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Transitions to Post-Compulsory Education of Foreign and Immigrant Students in Switzerland in Time of the COVID-19 Crisis

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Abstract: This paper examines whether the COVID-19 crisis reshaped the transition to upper secondary education in Switzerland and reinforced migration-related inequalities. Using exhaustive LABB administrative data, we compare three cohorts completing compulsory school before and during the pandemic with sequence analysis and detailed migration indicators. Results show more linear trajectories, higher entry into general education, and stable VET access. Inequalities by nationality and residence permit remain strong, with no clear pandemic exacerbation.

Keywords: Educational pathways, inequality of opportunities, migration background, COVID-19, sequence analysis

Transitions vers la formation post-obligatoire des élèves étrangers et issus de l'immigration en Suisse en période de crise du COVID-19

Résumé : Cet article examine si la crise du COVID-19 a modifié la transition vers le secondaire II en Suisse et renforcé les inégalités migratoires. À partir des données administratives exhaustives LABB, nous comparons trois cohortes avant et pendant la pandémie par analyse de séquences, utilisant des indicateurs migratoires détaillés. Les résultats montrent des parcours plus linéaires, davantage d'accès à l'enseignement général et un accès stable aux apprentissages. Les inégalités selon nationalité et permis de séjour restent fortes, sans aggravation nette due à la pandémie.

Mots-clés : Trajectoires éducatives, inégalité des chances, background migratoire, COVID-19, analyse de séquences

Übergänge von ausländischen und zugewanderten Schülerinnen und Schülern in die nachobligatorische Bildung in der Schweiz während der COVID-19-Krise

Zusammenfassung: Dieser Beitrag untersucht, ob die COVID-19-Krise den Übergang in die Sekundarstufe II in der Schweiz verändert und migrationsbezogene Ungleichheiten verstärkt hat. Mit vollständigen LABB-Verwaltungsdaten vergleichen wir drei Kohorten vor und während der Pandemie mittels Sequenzanalyse und differenzierter Migrationsindikatoren. Die Ergebnisse zeigen linearere Verläufe, mehr Eintritte in die Allgemeinbildung und stabilen Zugang zur Berufsbildung. Ungleichheiten nach Nationalität und Aufenthaltsstatus bleiben stark, ohne klare Pandemieverschärfung.

Schlüsselwörter: Bildungswege, Chancenungleichheit, Migrationshintergrund, COVID-19, Sequenzanalyse

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1 Introduction

The transition from compulsory school to upper secondary education is a pivotal moment in the Swiss education system. It marks the entry into either a vocational or academic path, thus influencing future educational and professional prospects. Failure to enter a certifying path is known to lead to more precarious work pathways (Sacchi & Meyer, 2016). This transition therefore strengthens social inequalities, leading to diverging trajectories between groups (Meyer, 2009).

The COVID-19 crisis has had a wide impact on our societies, including school closures, and redefined educational opportunities. More generally, global crises have been shown to be decisive moments altering life trajectories and school-to-work pathways (Buchmann, 2017). Economic shocks are often linked with increased academic enrolment, to postpone workforce entry (Muehlemann et al., 2020; Schoon & Bynner, 2019). Moreover, in-firm apprenticeships are tightly linked to the labour market, making the hiring process sensitive to economic conditions. As the vocational education and training (VET) path is predominant in Switzerland, the COVID-19 crisis and its ensuing economic uncertainties might have reshaped this transition, leading to the following research question:

Research question 1: How did the COVID-19 crisis affect the transition from lower to upper secondary education?

The article also focuses on immigration-centred inequalities, in this transition. Factors such as the country of birth, nationality, or language proficiency are known to affect educational pathways (Bauer & Riphahn, 2007; Gomensoro & Bolzman, 2016; Lagana et al., 2014; Tjaden & Scharenberg, 2017). Switzerland has experienced multiple waves of immigrants from diverse countries, resulting in a comparatively large population with diverse migration and social backgrounds, making their study particularly relevant (SCCRE, 2023). While the link between socioeconomic status (SES) and country of origin has been established (Gomensoro & Bolzman, 2019), no research simultaneously considers nationalities, legal permits, and age at arrival with exhaustive data on lower to upper secondary education transitions. By applying a particularly detailed operationalisation of migration-background, this work allows the identification of mechanisms that remain hidden in broader categories. Thus, shedding light on educational inequalities between foreign (non-nationals) and immigrant (born-abroad) students and their Swiss peers. This leads to the following second research question:

Research question 2: Are there immigration-related inequalities in the transition to post-compulsory education?

Eventually, crises do not affect all individuals and their educational trajectories in the same way (Buchmann, 2017). In the USA, ethnic minorities were overly affected by the COVID-19 crisis, strengthening pre-existing inequalities (Tai et al., 2022). In Switzerland, sectorial shutdowns during the first lockdown of 2020 (DETEC, 2020) might have reduced the number of available apprenticeship positions. This in turn

could have heightened the VET selection process, leading to increased competition between candidates. If the VET market was negatively affected by the pandemic, we expect that the opportunities of foreign students were disproportionately impacted, given that some of them are low achievers and that Switzerland has a long history of national preference in the job market during economic crises (D'Amato, 2008).

Research question 3: Were certain nationalities more negatively affected by the pandemic according to their migratory background?

Understanding these research questions requires a short overview of the transition from compulsory to upper secondary education. The Swiss education system is regulated at the cantonal level but can broadly be divided in three levels: compulsory, upper secondary, and tertiary education (SCCRE, 2023). Tracking usually starts three years before the end of compulsory schooling and shapes subsequent opportunities. Upper secondary education starts around 15 years old and consists of three main paths.

The first, undertaken by almost 60% of students, is vocational education and training (VET) (SCCRE, 2023). Most VET programs are firm-based and rely on labour-market logics, i. e., companies select apprentices based on their needs. VET graduates can access, under certain conditions, a vocational baccalaureate, enabling access to tertiary education. Second, general secondary education, undertaken by about one third of students, allows academic universities access. Baccalaureate schools, the prevailing form of general education, are selective and attended almost exclusively by students from the extended track. Finally, students not entering VET nor general education might follow interim programs, to improve their later opportunities. However, these programs, and more generally postponed transitions, often lead to lower-valued apprenticeships and labour market insertion at the bottom of the social ladder (Sacchi & Meyer, 2016). Overall, these three paths lead to starkly different education and work prospects: while VET allows a smooth transition into work, academic tracks give access to higher earning opportunities and lessen long term unemployment risk (Glauser & Becker, 2016; Zimmermann and Seiler, 2019).

For the method, we rely on the longitudinal exhaustive administrative LABB database (FSO, 2024) and sequence analysis to identify typical lower-to-upper-secondary-education pathways. We then compare three cohorts of students who finished compulsory school before and during the COVID-19 crisis in Switzerland, tracking their trajectories for two years. The first cohort acts as a reference as students transitioned before the pandemic. This medium-term perspective lets us examine not only the initial transition following compulsory education but also whether students' trajectories align with normative expectations of linear progression.

The article's contribution is threefold. First, it provides a trajectory-based analysis of the effects of the pandemic on post-compulsory education. Second, by adopting a fine-grained parametrisation of migration background, the article reveals educational disparities between foreign groups that are not visible in more aggregated

analyses. Third, it examines the effects of the COVID-19 on educational access of minority groups, which have received limited attention.

This work is structured as follows. Section 2 presents the theory mobilized and the current state of research on the subject. Section 3 outlines the data and method used in this article. Section 4 presents the results and section 5 discusses them. Section 6 concludes the work.

2 Theoretical Framework and Empirical Background

2.1 Education in Times of Crisis

The COVID-19 crisis has impacted the Swiss society as a whole. The first lockdown started with school and non-essential business closures in March 2020. GDP declined by 8% in the first half of 2020 compared with the last quarter before the crisis, but not all sectors were equally affected (Conseil fédéral, 2024). Some economic sectors (i.e., tourism, accommodation, and catering) were particularly impacted by the lockdown measures (Conseil fédéral, 2024). Education was affected by school closures, and some examination procedures were altered (Conseil fédéral, 2024), which could have facilitated the transition into educational pathways with examination requirements.

H1: Students who entered high-requirement educational paths during the pandemic were more likely to follow linear trajectories.

Moreover, because of the high propensity of firm-based VET in Switzerland and its link to the economy, the COVID-19 crisis might have specifically impacted the apprenticeship market. Indeed, VET admission is a hiring process, thus directly linking these positions to firms' economic situations.

H2a: Economic uncertainty lowered students' likelihood to go into VET during the pandemic.

H2b: Alternative paths were more likely during the COVID-19 crisis.

Young people's insertion into the labour market was negatively affected by previous economic downturns in several countries (Buchmann, 2017; Muehlemann et al., 2020; Schoon and Bynner, 2019). In Switzerland, fewer apprenticeship positions were available during economic shocks, such as the 2008 recession (Lüthi & Wolter, 2020). To anticipate the issue, the Swiss Confederation created a programme specifically designed to encourage and facilitate apprenticeships (Conseil fédéral, 2020), which might have counterbalanced some of the negative impacts of the pandemic on the VET market.

H2c: State intervention may have mitigated the expected decline in apprenticeship opportunities.

Currently, diverging estimations of the effect of the COVID-19 crisis on educational trajectories exist. Early reports found a decrease in apprenticeship

numbers in Germany (Dummert & Umkehrer, 2023), while Swiss-based analyses indicate a smaller decline than during the 2008 crisis or no change at all, with interim solutions emerging as likely alternatives (Goller & Wolter, 2021; Muehlemann et al., 2020).

2.2 Migration Background and Education

Migration background has a proven impact on educational outcomes. In Switzerland, some groups of foreign students were found to have less linear educational trajectories (Lagana et al., 2014; Meyer, 2009) and often face a more complex school-to-work transition (Gomensoro & Bolzman, 2019). After compulsory school, young migrants have a higher chance of entering non-certifying training, such as internships or interim programmes, especially if they arrived at a later age (Gomensoro & Bolzman, 2016). Non-nationals also have a lower upper secondary completion rate and diploma attainment (Gomensoro & Bolzman, 2019; Lagana et al., 2014). These differences can be explained through three mechanisms.

Educational inequalities between students with a migration background and natives can first be understood through Boudon's (1973) distinction between primary and secondary effects. Primary effects reflect achievement discrepancies between students of different SES. Given the strong link between migration background and SES in Switzerland (Gomensoro & Bolzman, 2019; Meyer, 2009), part of the observed differences in educational pathways may reflect performance gaps. Secondary effects capture discrepancies in path decisions at comparable achievement level. Amongst students with a migration background, secondary effects are often characterized by comparatively high educational aspirations (Gomensoro et al., 2025). This variation might reflect an *ethnic choice* motivated by optimism but also anticipated discrimination in the VET market (Kao & Tienda, 1995; Gomensoro & Bolzman, 2016; Tjaden & Scharenberg, 2017). At the same time, limited knowledge of the Swiss schooling system may constrain informed decision-making at key transition stages. This should especially affect migrants from countries with starkly different education systems or those who recently arrived and were thus less exposed to the Swiss system. Foreign and migrant students may thus favour academic paths over apprenticeships, while facing a higher risk of non-linear trajectories due to reorientations or unsuccessful transitions.

H3a: Foreign and migrant students are more likely to go into general education than VET and face higher risks of non-linear pathways than natives.

However, this effect should vary by nationality, reflecting SES discrepancies and distinct levels of familiarity with the Swiss education system. Foreign students are overall less likely to follow a VET path, but while students from neighbouring countries show entry rates similar to Swiss students, those from the Balkans, Turkey, Spain, and Portugal are significantly less likely to start apprenticeships (Tjaden & Scharenberg, 2017).

H3b: Students from countries with different school systems face higher risks of unsuccessful transitions.

Second, employer discrimination in firm-based VET may reduce opportunities for certain nationality groups. Migrant students have been found, at equal ability levels, to have a harder time integrating the apprenticeship market (Meyer, 2009), especially those coming from non-European countries (Imdorf, 2017). According to Imdorf (2017), discrimination is based on students' perceived capacity for integration within the company, opposing "foreign youth" to "Swiss or the like". This highlights further distinctions between nationalities, such as perceived cultural resemblance.

H4: Students with nationalities perceived as more foreign are less likely to integrate a VET pathway after mandatory school.

Finally, residence permit stability might affect educational prospects, acting as an institutional constraint. There are indeed large discrepancies in residence permits. C settlement permits are permanent, and B residence permits for Schengen nationals are renewable every five years, allowing long-term prospects for their holders. However, N permits for asylum seekers and F permits for provisionally admitted foreigners (usually awaiting refugee status) are less stable, although, against its officially temporary character, many F-permit holders are permanent residents (ODAE, 2015). This instability may hinder high educational aspirations. Furthermore, different permits yield different work and thus VET opportunities. Those with C or B permits essentially have the same access to VET as Swiss nationals (orientation.ch, 2024). However, less stable permits require further administrative steps, and F-permit holders generally have comparatively lower employment rates overall (ODAE, 2015). Nonetheless, to the best of our knowledge, no previous scientific research has addressed the potential impact of the residence permit on the transition following compulsory education in Switzerland.

H5: Students holding less stable residence permits face higher risks of unsuccessful transitions and reduced access to VET pathways.

Additionally, global crises may disproportionally impact vulnerable students. School closures and learning disruptions during the COVID-19 crisis, particularly impacted low-achieving students (Jakubowski et al., 2024). An increased risk of unsuccessful transitions is thus expected amongst foreign students, due to their overall lower school performances (Meunier, 2011). At the same time, a reduction in VET availability related to the crisis would have increased competition amongst students, leaving more room for discrimination mechanisms (Auer, 2022). However, temporarily lowered school requirements as well as state interventions supporting apprenticeships may have mitigated these negative effects.

H6a: VET entry of foreign and migrant students might have decreased during the COVID-19 crisis.

H6b: This effect might have been attenuated by reduced examination requirements and stately intervention encouraging VET programs.

By making nuanced distinctions between migration backgrounds according to the nationality, residence permit, and age at arrival, this article provides a detailed analysis of their effects on educational pathways. Moreover, by including a cohort comparison, we further explore the interaction between nationality and the COVID-19 crisis on educational trajectories.

3 Data and Methods

We use the exhaustive administrative data from the 'Longitudinal analyses in the education sector' (LABB) produced by the Federal Statistical Office (FSO, 2024). Using data from 2017 to 2022, we study the trajectories from the end of compulsory schooling into upper secondary education of three cohorts who finished mandatory school in 2017, 2019, and 2020 respectively. Our final sample includes 235 909 individuals allowing us to compare a pre-COVID-19 cohort (2017) with two cohorts who were affected by the crisis during their first year of upper secondary education (2019) and just before their transition (2020).

Three variables were constructed to account for migration background: nationality, age at arrival, and residence permits. Nationality was divided into nine categories: Switzerland, Spain/Italy, Portugal, Former Yugoslavia (which includes Bosnia and Herzegovina, Croatia, Macedonia, Montenegro, Serbia and Slovenia), Other European countries (which includes countries such as Germany and France), Turkey / Sri Lanka, Africa, America, and Asia/Oceania. These categories were chosen based on a consensus of similar characteristics regarding the parental educational level, measured on a representative subsample, and the students' school trajectories[1].

Age at arrival was divided into five groups: Born in Switzerland, arrived at ages 0–4, 5–12, 13+, and no information. These cut-offs reflect key institutional stages of the Swiss education system, distinguishing between individuals who arrived before the start of school, during primary or lower-secondary education.

Seven residence permits are distinguished: Swiss nationals (CH), establishment permits C (C), residence permits for Schengen nationals B and L (Bs/L), residence permits for non-Schengen nationals B (B), temporary/asylum-seeker permits and non-allocated permits (F/N/NA), and international civil servant permits (INT). The stability of permits varies significantly, ranging from those offering permanent residency (C) to permits which rely heavily on maintaining employment (Bs/L, B and INT), or those linked to external factors such as conflicts in the country of origin (F/N).

1 Nationality profiles were grouped according to their SES closeness (measured through parental educational level, available for 10% of the sample) as well as through a conditional inference tree (estimated using nationality and the final educational trajectory typology).

We included linguistic regions (German, French, and Italian speaking), lower-secondary tracks (extensive requirements, basic requirements, without distinction and other), sex, and age as control variables.

We used sequence analysis (SA) to create a typology of educational trajectories, and regression analysis to measure the association between covariates and typology membership. SA allows the analysis of both linear and disrupted post-compulsory trajectories by capturing complex patterns such as repetitions, dropouts, and track changes.

First, individual sequences were constructed with a yearly granularity over two years and aligned at the end of compulsory education. The sequence states are the three upper secondary statuses combined with the year of education to capture year repetitions. The first two, VET and general education, account for the main certifying option in the Swiss system, and distinguished according to grade level, create four states *VET, 1st year*, *VET, 2–4th year*, *General education, 1st year*, and *General education, 2–4th year*. *Other education* is a catch-all group for the rare other options giving access to a certificate. We also distinguish between *Interim solution* and *Not in education or training (NET)*, which groups all situations outside of the school system.

Second, the sequences were clustered into groups to create a typology of trajectories. We employed the method proposed by Studer et al. (2024) for large databases SA. *Optimal Matching* (OM) was chosen as a dissimilarity measure, which is a prevalent choice in SA (Liao et al. 2022). The sample size of our data was chosen at 1000 sequences and the number of iterations of the process at 500. The optimal typology was selected based on the cluster quality indices proposed by Studer et al. (2024).

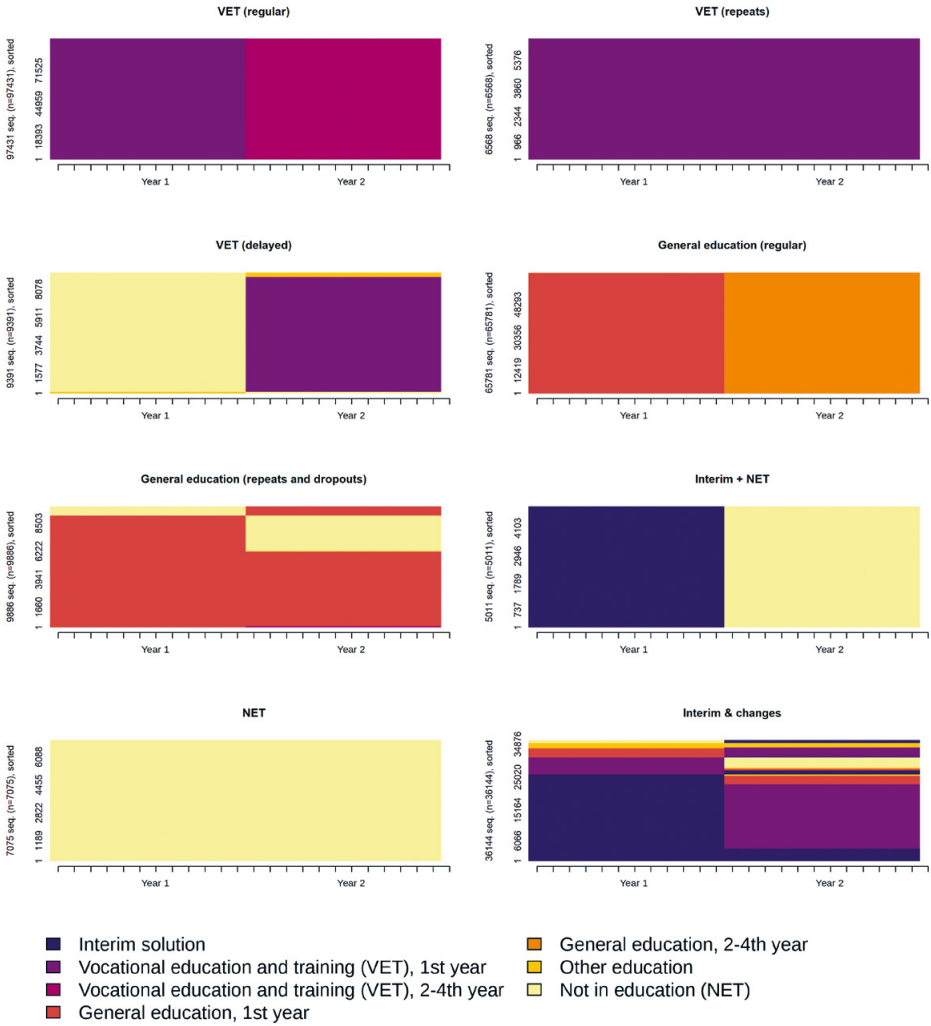
To measure the discrepancies in educational trajectories and answer our three research questions, several regressions were estimated. First, we estimated multinomial regressions, gradually adding all the variables of interest to test the effect of the COVID-19 crisis as well as migration background. The results are presented as Average Marginal Effects (AME) to improve readability. Second, an additional multinomial regression was estimated including interaction effects between nationality and cohort to measure the potential intersectionality between these variables.

4 Results

4.1 Typology

A solution in eight groups was chosen based on a consensus of quality measures and for its explanatory capacities. Figure 1 presents our typology using an *index plot*. Our clusters are very homogeneous, which is expected for educational trajectories, as they generally hold strong clustering structures.

Figure 1 Typology of Educational Trajectories



The first cluster, *VET (regular)*, groups students who go into VET after compulsory school and follow a linear trajectory. With over 40% of trajectories, it is the most common pathway.

The second cluster, *VET (repeats)*, aggregates the trajectories of students who started an apprenticeship after compulsory education. It differs from the first cluster in its lack of linearity, grouping apprentices who had to repeat their first year or restart another VET.

The third cluster, *VET (delayed)*, groups trajectories with a delayed entry into vocational education. The delay could be explained by difficulties in finding an apprenticeship position for instance.

The fourth cluster, *General education (regular)*, is the second largest cluster with just under 30% of pathways. It contains trajectories of direct entry into general school. It is one of the most desirable paths, because of its linearity and because it facilitates access to universities.

The fifth cluster, *General education (repeats and dropouts)*, groups trajectories of students who went into general education, but with lesser success than in the previous cluster. It is mainly characterized by paths with dropouts, year repetitions, or reorientations.

The sixth cluster, *Interim + NET*, contains trajectories of students who started their transition with an interim solution but failed to enter any kind of certifying path afterwards. This group is one of the least desirable, as certification is crucial to access job stability.

The seventh cluster, *NET*, groups students who did not enter any certifying path within the first two years of post-compulsory school. While this might code working situation, the lack of upper secondary school certificate is deemed problematic.

The last group, *Interim & changes*, is relatively large with 15% of the total population. It is the most heterogeneous cluster. Overall, this group is characterized by less favourable transitions into upper secondary education, with delayed or disrupted transition into secondary education.

We find that linear types, *VET (regular)* and *General education (regular)* amount to almost 70% of the sequences. However, a substantial percentage of students have difficulties transitioning after compulsory school with a little over 30% of non-linear trajectories.

4.2 Regressions

Table 1 presents the results of the first regression analysis using *Average Marginal Effects* (AME) that can be interpreted as the coefficients percentage points (PP). We first examine whether the COVID-19 crisis altered lower- to upper-secondary transitions by comparing trajectory patterns across cohorts. Overall, we found an increase in linear trajectories amongst the COVID cohorts. Indeed, fewer students delayed their entry into VET in 2019 (–0.4 PP) and in 2020 (–0.4 PP). The 2019 and the 2020 cohorts were also more likely to attend general education (regular) than the 2017 one (by respectively 2.5 PP and 1.7 PP). We observe opposite results for general education trajectories with repeats or dropouts in 2019. Moreover, we find a small drop in students leaving the school circuit (NET) for the 2020 cohort (–0.2 PP).

We then assess immigration-related inequalities in the transition to upper-secondary education, showing that trajectories differ markedly depending on

Table 1 Multinomial Regression Measuring Trajectory Type Membership (Including Nationalities) Results as AME (With 2017, Swiss, Born in Switzerland, German, Extensive, Male as Reference Variables)

	VET (repeats)	VET (delayed)	General education (regular)	General education (repeats and dropouts)	Interim + NET	NET	Interim & changes
2019 cohort	−0.004***	−0.004***	0.025***	−0.012***	−0.004***	−0.001	−0.000
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
2020 cohort	−0.001	−0.004***	0.017***	−0.002*	−0.002***	−0.002***	0.001
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Nationality: Spain/Italy	−0.002	−0.006***	−0.045***	−0.002	0.012***	0.004**	0.046***
	(0.002)	(0.002)	(0.005)	(0.002)	(0.002)	(0.002)	(0.004)
Nationality: Portugal	−0.005***	−0.0004	−0.082***	−0.011***	0.014***	0.009***	0.055***
	(0.002)	(0.002)	(0.005)	(0.002)	(0.002)	(0.002)	(0.004)
Nationality: Ex. Yugoslavia	0.002	0.001	−0.145***	−0.019***	0.008***	−0.000	0.070***
	(0.002)	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)	(0.004)
Nationality: Other European	−0.011***	−0.004*	0.067***	0.017***	0.006***	0.023***	0.015***
	(0.002)	(0.002)	(0.004)	(0.002)	(0.002)	(0.002)	(0.004)
Nationality: Turkey/Sri-Lanka	−0.007***	−0.005	−0.053***	0.019***	0.025***	0.006**	0.102***
	(0.003)	(0.003)	(0.009)	(0.006)	(0.003)	(0.003)	(0.007)
Nationality: Africa	−0.004	−0.002	−0.071***	0.002	0.022***	0.001	0.097***
	(0.003)	(0.004)	(0.009)	(0.004)	(0.003)	(0.002)	(0.008)
Nationality: America	−0.013***	−0.022***	0.013	0.026***	0.002	0.019***	0.025***
	(0.003)	(0.003)	(0.011)	(0.006)	(0.003)	(0.003)	(0.008)

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Continuation of Table 1.

	VET (repeats)	VET (delayed)	General education (regular)	General education (repeats and dropouts)	Interim + NET	NET	Interim & changes
Nationality: Asia/Oceania	−0.006**	−0.016***	−0.003	0.010**	0.015***	0.001	0.077***
	(0.003)	(0.003)	(0.009)	(0.004)	(0.003)	(0.002)	(0.007)
Arrival age: 0–4	0.006***	0.004	0.059***	0.009***	0.003*	0.012***	0.012***
	(0.002)	(0.002)	(0.005)	(0.002)	(0.001)	(0.002)	(0.004)
Arrival age: 5–12	0.005***	−0.002	0.054***	0.010***	0.005***	0.023***	0.014***
	(0.002)	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)	(0.003)
Arrival age: 13+	−0.000	−0.011***	0.077***	0.020***	0.015***	0.034***	0.053***
	(0.002)	(0.002)	(0.006)	(0.003)	(0.002)	(0.003)	(0.005)
Arrival age: No info.	−0.008**	0.007	0.061***	0.024***	0.014***	0.039***	0.009
	(0.003)	(0.005)	(0.010)	(0.006)	(0.004)	(0.006)	(0.009)
Region: French	0.013***	−0.017***	0.121***	0.056***	0.010***	0.010***	0.055***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Region: Italian	0.048***	−0.026***	0.083***	0.057***	−0.002	0.012***	0.043***
	(0.003)	(0.002)	(0.004)	(0.003)	(0.001)	(0.002)	(0.004)
Sec.I track: Basic	0.034***	0.039***	−0.364***	−0.047***	0.040***	0.029***	0.172***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
Sec.I track: No distinction	0.016***	0.038***	−0.207***	−0.005**	0.020***	0.034***	0.074***
	(0.002)	(0.003)	(0.004)	(0.003)	(0.002)	(0.003)	(0.005)
Sec.I track: Other	0.001	0.058***	−0.146***	−0.023***	0.033***	0.127***	0.157***
	(0.002)	(0.004)	(0.006)	(0.002)	(0.002)	(0.004)	(0.006)

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Continuation of Table 1.

	VET (repeats)	VET (delayed)	General education (regular)	General education (repeats and dropouts)	Interim + NET	NET	Interim & changes
Sex: Women	−0.016***	0.036***	0.095***	0.010***	0.007***	0.012***	0.006***
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Age	−0.000	0.013***	−0.054***	−0.003***	0.004***	0.011***	0.016***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)

Note: AIC: 625 213 BIC: 626 810.2. *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$.

nationality, residence permit, and arrival age. We find that students with nationalities from Spain and Italy (–4.5 PP), Portugal (–8.2 PP), Former Yugoslavia (–14.5 PP), Turkey and Sri Lanka (–5.3 PP), and Africa (–7.1 PP) are significantly less likely to enter the General education (regular) path than the Swiss. Some nationalities from the Other European group are, however, more likely to enter it (6.7 PP). Migrants are associated with a higher probability of entering General education (regular), especially those who arrived after the age of 13 (7.7 PP).

To a smaller effect, the likelihood of belonging to the General education (repeats and dropouts) cluster shows similar patterns by nationality and arrival age as the General education (regular) cluster.

Interim followed by NET is one of the less enviable clusters, as it doesn't lead to any type of certificate. We note that the added probability of being in this cluster is positive for all nationalities except America. The same applies for most arrival-age groups.

The probability of belonging to the NET cluster is higher amongst Other Europeans (2.3 PP) and Americans (1.9 PP). Those who arrived in Switzerland later are also more likely to belong to this cluster, and the link is strongest for students who moved to Switzerland relatively late.

All foreign nationalities are positively associated with the Interim and changes cluster, but there are variations of effect intensities according to groups. Indeed, students from Turkey and Sri Lanka or Africa are about 10 PP more likely than the Swiss to follow this trajectory, while the effect is much smaller for Other Europeans (1.5 PP) and Americans (2.5 PP). Migrants are also positively associated with this cluster.

Our second regression replaces nationalities with permits[2] (Table 2). Similar to the first regression, coefficients are shown as percentage points. Compared to the previous regression, results are similar for the cohort effects, as well as for the control variables[3].

We observe strong discrepancies according to residency permit type. Children of international civil servants are less likely to be in either the VET repeats (–2.8 PP) or delayed (–4.2 PP) cluster. The same is true for holders of C permits, and those holding Bs/L permits, but to a smaller degree.

Access to the General education (regular) path also varies according to permit type. All permit types, except the one held by children of international states employees, who are considerably more likely to enter this path (30 PP), report a lower likelihood of access compared to Swiss nationals. This effect is particularly strong amongst students with unstable F and N permits, as well as those without legal residency status (–11.7 PP).

As for General education (repeats and dropouts), we find that children of international public servants are more likely to belong to this cluster than the Swiss

2 Nationality and permits were modelled separately due to their high collinearity.
3 The table does not include control variables for readability purposes.

Table 2 Multinomial Regression Measuring Trajectory Type Membership (With Permits), Results as AME (With 2017, Swiss, Born in Switzerland, German, Extensive, Male as Reference Variables)

	VET (repeats)	VET (delayed)	General education (regular)	General education (repeats and dropouts)	Interim + NET	NET	Interim & changes
Cohort: 2019	−0.004***	−0.003***	0.025***	−0.014***	−0.006***	−0.001	−0.001
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Cohort: 2020	−0.002**	−0.005***	0.017***	−0.003***	−0.003***	−0.002**	0.0003
	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)
Permit: Int.	−0.028***	−0.042***	0.300***	0.072***	0.013	0.127***	−0.069***
	(0.004)	(0.001)	(0.014)	(0.012)	(0.011)	(0.016)	(0.016)
Permit: C	−0.003***	−0.005***	−0.035***	−0.001	0.011***	0.005***	0.045***
	(0.001)	(0.001)	(0.003)	(0.001)	(0.001)	(0.001)	(0.002)
Permit: Bs/L	−0.006***	−0.003	−0.039***	0.002	0.021***	0.016***	0.032***
	(0.002)	(0.003)	(0.006)	(0.003)	(0.003)	(0.002)	(0.005)
Permit: B	−0.001	−0.003	−0.018**	0.009***	0.018***	0.002	0.061***
	(0.003)	(0.003)	(0.007)	(0.003)	(0.002)	(0.002)	(0.006)
Permit:F/N/NA	−0.004	−0.003	−0.117***	−0.011**	0.044***	−0.002	0.177***
	(0.004)	(0.005)	(0.012)	(0.005)	(0.005)	(0.002)	(0.011)
Arrival age: 0–4	−0.002	−0.002	0.082***	0.015***	−0.001	0.017***	0.012***
	(0.002)	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)	(0.004)
Arrival age: 5–12	−0.002	−0.004**	0.078***	0.016***	0.0001	0.025***	0.012***
	(0.001)	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)	(0.003)

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Continuation of Table 2.

	VET (repeats)	VET (delayed)	General education (regular)	General education (repeats and dropouts)	Interim + NET	NET	Interim & changes
Arrival age: 13+	−0.003	−0.015***	0.090***	0.020***	0.004**	0.037***	0.054***
	(0.003)	(0.002)	(0.007)	(0.004)	(0.002)	(0.003)	(0.006)
Arrival age: No info.	−0.011***	−0.012***	0.064***	0.036***	0.009**	0.036***	0.002
	(0.003)	(0.004)	(0.010)	(0.006)	(0.004)	(0.006)	(0.008)

Note: AIC: 626 976.7 BIC: 628 356.1. *$p<0.1$; **$p<0.05$; ***$p<0.01$.
This table does not include region, secondary I track, sex and age for readability purposes.

Table 3 Multinomial Regression With Interaction Effects Between Cohorts and Nationalities (With 2017, Swiss, Born in Switzerland, German, Extensive and Male as Reference Variables)

	VET (repeats)	VET (delayed)	General education (regular)	General education (repeats and dropouts)	Interim + NET	NET	Interim & changes
Cohort: 2019	−0.196***	−0.075*	0.136***	−0.262***	−0.211***	0.145***	−0.017
	(0.035)	(0.030)	(0.015)	(0.031)	(0.046)	(0.039)	(0.018)
Cohort: 2020	−0.033	−0.086**	0.130***	0.016	−0.073	0.030	0.019
	(0.034)	(0.030)	(0.015)	(0.029)	(0.045)	(0.041)	(0.018)
Nationality: Spain/Italy	−0.102	−0.089	−0.042	−0.231*	0.544***	0.373***	0.335***
	(0.114)	(0.109)	(0.064)	(0.114)	(0.104)	(0.099)	(0.056)
Nationality: Portugal	−0.148	0.069	−0.603***	−0.427***	0.486***	0.407***	0.321***
	(0.103)	(0.095)	(0.068)	(0.102)	(0.091)	(0.086)	(0.051)
Nationality: Ex. Yugoslavia.	−0.095	−0.147	−1.361***	−0.484***	0.281**	0.370***	0.261***
	(0.097)	(0.079)	(0.089)	(0.128)	(0.092)	(0.085)	(0.045)
Nationality: Other European	−0.069	0.465***	0.888***	1.039***	0.617***	1.152***	0.445***
	(0.135)	(0.096)	(0.052)	(0.077)	(0.111)	(0.081)	(0.059)
Nationality: Turkey/Sri-Lanka	−0.339	0.233	−0.024	0.106	1.466***	0.470**	1.141***
	(0.244)	(0.143)	(0.112)	(0.220)	(0.124)	(0.169)	(0.075)
Nationality: Africa	0.334	0.724***	−0.265	0.950***	1.125***	0.352*	1.040***
	(0.198)	(0.153)	(0.149)	(0.160)	(0.145)	(0.156)	(0.096)
Nationality: America	−0.027	0.342	0.292*	0.918***	1.145***	1.250***	0.537***
	(0.273)	(0.211)	(0.138)	(0.171)	(0.171)	(0.146)	(0.126)

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Continuation of Table 3.

	VET (repeats)	VET (delayed)	General education (regular)	General education (repeats and dropouts)	Interim + NET	NET	Interim & changes
Nationality: Asia/Oceania	0.164	0.767***	0.845***	0.992***	1.018***	1.094***	1.110***
	(0.237)	(0.160)	(0.115)	(0.167)	(0.157)	(0.132)	(0.099)
Arrival age: 0–4	0.358***	0.163**	0.596***	0.576***	0.309***	0.628***	0.400***
	(0.065)	(0.062)	(0.032)	(0.054)	(0.072)	(0.058)	(0.034)
Arrival age: 5–12	0.272***	0.164***	0.535***	0.572***	0.479***	0.794***	0.367***
	(0.054)	(0.049)	(0.027)	(0.045)	(0.052)	(0.045)	(0.027)
Arrival age: 13+	0.385***	0.200*	0.872***	1.049***	1.172***	1.389***	0.849***
	(0.089)	(0.079)	(0.047)	(0.071)	(0.066)	(0.058)	(0.041)
Arrival age: No info.	0.542***	0.675***	0.884***	1.036***	0.153	1.316***	0.428***
	(0.141)	(0.120)	(0.070)	(0.108)	(0.204)	(0.113)	(0.082)
2019xSp/It	0.298	0.003	−0.188*	0.417**	−0.106	−0.143	0.038
	(0.156)	(0.157)	(0.090)	(0.154)	(0.155)	(0.138)	(0.079)
2020xSp/It	0.071	0.255	−0.185*	0.143	−0.057	−0.124	0.043
	(0.157)	(0.147)	(0.089)	(0.152)	(0.147)	(0.142)	(0.078)
2019xPt	0.104	−0.065	0.064	−0.043	−0.108	0.013	−0.004
	(0.146)	(0.135)	(0.094)	(0.155)	(0.134)	(0.115)	(0.071)
2020xPt	0.253	0.197	0.021	−0.019	−0.022	0.143	−0.037
	(0.139)	(0.131)	(0.095)	(0.148)	(0.131)	(0.120)	(0.073)
2019xForY	0.175	−0.170	0.182	−0.478*	0.219	−0.742***	0.018
	(0.140)	(0.119)	(0.120)	(0.223)	(0.132)	(0.141)	(0.064)

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Continuation of Table 3.

	VET (repeats)	VET (delayed)	General education (regular)	General education (repeats and dropouts)	Interim + NET	NET	Interim & changes
2020xForY	0.116	−0.041	0.123	−0.588**	−0.196	−0.647***	−0.028
	(0.138)	(0.117)	(0.121)	(0.212)	(0.142)	(0.147)	(0.065)
2019xOE	0.281	−0.463**	−0.263***	−0.195	−0.319	−0.070	0.012
	(0.175)	(0.141)	(0.068)	(0.106)	(0.164)	(0.103)	(0.078)
2020xOE	0.145	−0.221	−0.351***	−0.415***	0.255	0.029	−0.040
	(0.173)	(0.134)	(0.067)	(0.103)	(0.143)	(0.106)	(0.078)
2019xTu/SL	0.419	−0.011	0.080	0.072	−0.483*	−0.079	−0.408***
	(0.322)	(0.205)	(0.156)	(0.329)	(0.200)	(0.237)	(0.111)
2020xTu/SL	0.785**	−0.012	−0.214	0.410	−0.632**	−0.196	−0.339**
	(0.297)	(0.207)	(0.163)	(0.287)	(0.202)	(0.255)	(0.110)
2019xAf	0.062	−0.639**	0.221	−0.373	0.227	−0.248	−0.238
	(0.276)	(0.236)	(0.193)	(0.243)	(0.194)	(0.219)	(0.132)
2020xAf	−0.480	−0.845***	−0.074	−1.226***	−0.222	−0.380	−0.603***
	(0.275)	(0.231)	(0.191)	(0.257)	(0.194)	(0.224)	(0.128)
2019xAm	−0.199	−0.446	−0.101	−0.242	−1.440	−0.802	−0.063
	(0.404)	(0.330)	(0.194)	(0.257)	(0.347)***	(0.221)***	(0.175)
2020xAm	0.792*	−0.230	0.680**	0.441	−0.106	0.025	0.667***
	(0.377)	(0.399)	(0.215)	(0.265)	(0.300)	(0.249)	(0.195)
2019xA/O	0.313	−0.807***	−0.643***	−0.668**	0.105	−1.016***	−0.469***
	(0.289)	(0.236)	(0.151)	(0.245)	(0.201)	(0.192)	(0.129)

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Continuation of Table 3.

	VET (repeats)	VET (delayed)	General education (regular)	General education (repeats and dropouts)	Interim + NET	NET	Interim & changes
2020xA/O	−0.286	−0.900***	−0.607***	−0.591*	−0.017	−0.511**	−0.404**
	(0.316)	(0.240)	(0.153)	(0.232)	(0.203)	(0.184)	(0.129)
Constant	−4.088***	−6.617***	4.146***	−0.626*	−7.988***	−10.646***	−3.510***
	(0.302)	(0.256)	(0.144)	(0.267)	(0.316)	(0.261)	(0.151)

Note: AIC: 625 373.9 BIC: 628 132.7. *$p<0.05$; **$p<0.01$; ***$p<0.001$.
This table does not include region, secondary I track, sex and age for readability purposes.

(7.2 PP), while the opposite is true for holders of F and N permits and students without permits (–1.1 PP).

The heightened probability of belonging to trajectories dominated by NET is strongest amongst children of international civil servants (12.7 PP), while a small positive effect exists for students with C or Bs/L permits. Aside from children of international public servants, permits are positively associated with more problematic paths with interim spells. This is especially true for holders of a F/N/NA permit who are 17.7 PP more likely than the Swiss to belong to the Interim and changes cluster.

Finally, we examine whether the COVID-19 crisis disproportionately affected certain migration groups. Table 3 presents the results of this interaction model. While we cannot directly compare coefficients with the previous regressions, most of their signs remain stable[4].

We observe a significant interaction effect between some nationalities and the different cohorts. African and Asian/Oceanian students were less likely to delay their entry into VET during the COVID-19 crisis. Smaller attendance in general education for students from Other Europe and from Asia/Oceania. Fewer delayed entries into General education were reported amongst both American and African students. We found that students from Former Yugoslavia, America, and Asia/Oceania were less likely to drop out during the pandemic. The link between cluster *Interim & changes* and nationality is weakened for the 2019 cohort for students from Turkey / Sri Lanka and from Asia/Oceania. For the 2020 cohort, students from Africa and America experienced changes as well, with the former experiencing a drop in the likelihood of belonging in this cluster and the latter reinforcing its positive link with this group of trajectories.

Overall, our regressions show noticeable effects of all our main explanatory variables. The interaction between the nationality and the COVID-19 crisis yields significant results as well.

5 Discussion

The study first aims to highlight how the transition from lower to upper secondary school was affected by the COVID-19 crisis in Switzerland. Our results show that cohorts affected by the pandemic were more likely to follow linear trajectories and go into general education. While this could partially confirm the general increased interest in this path (Gomensoro & Meyer, 2021), the reduced incidence of repeats and dropouts suggests that progression in this track was facilitated during the first lockdown, thereby supporting *H1*. Lower requirements or exam cancellations might have contributed to this *COVID-19 effect*.

4 The table does not include control variables for readability purposes.

Contrary to our hypothesis (*H2a*), our results suggest that the number of VET contracts was, overall, not negatively impacted by the crisis, confirming early findings (Goller & Wolter, 2021). Similarly, no increase of interim solutions is observed during the COVID-19 crisis, which goes against our hypothesis (*H2b*) and previous studies' estimations (Muehlemann et al., 2020). The small drop of repeats and delays of VET trajectories could be explained by the lowering of expectations for successful passage into the second year, similar to the general education track. Additionally, we noticed a small drop in students leaving the institutional offers (NET) in the 2020 cohort.

Explanations for this stability include state intervention programs promoting VET (*H2c*), as well as the relatively low level of restrictions in Switzerland during the pandemic, travel difficulties and the economic interest of apprenticeship contracts for private firms. However, discrepancies in VET contracts could exist at the sectorial level, as sectors such as tourism or catering were particularly affected by the lockdowns, while the healthcare sector was in high demand (Conseil fédéral, 2024). The decrease in interim solutions and NET can overall be considered a positive result, as non-certifying paths are known to negatively affect professional outcomes (Sacchi & Meyer, 2016).

In line with previous research, our results confirm migration-related inequalities in education (Gomensoro & Bolzman, 2016; Lagana et al., 2014; Tjaden & Scharenberg, 2017). Supporting *H3a*, migrant students have a higher probability of attending general schools, especially when they arrived late, which could be ascribed to higher aspiration levels in this group (Gomensoro & Bolzman, 2019; Tjaden & Scharenberg, 2017). However, our results also confirm previous research, in finding them more likely to follow paths dominated by interim or dropouts (Gomensoro & Meyer, 2021; Lagana et al., 2014). These findings highlight the heterogeneity of first-generation immigrants. In recent years, migration to Switzerland has been dominated by families with higher levels of education, making immigrants a very diverse group (NCCR, 2021), with varying aspiration levels and familiarities with the Swiss school system. This could explain the propensity for migrants to follow both promising and problematic pathways, and the stronger effect found for newly arrived immigrants.

Similarly, nationality is found to be an important determinant of educational pathways, thereby confirming *H3a* and previous studies' findings (Gomensoro & Bolzman, 2019; Tjaden & Scharenberg, 2017). However, these patterns vary markedly by nationality, supporting *H3b* and *H4*. Students from Spain/Italy, Portugal, Former Yugoslavia, Turkey / Sri Lanka, and Africa are less likely to access general education but more likely to follow non-linear pathways than the Swiss, while the trajectories of students from Other Europe, a category which includes countries such as Germany and France, and from America or Asia/Oceania are closer to the Swiss'. This second group of foreigners is also characterized by high entry levels into general education.

However, we do observe that the nationalities most likely to pursue general education are also those with the highest failure rate.

On the one hand, discrepancies between foreigners and Swiss nationals may stem from unfamiliarity with the complex Swiss education system and, more generally, aspiration variations. On the other hand, disparities between foreign nationalities can be ascribed to differences in the distance between their school systems of origin and the Swiss system, as well as to variations in their SES and exposure to discrimination. Previous research has found discrepancies in the level of education of migrants according to the country of origin (Meyer, 2009; NCCR, 2021). We measured the link between nationality and household's highest level of education on a representative subsample, which confirms a strong link between the two[5]. We expect these SES differences to mainly affect the likelihood to go into general education, with VET acting as diversion of lower classes, or certain foreign groups into paths with fewer opportunities (Combet & Oesch, 2020). The high prevalence of interim spells amongst the first group of foreign nationals may be explained by discriminatory practices in the VET market, leading to difficulties in securing contracts (Imdorf, 2017). Overall, we observe a division between what can be described as more privileged nationalities and those facing significantly poorer odds.

We also find a significant effect of residence permit holders on education trajectories. In line with *H5*, students holding foreign permits, save for children of international public servants, face higher risks of non-linear transitions than the Swiss. Moreover, the more unstable permits such as F/N/NA show some of the strongest links with less enviable options, such as interim spells, and their holders are exceedingly unlikely to access any type of general education. These discrepancies could be attributed to a lack of stability, which might hinder the student's capacity to plan their life trajectories, but also to discrimination that could obstruct their access to VET contracts. Conversely, children of international public servants fare better than all other types of permit holders and generally have a higher propensity than Swiss nationals to enter general education. This can be attributed to their high SES. Overall, students with unstable residency permits appear particularly vulnerable during transitions, which raises significant concerns.

Our results underline that inequalities by migration background persist in the transition to upper secondary education, even when accounting for lower-secondary tracks. Diplomas are required to build a stable life trajectory, and its differentiated access is thus strongly detrimental to individuals and society.

Turning to our third research question, we find no consistent evidence that the pandemic exacerbated migration-related inequalities, thus contradicting our hypothesis (*H6a*). Our findings show that delays in VET entry as well as dropout numbers were reduced during the pandemic for some nationalities. This could be due to state-led interventions stabilizing the VET market, as well as a lack of opportunities

5 Cramer's V equals 0.203.

outside of institutions during the pandemic. Students usually more likely to delay starting an apprenticeship may thus have been pushed more into VET programs. One unanticipated result was that the latest cohorts from America and Asia/Oceania were less likely to go into general education. While this is surprising considering their propensity towards this trajectory, it could be explained by a ceiling effect as these groups were already overrepresented in this pathway before the pandemic.

Overall, we do not find evidence that the COVID-19 crisis disproportionately worsened school accessibility for certain nationalities. While variations amongst nationalities appeared during the pandemic, these changes were generally positive and aligned with global trends.

6 Conclusion

In this article, we studied the impact of the COVID-19 crisis and migration background on educational trajectories, both independently and jointly. Using a medium-term perspective, we analysed the students' path in the two years following the end of compulsory school. Combining sequence and regression analysis, we produced comprehensive research on the critical transition from lower to upper secondary education in Switzerland.

The cohorts affected by the COVID-19 crisis bear importance as they inform us on the repercussions of crises and the impact of measures implemented to ease them. We observe that students' passage into their second year of upper secondary education was facilitated, a phenomenon not yet documented. Future research could follow these cohorts to investigate whether a catching-up effect arises later on, for example, with higher failure rates in subsequent years. A lack of compensation would highlight the difficulty of the current school selection process and put its legitimacy into question.

Our findings show robust evidence of migration background effects. By moving beyond a binary measure of migration background, we add on to the existing literature and highlight the strong educational trajectory discrepancies between foreign nationalities. We also find that migrant students are more likely to attend any other pathway than the traditional VET one, and this distinction from Swiss-born students is strongest amongst those who migrated at a later age. Finally, we show that more vulnerable permits are associated with non-linear pathways, a difference that can negatively impact medium- and long-term prospects of those students.

As for interaction effects between nationalities and the COVID-19 crisis, our analysis does not yield conclusive evidence of a particularly negative impact on foreign students during their transition after compulsory schooling. While some changes do occur, they are predominantly positive or moderate an existing positive trend.

The interpretation of the results should consider three main limitations of this study. First, the restricted time window available for analysis, combined with our

focus on cohort comparability limits the observation period to two years. While SA is often applied to longer time spans, our framework already allows us to analyse pathways' linearity. Second, this emphasis on linearity restricts the possibility of a detailed investigation of within-VET discrepancies. Future research using the same data could focus on sector-specific variation during the COVID-19 crisis. Lastly, the limited availability of SES variables in our data set constitutes a constraint, as it prevents a full account of socioeconomic disparities.

Our findings have direct policy implications. First, the absence of VET entry decrease during the pandemic suggests that state intervention can effectively buffer recessions in this sector. Second, the strong disadvantages associated with unstable permits raise concerns regarding the school integration of foreign students. Policies aimed at reducing administrative barriers to VET and more broadly access to stable residency permits could substantially improve transition outcomes. Overall, migration-related inequalities remain a central issue in education in Switzerland, requiring additional measures to lessen them.

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