6 Effects of Students Sociocultural Background on Economic Competencies in Upper Secondary Education

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6.1 Introduction

One of the main tasks of educational systems is to promote young people's competencies and support them on their path to adulthood (Fend 1981). Thereby, educational systems can be described as "sorting machines" that stratify the forthcoming generation and allocate life chances (Kerckhoff 2001). This allocation or stratification should be determined only by students' academic achievement rather than by ascribed attributes such as social status, migration background and gender. This claim is known as the "meritocratic principle" (Solga 2008). However, it has often been shown that educational systems cannot fulfil this principle. There is a large body of evidence that social and ethnic disparities exist in many countries, with ethnic differences being primarily due to social inequalities (Becker & Schubert 2011; Breen, Luijkx, Müller & Pollak 2009; Kronig 2007; Schimpl-Neimanns 2000; Shavit & Blossfeld 1993). Switzerland is one of the countries where such disparities were widely discussed following the publication of the "PISA 2000" study results in particular (Baumert & Schümer 2001; Becker & Lauterbach 2007b; Ramseier & Brühwiler 2003; Maaz, Watermann & Baumert 2007; Zutavern, Brühwiler & Biedermann 2002), the following PISA-studies (Konsortium PISA.ch 2011, 2014) and data gathered in the TREE-Project (*Transition from Education to Employment*) (Hupka-Brunner et al. in press; Kost 2014; Scharenberg et al. 2014; Schumann 2011).

Meanwhile, a large amount of research exists on sociocultural disparities in school competencies such as mathematics, science and reading comprehension. However, with respect to many other domains, we can also observe a striking empirical deficit–amongst others–in economic competencies. Given the growing complexity of economic processes in private life and in the modern and internationalised world, economic competencies play an important role in preparing young people for social participation (Eberle 2015; Schumann & Eberle 2012, 2014a). Against this background, the present article provides further insights into the relationship between learners' sociocultural characteristics and economic competencies by analysing data

from the OEKOMA[1] study (Schumann, Oepke & Eberle 2011; Schumann & Eberle 2014a).

6.2 Theoretical and Empirical Background

6.2.1 Upper secondary and tertiary education in Switzerland

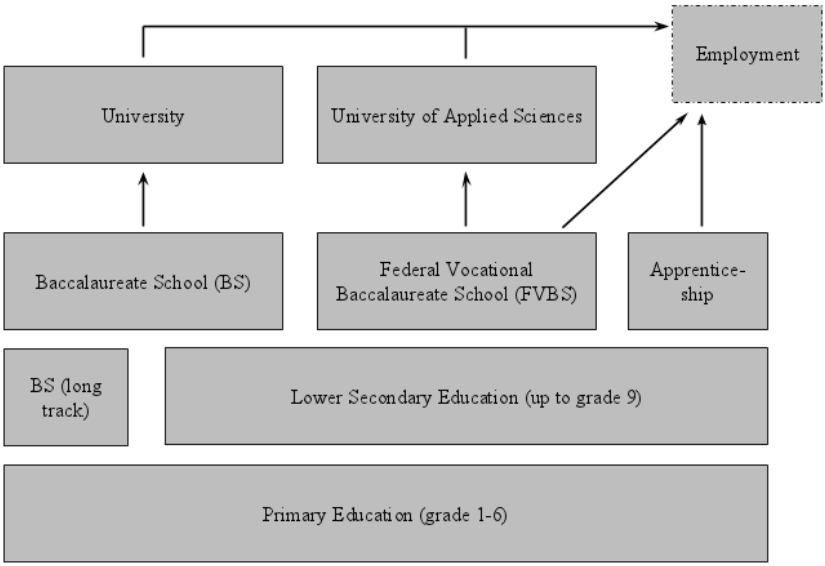
Traditionally, the Swiss educational system comprises two main tracks: an academic track to universities via Baccalaureate Schools (BS, Gymnasium) and a more practical track to vocational education and training (VET) via the regular schools (beyond the BS). Figure 1 presents an illustration of the Swiss educational system. Until the early 1990s, there was a de facto impermeability between the two tracks following lower secondary education. In line with the institutionalisation of universities of applied sciences in the 1990s, a new opportunity in VET was created – the Federal Vocational Baccalaureate Schools (FVBS). The FVBS connect an occupational education with deeper general education in six different profiles (e.g., commercial profile). The degree at this newly developed type of VET school permits unconditional but regular profile-specific access to Universities of Applied Sciences (Gonon 2013). The Federal Vocational Baccalaureate is an important instrument of permeability within the Swiss education system. To date, it has primarily been perceived as a "story of success" (ibid.), although newer findings have shown that permeability as a single structural instrument cannot decrease social disparities without improving the resources that determine educational success (Hillmert & Jacob 2008; Kost 2014; Schumann 2011).

In the present paper, two questions will be answered: 1) the extent to which there are sociocultural differences between students in these two types of schools, and 2) whether the two school types are associated with the same or different factors in determining economic competencies. To understand possible differences, it is important to know the extent to which economics is taught in the tracks and profiles. In BS and FVBS, economic education is obligatory and taught in discrete courses. In BS, this course is called "Economics and Law", which can be taken as a basic (depending on the canton, it consists of approximately one lesson per week) or as a major course (4 to 6 lessons per week). In FVBS, all students must take the "Business Administration/Economics/Law" course. Students with a commercial profile have

1 OEKOMA was funded by the Swiss National Science Foundation (05/2010 – 07/2012) and can be translated as "Economic Competencies of Swiss Students at the End of Upper Secondary Education" (Project No. 130301).

more lessons per week than students with other profiles; furthermore, they additionally take the "Accounting and Finance" course.

Figure 1: Swiss educational system (simplified)



6.2.2 Competencies and sociocultural background

A majority of studies on economic competencies and their effects on learning outcomes have been conducted in the US. A first milestone was the report entitled "Economic Education in Schools", which was published in 1961 (Committee for Economic Development 1961). The report specified the contents and benchmarks for economic knowledge and skills in upper secondary education. Subsequently, the Test of Economic Understanding (TEU, National Council on Economic Education (NCEE 1964)) and the frequently used Test of Economic Literacy (TEL, Soper 1979) were developed.[2] Using the TEU, studies have identified a substantial lack of knowledge among students irrespective of their sociocultural background. Because the TEU was not particularly effective, international studies have mostly used the TEL or a translation of it (e.g., the German translation of Beck & Krumm 1990; Beck, Krumm & Dubs 1998) to measure economic competencies in the school

2 The fourth edition of the TEL is now available (Walstad, Rebeck & Butters 2013).

context. An overview of the results shows considerable differences between countries (Walstad 1994). Students in Australia, the UK and South Korea performed better, whereas the mean scores of students in the US, Germany, Austria, Switzerland and particularly Greece were low. Furthermore, only a few American and other international studies considered the effects of sociocultural background on economic competencies (Becker, Greene & Rosen 1990; Grimes & Millea 2011; Jackstadt & Grootaert 1980; NCES 2013; Walstad 1993; Walstad, Rebeck & Butters 2013), but rarely as the main question of interest; thus, there is a lack of research on students in secondary education. In general, only a few studies on students' competencies at the end of upper secondary education in Switzerland have been conducted (Eberle et al. 2008; Ramseier et al. 1999; Ghisla, Bernasconi & Poglia 2009; Schumann, Eberle & Oepke 2013, Schumann & Eberle 2014b). Except for the articles by Schumann, Eberle and Oepke (2013) and Schumann and Eberle (2014a, 2014b) that were based on OEKOMA data, none of the other studies have taken economic competencies into account. Moreover, these studies have not considered or reported data on sociocultural background.

The theoretical model developed by Boudon (1974) is often used to better understand the effects of sociocultural background (e.g., Becker 2012; Kost 2014; Schumann 2011). This model belongs to the rational choice theory and distinguishes two types of effects of social background: primary and secondary effects. As the migration background can be seen as a special case of social background (e.g., Becker, Jäpel & Beck 2011; Becker & Schubert 2011; Kalter 2008; Meunier 2011), these effects also explain disparities that arise because of migration backgrounds.

With regard to primary effects, Boudon (1974) summarised the effects that a family's socialisation has on the developing child. Typically, families from lower socioeconomic classes provide less stimulating environments because they have fewer resources available and, therefore, are at a disadvantage in terms of supporting their children's school performance. Resources must be not only economical but also cultural (the spoken language in the family, the availability of books and the appreciation of reading them) and social (e.g., contact with higher-privileged persons) (Bourdieu 1983). Children's school success is affected by these factors in the earliest years of childhood. Therefore, they start their school career at a lower competence level – and this disadvantage is increasing, at least in primary education (Ditton & Krüsken 2009; EDK-Ost 2010).

The secondary effects of social background are also important, especially in highly stratified educational systems such as that in Switzerland (Becker & Lauterbach 2007a; Becker 2010; Dustmann 2004; Griga & Hadjar 2013; Holm et al. 2013). These effects play a role in children's transitions within the educational system and refer to the effects of the availability of family resources on parents' educational decisions (Boudon 1974). Given equal

student abilities, there is a discrepancy in the different social classes' valuation of the benefits of higher education; these benefits are perceived as less valuable by individuals in lower social classes. At the same time, the costs of investments in education are valued higher by these classes. In contrast, those in higher social classes have a much greater risk of experiencing a loss of status (Keller & Zavalloni 1964). People from lower socioeconomic classes tend to regard higher education with contempt, which is related to their greater uncertainty concerning educational success. This uncertainty goes hand-in-hand with these parents' unfamiliarity with higher educational tracks. Hence, regardless of students' abilities, families from lower socioeconomic classes more often decide to forgo higher educational tracks.

Both primary and secondary effects have been observed and confirmed in many studies in Switzerland and Germany. Secondary effects particularly appear during preschool education (Arens 2007; SKBF 2011; SKBF 2014) and at the transitions from primary to lower secondary education (Arens 2007; Autorengruppe Bildungsberichterstattung 2008, 2010, 2014; Becker, Jäpel & Beck 2011; Becker 2013; Biewer, Wandeler & Baeriswyl 2013; Geißler 2006; Neuenschwander & Malti 2009; SKBF 2011; Zutavern, Brühwiler & Biedermann 2002), from lower secondary to higher secondary education (Arens, 2007; Baumert & Schümer, 2002; Neuenschwander & Malti 2009; Ramseier & Brühwiler 2003; Schumann 2011) and from higher secondary education to the tertiary level (Arens 2007; Autorengruppe Bildungsberichterstattung 2008, 2010; 2012; Buchmann et al. 2007; Kost 2014). Primary effects have also often been observed, although mostly for primary school and lower secondary education (Angelone & Keller 2014; Baumert, Watermann & Schümer 2003; Becker, Jäpel & Beck 2011; Becker & Schubert 2011; Ditton & Krüsken 2009; Ehmke & Jude 2010; Geißler 2006; Meunier 2011; Moser 2002; OECD 2001; Ramseier & Brühwiler 2003), with fewer effects found for upper secondary education (Kost 2014; Schumann 2011; Watermann & Maaz 2006).

Especially in the Swiss educational system, which is characterised by high stratification and early segregation, evidence exists of a strong association between children's sociocultural background and educational achievement (e.g., OECD 2002; Wößmann 2004) and attainment (e.g., Bauer & Riphahn 2006, 2007; Buchmann et al. 2007). For example, children with a disadvantaged sociocultural background perform worse in subjects such as reading comprehension and mathematics (Angelone & Keller 2014; Becker, Jäpel & Beck 2011), although these primary effects are mainly caused by socioeconomic differences between groups (e.g., Beck, Jäpel & Becker 2010). However, even after controlling for achievement, there are substantial differences in transitions, starting from preschool (e.g., SKBF 2014) up to tertiary education (e.g., Buchmann et al. 2007). Early segregation and school tracking increase these effects and strengthen the intergenerational perpetua-

tion of educational track and class status (Buchmann et al. 2007; Pfeffer 2008).

Furthermore, there is considerable evidence that these effects on transition accumulate throughout the school career and play an important role at the threshold to vocational education (e.g., Beicht & Granato 2010; Konietzka & Seibert 2003; Solga & Menze 2013). Thus, the current state of research shows that sociocultural (primary) effects are minimised for apprenticeship (e.g., Seibert 2005). This fact is supported by research on the transition of students of lower socioeconomic backgrounds – mainly those with a migration background – from apprenticeship to work. It can be shown that these students are rather disadvantaged in terms of school and job performance and become victims of institutional discrimination by companies because of their specific background (e.g., Kalter 2006; Seibert 2011).

Overall, it can be assumed that effects of sociocultural background are particularly strong for early transitions in individuals' educational career (Mare 1981) and are cumulative across all transitions (Baumert, Watermann & Schümer 2003; Becker 2009, 2010; Hillmert 2005). Furthermore, there is empirical evidence that primary effects become weaker for transitions that take place later in the educational trajectory (Becker 2009; Blossfeld & Shavit 1993; Breen & Goldthorpe 1997) and that they are also minimised for apprenticeship.

However, as previously mentioned, none of the cited studies have examined economic competencies. The question, therefore, is whether there are primary effects on economic competencies and, if so, whether there are differences between the BS and FVBS school types.

6.3 Research questions

Following the theoretical framework and based on the state of research in the field, two research questions will be answered in this paper:

(1) Are there sociocultural effects on attendance in educational tracks (BS vs. FVBS) and profiles within these tracks (economic or commercial vs. other profiles)?
(2) Are there sociocultural effects on economic competencies after control of individual (e.g., gender) and contextual (e.g., educational track/profile) variables?

6.4 Method

6.4.1 Sample

Data from the SNF-Project OEKOMA are used for the analyses. OEKOMA is a cross-sectional study with a sample of 2,328 students from 150 classes from BS (N=1,277) and FVBS (N=1,051) in the German-speaking part of Switzerland. The students were surveyed by externally trained test administrators at the end of the 2010/2011 school year shortly before they received their degrees. Students in BS were stratified based on whether they took "economics and law" as major subject. Students in FVBS were stratified according to whether they had a commercial profile or non-commercial profile. A representative sample of 200 classes was drawn. The class-level return rate was 75%, and the student-level rate was approximately 64%. Analyses of dropouts showed that the non-participating classes did not differ from the participating classes regarding the criteria of interest (Schumann & Eberle 2014a).

Table 1: Descriptive sample statistics

educational track	profile	classes	students	gender		age	
		n	*n*	*female*	*male*	*M*	*SD*
Baccalaureate Schools	economics & law	42	666	280 (42%)	386 (58%)	18.6	0.9
	other	37	611	384 (63%)	227 (37%)	18.6	0.9
	total	79	1,277	664 (52%)	613 (48%)	18.6	0.9
Federal Vocational Baccalaureate Schools	commercial	35	525	307 (59%)	218 (41%)	19.6	2.3
	other	36	526	148 (28%)	378 (72%)	20.8	2.3
	total	71	1,051	455 (43%)	596 (57%)	20.2	2.3
total		*150*	*2,328*	*1,119 (48%)*	*1,209 (52%)*	*19.4*	*1.9*

Regarding gender, the typical Swiss distribution can be seen: male students dominate the "economics and law" profile of BS and the non-commercial profiles of FVBS, whereas this finding is reversed for the other two profiles. Regarding the sample as a whole, the gender distribution is nearly balanced. The students attending FVBS are more heterogeneous in terms of age and are older than the BS students.

6.4.2 *Instruments*

Achievement tests and one questionnaire were used to obtain information about the students' economic competencies and mathematics and reading comprehension abilities. The instruments for math and reading were developed within the EVAMAR II study (Eberle et al. 2008), which focused on students' aptitude for higher educational studies at the end of secondary education, whereas the test of the cognitive facet of economic competencies was newly developed for the purposes of OEKOMA. The test consists of 111 items that relate to economics, business administration and accounting and are mainly presented as multiple choice questions (5 items are open-ended questions). Modified newspaper articles were used to establish a proper context, and for each newspaper article, four to eight items were generated. The items were partly related to this introductory article, and a pool of 21 articles was developed. With an EAP/PV reliability of 0.75, the psychometric quality of the test can be described as sufficient (for more details, see Schumann & Eberle 2014a). Furthermore, the KFT 4-12R developed by Heller and Perleth (2000) was used to test students' cognitive ability as a control variable. Table 2 provides an overview of the test instruments.

Table 2: Instruments

Variable	Number of Items	Source
Economic Knowledge and Skills	111	Schumann & Eberle (2014a)
Cognitive Ability	45	KFT 4-12R (Heller & Perleth 2000)
Reading Comprehension	91	Eberle et al. (2008) / EVAMAR II
Mathematics	59	Eberle et al. (2008) / EVAMAR II

A questionnaire was used to gather data regarding migration and social backgrounds. The students were asked if they or one or both of their parents were born in Switzerland or abroad and which language was mainly spoken at home. Fathers' educational certificates were used as an indicator of a student's social background (family's educational background). The education of the mother and the father were taken into account and treated separately. Descriptive statistics will be presented according to the five different educational tracks (see next chapter).

6.4.3 *Procedures*

To answer the first research question, we will examine the extent to which there are differences in the distributions of the two educational tracks in

terms of migration status and the educational attainment of the fathers. Family educational background was categorised into five levels: 1) lower secondary (obligatory education), 2) upper secondary vocational, 3) upper secondary general, 4) tertiary B, 5) tertiary A (including doctoral degree). This categorisation does not represent any hierarchical order because theoretically, and especially in Switzerland, there is no reason to prioritise the general educational track over the vocational track or vice versa. In Switzerland, vocational education is highly respected (e.g., Hoeckel et al. 2009).

To construct an adequate migration index, it is necessary to distinguish between a *geographical migration* and a *linguistic migration* background. With regard to a geographical background, we followed the approach of Moser, Ramseier and Berweger (2002), who differentiated among five states of migration to describe an individual's geographical migration background. Table 3 provides an overview of the different geographical migration states. For linguistic migration background, it is necessary to distinguish the language spoken at home, which refers to whether the students speak with both parents, only one parent or with neither of their parents in the language of instruction. For the regression analyses, this variable was dichotomised; that is, a student was considered to have a linguistic migration background if he or she primarily spoke a language other than Swiss or German with at least one of his/her parents and/or friends.

Table 3: Geographical migration status

	student born in CH	*student born abroad*
mother born in CH/father born in CH	local	local
mother born in CH/father born abroad	cultural-mixed	cultural-mixed
mother born abroad/father born in CH	cultural-mixed	cultural-mixed
mother born abroad/father born abroad	2nd generation	1st generation

CH: Switzerland

The analyses will examine whether there are differences in students' reading comprehension, mathematics or economics abilities according to the previously described categories of educational and sociocultural backgrounds. To estimate abilities, weighted maximum likelihood estimators (WLE) were computed, z-transformed and then standardised[3] to allow comparisons. Because the distribution of the sample regarding the two educational tracks (BS and FVBS) is disproportionate to the distribution in the population, subsequent weighting of the data was necessary. All analyses in this paper take this weighting into account.

3 Standardised to a mean of 500 and standard deviation of 100.

6.5 Findings

6.5.1 Effects of educational tracks and profiles

Table 4 shows the descriptive findings separated by profile, aggregated for the two tracks (BS and FVBS) and for the total sample. As shown, the highest education of the fathers is not distributed equally among tracks and profiles, χ^2 (12, N = 2,328) = 41.55, $p < .01$. Although there is no difference between BS and FVBS students in terms of lower secondary education, there is a difference within the FVBS track, χ^2 (1, N = 912) = 5.12, $p < .05$. Regarding the percentage distribution, the fathers of students taking a commercial apprenticeship are 1.9 times[4] more likely to report lower secondary level as their highest education level compared to the fathers of students with a non-commercial education. Moreover, differences regarding the educational track of fathers of students graduating in BS versus FVBS are observed, χ^2 (1, N= 2.186) = 36.49, $p < .01$. Students of FVBS are more likely to have a father who graduated in the vocational track, whereas parents of BS students are more likely to have completed their education in the general track. Regarding the percentage distribution in the tertiary A level, a BS student is 1.4 times more likely to have a father who graduated there than an FVBS student, χ^2 (1, N = 2,186) = 21.41, $p < .01$. This finding is reversed for graduation in the tertiary B level, where fathers of FVBS students are overrepresented, χ^2 (1, N = 2,186) = 12.76, $p < .01$. Overall, these effects balance each other such that there is no difference in total graduation at the tertiary level.

Table 5 provides an overview of the distribution of the geographical migration status across the different profiles. Although there are no significant differences for the four states of migration, there are differences for the dichotomised variable of commercial and non-commercial FVBS, χ^2 (1, N = 912) = 5.58, $p < .05$. However, no unambiguous results are observed overall. Therefore, we further examined participants' linguistic migration backgrounds.

4 Calculation: 7.4 / 4.0 = 1.85. This value refers to the share of students and not the absolute number.

Table 4: Distribution of educational family background across tracks and profiles (in percent)

		lower sec.	upper sec. voc.	upper sec. gen.	tertiary B	tertiary A	voc. track	gen. track	upper sec.	tertiary
BS	economics & law	6.0	30.0	8.1	16.5	39.4	46.5	47.5	38.1	55.9
	other	6.5	38.8	7.0	13.3	34.4	52.1	41.4	45.8	47.7
	total BS	*6.3*	*34.2*	*7.6*	*14.9*	*37.0*	*49.1*	*44.6*	*41.8*	*51.9*
FVBS	commercial	7.4	40.6	5.7	19.2	27.0	59.8	32.7	46.3	46.2
	other	4.0	44.1	6.5	19.6	25.9	63.7	32.4	50.6	45.5
	total FVBS	*5.7*	*42.3*	*6.1*	*19.4*	*26.5*	*61.7*	*32.6*	*48.4*	*45.9*
	total sample	6.1	37.8	6.9	17.0	32.2	54.8	39.1	44.7	49.2

Abbr.: BS: Baccalaureate Schools; FVBS: Federal Vocational Baccalaureate Schools; sec.: secondary; voc.: vocational; gen.: general

The percentage of students with a linguistic migration background is only 13.8% compared to the 27.1% with a geographical migration background. Thus, many of the students with a geographical migration background speak German or Swiss in conversations with their family or friends. However, there some students do not, especially the non-commercial FVBS students, χ^2 (1, N = 2,328) = 9.62, $p < .01$. In this group, 90.3% of the students speak their official language with both parents, whereas only approximately 84% of the students with other profiles do so. Accordingly, only 9.7% of non-commercial FVBS students have a linguistic migration background, which is only half the share of BS "economics and law" students (see Table 6).

Table 5: Distribution of geographical migration background across tracks and profiles (in percent)

		status of migration				geographical migration background	
		local	cultural mixed family	2nd-generation immigrant	1st-generation immigrant	no	yes
BS	economics & law	69.5	14.8	11.5	4.1	69.5	30.5
	other	72.4	15.3	8.6	3.8	72.4	27.6
	total BS	*72.0*	*15.2*	*9.0*	*3.8*	*72.0*	*28.0*
FVBS	commercial	69.9	17.1	8.5	4.5	69.9	30.1
	non-commercial	77.4	14.4	5.4	2.9	77.4	22.6
	total FVBS	*74.3*	*15.5*	*6.7*	*3.6*	*74.3*	*25.7*
	total sample	72.9	15.3	8.1	3.7	72.9	27.1

Abbr.: BS: Baccalaureate Schools; FVBS: Federal Vocational Baccalaureate Schools

Table 6: Distribution of linguistic migration background across tracks and profiles (in percent)

		parents speak Swiss/German			linguistic migration background	
		both	one	none	no	yes
BS	economics & law	83.4	8.1	8.5	82.9	17.1
	other	85.8	7.0	7.2	85.1	14.9
	total BS	*85.5*	*7.1*	*7.4*	*84.8*	*15.2*
FVBS	commercial	86.3	8.0	5.8	85.9	14.1
	other	91.4	3.9	4.7	90.3	9.7
	total FVBS	*89.3*	*5.6*	*5.2*	*88.4*	*11.6*
	total sample	87.0	6.5	6.5	86.2	13.8

Abbr.: BS: Baccalaureate Schools; FVBS: Federal Vocational Baccalaureate Schools

Overall, the data show sociocultural background had a particular effect among non-commercial FVBS students. There are fewer students whose fathers' highest educational achievement was at the lower secondary level and fewer students with a linguistic migration background. Regarding the latter, the share of BS students is higher than that of FVBS students, χ^2 (1, $N = 2{,}328$) = 6.34, $p < .05$. Next, we will describe the way in which the groups differ in their economics (economic knowledge and skills), reading comprehension and mathematics achievement.

6.5.2 Effects on test performances

For the first analysis, the father's highest education level was again used as an indicator of social background. The analysis was conducted on the entire sample rather than separately for each profile. We used this approach because differences between the groups, independent of profile, are of greater interest. All results are displayed in Table 7.

An examination of the effect of social background on student performance reveals some unexpected results. For example, students whose fathers graduated at the lower secondary level have the highest average scores on reading comprehension (together with upper secondary education) and are the most homogeneous group. Students with a father at the tertiary B level receive the lowest average reading comprehension scores. However, the greatest difference is only approximately 7 points (one-sixth of a standard deviation) and is not statistically significant[5]. For the average scores in mathematics and economics, opposite results are found. In regard to mathematics, students with a father who graduated at the tertiary A level perform well, and students with a father who graduated at the tertiary B level show

5 ANOVA was used for significant testing.

the same math performance as students with a family background at the lower secondary level. This finding reverses, however, when we examine test performance in economics. In both cases, the large differences between students with a father who graduated from a tertiary track are striking. Specifically, in one case, students with a family background of the general tertiary A track perform significantly better (in mathematics, $p < .05$), and in the other case, students with a family background of the vocational tertiary B track perform better (in economics, $p < .01$).

With regard to migration background, a heterogeneous picture can also be observed. In regard to reading comprehension and mathematics, first-generation immigrants show the lowest test achievement. However, they perform proportionally well in economics, while the second-generation immigrants perform worse. These differences are significant only for second-generation immigrants ($p < .01$), and they are particularly affected by the second-generation immigrants' low test performance. Local students achieve the best results on all three domain-specific tests.

Table 7: Test performances in reading comprehension, mathematics and economics by sociocultural background

	Reading Comprehension		Mathematics		Economics	
Highest education of the father	*M*	*SD*	*M*	*SD*	*M*	*SD*
lower secondary level	515	92.8	496	83.1	472	97.0
upper secondary level voc.	515	112.3	512	109.7	489	94.5
upper secondary level gen.	504	97.0	509	102.3	471	101.1
tertiary B	498	97.2	498	100.7	494	103.4
tertiary A	504	115.1	522	114.9	474	111.5
Migration status						
1st-generation immigrant	485	91.6	497	81.4	482	89.2
2nd-generation immigrant	504	99.8	515	117.5	460	99.4
cultural mixed family	506	125.1	509	115.7	477	100.0
local	510	98.6	513	104.3	487	99.1
Parents speak Swiss/German						
none	481	127.7	517	112.8	466	108.4
one	516	118.2	495	100.6	469	102.0
both	510	94.4	513	105.6	485	100.1

Finally, we examined student test performance as a function of the parent's primary spoken language. Students who speak with both parents in a language other than Swiss or German have reading comprehension scores that are approximately 30 to 35 points (one-fourth of a standard devia-

tion, $p < .01$) lower than those who speak Swiss or German with at least one parent. We did not find this effect for mathematics. For economics, it appears more important for students to speak the official language with both parents ($p < .05$). However, for mathematics and economics, the differences are rather low relative to differences in reading comprehension.

With regard to the second research question, no unambiguous results for sociocultural background were obtained. The differences are rather small (nonsignificant) and unsystematic. Most significant results pertain to the language spoken at home as an indicator of migration background.

6.5.3 Multivariate analyses

To estimate the effects via multivariate analyses, we executed linear regressions. Regarding the influence of the highest parental graduation level on economic test performance, we dichotomised the variable of the highest educational degree of the parents to distinguish between two subgroups (subgroup 1: one or both of the parents have an academic degree (tertiary A) vs. subgroup 2: neither parent has an academic degree). With regard to the migration background, the "language-index" was used (speaking Swiss/German with both parents vs. speaking Swiss/German rarely with even one person or never speaking Swiss/German). These variables will be included in the linear regression in the next chapter to obtain evidence on variables that influence economic test performance and a clearer answer to the second research question. To eliminate effects of school type, the analyses were calculated separately for BS and FVBS.

Tables 8 and 9 display results by school type. First, for BS students, being part of an academic family does not have an effect on economic competencies. In contrast, we did observe an effect for migration background, although that effect is rather small. More importantly, there are differences in reading comprehension and mathematics and in students' cognitive ability. These factors explain 12% of the variance. While gender and profile represent two important variables, profile has the strongest effect. Overall, this model accounts for more than 21.2% of the variance.

The findings for FVBS are quite similar (see Table 9). Graduation of the parents and linguistic migration background have no effect on economic competencies and exhibit only a marginal influence on mathematics scores. The effect is nonsignificant in models 3 and 4 and only becomes significant in model 5, where profile was taken into account. Profile is the key factor concerning the differences in economic competencies and is more influential in FVBS analyses than in analyses for the BS students. Furthermore, reading comprehension test performance is important for FWBS students (as it is for BS students). In addition, gender has an effect, as male students perform better than females. Cognitive ability plays only a marginal role. Overall, model 5 explains 19.6% of the variance in economic test performance.

Table 8: Prediction of economic competence (Baccalaureate Schools, linear regression models)

	Model 1			Model 2			Model 3			Model 4			Model 5		
Included Variables	*B*	*SE(B)*	*β*	*B*	*SE(B)*	*β*	*B*	*SE(B)*	*β*	*B*	*SE(B)*	*β*	*B*	*SE(B)*	*β*
constant term	492.94	3.58	-	468.98	8.71	-	211.51	22.36	-	187.447	22.17	-	106.699	23.57	-
academic family (0 = no; 1 = yes)	-1.983	5.93	-0.010	0.278	5.81	0.001	1.658	5.51	0.008	0.040	5.43	0.000	-2.359	5.26	-0.011
linguistic migration (0 = yes; 1 = no)				27.421	9.24	0.097**	20.180	8.02	0.071*	20.683	7.798	0.073**	20.047	7.68	0.071*
reading compr.							0.196	0.03	0.190**	0.231	0.03	0.224**	0.248	0.03	0.240**
mathematics							0.107	0.03	0.108**	0.060	0.03	0.061	0.091	0.03	0.092**
CAT							0.191	0.04	0.180**	0.146	0.04	0.137**	0.137	0.03	0.129**
gender (0 = female; 1 = male)										38.558	5.57	0.195**	31.956	5.4603	0.161**
profile (0 = other; 1 = e&l)													61.431	7.32	0.310**
Observations			1.120			1.120			1.120			1.120			1.120
Adjusted R^2			0.000			0.010			0.127			0.163			0.212

Abbr.: e&l: economics & law; CAT: Cognitive Ability Test; B: regression coefficient; SE(B): standard Error of B; β: standardised regression coefficient

* $\rho < 0.05$; ** $\rho < 0.01$

Table 9: Prediction of economic competence (Federal Vocational Baccalaureate Schools, linear regression models)

	Model 1			Model 2			Model 3			Model 4			Model 5		
Included Variables	*B*	*SE(B)*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*B*	*B*	*SE*	*β*
constant term	483.97	5.06	-	475.41	13.89	-	282.38	32.56	-	248.388	34.82	-	-56.957	49.34	-
academic family (0 = no; 1 = yes)	-12.427	9.38	-0.061	-11.737	9.48	-0.057	-8.548	9.17	-0.042	-8.937	9.16	-0.044	-9.278	8.64	-0.045
linguistic migration (0 = yes; 1 = no)				9.375	14.08	0.033	1.773	13.62	0.006	4.238	13.656	0.015	7.203	12.71	0.025
reading compr.							0.258	0.05	0.253**	0.302	0.05	0.296**	0.248	0.05	0.243**
mathematics							0.023	0.05	0.024	-0.003	0.05	-0.003	0.145	0.05	0.155**
CAT							0.149	0.05	0.140**	0.110	0.05	0.103*	0.090	0.05	0.084*
gender (0 = female; 1 = male)										25.422	9.47	0.129**	35.609	9.0178	0.180**
profile (0 = other; 1 = comm.)													78.093	9.42	0.341**
Observations			558			558			558			558			558
Adjusted R^2			0.002			0.001			0.087			0.097			0.196

Abbr.: comm.: commercial; CAT: Cognitive Ability Test; B: regression coefficient; SE(B): standard Error of B; β: standardised regression coefficient

* $\rho < 0.05$; ** $\rho < 0.01$

Thus, for the second research question, we can conclusively state that the highest education of the parents does not play a significant role when examining students' economic competencies. Linguistic migration only has an effect on BS students, but this effect is small and accounts for only approximately 1.0% of the variance. Therefore, neither variable is (very) important for explaining economic competencies. The effects of test performance in the other domains (mathematics, reading comprehension), cognitive ability, gender and the profile effect are much more important.

6.6 Summary and Discussion

This paper examined the extent to which there are sociocultural effects on students' attendance in educational tracks and profiles and economic competencies at the end of upper secondary education in the German-speaking part of Switzerland. In this chapter, our results are summarised and discussed.

6.6.1 Main findings

Results from linear regressions show that for both types of schools, the school profile has the strongest effect on economic competencies. Regarding the effects of sociocultural background on FVBS students, no effects are observed even when other abilities such as reading comprehension and mathematics are controlled. For BS students, there is a marginal effect of linguistic migration background, which is only partly explained by reading comprehension. The educational family background does not play a role. We can conclude, then, that there are no or only small primary effects on economic competencies at the end of upper secondary education. One potential explanation for this finding pertains to the upstream secondary effects (Becker 2010; Ramseier & Brühwiler 2003; SKBF 2011; Zutavern et al. 2002) that contributed to a highly selective sample in this study. Therefore, the educational system already functioned as a 'sorting machine'. Furthermore, the so-called 'scissors effect' appears such that from the point of transition, the differences in student achievement between different school types (tracks) are often even larger (Alexander & McDill 1976; Ansalone 2010; Hallinan 1988; Hanushek & Wößmann 2006; Kalogrides & Loeb 2013; Maaz, Baumert & Trautwein 2009; Oakes 1985; Ramseier & Brühwiler 2003). The strong stratification of the Swiss educational system supports these effects (Buchmann et al. 2007; Griga & Hadjar 2013; Pfeffer 2008); these findings are also consistent with findings for upper secondary education in Germany (Watermann, Nagy & Köller 2004) and other countries (e.g., Pfeffer 2008).

In line with our results, Ramseier and Brühwiler (2003) showed that at the end of lower secondary education, geographical and linguistic migration backgrounds do not affect the likelihood of attending BS or FVBS when controlling for cognitive abilities, social background and reading comprehension. The sample therefore consisted of "special" immigrants who made it to the end of upper secondary education (Blossfeld & Shavit 1993). When examining the regression analyses, it is also important to bear in mind that approximately 87% of the sample does not have a linguistic migration background, which also partly explains the weak effects in the regression analysis. The highly selective sample of FVBS students can also be partially explained by selection procedures at the beginning of apprenticeship because prejudice exists against young adults from educationally disadvantaged environments, especially when they have a migration background (Lehmann, Ivanov et al. 2013; Lehmann, Seeber et al. 2013; Solga & Menze 2013). Students with a migration background are consistently the least likely to start vocational training, even after controlling for educational achievement and socioeconomic background (e.g., BIBB 2011, 2012, 2013; Diehl et al. 2009; Solga & Menze 2013).

However, students with a migration background perform slightly worse in reading comprehension and economics. Reading comprehension, as a domain-independent key competence (OECD 2001), plays a special role, which is also clear from the results of the regression analyses. In this study, reading comprehension has the second strongest influence on economic competencies for both school types.

In contrast to social and migration backgrounds, gender has an impact, as male students in both schools types outperform their female counterparts. This result is consistent with previous data (Schumann & Eberle 2014b) and is a common finding when testing for (facets of) economic knowledge and skills (e.g., Jähnig 2013; Schmidt et al. 2015; Zlatkin-Troitschanskaia et al. 2013), although some studies have barely detected or not detected this effect (e.g., Williams, Waldauer & Duggal 1992). Several explanations have been put forth for the observed gender effect, including cultural reasons (Fann & Tsai 2010; Förster et al. 2015), test standardisation factors (e.g., multiple choice vs. open-ended questions) (e.g., Ben-Shakar & Sinai 1991), male students' stronger affinity towards economic themes (e.g., Williams, Waldauer & Duggal 1992) and structural characteristics of the (Swiss) educational and occupational systems (Buchmann et al. 2007). Because gender differences are not the focus of this article, these reasons will not be discussed in detailed here.

An examination of the economics and mathematics test scores shows differential effects concerning the educational background of the family. Students with a family educational background in the general track perform better in mathematics. However, they perform worse in economics, with

students with a background in the vocational track exhibiting better achievement.
Overall, we found no extensive differences in student characteristics between the two types of schools. Only non-commercial FVBS stand out, where the share of students with low social and migration background is small. Moreover, we observed effects for family educational background. Specifically, students of families with a vocational educational background are more likely to attend FVBS and, therefore, maintain their educational track. The same holds for BS students regarding the general track. Both findings support some type of intergenerational tracking between vocational and general education (see also Buchmann et al. 2007 for higher education in Switzerland). However, the present study does not indicate that sociocultural background is important for the prediction of the examined population's economic competencies.

6.6.2 Limitations and further research

One limitation of the study is the operationalisation of the background variables. The educational background of the father was used as an indicator of the family's social status. Of course, there are many other important factors that could provide more insight into the social family background, such as parents' vocational status, family income and cultural capital. All these factors are combined in the *International Socio-Economic Index of Occupational Status (ISEI)* (Ganzeboom, de Graf, Treiman & de Leeuw 1992), which is typically used to operationalise social background and should be used in further studies that link background effects to (economic) competencies. However, it must be noted that many empirical findings have indicated that among all background characteristics, family educational background is one of the most important factor(s) in individuals' educational attainment (Buchmann & Sacchi 1998; Pfeffer 2008). A second study limitation is that our data did not fully address Boudon's (1974) model because there was no consideration of variables pertaining to educational decision making. Thus, statements about primary effects were possible but conclusions about secondary effects were not. The operationalisation of these variables would have been necessary to make conclusions about such effects.

Regarding migration background, it would be helpful to know the concrete origin country of the students because immigrants of different parts of the world (Asia, Southern Europe, European Union, etc.) are characterised by varying performances (Angelone & Keller 2014; Kao & Thompson 2003; Lehmann, Ivanov et al. 2013). Additional information that was not considered in this analysis is the duration that immigrants had already lived in Switzerland. As previously mentioned, this factor could explain some variance in students' competencies (SKBF 2011) and should be considered in future

studies. Furthermore, because we only examined primary effects, future studies should more explicitly address the role of secondary effects.
A main limitation is the study's cross-sectional design and especially the fact that the study was conducted shortly before the students graduated. A suggestion for future research is the use of a longitudinal design that surveys students at the beginning of upper secondary education and again one or two years later and that considers variables regarding educational decisions. It would then be possible to observe the 'scissor-effect' and the characteristics of students who drop out before reaching the end of their upper secondary education.

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