5 months. However, as postulated in H4b, the proportion of general skills becomes beneficial when we examine the quality of the job after unemployment: Large proportions of general skills reduce the likelihood of status loss at re-entry (see Table 2, models 3–5), albeit the effect of general knowledge is only significant in some time-intervals. Unemployed VET diploma holders who trained in programmes with higher proportions of general knowledge, communication, and general ICT skills have lower risks of status loss at re-employment than unemployed who trained in occupations that provided fewer of these skills (H4b). This is also illustrated by the predicted survival functions in Figure 4 (right panel) at different levels of general ICT skills, which show that individuals who trained in occupations teaching comparatively large proportions of general ICT skills have a much lower probability of status loss than individuals who trained in occupations providing fewer of such skills.

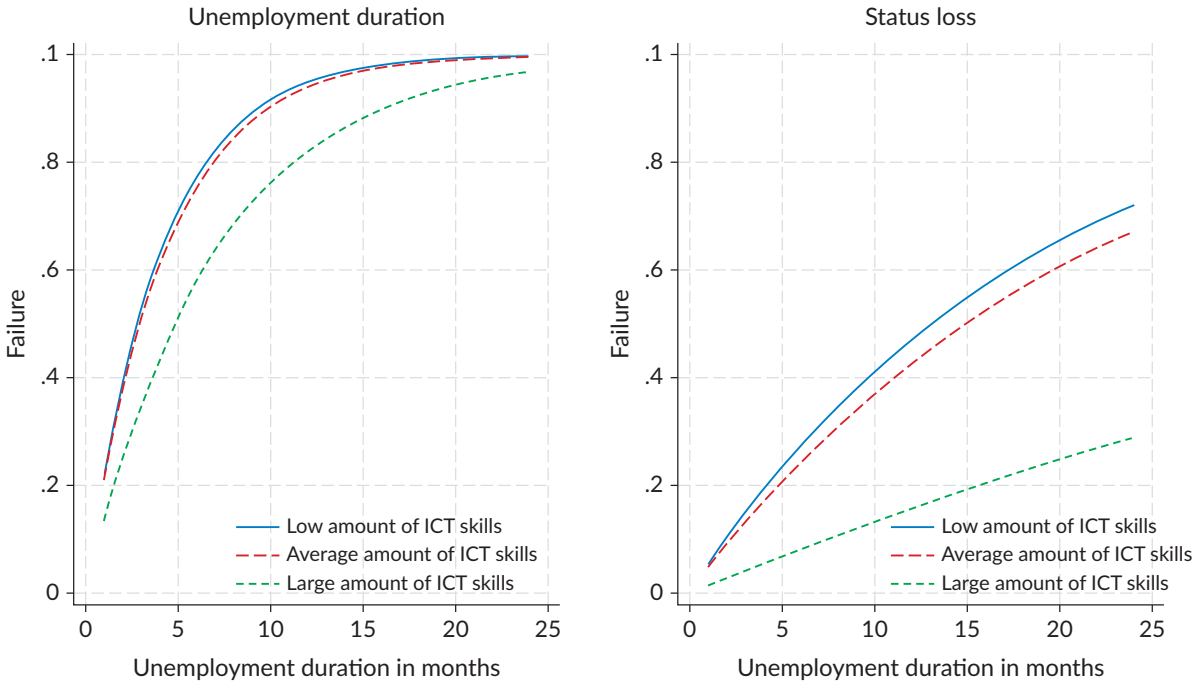

Figure 4. Predicted failure function of unemployment and status loss by levels of ICT skills (minimum, mean, maximum).

Table 2. Probabilities of re-employment and status loss at re-employment, piecewise constant exponential model.

	Model 1		Model 2		Model 3		Model 4		Model 5	
	Re-employment	Status Loss at re-entry	Re-employment	Status Loss at re-entry	Re-employment	Status Loss at re-entry	Re-employment	Status Loss at re-entry	Re-employment	Status Loss at re-entry
T1	−1.52*** (0.10)	−3.23*** (0.23)	−2.90*** (0.36)	−5.35*** (1.23)	−1.37*** (0.10)	−3.14*** (0.24)	−1.53*** (0.10)	−3.27*** (0.23)	−1.49*** (0.10)	−3.20*** (0.23)
T2	−1.37*** (0.10)	−3.04*** (0.23)	−2.27*** (0.38)	−5.38*** (1.25)	−1.30*** (0.10)	−2.97*** (0.24)	−1.40*** (0.10)	−3.08*** (0.23)	−1.37*** (0.10)	−2.99*** (0.23)
T3	−1.51*** (0.10)	−3.12*** (0.23)	−2.25*** (0.41)	−6.10*** (1.30)	−1.47*** (0.10)	−2.93*** (0.25)	−1.56*** (0.10)	−3.17*** (0.23)	−1.51*** (0.10)	−2.97*** (0.24)
T4	−1.57*** (0.10)	−3.24*** (0.23)	−2.36*** (0.50)	−6.36*** (1.44)	−1.53*** (0.11)	−2.90*** (0.26)	−1.63*** (0.10)	−3.35*** (0.24)	−1.62*** (0.10)	−3.11*** (0.25)
T5	−1.84*** (0.11)	−3.57*** (0.25)	−2.94*** (0.78)	−7.74*** (1.97)	−1.81*** (0.13)	−3.15*** (0.32)	−1.89*** (0.11)	−3.68*** (0.26)	−1.76*** (0.12)	−3.19*** (0.29)
T6	−1.81*** (0.11)	−3.34*** (0.26)	−3.45*** (1.04)	−6.55** (2.28)	−1.77*** (0.16)	−3.23*** (0.37)	−1.87*** (0.12)	−3.41*** (0.28)	−1.77*** (0.14)	−3.15*** (0.32)
T7	−1.93*** (0.13)	−3.57*** (0.29)	−5.56*** (1.50)	−11.3*** (3.19)	−1.78*** (0.21)	−2.89*** (0.45)	−1.89*** (0.15)	−3.48*** (0.33)	−1.73*** (0.18)	−3.08*** (0.40)
T8	−1.81*** (0.16)	−3.67*** (0.36)	−2.39 (2.20)	−9.70+ (4.98)	−1.63*** (0.29)	−3.54*** (0.70)	−1.93*** (0.19)	−3.73*** (0.45)	−1.98*** (0.26)	−3.43*** (0.59)
Total occupation-specific labour demand	0.03** (0.01)		0.04*** (0.01)		0.03*** (0.01)		0.03** (0.01)		0.03*** (0.01)	
Occ.-specific labour demand of at least equal status		0.02 (0.03)		0.01 (0.03)		0.01 (0.03)		0.01 (0.03)		0.01 (0.03)
Occupation-specific labour demand of lower status		0.72*** (0.06)		0.71*** (0.06)		0.72*** (0.06)		0.71*** (0.06)		0.72*** (0.06)

Table 2. (Cont.) Probabilities of re-employment and status loss at re-employment, piecewise constant exponential model.

Type of skill			Workplace Training		General Knowledge		General ICT skills		General communication skills	
Coefficient of skill at t1			1.65***	2.47+	−2.43***	−1.93	−1.43***	−3.46**	−0.69***	−1.34*
			(0.42)	(1.43)	(0.38)	(1.40)	(0.37)	(1.10)	(0.21)	(0.65)
Coefficient of skill at t2			1.04*	2.76+	−1.74***	−1.80	−0.83*	−3.61**	−0.43+	−1.45*
			(0.43)	(1.45)	(0.39)	(1.41)	(0.39)	(1.13)	(0.22)	(0.68)
Coefficient of skill at t3			0.83+	3.60*	−1.47***	−2.57+	−0.21	−3.38**	−0.35	−2.25**
			(0.49)	(1.53)	(0.42)	(1.44)	(0.45)	(1.23)	(0.26)	(0.74)
Coefficient of skill at t4			0.90	3.79*	−1.56**	−3.66*	0.080	−1.94	0.037	−2.11*
			(0.61)	(1.73)	(0.50)	(1.55)	(0.57)	(1.44)	(0.34)	(0.90)
Coefficient of skill at t5			1.31	5.16*	−1.44+	−4.26*	−0.053	−1.92	−1.12+	−4.22**
			(0.98)	(2.46)	(0.74)	(1.95)	(0.96)	(2.22)	(0.58)	(1.44)
Coefficient of skill at t6			2.01	3.90	−1.52	−2.05	0.068	−2.70	−0.74	−2.53
			(1.33)	(2.90)	(0.97)	(2.21)	(1.28)	(2.77)	(0.79)	(1.73)
Coefficient of skill at t7			4.58*	9.75*	−2.42+	−6.29*	−2.55	−7.46	−2.13+	−5.26*
			(1.92)	(4.06)	(1.39)	(2.99)	(2.23)	(5.16)	(1.16)	(2.61)
Coefficient of skill at t8			0.63	7.57	−2.60	−2.18	1.98	−3.12	1.05	−3.06
			(2.85)	(6.41)	(2.02)	(4.44)	(2.67)	(7.45)	(1.60)	(4.10)
Region included	x	x	x	x	x	x	x	x	x	x
Occupation-specific controls	x	x	x	x	x	x	x	x	x	x
Individual level controls	x	x	x	x	x	x	x	x	x	x
N	135459	112894	135459	112894	135459	112894	135459	112894	135459	112894
Log likelihood	−101541.4	−38847.2	−101525.0	−38840.3	−101504.5	−38839.2	−101521.6	−38840.7	−101529.0	−38837.8
LnTheta	−4.10***	−1.40***	−4.18***	−1.42***	−4.43***	−1.40***	−4.13***	−1.46***	−4.15***	−1.41***
	(0.17)	(0.13)	(0.17)	(0.13)	(0.19)	(0.13)	(0.17)	(0.14)	(0.17)	(0.13)

Notes: + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$ ***; $p < 0.001$. Coefficients refer to log hazards. Models control for age, gender, citizenship, horizontal job match before unemployment, work experience, intellectual requirement profile of training occupation, NUTS-2 regions, occupation group, and occupation-specific unemployment rates. For the full model see Table A2 in the appendix.

In sum, we find that the proportion of general skills and workplace training imparted during training are related differently to the re-employment prospects of unemployed VET graduates in the early phase of their careers. While more workplace training increases the probability of exiting unemployment quickly, it also increases the risk of status loss at re-employment. By contrast, general skills reduce the likelihood of rapid re-employment but also reduce the risk of status loss at re-entry. Our main results are robust to various time splits in the piecewise constant exponential models (see Supplementary File, Tables A4 and A5).

H5a and 5b assume that VET diploma holders' probabilities of re-entry and status loss depend on an interplay between skills imparted during VET and labour demand. We tested these hypotheses by interacting skill variables with labour demand variables and calculating average marginal effects for all skill variables (see Supplementary File, Figures A3–A10). In the interaction models, we opted for six-monthly time splits rather than three-monthly splits to increase the number of observations within each combination of the variables and enable the calculation of standard errors. As Table A3 and Figures A3–A10 indicate, we find no evidence that the relationships between skills and re-entry or status loss are moderated by labour demand. Our analyses neither reveal any significant interactions between labour demand and skills on the overall probability of re-employment nor on status loss, as indicated by mostly flat curves and/or large confidence intervals.

5. Discussion and Conclusion

Our article investigated whether unemployment duration and the probability of status loss at labour market re-entry depend on the interplay between occupation-specific labour demand and the skillsets imparted by workers' training occupations. We analysed these questions with complete national register data on Swiss VET diploma holders who completed their training in 158 training occupations between 2011 and 2018 and registered as unemployed during the first years after graduation at least once. The high within-programme standardization of taught skills and heterogeneity between programmes captured by curriculum data offer ideal conditions for analysing our research question. However, this approach based on a comparison of VET occupation curricula also implies that we are not able to generalize our conclusions to other types of education.

The results are largely in line with our hypotheses. They confirm that unemployment episodes have scarring effects on recent VET diploma holders by decreasing their employment chances and increasing the risk of status loss. The fact that the re-employment probability declines sharply for unemployed workers who do not find a new job within three months supports the assumption that in labour markets with generally low unemployment rates, unemployment spells are interpreted by employers as signals of low productivity and motivation (see also Sacchi & Samuel, 2024). However, we cannot fully discount the possibility that self-selection mechanisms are at work and that a part of the decline in re-employment is voluntary. Unemployment also generally increases the probability of status loss because workers are likely to feel pressure to accept jobs of lower quality.

Furthermore, the findings show that these general patterns may be attenuated or intensified by occupation-specific labour demand and the skills taught in vocational training programmes. Unsurprisingly, re-employment chances and the risk of downward mobility are tied to the number and the quality of jobs that workers have potential access to with their VET diploma. Finding a new job is easier at times of high occupation-specific labour demand, when employers experience greater difficulty in filling their job

vacancies and are more willing to hire unemployed candidates despite the negative signal sent by their unemployment status. The findings also indicate that the risk of status loss is related to the status composition of accessible job opportunities and increases when large numbers of accessible job opportunities offer lower status than the job before unemployment. These findings underline that the risk of unemployment scarring is tied to macrolevel factors, such as the number and quality of job opportunities, which are independent of individuals' agency but tied to their upper-secondary VET programme.

The importance of the VET programme is also manifest in the findings for skills, which indicate that the proportions of occupation-specific and general skills taught in upper-secondary VET influence unemployment scarring. Large proportions of occupation-specific skills seem to be a mixed blessing. Workers who trained in occupations teaching large proportions of occupation-specific skills have a higher probability of re-employment. However, they also face a higher risk of status loss. This holds from the beginning of the unemployment spell and rises with increasing unemployment duration. A likely reason for the higher re-employment probability is that occupation-specific skills boost workers' immediate productivity and thus employability. Unemployed workers who trained in occupations that imparted large proportions of occupation-specific skills are thus more attractive job candidates than unemployed workers who trained in occupations teaching lower proportions of occupation-specific skills. The predominant explanation for the growing risk of status loss with increasing unemployment duration is that occupation-specific skills are subject both to rapid depreciation when unused during unemployment and to limited transferability. Consequently, workers are more often forced to accept jobs of lower status in which they cannot use all the skills acquired during training and in any foregoing job episodes. However, the depreciation argument does not explain why workers who trained in occupations imparting large proportions of occupation-specific skills face a higher risk of status loss from the very beginning of the unemployment spell. Possible reasons are that these workers either have less effective job search strategies or that they are more willing to accept a job of lower status immediately after becoming unemployed because they anticipate difficulties in finding a matching job due to stigmatization or low skill transferability.

Unemployed VET diploma holders who were taught larger proportions of general skills face more difficulties in finding new jobs. A likely reason is that large proportions of general skills in workers' skillsets signal lower productivity when beginning new jobs because workers need more on-the-job training to acquire job-specific skills. This renders unemployed workers less attractive to employers despite the higher trainability ascribed to this group. However, unemployed VET diploma holders from training occupations that imparted comparatively large proportions of general skills also manage to find jobs of equivalent status more often. This finding is in line with the view that general skills support successful job search strategies and adaptation to challenging situations.

We found no evidence of an interaction between skills and labour demand. Therefore, our assumption that the usefulness of occupation-specific skills is more sensitive to labour demand than general skills cannot be confirmed for the Swiss labour market. This is in line with results from Sacchi and Samuel (2024), who used a factorial survey experiment to show that unemployment episodes in occupational labour markets lowered the hiring chances of young workers irrespective of general unemployment levels. Taken together, these findings support Sacchi and Samuel's (2024) interpretation that in labour markets with generally low levels of unemployment, unemployment scarring is the result of stigmatization and the ascription of low motivation, social skills, and reliability rather than demand and supply mechanisms. It is plausible to assume

that demand and supply factors play a more important role in labour markets characterized by high unemployment, where the re-employment chances of young unemployed workers are likely to depend on the interplay between skills and labour demand.

In summary and from a theoretical perspective, the findings highlight that in occupationally segmented labour markets, such characteristics of training occupations as the proportion of occupation-specific versus general skills taught in upper-secondary VET matter for unemployment scarring and are thus drivers of social inequality that have hitherto been rarely considered in sociological research. Training occupations offer different skill mixes, which not only affect wage levels and occupational mobility in the early career, as previous research has shown (Grønning et al., 2020a; Grønning & Kriesi, 2022), but also affect workers' re-employment chances and the risk of downward mobility after becoming unemployed within the first few years after completion of VET training. Our findings further support the assumption of a trade-off between occupation-specific and general skills. Occupation-specific skills increase young people's re-employment chances and help to shorten spells of unemployment. However, they also increase the risk of downward mobility for those young people who experience spells of unemployment. Conversely, large proportions of general skills hamper the speed of re-employment but prevent occupational downward mobility. Educational policy thus needs to strike a well-considered balance between skill types in VET.

Lastly, a few words on limitations are in order. As mentioned above, our results are limited to young workers with upper-secondary VET diplomas. Whether our findings also hold for workers with tertiary-level education is an open question. Given that fields of study also differ considerably in their proportions of general and occupation-specific skills, it is likely that similar mechanisms are at play. However, the data currently available do not allow this assumption to be corroborated.

Moreover, the disadvantage of using national register data on all VET diploma holders with registered unemployment spells during the observation period is the lack of individual-level data on skills, competences, and motivation. Although we controlled for the average intellectual requirement level of each training occupation and use frailty models to account for unobserved heterogeneity between occupations, we cannot fully discount the possibility that our results are partly driven by selection effects. Furthermore, we lack information at the job level. We are thus unable to control for the potentially confounding effects of job characteristics that may correlate with the skill variables at the occupational level. However, we are not aware of any individual-level data on unemployment episodes that would include information on individual skills and job characteristics. Ideally, further research will focus on collecting more comprehensive and longitudinal data that will allow both more in-depth analyses of the drivers of unemployment scarring for workers with all types of education and cohort comparisons.

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Conflict of Interests

The authors declare no conflict of interests.

Data Availability

Due to data protection legislation, the authors do not have the right to make their data available. However, the data used for this article is available on request at the Swiss Statistical Office (see Längsschnittanalysen im Bildungsbereich [LABB]) and the State Secretariat for Economic Affairs (information on data processing). Data linkage is done exclusively by the Swiss Statistical Office.

Supplementary Material

Supplementary material for this article is available online in the format provided by the author (unedited).

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