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**Opening Doors for Immigrants: The  
Importance of Occupational and  
Workplace-Based Cultural Skills for  
Successful Labor Market Entry**

Chiara Zisler, Samuel Lüthi, Damiano Pregaldini  
and Uschi Backes-Gellner



Universität Zürich  
IBW – Institut für Betriebswirtschaftslehre

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# Opening Doors for Immigrants: The Importance of Occupational and Workplace-Based Cultural Skills for Successful Labor Market Entry

Chiara Zisler<sup>ab</sup>, Samuel Lüthi<sup>c</sup>, Damiano Pregaldini<sup>d</sup>, Uschi Backes-Gellner<sup>e</sup>

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## Abstract

Young immigrants, who often lack country-specific human capital, face greater challenges in the transition from education to the labor market (e.g., lower employment probabilities, longer unemployment spells) than native adolescents. This paper analyzes the effect of workplace-based cultural skills—skills that can only be acquired at work—on a successful transition. We exploit a natural experiment in which students acquire occupational skills in one of two types of vocational education and training (VET): either dual programs with training in firms complemented by vocational schooling or purely school-based programs. While well-defined curricula ensure identical occupational skills in both programs, the training of workplace-based cultural skills differs systematically and is concentrated in dual programs. As young immigrants lack essential cultural skills, we expect that additional workplace-based cultural skills training in dual VET improves immigrants' transition into the labor market and thus their longer-term employment prospects. Using administrative data, we compare the way both programs affect the labor market entry of immigrant groups with pronounced cultural disadvantages. To estimate causal effects on employment outcomes, we exploit variation in travel times to vocational schools that offer school-based VET programs. Results show that completing dual VET, as opposed to school-based VET, leads to significantly reduced unemployment probabilities for young immigrants, suggesting that workplace-based cultural skills are crucial for young immigrants' transitions from education into the labor market.

**JEL Classification:** J24, J61, I25, I26, I21, M53

**Keywords:** Immigrants, Labor market integration, Education-to-work transition, Education programs, Cultural heterogeneity, Age at Arrival

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<sup>a</sup> Corresponding author.

<sup>b</sup> University of Zurich, Department of Business Administration. Email: [chiara.zisler@business.uzh.ch](mailto:chiara.zisler@business.uzh.ch)  
Address: Plattenstrasse 14, 8032, Zurich, Switzerland

<sup>c</sup> Swiss Coordination Centre for Research in Education (SCCRE); University of Bern. Email: [samuel.luethi@skbf-csre.ch](mailto:samuel.luethi@skbf-csre.ch)  
Address: Entfelderstrasse 61, 5000, Aarau, Switzerland

<sup>d</sup> University of Zurich, Department of Business Administration, Email: [damiano.pregaldini@business.uzh.ch](mailto:damiano.pregaldini@business.uzh.ch)  
Address: Plattenstrasse 14, 8032, Zurich, Switzerland

<sup>e</sup> University of Zurich, Department of Business Administration. Email: [backes-gellner@business.uzh.ch](mailto:backes-gellner@business.uzh.ch)  
Address: Plattenstrasse 14, 8032, Zurich, Switzerland

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## **1. Introduction**

Young adolescents' difficulties when entering the labor market lead to severe social and economic problems in many countries (Cahuc & Hervein, 2020; Paul, 2001; Riphahn & Zibrowius, 2016; von Wachter, 2020), with ethnic minorities and young immigrants in particular facing greater challenges (Heath et al., 2008). Young immigrants often face language barriers, find that host country institutions do not recognize the qualifications they acquired in their home country, or both (Lee et al., 2022). Moreover, lack of knowledge about prevalent working values or the functioning of their host country's labor market often prevents young immigrants from easily securing employment (Andersson Joona & Nekby, 2012; Reinke & Goller, 2022). Given that both actual and expected difficulties in labor market entries can impede skills development, human capital investments, and employment prospects over the entire life cycle, reducing the host country native-immigrant gap is crucial (Riphahn & Zibrowius, 2016). To prevent losing immigrants' great economic potential, educational institutions must provide them with the skills essential for successfully navigating the critical transition phase from education to work (Kogan, 2016).

Economic assimilation theory posits that the extent of immigrants' challenges in this transition phase depends on two immigrant-related factors. First, such challenges are likely to vary by the cultural and linguistic distance from the immigrant's country of origin to the host country (Blume & Verner, 2007; Raux, 2023; Stewart & Hyclak, 1984). Second, these challenges also include the immigrants' temporal distance, i.e., their length of stay in the host country (Borjas, 1995; Card & Peri, 2016; Chiswick & Miller, 2012). For immigrants, the actual degree of cultural distance when entering the labor market is closely tied to the temporal distance. The longer they live in the host country, the more time they have to accumulate host country-essential knowledge, thereby reducing country-specific human capital deficiencies

(Chiswick & Miller, 2012). Yet temporal distance also includes the age at which immigrants arrive. Entering during early childhood—particularly before age 5—means that immigrants acquire language and cultural skills during formative phases such as kindergarten, while later arrival often implies more persistent deficiencies (Bleakley & Chin, 2010). Overall, the greater both distances are, the greater the deficiencies in country-specific human capital, in turn exacerbating the challenges facing young immigrants during their education-to-work transition.<sup>1</sup>

In essence, economic assimilation theory suggests that the successful labor market entry of immigrants depends not only on *occupational skills* but also on *workplace-based cultural skills*. While occupational skills cover the technical knowledge and abilities required for performing a specific job or task, workplace-based cultural skills entail tacit and often unspoken norms, behaviors, and attitudes that contribute to successful integration and performance in a workplace environment. For example, for a bank clerk, “writing a loan contract” is an occupational skill, whereas effectively greeting and serving a client while adhering to country-specific workplace norms constitutes a workplace-based cultural skill. While several studies demonstrate the importance of language skills for immigrants’ labor market outcomes (e.g., Bleakley & Chin, 2010; Chiswick, 1991; Dustmann & Fabbri, 2003), empirical evidence on other skill types critical for young immigrants’ labor market integration remains scant.

In this paper, we use administrative data to examine the relative importance of occupational and workplace-based cultural skills for young immigrants’ (hereafter, “immigrants”) successful transition from the educational system to the labor market. Specifically, we estimate the effect of two different skill formation systems—providing either combined occupational

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<sup>1</sup> In our study we use the term “education-to-work transition” rather than “school-to-work transition (a phrase prevalent in the education economics literature, e.g., Cahuc et al., 2021; Ryan, 2001). By doing so, we emphasize that the transition to work encompasses not only students transitioning from a purely school-based education to work but also those transitioning from predominantly practical, workplace-based education programs.

and workplace-based cultural skills training or exclusively occupational skills training—on immigrants’ unemployment at the education-to-work transition. Categorizing immigrants by their cultural and temporal distance from Switzerland, we investigate immigrant groups that are likely to face different degrees of challenges. Our analysis allows us to draw a very nuanced picture of the skills critical for the labor market success of particularly vulnerable immigrant groups.

Switzerland offers an excellent setting for investigating both skill types for different immigrant groups. First, to shed light on the relative importance of workplace-based cultural skills compared to occupational skills, we can exploit the Swiss vocational education and training (VET) system. VET students in Switzerland acquire occupational skills in one of two types of vocational education programs: either *dual* VET programs—which combine both practical training in a training firm through an employment contract (about 80% of total training time) and education in a vocational school (about 20%)—or purely *school-based* VET programs, which provide solely academic education in vocational schools.

Given the comprehensive and legally binding national VET curricula in Switzerland, we can assume that for the same occupation (e.g., bank clerk), the acquired occupational skills are identical in both dual and school-based VET programs. We make this assumption because the identical and well-defined occupational skills in the curricula (e.g., “handling mortgages for family homes” or “trading securities”) ensure that students acquire the same occupational skills regardless of which VET education they choose. However, for workplace-based cultural skills, a marked difference exists between the two programs. Exposure to the actual working environment provided in dual VET programs allows students to automatically acquire the tacit, workplace-based skills (e.g., ways of greeting and serving customers) as part of their in-firm training. In contrast, students in purely school-based VET programs, which largely lack direct

workplace interaction, do not receive the same opportunities for developing the tacit workplace-based cultural skills that are inherently tied to the workplace.

Therefore, the training of workplace-based cultural skills differs systematically between dual and school-based VET programs. By analyzing the effect of both VET programs on immigrants' labor market transition, we can identify the importance of both skill types and determine whether workplace-based cultural skills add significant value to occupational skills and foster a successful education-to-work transition.

Second, Switzerland has an immigrant population that is both sizable and highly diverse compared to other OECD members (Meunier, 2011), thereby providing sufficient heterogeneity for our analysis. According to a 2022 Swiss Federal Statistical Office report, 40% of the "permanent resident" population are immigrants or of immigrant descent (FSO, 2023). Moreover, roughly 27% of the residents younger than 15 are foreign nationals (FSO, 2023). This large and diverse immigrant population generates variation in cultural distance (because immigrants come from countries that are either more or less culturally distant), thereby offering an ideal setting for studying education-to-work transitions among immigrants.

For our empirical analysis, we combine two administrative data sets from the Swiss Federal Statistical Office's LABB program ("Longitudinal analysis in education"). First, we exploit the data set containing longitudinal analyses resulting from linking and aligning various data sources from the Swiss education system and population and household statistics. Drawing on this rich data set, we can observe the educational participation of the entire Swiss population from primary through tertiary levels and track enrollment in dual or school-based VET programs at the individual level. Moreover, this data set allows us to extract information on all student's migration histories. Second, we use the LABB labor-related data set to observe individual graduation dates and the employment status in the transition phase from education

to work. We analyze eight full Swiss cohorts graduating from one or the other VET program between 2012 and 2019, including the graduating class of 2019.

To identify whether and, if so, how receiving additional workplace-based cultural skills training in dual VET relates to immigrants' successful labor market transition, we apply two econometric methods. First, to examine whether dual VET has differential effects for immigrants with varying cultural distances, we estimate ordinary least squares (OLS) regressions with interaction terms. In these regressions we control for an essential set of variables, e.g., language region, regional unemployment rate, cohort fixed effects, occupation-specific fixed effects, gender, and age—and thus for observed heterogeneity.

Second, to deal with unobserved factors that may affect immigrants' selection into one of the two types of VET programs and identify causal effects, we use an instrumental variable (IV) strategy. We use proximity to the nearest full-time school-based VET offering, as an exogenous determinant of VET program choice (dual vs. school-based). Following Card's (1999) pioneering use of geographical proximity as an instrumental variable, studies have frequently relied on distance to educational institutions to identify causal effects and confirmed that distance influences participation decisions (e.g., Frenette, 2006; Spiess & Wrohlich, 2010). While researchers often use travel distance as an instrument for tertiary institution choice, student mobility can limit the instrument's strength in that setting. In contrast, VET students typically remain with their parents, making geographic proximity a decisive factor in VET choice (Kuhn, 2022).

Therefore, we argue that geographic variation in access to school-based VET programs affects the likelihood of enrolling in such programs, and that longer travel times to school-based VET programs increase the probability of enrolling in dual VET, conditional on observed characteristics. In doing so, we follow studies that leverage geographic variation in educational

access as a source of exogenous variation in educational choices (Bentolila et al., 2023; Card, 1999; Lüthi, 2025; Matthewes & Ventura, 2022).

Our results show that dual VET, which trains the combination of occupational skills and workplace-based cultural skills, leads to better labor market transition, i.e., a reduced probability of unemployment for immigrants in the education-to-work transition after graduation. Specifically, we find that immigrants arriving from a developing country experience a reduction in unemployment probability of 8.1 percentage points (pp.) compared to Swiss natives and Swiss-socialized immigrant groups (who likely acquired workplace-based cultural skills through early socialization and parental labor-market exposure). This comparison allows us to shed light on the role of dual VET for immigrant groups facing greater temporal and cultural distance.

Furthermore, we examine heterogeneity more precisely along two dimensions: the development status of the country of origin and immigrants' age at arrival, a measure for exposure to the Swiss education system that complements distinctions by generation. For immigrants from developing countries who arrived at age 5 or younger, we find no significant difference from natives in OLS regressions, consistent with their early integration into Swiss schooling (point estimate: 4.5 pp). In contrast, for immigrants who arrived between ages 6 and 13, additional workplace-based cultural skills training is associated with an 8.1 pp lower unemployment probability, and for those arriving after age 13, with a 7.6 pp lower probability. These patterns align with theoretical predictions of cultural adaptation, with later arrivals benefiting more from workplace-based cultural training. Although limited subgroup sizes may reduce statistical power and prevent significance in the IV, the coefficients consistently point in the same direction.

This paper contributes to the literature on immigrants' economic assimilation by being among the first to analyze the role of different skill types in successful education-to-work

transitions among immigrants. Our study breaks new ground by effectively separating two types of skills that have traditionally been difficult for researchers to disentangle (i.e., occupational and workplace-based cultural skills). By leveraging Switzerland's distinctive VET system, we can clearly distinguish between occupational and workplace-based cultural skills and evaluate their respective contributions to immigrants' labor market transition. We demonstrate that, by receiving both workplace-based cultural skill training and occupational skill training, immigrants can increase their employment prospects at the education-to-work transition—a finding valuable for educational policy makers focused on integrating immigrants into the labor market.

The rest of the paper is structured as follows. Section 2 discusses the literature on immigrants' economic assimilation. Section 3 presents the data and explains the operationalization of the main variables. Section 4 describes the empirical strategy. Section 5 presents the results of both the analyses and the robustness checks. Section 6 concludes.

## **2. Theoretical Background and Related Literature**

To reveal the challenges that immigrants face in their education-to-work transitions, we draw on the literature on immigrants' economic assimilation. Alba and Nee (1997) describe the process of assimilation in general as a decrease in immigrant-native differentials. Upon arrival in the host country, immigrants differ from natives because they lack country-specific knowledge and skills (Borjas, 1985). For example, immigrants might not possess certain necessary educational credentials, be proficient in the host country's major language, or have implicit knowledge of the working environment (Heath et al., 2008). Moreover, they face difficulties in identifying critical information about the new labor market and obtaining access to social networks (Lee et al., 2022). Immigrants' economic assimilation thus reflects their

success in reducing their country-specific knowledge deficiencies (Strøm et al., 2018). When immigrants reduce these deficiencies, they tend to face fewer challenges in the transition from education to the labor market, thereby reducing unemployment probabilities.

The extent to which immigrants manage to reduce country-specific knowledge deficiencies depends on the skills they acquire. Although the research on economic assimilation is both extensive and insightful, the importance of diverse skill types for immigrants to effectively integrate into the new labor market remains underresearched. Standard economic assimilation models often show immigrants' labor market outcomes as a function of home-country and host-country human capital acquisition (Borjas, 1985; Chiswick, 1978; Dustmann & Glitz, 2011). These models strongly emphasize skills acquired in formal education or retraining programs (i.e., occupational skills), while not focusing on other skill types, such as non-cognitive ones. For example, the importance of language proficiency as a formal skill has been well-established, with Dustmann and Fabbri (2003) and Chiswick (1991) finding a positive effect of fluency in English on employment probabilities for ethnic minorities in the U.K. and the U.S., respectively. Yet knowledge on the relative importance of different skill types for immigrants' labor market integration remains limited.

Moreover, few studies examine the role of non-cognitive skills (personal characteristics, attitudes and behaviors not directly related to cognitive skills or academic knowledge) in the migration context (Heckman, 2008). Hull and Norris (2020) analyze the cognitive and non-cognitive skill development of immigrant children in elementary school in the U.S. Although they do not observe labor market outcomes, they highlight the potential of non-cognitive skills for successfully entering the labor market. Akay and Yilmaz (2023) proxy non-cognitive skills with personality traits. However, while they show that extroversion and emotional stability reduce immigrants' employability disadvantages, these traits reflect broad and relatively stable dispositions that are only partially malleable.

Nevertheless, both studies suggest that skills beyond formal occupational ones are important for immigrants' economic integration. In particular, workplace-based cultural skills—tacit, context-specific abilities acquired in real work environments—likely complement occupational skills in helping immigrants overcome country-specific human capital deficiencies and navigate the education-to-work transition. Because dual VET combines both occupational and workplace-based cultural training, we expect it to provide strong support for immigrant integration at this critical stage.

However, as deficiencies in country-specific knowledge differ systematically across immigrant groups, the potential benefits from dual VET may also vary. According to economic assimilation theory, two critical factors affect the reduction of country-specific knowledge deficiencies. First, the cultural distance between the immigrant's home country and host country determines the economic assimilation process (Bredtmann et al., 2020; Raux, 2023). Lazear (1999) notes that common culture and language provide trust and induce immigrants and natives to establish contracts. The more distant the culture of immigrants' countries of origin from that of the host culture, the more effort they must make to build trust and engage with local natives—with the increased effort slowing the assimilation process.

Several studies proxy cultural distance with language, creating distant language measures (Adserà & Pytliková, 2015; Bredtmann et al., 2020; Dustmann & Fabbri, 2003; Ginsburgh & Weber, 2020; Isphording, 2014; Isphording & Otten, 2014; Strøm et al., 2018). These studies find that economic assimilation decreases with linguistic distance. One explanation for this negative relationship is the high educational and other costs that immigrants with a more distant first language face (Dustmann & Fabbri, 2003). Low linguistic proximity not only decelerates the acquisition of the dominant language in the host country but also requires greater investments (e.g. in skills training) for reducing country-specific knowledge deficiencies (Isphording, 2014).

Second, the length of time that immigrants have spent in the host country (i.e., temporal distance) determines their economic assimilation, in turn affecting their cultural distance. As previously mentioned, immigrants arrive with a specific skill set not fully applicable in the host country. In addition, they find that certain skills acquired in their country of origin are not perfectly transferrable (Chiswick & Miller, 2012; Friedberg, 2000). Consequently, after moving to a new country, immigrants must invest in skills valuable for living in it. While these skill investments are usually highest immediately after arrival, they decrease with duration in the country and pay off over time. Overall, immigrants' assimilation and their labor market prospects increase with duration in the host country (Borjas, 1985; Chiswick & Miller, 2012).

Strong empirical evidence shows that immigrants arriving at older ages face greater disadvantages than those arriving in early childhood (Beck et al., 2012; Bleakley & Chin, 2010; Bratsberg et al., 2014; Hermansen, 2017; Hull & Norris, 2020). For example, the literature on immigrants' age at migration identifies primary school age as a critical period for children migrating to the U.S. (Beck et al., 2012). Children exposed to a new language after this age lose their natural ability to effortlessly acquire native proficiency in that language (Clarke, 2018). Instead, they experience greater language-learning difficulties, which likely impede their assimilation process and increase their risk of dropping out of school (Bleakley & Chin, 2010). Chiswick and DebBurman (2004) highlight the marked difference in assimilation between immigrants receiving a major part of their education in the host country and those receiving almost none. Consequently, we expect considerably fewer country-specific knowledge deficiencies, and thus better employment prospects at the education-to-work transition, for immigrants arriving at an early age.

Overall, the literature on immigrants' economic assimilation implies that country-specific knowledge deficiencies—and in turn the value of workplace-based cultural skills—vary systematically with their cultural and temporal distance from the host country. Therefore, in

this paper we account for both distances when identifying the skills necessary for immigrants' successful labor market transitions.

First, we distinguish between immigrants from developing and non-developing countries. In cultural and linguistic terms, immigrants from developing countries are more distant from Switzerland (Naveed & Wang, 2021) and therefore likely face greater country-specific knowledge deficiencies. Similarly, Dustmann and Frattini (2011) show that, in many countries, immigrants from non-European countries (most of which are classified as developing) experience greater disadvantages relative to labor market integration than those from European countries. Given that the percentage of immigrants from developing countries in industrialized countries continues to rise (Pineda-Hernández et al., 2022), integrating them and their children constitutes a critical condition for future economic and social development. Thus, because immigrants from developing countries face distinct challenges, our measure of cultural distance—i.e., developing versus non-developing countries—serves as a useful proxy.

Second, we distinguish between immigrants arriving younger or older. When investigating the educational attainment or economic integration of immigrants over time, most studies observe different generations of immigrants (Abrassart et al., 2020; Azzolini & Barone, 2013; Carlana et al., 2022; Pineda-Hernández et al., 2022; Siahhaan et al., 2014). To capture immigrants' temporal distance from the host country, we follow this approach and define immigrants by generation. Specifically, we focus on immigrants (i.e., individuals who are foreign nationals, were born abroad, and migrated to the host country), who are likely to face greater cultural and institutional barriers than children of immigrants (i.e., foreign nationals born in the host country). Complementing this generational perspective, we also capture immigrants' temporal distance by their age at arrival. This measure allows us to distinguish between immigrants who enter the host society at formative school ages versus those who

arrive later, thereby capturing important differences in cultural adaptation and exposure to the host country's institutions.

### **3. Data and Operationalization**

To analyze how receiving workplace-based cultural skill training in tandem with occupational skill training affects immigrants' unemployment at the education-to-work transition, we match two administrative data sets from the Swiss Federal Statistical Office's LABB program, which links several data sources. The LABB data comes from (a) a structural survey (SE), (b) the statistics of population and households (STATPOP), and (c) registry data on the education system. Moreover, it includes data from the Central Compensation Office (ZAS) and from the information system for employment services and labor market statistics (AVAM). The LABB program data offers two main advantages. First, it allows us to analyze the full population of students in Switzerland. Second, we can extract reliable information on immigrants' transitions from education to the labor market.

Our data set, which covers the educational participation of the entire population in Switzerland from 2011 through 2020, allows us to identify all individuals who chose either dual VET or school-based VET. As explained earlier, dual VET entails the parallel training of VET students in both a vocational school and a firm-based apprenticeship, with the precondition of a training contract between a training firm and the student. Moreover, we have vital information on individuals' occupation, canton<sup>2</sup> of residence, municipality of residence, nationality, country of birth, age, gender, and age of arrival in Switzerland. The data also allows us to retrace the pathway of all students moving from VET to the labor market. Specifically,

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<sup>2</sup> In Switzerland cantons are distinct administrative and governmental entities much like states in the US.

we observe the unemployment spell after the exact graduation dates at the individual level. To ensure a meaningful comparison between school-based and dual VET, we include only occupations available in both types of VET program. This approach eliminates structural differences across occupations that would otherwise confound training format effects.

Our analysis concentrates on individuals who are in the typical age range for completing VET, age 18-24. In doing so, we ensure that outliers with very atypical completion ages do not bias the results. Given that the data does not yet capture the labor market outcomes of the cohort graduating from VET in 2020 and that the entries of the cohort of 2011 are incomplete, we exclude both cohorts. Thus we analyze eight Swiss cohorts of individuals graduating from a VET program between 2012 and 2019. Overall, we count 116,886 observations.

Our dependent variable is binary, indicating whether an individual is unemployed after graduation. For this variable, we consider individuals as unemployed if they are “not in employment, education, and training” (NEET). In the LABB data the NEET status is subdivided into four categories: (1) individuals who register officially as unemployed, (2) individuals who receive benefits from disability insurance, (3) individuals who receive benefits from income compensation programs, (4) and other. To avoid conflating health-driven non-participation with unemployment stemming from challenges in transitioning from education to work, we exclude category (2) when defining the dependent variables. In addition, as category (3) covers such items as compensation for maternity or military service, it is not necessarily connected to our outcome of interest. Therefore, we also exclude category (3).

For our analyses, we define VET type and individuals’ migration history as explanatory interaction terms. Again, the variable VET type is binary, taking the value of 1 if the individual holds a dual VET degree and 0 for a school-based one. We also include several control variables in our interaction model.

The LABB dataset provides a migration status variable, jointly coding individuals' country of birth and citizenship. Specifically, this variable allows us to distinguish the four immigrant categories illustrated in Table 1. Given that immigrants face particularly high barriers to institutional integration and labor market transition and thus constitute the most policy-relevant group, we focus on *non-Swiss-citizen immigrants*. This first group comprises individuals who were neither born in Switzerland nor have Swiss nationality. Because the other groups consist of individuals who have integration pathways into Swiss culture and institutions through their parents, we classify them jointly as the reference category. The second group comprises individuals who are the children of non-Swiss-citizen immigrants and are not Swiss natives, i.e., *Swiss-socialized non-citizens*.

The third group comprises (a) immigrants who have become Swiss nationals and (b) individuals who, while not born in Switzerland, are children of Swiss natives living abroad and who have returned to Switzerland (*Swiss foreign-born natives*). The fourth group consists of individuals who were born in Switzerland and are Swiss natives (*Swiss natives*). While the second group acquires cultural skills and orientation through parents who themselves gained experience in the Swiss society or labor market, the third and fourth groups benefit from the Swiss-specific knowledge of their Swiss parents, even if they were born abroad.

**Table 1: Definition of immigrant groups by country of birth and nationality**

Country of birth	Nationality		
		<b>Non-Swiss</b>	<b>Swiss</b>
	<b>Not Switzerland</b>	(1) Non-Swiss-citizen immigrants	(3) Swiss foreign-born natives
<b>Switzerland</b>	(2) Children of non-Swiss-citizen immigrants	(4) Swiss natives	

*Notes:* Definition of four immigrant groups adapted from classifications by the Swiss Federal Statistical Office (FSO, 2023).

We draw on this classification to define our main operationalization of individuals migration histories, a binary indicator coded 1 if an individual is an immigrant originating from a developing country and 0 otherwise. In doing so, we capture both immigrants' temporal and cultural distance from the host country. To differentiate between developing and non-developing countries, we draw on the 2022 Development Assistance Committee (DAC) list, recording all countries eligible to receive official development assistance (OECD, 2022).

To build more detailed immigrant groups for heterogeneity analyses, we first use the information on immigrants' age of arrival in Switzerland. As discussed in Section 2.2, this age represents a crucial dimension of their assimilation process. Therefore, in Table 2, we categorize immigrants into three groups corresponding to critical age periods in the compulsory part of the Swiss education system. The first group comprises immigrants who arrive after age 0 and before age 5 (preschool); the second, those who arrive after age 5 and before or at age 13 (primary school); and the third, those who arrive after age 13 (during or after secondary school).

**Table 2: Definition of immigrant groups by age of arrival**

Age of arrival in Switzerland	Immigrant group
$0 < \text{age of arrival} \leq 5$ (pre-school-level)	Pre-school arrivals
$5 < \text{age of arrival} \leq 13$ (primary level)	Primary school arrivals
$13 > \text{age of arrival}$ (at or after secondary level)	Secondary school arrivals

*Notes:* The age of arrival categories align with the critical age periods in the Swiss education system.

Second, in Table 3, we refine these immigrant groups by further distinguishing between immigrants from developing countries and those from non-developing ones. Overall, our explanatory variable for migration history in the heterogeneity analysis captures all six groups,

with Swiss natives as the reference category. However, given our interest in the most vulnerable and distant immigrant groups, we focus on the three groups who emigrated from a developing country to Switzerland (i.e., groups 4, 5, and 6 in Table 3).

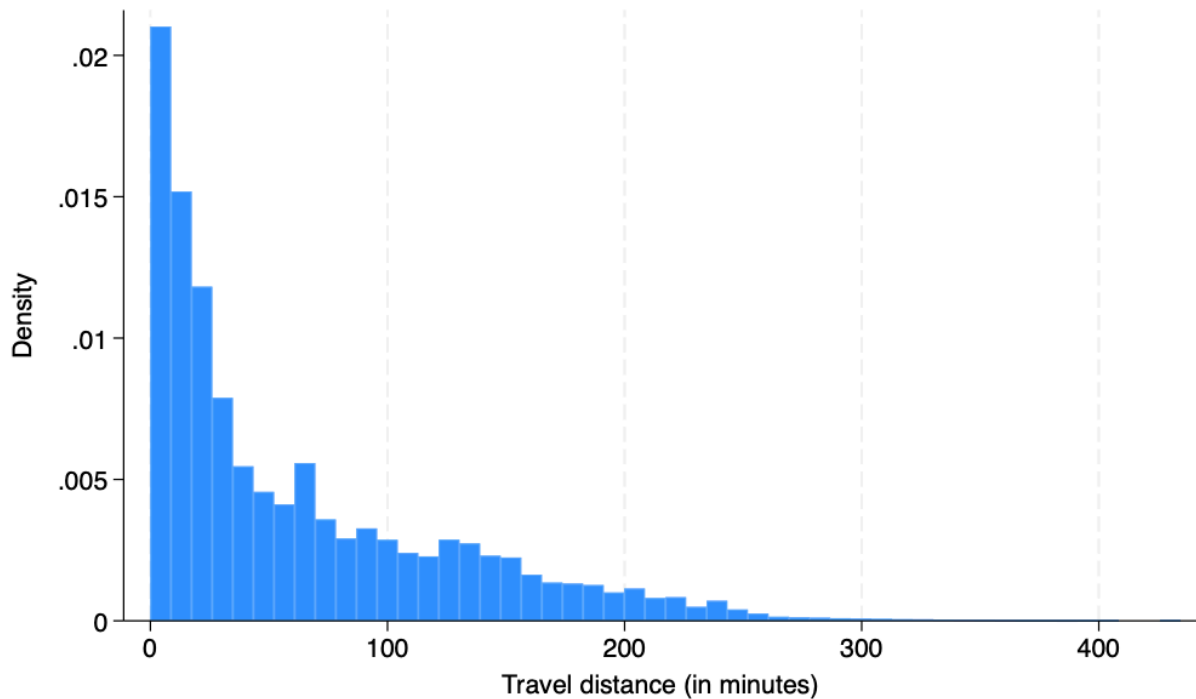
**Table 2: Definition of immigrant groups by age of arrival and country of birth**

Age of arrival in Switzerland	Country of birth: Non-developing country	Country of birth: Developing country
0 < age of arrival ≤5 (pre-school-level)	Group 1	Group 4
5 < age of arrival ≤13 (primary level)	Group 2	Group 5
13 > age of arrival (secondary level)	Group 3	Group 6

*Notes:* The age of arrival categories align with the critical age periods in the Swiss education system.

#### *Instrumental Variable*

As selection into the type of VET may not be random (Cavaglia et al., 2020; Matthewes & Ventura, 2022), we additionally apply an IV approach to avoid potential endogeneity problems. We use the travel distance (in minutes) from individuals' municipalities of residence at the start of secondary education and the nearest school-based VET provider that offers training in their *chosen occupational field* as an IV. As the LABB program data contains variables that capture individuals' municipalities of residence, we use this information to generate our instrument. Figure 1 shows the distribution of our instrument. It is right-skewed, with most individuals living relatively close to a school-based VET provider but with a long right tail reflecting substantial regional variation.



**Figure 1: Distribution of travel distance to the nearest school-based VET institution**

*Notes:* This figure plots the distribution of travel time (in minutes) from individuals' municipalities of residence at the start of secondary education to the nearest school-based VET provider offering training in their chosen occupational field. Authors' calculations based on LABB data (2012–2019).

### *Summary Statistics*

Table 4 displays all relevant summary statistics for our estimation sample by VET program. Our final sample comprises 105,952 dual VET graduates (90.89%) and 10,934 school-based VET graduates (9.36%). Across essential background characteristics, we observe that both groups are relatively similar. On average, the subjects in both programs are 20 years old and the share of males corresponds to about 50% in dual VET and 54% school-based VET. While 87.75% in our sample are Swiss natives, 12.25% are immigrants. Swiss natives constitute 88.2% of dual VET participants and 83.2% of school-based VET participants.

Immigrants from developing countries are also almost equally represented in dual VET and school-based VET at 6.3% and 8.4%, respectively. Among immigrants, approximately 1.3% in dual VET and 1.8% in school-based VET arrived after age 13 in Switzerland, and 3.5% and

4.8%, respectively, between ages 0 and 5. Most immigrants arrived between ages 5 and 13, with 5.5% in dual VET and 8% in school-based VET. Our main specification of migration history focuses on immigrants from developing countries, who represent 3.7 percent of the dual VET group and 4.5 percent of the school-based VET group.

**Table 3: Summary statistics**

	Dual VET	School-based VET	Min	Max
	Mean	Mean		
<i>Panel 1: Background Characteristics</i>				
Age	19.838 (1.318)	19.884 (1.182)	18	24
Male	0.489 (0.500)	0.538 (0.499)	0	1
Direct Tertiary	0.128 (0.334)	0.448 (0.497)	0	1
Military	0.120 (0.325)	0.104 (0.305)	0	1
German-speaking region	0.846 (0.361)	0.336 (0.473)	0	1
Rural	0.205 (0.404)	0.128 (0.334)	0	1
<i>Panel 2: Country of Origin</i>				
Switzerland (CH)	0.882 (0.322)	0.832 (0.374)	0	1
Non-developing country (NDC)	0.055 (0.228)	0.085 (0.278)	0	1
Developing country (DC)	0.063 (0.242)	0.084 (0.277)	0	1
Western Europe	0.837 (0.370)	0.815 (0.388)	0	1
Eastern Europe	0.003 (0.058)	0.005 (0.073)	0	1
Africa	0.008 (0.090)	0.014 (0.119)	0	1
Western Asia	0.013 (0.112)	0.008 (0.089)	0	1
Eastern Asia	0.001 (0.033)	0.001 (0.037)	0	1
<i>Panel 3: Migration History</i>				
Immigrants from DC	0.037 (0.189)	0.045 (0.207)	0	1
Age of arrival in Switzerland	1.067 (3.407)	1.537 (3.979)	0	24
Immigrants 0 < age of arrival <=5	0.035 (0.185)	0.048 (0.214)	0	1
Immigrants 5 < age of arrival <=13	0.055 (0.227)	0.080 (0.271)	0	1
Immigrants age of arrival >13	0.013 (0.112)	0.018 (0.134)	0	1
Observations ( <i>N</i> = 116,886)	105,952	10,934		

Notes: Authors' calculations based on LABB data, 2012-2019.

**Table 4 Summary statistics – Continued**

	Dual VET	School-based VET	Min	Max
	Mean	Mean		
<i>Panel 4: Occupational Field</i>				
Humanities/Arts	0.017 (0.128)	0.056 (0.230)	0	1
Business/Law	0.367 (0.482)	0.567 (0.496)	0	1
ICT	0.029 (0.168)	0.075 (0.264)	0	1
Engineering	0.282 (0.450)	0.191 (0.393)	0	1
Agriculture	0.048 (0.214)	0.007 (0.085)	0	1
Health	0.189 (0.392)	0.096 (0.294)	0	1
Services	0.068 (0.251)	0.007 (0.085)	0	1
<i>Panel 5: Outcome Variable</i>				
Unemployed	0.020 (0.140)	0.200 (0.400)	0	1
Observations ( <i>N</i> = 116,886)	105,952	10,934		

*Notes:* Authors' calculations based on LABB data, 2012-2019.

## 4. Empirical Strategy

Our aim is to examine the effect of combining workplace-based cultural skill training with occupational skill training (relative to pure occupational skill training) on unemployment across individuals with different migration histories. Therefore, we estimate regression equations of the following form:

$$y_{irtso} = \alpha + \beta D_i + \gamma M_i + \delta(D_i M_i) + \lambda R_{rt} + \mu L_s + \theta X_i + \eta_s + \phi_o + \rho_t + \varepsilon_{irtso} \quad (1)$$

Where  $y_{irtso}$  in equation 1 is our measure for unemployment for individual  $i$  who resides in municipality  $s$  in region  $r$ , completed VET in occupation  $o$ , and belongs to cohort  $t$ . We measure unemployment after VET graduation as a binary variable. This binary unemployment variable  $y_{irtso}$ , which takes the value 1 if the individual has been unemployed following VET graduation and 0 otherwise.  $D_i$  and  $M_i$  represent the two interaction variables. While  $D_i$  is a dummy variable that is equal to 1 if the individual completed dual VET and learned workplace-based cultural skills and equal to 0 if the individual completed school-based VET,  $M_i$  is either a binary (equal to 1 if the individual is an immigrant from a developing country, 0 otherwise) or a categorical variable (immigrant groups 4, 5, and 6 of Table 3) indicating the individual's migration history. Interacting both variables allows us to measure the extent to which labor market outcomes for dual instead of school-based VET differ across immigrant groups.

We control for vector  $X_i$ , which captures individual characteristics, i.e., age, gender, military service participation, and a binary indicator for enrollment in tertiary education within one year of VET completion. Including indicators for military service and post-VET tertiary enrollment, we account for delayed labor market transition and receiving further education which may otherwise confound observed unemployment outcome. In addition, we add regional controls

for the annual regional unemployment rate ( $R_{rt}$ ), the Swiss language region<sup>3</sup> of the individual's municipality of residence ( $L_s$ ), and the urban-rural classification of the municipality of residence ( $\eta_s$ ). We also control for occupation fixed effects ( $\phi_o$ ) and cohort fixed effects ( $\rho_t$ ). Standard errors are clustered at the municipality level.

Our main coefficient of interest in the model is  $\delta$ , which captures an interaction term, not an isolated coefficient. We aim at identifying the interaction between the completed VET program and an individual's migration history. If  $D_i$  was completely exogenous,  $\delta$  would reflect the causal interaction effect of additional workplace-based cultural skills training and an individual's migration history on unemployment.

Nonetheless, even after adding essential controls and fixed effects, our interaction model might not fully account for the selection of individuals into dual versus school-based VET. As with any type of education, estimating unemployment outcomes for dual and school-based VET is challenging. The main challenge originates from individuals' strong self-selection into certain educational pathways (Matthewes & Ventura, 2022). An individual's educational choice is likely to be concomitant with unobserved characteristics that, in turn, affect labor market outcomes such as unemployment.

To deal with this endogeneity issue and the source of bias, we apply an IV strategy. One way of achieving causality is to use variation in the probability of completing a dual VET, a variation not otherwise correlated with the probability of unemployment. Following Lüthi (2025) and Bentolila et al. (2023), we choose the travel distance from individuals' municipalities of residence in the first year of their secondary education to the nearest school-

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<sup>3</sup> Switzerland has three language regions: German-speaking in central and eastern areas, French-speaking in the west, and Italian-speaking in the south. These regions represent long-standing cultural and institutional distinctions, reflected not only in language but also in education and administrative practices. To account for systematic institutional differences across these cultural areas, we include Swiss language regions as regional controls.

based VET provider as an instrument. As longer distances increase the commuting time required for attending school-based VET, thereby making workplace-based dual programs more attractive, we argue that travel distances strongly predict dual VET enrollment (Lüthi, 2025).

The use of geographic distance as an instrument for educational decisions originates with Card (1999) and has since been applied in several empirical settings. For example, Bentolila et al. (2023), examining a Spanish reform that introduced a dual VET track, instrument VET participation with distances to the nearest dual and school-based VET provider. Following Lüthi (2025), who adapted this strategy to the Swiss context, we use only the distance to the nearest school-based VET provider. While in school-based VET students apply directly to vocational schools—making proximity a key determinant of program choice—in dual VET they apply to firms, which then assign them to a vocational school. Thus the location of dual VET schools does not affect students’ choices as directly. In our setting, distance to the nearest school-based VET provider varies substantially across regions, offering a credible source of exogenous variation.<sup>4</sup>

To implement the IV approach, we determine the travel distances to the nearest school-based VET school, our instrument  $z_i$ , for each individual  $i$ . Given that occupational preferences are key to enrollment decisions, we use the distance to the nearest school-based provider in the chosen occupational field as the instrument. Following the rationale of Bentolila et al. (2023) and Lüthi (2025), we argue that only proximity to desired training opportunities is likely to influence enrollment decisions.<sup>5</sup> For example, a student interested in technology is unlikely to choose a nearby VET school specializing in nursing.

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<sup>4</sup> See Lüthi (2025) for a detailed map of school locations, illustrating this regional variation.

<sup>5</sup> In similar estimations where we used regional baccalaureate shares as an instrumental variable, either at the municipality or cantonal level, we obtained similar results, but the instruments were less convincing so we refrained from integrating them here.

To maximize the number of cohorts included in our analysis, we deviate from Lüthi (2025) by measuring the distance from the municipality of residence at the onset of secondary education rather than at the end of compulsory schooling. However, given that VET students in Switzerland typically remain in the parental household, rarely relocate for training, and rely on local networks for both information and access (Kuhn, 2022), this adjustment does not compromise the validity of our instrument. Unlike academic universities, VET institutions generally do not offer student housing, primarily because firms—the primary training providers in Switzerland—are geographically dispersed rather than concentrated in a campus setting (Lüthi, 2025). This institutional structure explains VET students’ rarely moving for training and instead residing in the parental household.

To obtain meaningful estimates, our IV strategy must hold three assumptions. First, our instrument—the geographical distance—must be strongly associated with the binary treatment variable  $D_i$  (instrument relevance), i.e.,  $\text{cov}(z_i, D_i) \neq 0$ . To test instrument relevance, we report, in addition to the first-stage estimates in Table A1, the Sanderson-Windmeijer F-statistics. Several studies using regressions with multiple endogenous regressors draw on these F-statistics to evaluate the power of their instruments (Akerman et al., 2022; Eggenberger et al., 2022).

Second, our instrument must not be correlated with the outcome  $y_{irtso}$  apart from the possible indirect effect running through the treatment variable (instrument exogeneity). In other words, the proximity to the nearest school-based VET must not directly correlate with an individual’s unemployment probability. If schools were non-randomly placed in response to local demand or other strategic considerations, this exclusion restriction would be violated.

We deal with three potential sources of such endogeneity: (a) the higher prevalence of school-based VET in French-speaking regions, (b) the potential concentration of school-based VET providers in urban areas, and (c) the higher prevalence of certain occupations in school-

based VET (Lüthi, 2025). To account for factors (a) and (b), we control for regional characteristics, the language region (i.e., French/German/Italian) and urban versus rural municipalities of residence. To account for factor (c), variations in the supply of VET positions, we include occupational fixed effects, which also capture the average travel distance for each occupation. Including these fixed effects is essential. Otherwise, students pursuing unpopular occupations would, on average, face longer travel times, confounding the relationship between distance and occupational choice (i.e., distance would depend directly on students' occupational choices).

Endogeneity may also arise if regional labor market conditions influence both the location of school-based VET providers and individuals' unemployment outcomes. In Switzerland, however, long-standing education infrastructure and centralized planning, not recent labor market shifts, determine school locations (Lüthi, 2025). Central authorities plan public VET schools and rarely relocate them, limiting the potential for endogenous placement. Moreover, students typically do not move in response to school locations. These institutional features reduce the risk that distance correlates with unobserved factors affecting unemployment. For a more detailed discussion of these institutional factors, see Lüthi (2025).

Third, the identification of the interaction term of one endogenous and one exogenous variable<sup>6</sup> requires that the variable migration history and the omitted variables are jointly independent of the instrument (Eggenberger et al., 2022; Nizalova & Murtazashvili, 2016). We follow Eggenberger et al. (2022)—whose coefficient of main interest, like ours, is the

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<sup>6</sup> As previously explained, we construct the variable migration history by using the variable country of birth and immigrants' age of arrival in Switzerland. While the variable country of birth is clearly exogenous because an individual is not able to choose it, the exogeneity of the age at which an individual migrates is less certain. For example, the parents of immigrants could manipulate their children's age at migration, which could have an impact on unemployment later in life. However, in our case it is very unlikely given that parents from developing countries usually make their relocation decision to Switzerland contingent on employment opportunities. FSO 2019 statistics shows that many immigrants from non-EU/EFTA countries, which include many developing countries, already have employment contracts before migrating to Switzerland (FSO, 2019). This indicates that employment prospects, rather than children's age, determine the timing of migration (FSO, 2019).

interaction of one endogenous and one exogenous variable—by using a single instrument for identification.

Thus, in our case, the country of birth and age of arrival must be independent of the travel distance to the nearest school-based VET. A related concern is that immigrants might strategically select their municipality of residence based on proximity to school-based VET providers, a scenario that would violate the exclusion restriction. Yet such strategy sorting is unlikely. Given that in Switzerland immigrants typically require an employment contract to reside in the country, they primarily base their residential choices on job opportunities. Moreover, immigrants—particularly those from developing countries—encounter the two-type Swiss VET system as something entirely new. With no comparable institutional set-up in their home country, immigrants are very unlikely to choose their residence by proximity to school-based VET providers. However, as job opportunities concentrate in cities, immigrants more often settle in urban areas (Zufferey & Wanner, 2020). Controlling for an urban-rural indicator of the municipality of residence, we deal with this potential identification threat.

#### *Instrument Validity: Balance Tests*

To provide additional evidence for the plausibility of our exclusion restriction, we follow Matthewes and Ventura (2022) and examine whether our distance instrument is systematically related to observable individual characteristics. Specifically, we regress a range of demographic variables—age, gender, military service, age at arrival in Switzerland, and migration history—on travel distance. Like Matthewes and Ventura (2022), we condition on the same set of baseline controls as in our main specifications and on all other demographic covariates except the one that serves as the dependent variable in that column. As reported in Table 7, the coefficients on the distance instrument are essentially zero across all specifications.

While they appear statistically significant—which is unsurprising given the large sample size—their magnitudes are economically irrelevant. For instance, in the regression where age is the dependent variable, the coefficient implies less than 0.001 years of age (i.e., under one day) per kilometer of distance. These results thus show no systematic association between travel distance and observable student characteristics, thereby supporting the assumption that distance serves as a valid instrument for school-based VET attendance.

**Table 7: Instrument balance tests.**

Dep Var	Demographics				
	Age	Male	Military	Age at arrival	Immigrants from DC
Travel	0.001***	0.000***	0.000**	0.001***	0.000***
Distance $z_i$	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Obs	116,886	116,886	116,886	116,886	116,886

*Notes:* Each column reports the coefficient from an OLS regression of the listed demographic variable on travel distance, controlling for the full set of controls (language-region FE, cohort FE, urban/rural, occupation FE, and the local unemployment rate) and all other individual covariates (age, sex, military, age at arrival, and migration history), excluding the covariate in question. Standard errors clustered at the municipality level. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 5. Results

### *Main Results*

Table 5 reports the OLS (columns I) and the two-stage least squares (2SLS) estimates (columns II) of the coefficients of  $D_i \times M_i$  on unemployment for immigrants from developing countries in comparison to Swiss-socialized individuals, i.e., group 2, 3, or 4 in Table 1.

Our outcome captures the binary measure of unemployment after graduation. In both models, we control for cohort fixed effects, occupation-specific fixed effects, language region, regional unemployment rate, an indicator for urban versus rural municipality of residence, post-

graduation military participation, enrollment in tertiary education, age, and gender. In the 2SLS models we instrument the interaction  $D_i \times M_i$ , with the travel distances of individual municipality of residencies to the nearest school-based VET school  $z_{i,t}$ . The interaction term is negative and statistically significant in both specifications.

In column I of Table 5, the OLS results indicate that being an immigrant from a developing country increases the probability of unemployment at the education-to-work transition by about 9.9 pp, whereas completing dual VET reduces unemployment by about 17 pp. Most importantly, the interaction term shows that immigrants from developing countries experience an additional 9.7 pp reduction in unemployment when participating in dual VET, relative to Swiss natives and Swiss-socialized individuals (i.e., children of immigrants).

When we use school-based VET provider proximity as an instrument for dual VET enrollment, the results confirm the OLS pattern: in column II of Table 5, being an immigrant from a developing country increases the probability of unemployment, whereas completing dual VET reduces unemployment. Notably, the interaction effect remains highly significant and sizable. The 2SLS estimate yields a similar reduction of 8.1 pp. Together, both estimates demonstrate that immigrants benefit disproportionately from dual VET compared to Swiss natives and Swiss-socialized individuals.

To assess the validity of our instrument, we report the Sanderson-Windmeijer F-statistics for our 2SLS model in the lower part of Table 5. As the F-values are large, our instrument appears to have strong predictive power. Moreover, we report the first-stage results in Table A1 of the Appendix, showing positive and substantial correlations between the travel distance and the probability of choosing dual instead of school-based VET. This result is in line with our argument that greater travel distances to purely school-based VET providers increase the costs of attending school-based programs, thereby making dual VET more attractive.

**Table 4: The effect of additional workplace-based cultural skills training compared to exclusively occupational skills training on unemployment for immigrants from developing countries.**

	I OLS	II 2SLS
Dep Var	Unemployed	Unemployed
Dual	-0.170*** (0.012)	-0.277*** (0.031)
Immigrant from DC	0.099*** (0.017)	0.082*** (0.031)
Dual=1# Immigrant from DC	-0.097*** (0.018)	-0.081** (0.034)
<i>Sanderson-Windmeijer F-Stat</i>		
Dual		81.64
Dual=1# Immigrant from DC		116.36
Controls	Yes	Yes
R-square	0.119	0.114
Observations	116,886	116,886

*Notes:* Standard errors are clustered at the municipality level and reported in parentheses. The dependent variable is the unemployment probability after VET graduation. Independent variable: dual VET. Controls: age, sex, cohort, rural, Swiss language region, unemployment rate (per region/year), military participation, enrollment in tertiary education, occupation fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

### *Heterogeneity Analysis*

Table 6 reports our heterogeneity analysis, using our categorical migration history variable defined by age of arrival and the development status of country of birth. This specification allows us to test whether the benefits of dual VET—combining workplace-based cultural and occupational skills—vary systematically with immigrants’ cultural and temporal distance from Switzerland.

Column I in Table 6 presents the results of the OLS regressions. These estimates yield three insights. First, the migration history estimates indicate that early-arriving immigrants from developing countries (i.e., before age 5) do not differ significantly from Swiss natives in their unemployment probability in the education-to-work transition. This result is consistent with evidence that very young arrivals tend to acquire host-country language skills and cultural

competencies more easily, making them largely “Swiss-socialized” and therefore comparable to the reference group. In contrast, immigrants arriving after age 5 face substantially higher unemployment probabilities than Swiss natives. Second, the dual VET estimate is negative and significant, showing that completing dual instead of school-based VET is associated with a reduction in unemployment probabilities in the critical labor market transition period.

Third, the OLS interaction coefficients show that late-arriving immigrants from developing countries benefit disproportionately from dual VET. For those arriving before age 5, the interaction estimate is small and insignificant (4.5 pp), reflecting their close similarity to Swiss natives and the correspondingly limited marginal benefit of workplace-based cultural training. In contrast, the interaction coefficients for later arrivals are sizable and significant at the 1% level. For immigrants arriving from a developing country after age 5 but before age 13, we observe the highest coefficient: for them, completing dual instead of school-based VET correlates with a reduction in unemployment by 8.1 pp compared to Swiss natives. For immigrants from a developing country arriving after age 13, dual VET completion correlates with a reduction by 7.6 pp.

The pattern of the OLS regressions presented thus far provides partial support for our hypothesis that immigrants with higher temporal distances from the host country experience greater *reductions* in unemployment if they participated in a dual VET program, where they received additional workplace-based cultural skill training. While the coefficient is insignificant for the least distant immigrant group (arrival before age 5), the two more distant groups show substantial and statistically significant correlations. We observe the largest estimate for the mid-distance group (arrival between ages 5 and 13), followed by the most distant group (arrival after age 13). This non-monotonic pattern suggests that while distance matters, the relationship may not be strictly increasing.

Column II of Table 6 reports the results of the second stage 2SLS regressions. The overall pattern is highly consistent with the OLS results. While immigrants arriving from developing countries again face higher unemployment risks during the education-to-work transition, dual VET reduces unemployment. The interaction coefficients are negative and of similar magnitude to those reported in column I. Yet none of the subgroup interactions are statistically significant. Given that the subgroup definitions yield relatively small cell sizes and that IV estimation generally requires large samples for precise inference, this lack of significant heterogeneity effects in the 2SLS estimates may simply reflect insufficient statistical power to detect subgroup differences. Detecting significance at conventional levels would require much larger subgroup sizes than ours, which makes the absence of significance more plausibly a power issue than a reflection of no effect. Taken together, the OLS and 2SLS results provide a consistent picture. While we cannot make strong claims about heterogeneity across age-of-arrival groups, both approaches suggest that immigrants arriving relatively late from developing countries benefit more than Swiss natives if they acquire occupational and workplace-based cultural skills in dual VET instead of only occupational skills in school-based VET.

**Table 5: The effect of additional workplace-based cultural skills training compared to exclusively occupational skills training on unemployment by immigrant group.**

	I	II
	OLS	2SLS
Dep Var	Unemployed	Unemployed
Dual	-0.182*** (0.012)	-0.281*** (0.032)
Immigrants from DC & 0 < age of arrival <=5	0.052 (0.033)	0.065 (0.052)
Immigrants from DC & 5 < age of arrival <=13	0.091*** (0.023)	0.053 (0.041)
Immigrants from DC & age of arrival >13	0.062** (0.028)	0.037 (0.040)
Dual=1 # Immigrants from DC & 0 < age of arrival <=5	-0.045 (0.034)	-0.062 (0.057)
Dual=1 # Immigrants from DC & 5 < age of arrival <=13	-0.081*** (0.024)	-0.042 (0.045)
Dual=1 # Immigrants from DC & age of arrival >13	-0.076*** (0.029)	-0.050 (0.044)
<i>Sanderson-Windmeijer F-Stat</i>		
Dual		94.25
Dual=1 # Immigrants from DC & 0 < age of arrival <=5		140.83
Dual=1 # Immigrants from DC & 5 < age of arrival <=13		143.41
Dual=1 # Immigrants from DC & age of arrival >13		134.83
Controls	Yes	Yes
R-square	0.127	0.114
Observations	116,886	116,886

*Notes:* Standard errors are clustered at the municipality level and reported in parentheses. The dependent variable is the unemployment probability after VET graduation. Independent variable: dual VET. Controls: age, sex, cohort, rural, Swiss language region, unemployment rate (per region/year), military participation, occupation fixed effects. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

## 6. Conclusion

This paper analyzes the importance of workplace-based cultural skills for the successful transition of immigrants from education to the labor market. As the Swiss VET system offers both dual and school-based VET programs that provide identical occupational skills training while differing systematically in workplace-based cultural skills training, it offers an ideal setting for comparing the relative importance of the two skill types. By estimating the effect of participating in dual VET compared to school-based VET on immigrants' unemployment, we reveal whether they benefit from the additional training of workplace-based cultural skills in dual VET.

Instrumenting the chosen VET program with travel distance to the nearest school-based VET provider, we identify a decline in immigrants' unemployment during the education-to-work transition when they chose dual, not school-based, VET. We find that immigrants arriving from a developing country can decrease their unemployment probability during their labor market transition by 8.1 pp through participation in dual VET. Given that this group faces an average unemployment disadvantage of 8.2 percentage points relative to Swiss natives, our results show that dual VET completion can nearly offset this initial gap during the education-to-work transition.

Given that immigrants' disadvantages—rooted in socialization, cultural differences, discrimination, or other barriers—often persist despite training interventions, our main effect is notably large and, at first glance, striking. Yet, given the structure of the Swiss dual VET system, with its strong emphasis on workplace integration throughout training, the effect is plausible. Dual VET completion provides immigrants with (a) strong workplace-based cultural skills and (b) a nationally recognized credential, ensuring full equivalence across Switzerland. This combination makes immigrants comparable to natives in both occupational and cultural

domains of the Swiss labor market and serves as a clear signal to Swiss employers that reduces uncertainty. Overall, upon completing dual VET, immigrant graduates can credibly signal their comprehensive skill sets and thereby offset the employment gap typically observed in the transition from education to work.

To disentangle potential heterogeneity effects, we examine immigrant groups with different degrees of cultural and temporal distance from Switzerland and compare them to Swiss natives. We observe that the effect indeed varies by immigrant group. For those immigrating from developing countries at a relatively early age (age at arrival  $\leq 5$ ), i.e., facing the least temporal and cultural distances, we find a negative but insignificant correlation between unemployment and learning workplace-based cultural skills in dual VET programs. Consistent with economic assimilation theory, early arrivals face fewer country-specific human capital deficiencies and are more socialized into the host country than late arrivals. Thus they do not differ significantly from natives, nor do they derive substantial returns from additional workplace-based cultural training. In contrast, while immigrants arriving after age 5, i.e., those experiencing greater temporal and cultural distance, face substantially higher unemployment risks during the education-to-work transition, they also greatly benefit from the workplace-based component of dual VET. Overall, these patterns support our theoretical argument that workplace-based cultural skills are particularly valuable for groups facing larger host-country human capital deficiencies.

Although the subgroup correlations turn statistically insignificant in the 2SLS specifications, the negative coefficients remain consistent with the OLS estimates. This result suggests that the lack of significance stems from limited statistical power in smaller subgroups rather than from an absence of the underlying effect. At the same time, the IV results do not allow us to make strong claims about heterogeneity across detailed arrival-age categories. However, taken together, both the OLS and IV results point in a consistent direction:

immigrants arriving relatively late from developing countries appear to benefit disproportionately from dual VET compared to Swiss natives, a finding consistent with the theoretical expectation that workplace-based cultural skills matter most where country-specific human capital deficiencies are largest.

We argue that the acquisition of workplace-based cultural skills is a critical component of an immigrant's successful transition to the labor market. By fostering social integration, facilitating access to mentorships, and enhancing communication abilities, these skills can serve as a valuable additional resource for immigrants seeking to establish themselves in a new cultural labor market. Future research should further investigate these proposed mechanisms by, for example, analyzing how and to what extent workplace-based cultural skills shape the development of a labor-market-related network and mentorships.

Our results provide three important insights for policy makers focusing on immigrant integration into the labor market. First, our results show that granting immigrants access to in-firm training helps them acquire the necessary workplace-based cultural skills for making that transition, thereby improving their chances of entering the labor market. Therefore, policy makers should aim at establishing an educational system that provides immigrants (and natives alike) systematic access to in-firm training in well-structured dual VET programs. Second, our results point to the decisive role of employers in immigrants' labor market entry. Policies could support employers in providing workplace-based training opportunities, particularly for culturally distant, late-arriving immigrants. These policies could yield substantial integration benefits.

Third, our results indicate that young adult immigrants and their families need to receive early and comprehensive information about either any host country educational system that can offer in-firm training (such as dual VET) or any similar labor market-aculturating training. Such information can help counter potentially biased perceptions among immigrant families,

who—because of educational patterns in their country of origin—may view academically oriented programs as the universally superior option. Taken together, effective educational policy for immigrant integration into the labor market entails three key tasks: establishing well-developed dual VET programs, ensuring firm participation in such programs, and providing immigrants with clear information on the benefits of these programs for their labor market success.

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## Appendix

### First-Stage and Reduced-Form Regressions

This section reports the first-stage and reduced-form regressions underlying the 2SLS estimates presented in Table 5 (Section 2.5) and outlines our IV strategy in greater detail. As we aim to identify the causal effect of an endogenous interaction term  $D_i \times M_i$ , we follow the empirical strategies of Lüthi (2025) and Eggenberger et al. (2022) in using travel distance to the nearest school-based VET provider  $z_i$  and its interaction with an individual's migration history  $z_i \times M_i$  as instruments. We instrument both the main regressor  $D_i$  and its interaction with the migration history indicator  $M_i$ . We estimate the following first-stage equations:

$$D_i = \pi_0 + \pi_1 z_i + \pi_2 M_i + \pi_3 z_i M_i + \mathbf{X}'_i \gamma + \lambda_{rt} + \mu_s + \eta_s + \phi_o + \rho_t + \epsilon_i \quad (\text{A1})$$

$$D_i \times M_i = \kappa_0 + \kappa_1 z_i + \kappa_2 M_i + \kappa_3 z_i M_i + \mathbf{X}'_i \gamma + \lambda_{rt} + \mu_s + \eta_s + \phi_o + \rho_t + v_i \quad (\text{A2})$$

$\mathbf{X}'_i$  captures the full set of individual-level controls described in Section 2.5. We cluster standard errors at the municipality level. Moreover, we estimate the reduced-form regression, in which we regress the unemployment outcome  $y_i$  directly on the instrument  $z_i$ , its interaction with migration history, and covariates:

$$y_i = \beta_0 + \beta_1 z_i + \beta_2 M_i + \beta_3 z_i M_i + \mathbf{X}'_i \gamma + \lambda_{rt} + \mu_s + \eta_s + \phi_o + \rho_t + u_i \quad (\text{A3})$$

Table A1 presents the first stage and reduced form estimates of our instrumental variable strategy. Columns I and II of Table A1 report the first-stage regressions, showing that both

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instruments strongly predict the endogenous variables. Travel distance is significantly associated with the probability of dual VET participation, with a stronger correlation for immigrants from developing countries. Specifically, a one-minute increase in travel time to the nearest school-based VET provider correlates with a 0.378 pp higher probability of enrolling in a dual VET program. The Sanderson-Windmeijer F-statistics confirm that the instruments are sufficiently strong.

Column III of Table A1 reports the reduced-form estimates, regressing unemployment on the instrument and its interaction. Greater travel distance to the nearest school-based VET provider is significantly associated with a higher probability of unemployment. This finding is consistent with the interpretation that easier access to school-based VET (i.e., shorter travel distance) reduces the likelihood of dual VET participation and increases the risk of unemployment during the education-to-work transition. The interaction term with migration history is not statistically significant, suggesting that the reduced-form effect of travel distance on unemployment operates similarly across immigration history. Overall, the results support the relevance and validity of our instrument and provide the basis for our 2SLS estimation of the causal impact of dual VET participation on unemployment outcomes.

**Table A1: First-stage and reduced-form regressions using travel distance as an instrument for dual VET enrollment**

	I	II	III
Dep Var Dual	First Stage $D_i$	First Stage $D_i \times M_i$	Reduced Form $y_i$
Travel Distance $z_i$	0.00378*** (0.000)	-0.0000374*** (9.08e-06)	-9.88*10 <sup>-6</sup> ** (0.000)
$z_i \times M_i$	0.00384*** (0.000)	- 0.0016242*** (0.000233)	-9.03*10 <sup>-6</sup> (0.000)
$M_i$	-0.01564*** (0.004)	0.7820131*** (0.0285858)	0.005 (0.004)
F-Statistics	41.26	28.45	—
Sanderson Windmeijer F-Stats	81.64	116.36	—
Controls	Yes	Yes	Yes
Observations	116,886	116,886	116,886

*Notes:* The table reports the first-stage regressions and reduced form regressions from Table 5. The dependent variable is a binary indicator for dual VET participation. All models include cohort, region, and occupational fixed effects as well as the full set of individual-level controls (gender, age, military participation, tertiary enrollment). Standard errors are clustered at the municipality level and reported in parentheses. \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$