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# Work or university? Economic competencies and educational aspirations of trainees with hybrid qualifications in Switzerland

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## Abstract

**Background:** The Federal Vocational Baccalaureate constitutes the major link between the academic and vocational tracks in the Swiss educational system. Statistics show that only 20 % of a cohort move immediately to an academic track after graduation. Regarding the effects of economic competencies on these transitions, there is a substantial lack within the current state of research. This study thus aims to elucidate these effects by following a prevailing explorative approach.

**Methods:** A cross-sectional design is used, and the data are based on a representative sample of N = 1.051 Federal Vocational Baccalaureate students of the German-speaking part of Switzerland. Data were gathered at the end of the school year 2010/2011 via an achievement test and a questionnaire.

**Results:** Results show positive interrelations for economic knowledge and skills, value-oriented dispositions as well as attitude towards economics on the one side and educational aspirations on the other side. Thus, interrelations regarding the intention to study in economics or a related field are stronger than for other fields.

**Conclusion:** The study offers new insights on the effects of economic competencies and supports the assumption that economic competencies are part of prerequisites of students' educational aspirations and in the long run for social participation.

**Keywords:** Transitions, Economic competencies, Vocational education, Tertiary education

## Introduction

The transition from secondary to tertiary level represents an important juncture in the lives of many students, as it requires them to make momentous decisions for their future (e.g., Bornkessel and Asdonk 2011; Asdonk et al. 2013; Parker et al. 2004; Dias and Sa 2012; Nel et al. 2009). In the educational systems in, e.g., Switzerland or Germany, students are often asked to choose between an academic and a vocational track at the end of the upper secondary level. Because Federal Vocational Baccalaureate (FVB) graduates in Switzerland can choose both an academic and a vocational track, these students face an especially complex situation, and problems with these transitions in such systems can be

observed from the relatively high drop-out rates, dissatisfaction with one's educational circumstances, inadequate performance and other effects (e.g., SCCRE 2014; Bornkessel and Asdonk 2011; Lowe and Cook 2003). Against this background, matching students' individual competencies with the domain-related requirements at a university or place of work becomes the main aim for these highly stratified educational (or vocational) systems (Orr 2013). When focussing on the educational or vocational decisions of students at the upper secondary level, it becomes clear that among other factors, domain-related abilities play a significant role (e.g., Aeschlimann et al. 2015; Denzler 2013; Trapmann 2008; Köller et al. 2004; Hayden and Carpenter 1990). However, many studies use (high) school grades instead of test scores to measure these abilities and predict academic or vocational success (e.g., Wilson 2012; Bornkessel and Asdonk 2011; Schumann 2011). Further, there is almost no empirical evidence with regard to the interrelation between students' economic competencies and their educational aspirations. This lack of evidence is surprising, especially because empirical findings indicate that economic knowledge and skills are highly relevant competencies within different courses of study in higher education (Oepke and Eberle 2014) and because of the popularity of economic (or similar) fields of study as well as commercial apprenticeships in Switzerland (Swiss FSO 2013a).

Against this outlined background, the present study aims to determine whether FVB students prefer an academic or vocational track and how economic competencies and other characteristics influence these preferences; differences amongst the economic competencies of FVB students with different educational aspirations are of particular interest. Therefore, a representative sample (see, e.g., Schumann and Eberle 2014; Schumann et al. 2013; Angelone and Berger 2011) of FVB students in the last year of apprenticeship from the German-speaking part of Switzerland will be analysed with regard to their economic competencies and educational aspirations. As the current state of research is rather rudimentary and just little empirical evidence of the predictive validity of economic competencies regarding educational aspirations exists, we are following an explorative approach.

## Background

### The Federal Vocational Baccalaureate—hybrid qualification within the Swiss Educational System

For an international comparison, the Swiss educational system is characterised by a historical divide between the academic and vocational tracks. The academic track usually leads to university entrance and typically requires the certification of a general Baccalaureate School (BS).[1] The "pure" academic track via a BS is rather small, with approximately 20 % of individuals pursuing this track. This rate has been more or less stable over the past 20 years (FSO 2015a; Eberle and Brüggenbrock 2013). In contrast, the vocational track is geared towards professions within employment systems, and it is characterised by the dominance of so-called dual apprenticeships, which involve a combination of company- and school-based training (Maurer and Gonon 2013; SERI 2014).

[1] BS represent the counterpart to grammar schools within other educational systems, e.g., the German system.

Until the 1990s, there was de facto almost no permeability between the academic and vocational tracks. However, with the Universities of Applied Sciences (UASs) and FVB schools, new elements of tertiary and upper secondary education were established in the 1990s. Both of these institutions can be interpreted as signs of "academisation" within Swiss society (Gonon 2013).

The FVB combines a vocational apprenticeship with general education. An FVB can be obtained either in parallel to a three- to four-year apprenticeship (integrated model) or subsequent to a three- to four-year apprenticeship (consecutive model, e.g., Gonon 1994, 1997), and FVB graduates have the opportunity to study at a UAS. An FVB is thus a typical form of a hybrid qualification (Deissinger et al. 2013). However, FVB graduates usually have permission to study only in their professional field. Thus, six different school profiles exist: technical, commercial, artistic, industrial (trade), health related and social or natural science. Under the FVB regulation in October 2013, these profiles were substituted by basic, major and supplementary subjects (Swiss Federal Council 2013).

The popularity of the FVB has grown constantly since its foundation (e.g., Pfister and Sartore 2015). Almost 15 % of a cohort obtains an FVB. Approximately 50 % of that FVB cohort pursues the commercial school profile (FSO 2015a; Gonon 2013). Furthermore, notably, lessons in economics/business/accounting are obligatory for all FVB students; however, FVB students with the commercial profile are required to attend a greater number of lessons within this domain.

After graduation, approximately 60 % of FVB students move to an UAS (FSO 2013a), where approximately 20 % of students move immediately after graduation, and 40 % transition 1 or 2 years after graduation (ibid.). Hence, transitions from school to UAS are often "delayed".[2]

#### Educational aspirations and decisions

Research aiming to analyse and explain individuals' educational aspirations and decisions has a long tradition in various disciplines, and sociological and (socio-)psychological approaches can be considered the "major drivers" within this field (Maaz et al. 2006; Trebbels 2015). Whereas sociological models (e.g., the Wisconsin model; Sewell et al. 1969, 1970) are mainly focussed on the causes and consequences of educational inequality, (socio-)psychological models (e.g., different rational-choice theories) are focussed on cognitive processes and the consequences of students' decisions. So far, there has been no common definition of educational aspirations. Instead, other terms such as plans, expectations, decisions or preferences, are also commonly used (Lent et al. 1994; Rojewski 2005; Trebbels 2015). Therefore, there is often no clear differentiation amongst educational aspirations and these terms, and explanatory variables are frequently used equally (Becker 2010; Stocké 2009a, b; Trebbels 2015). The main difference amongst those terms can be observed in the "degree of specificity and proximity to the choice implementation" (Trebbels 2015, p. 37). Regardless of these different views and definitions, a common ground can be observed within the description of the educational goals that students set for themselves (ibid.).

[2] For BS students, transitions from school to university are very different. More than 90 % of all BS students of a cohort move into a tertiary system within 2 years after graduation (FSO 2013b).

One of the most popular models is the micro-sociological approach of Boudon (1974). Within this model, three aspects mainly explain educational aspirations (Maaz et al. 2006; Waterman and Maaz 2006): school performance, selective mechanisms of the educational system (regulations of transitions) and family decision making. With regard to educational aspirations, Boudon (1974) differentiate between primary and secondary effects of social background (for more information see, e.g., Maaz et al. 2006). A famous psychological approach is the theory of planned behaviour (Ajzen 1991). This theory also suggests that three different aspects explain educational aspirations: attitude (towards a behaviour), subjective norms and perceived behavioural control. In addition, other theories and models have been proposed.[3] Therefore, some other aspects to explain educational aspirations can be identified, such as the educational aspirations of significant others (e.g., Blau-Duncan model by 1967 or the Wisconsin model by Sewell et al. 1969, 1970), costs and benefits of an educational alternative (e.g., Boudon 1974; Erikson and Jonsson 1996), values and expectations of different educational alternatives (e.g., Atkinson 1957; Eccles et al. 1983; Esser 1999) or cultural constraints (e.g., Stocké 2013, Trebbels 2015). Maaz et al. (2006) recommend linking both sociological and (socio-)psychological theories and models and using combined solutions. Therefore, in the present study, we consider both sociological and psychological aspects. So far, no theoretical model that includes all the named aspects and its interrelations to explain educational aspirations exists. Within this study, we do not focus on a certain model mentioned above, but rather include the relevant aspects of different theories to sufficiently control the interrelation of economic competencies.

Most of the studies in this field focus the transitions from primary to lower secondary and from lower secondary to upper secondary school. Notably, social background is mainly reported to effect such transitions (e.g., Buchmann et al. 2007; Neuenschwander 2012; Becker 2013; Kost 2013; Gomensoro and Bolzman 2015) but to hardly influence the transition from the upper secondary to tertiary level (e.g., Denzler 2013). An explanation for this pattern of effects is that in highly stratified educational systems, such as in Switzerland or Germany, transitions from the upper secondary to tertiary level are mainly influenced by school performance, interest and motivation but only slightly by social background (ibid.). Moreover, within these systems, students are tracked very early (Neuenschwander 2012; Shavit and Müller 2000), e.g., at the primary or secondary level.

Shavit and Müller (2000) also emphasise the importance of the structure of different educational systems, which might also influence educational decisions, e.g., because of a gap in occupational prestige between the vocational and academic tracks. In addition, the effects of school profile (or school type) play an important role. For Switzerland, considerable differences with regard to (school) performance, social background and study aspirations between the BS and FVB students are reported (Schumann 2011; Schumann and Eberle 2014; Schumann and Jüttler 2015; Jüttler and Schumann 2016). Furthermore, Oepke and Eberle (2014) report that the school profile fosters domain-related competencies, which again led to a successful transition from school to university.

[3] Additional popular models are value-expectancy theories (e.g., Breen and Goldthrope 1997; Erikson and Jonsson 1996; Esser 1999). According to such theories, educational decisions basically depend on the (subjective) value of a certain alternative and the (subjective) expectation of achieving success after choosing this path. These types of models also exist within psychology, such as the expectancy-value theory of Eccles et al. (1983).

Only few empirical studies on educational aspirations, especially those of FVB students, exist. Pfister and Sartore (2015) report different effects for parents' educational aspirations, where systematic interrelations can be found for students who have chosen an academic or vocational track but not for students who have chosen a "mixed" track, like FVB students. The importance of parents' education and educational aspirations (or rather aspirations of significant others) and their expectations has also been noted in other studies (e.g., Sewell and Shah 1968a, b; Sewell et al. 1969; Mau and Bikos 2000; Stamm 2005; Dustman 2004; Neuenschwander and Malti 2009; Rockwell 2011; Schmid and Gonon 2011a, b; Trebbels 2015). In addition, Schmid and Gonon (2011a, b) provide further results, finding school performance (i.e., reading literacy), gender and educational background (at the lower secondary level) as good predictors. Therefore, students who score higher in reading comprehension, students who are male and students who visited a school with extended requirements (instead of a school with basic requirements)[4] at the lower secondary level are more likely to choose the academic track. Overall, female students have a higher participation rate than male students within the academic track (e.g., Neuenschwander 2012; Neuenschwander and Malti 2009). For male students, Schmid and Gonon (2011a, b) assume that more of these use the vocational track before entering the academic track. In contrast, different language regions (e.g., the German-speaking part of Switzerland), status at the first year after finishing lower secondary school (certified apprenticeship vs. no apprenticeship vs. transition options), the parents' educational background and migration background do not show any predictive validity (ibid.).

Focussing on school (or academic) performance, substantial effects on educational aspirations have been reported (e.g., Mau 1995; Mau and Bikos 2000; Waterman and Maaz 2006, Maaz et al. 2006; Schmid and Gonon 2011a, b; Trebbels 2015), and mediating effects of different structural variables have also been reported (e.g., Mau and Bikos 2000; Trebbels 2015). These mediating effects are described within the Blau-Duncan model (1967) and the Wisconsin model (Sewell et al. 1969).

Finally, using the rational-choice models by Esser (1999) and Breen and Goldthrope (1997), Becker and Hecken (2007, 2009) also find that social disparities with regard to expected academic success, maintenance of socio-economic status and subjective perceptions of the educational costs are very important for explaining educational decisions (academic vs. vocational track). In their study, they find inequalities in educational opportunities regarding higher education for high school graduates in Germany (Becker and Hecken 2009, p. 25). Similar results can be observed in other studies (e.g., Stocké 2007).

#### Economic competencies in upper secondary education

To gain a better understanding of economic competencies, both modelling and measuring will be discussed. Historically, the origin of modelling and measuring economic competencies can be observed in the US in the report "Economic Education in School" (Committee for Economic Development 1961). Subsequently, a large number of different

[4] For further information on lower secondary schools with basic and extended requirements, see, e.g., FSO (2015b).

definitions and (test) instruments have followed to explain and measure economic competencies. Definitions then changed from a more rudimentary and instrumental understanding of the basic content (e.g., how to foot a bill?) towards a more basic economical understanding, which includes a basal understanding of marketing principles, economic systems, shortage of goods, factors of production, incentive systems, economical trade-offs, and other factors (Soper and Walstad 1987; see Kotte and Witt 1995).

Today, many different views on economic competencies exist. These different approaches often differ in terms of the included dimensions of competence. Thereby, cognitive and non-cognitive dimensions can be separated from each other. Whereas cognitive dimensions mostly focus on knowledge and skills within a certain domain (or also on intelligence in general), non-cognitive dimensions include stronger emotional or affective aspects such as motivational orientation (e.g., Winther 2010; Hartig and Klieme 2006; Klieme 2004), but also aspects such as self-efficiency, self-esteem or other "soft skills" (e.g., Weinert 2001a; Heckman et al. 2006; Kautz et al. 2014). With regard to the relevant content, researchers often focus only on a cognitive dimension, e.g., economic knowledge and skills (such as in many US studies). Because economic competencies include more than knowledge in one content area, these approaches are often criticised (see Seeber et al. 2015; Schumann et al. 2011; Tramm and Seeber 2006; Beck 1989). Uncoupled from the definition of economic competencies, Weinert (2001a, b) provides a general definition of competencies that also includes non-cognitive dimensions (apart from knowledge, skills and understanding). In addition to this general definition, Beck (1989), for example, developed a three-dimensional model that includes the cognitive dimension "Economic knowledge and skills", as well as two non-cognitive dimensions: attitude towards economics and the ability to morally reflect on economic decisions. On the basis of these considerations, Schumann and Eberle (2014) developed a model that includes economics, accounting and business and administration, as three separate content areas to represent the cognitive dimension (see, e.g., Schumann et al. 2013). In addition, the non-cognitive dimensions are included, which leads to a multidimensional understanding of economic competencies. Here, the non-cognitive dimensions are attitude towards economics, value-oriented disposition, interest in economics and intrinsic motivation to solve economic problems. These considerations also form the conceptual basis for the definition of economic competencies in the present study.

Schumann and Eberle (2014) provide data on a representative sample of students of the German-speaking part of Switzerland. In their study, they measured the economic competencies of Swiss high school students who were about to gain their (Federal Vocational) Baccalaureate using an internally developed instrument. Their results reveal strong profile effects: FVB students who belong to the commercial school profile (or BS students with "Economics and Law" as their major subject) perform significantly better on the test. Furthermore, male students (regardless of the school profile or the major subject) perform better than female students. In addition to economic competencies, they measured knowledge and skills in mathematics, reading comprehension and cognitive abilities, which are all positively interrelated with economic knowledge and skills. In addition, other German studies provide results regarding the measurement of economic competencies (e.g., Brandlmaier et al. 2006; Freundlinger 1992; Katschnig and Hanisch 2005; Nagy et al. 2008; Schlegel 2009 or Seeber 2009).

### State of research on the interrelation between economic competencies and educational aspirations

Most studies on the (long-term) effects of economic competencies have focussed on their importance with respect to general education (e.g., Eberle 2006; Wuttke 2008; Eberle 2015), social and financial participation within modern society (e.g., Retzmann et al. 2010; Eberle 2015; Cole and Shastry 2008, 2009) or performance within commercial apprenticeships (e.g., Winther 2010). However, only a few of these studies empirically analysed these effects and most of these refer to the US educational system. Here, positive interrelations between economic competencies and the aspiration to study (at a college) were found (e.g., Sedai 1998; Davis et al. 2006; Mandell 2008). One problem with the results from US studies lies in the transferability to the Swiss or comparable education systems. Especially with respect to transitions from the secondary to tertiary level, appropriate studies must be considered. Here, almost no studies exist. Oepke and Eberle (2014) show that former BS students attribute high importance to the elective subject "Economics and Law" with regard to its usefulness for their studies in Swiss universities. Among the 15 subjects, it is ranked in the fourth place, directly after mathematics, German and English and directly before biology and physics. The assumption is that students with more previous knowledge of economics (e.g., owing to a commercial apprenticeship or another previous education in this field) have advantages when they study, e.g., economics, business administration or another related field of study, as verified in other studies (e.g., Förster et al. 2015; Zlatkin-Troitschanskaia et al. 2013; Beck and Wuttke 2004; Jähnig 2014). Schumann and Jüttler (2015) analyse the aspiration to study economics, business administration or another related field of study and find that students with higher economic competencies are more likely to wish to study in one of these fields. Attitude towards economics is noted as the primary factor, but also school profile and gender play a role, as male students are more likely to wish to study in this field (conditioned on their academic achievement). Comparing FVB students and BS students, Schumann and Jüttler (2015) find some significant differences. First, knowledge and skills in economics play a notably important role for BS students with regard to their aspiration to study economics, business administration, or other related fields. Furthermore, the effects of migration background could be found only for BS students. Especially for FVB students, school profile is an important predictor, as FVB students gain only a domain-related qualification. Therefore, the effect of school profile is much stronger for FVB students than for BS students.

Overall, the current state of research with regard to the (long-term) effects of economic competencies can be described as rudimentary. Although a remarkable number of national and international studies have focussed on the value and partially on the effects of economic competencies (e.g., Walstad et al. 2010; Förster et al. 2015; Helm 2015; etc.), most of these studies cannot explain the (long-term) effects, such as educational transition and educational success. In US studies, the main focus lies in the effects of a financial education on financially appropriate behaviour in later life (such as savings, wages, investments, retirement readiness, wealth, and financial market participation; see, e.g., Lusardi and Mitchell 2009; Behrmann et al. 2010; Cole and Shastry 2008, 2009), but other behaviours, such as educational or vocational decisions, are largely neglected. Nevertheless, currently, better knowledge and better skills in economics can be assumed

to lead to a better fit between an individual's personal abilities and the requirements for studying economics or another related course of study. In addition, notably, empirical evidence suggests that economic competencies constitute a basic competency for the ability to study (e.g., Oepke and Eberle 2014). For this reason, economic competencies can be assumed to positively affect the decision to study and, therefore, educational aspirations in general, not merely those for a studying in economics or a related field of study.

So far, almost no empirical studies have explained the interrelations of the different dimensions of economic competencies and study aspirations. Schumann and Jüttler (2015) report that economic knowledge and skills and the attitude towards economics are good predictors of the aspiration to study economics, business, accounting or another related subject, although the attitude towards economics exhibits a higher predictive validity.

Against this outlined background, the interrelations between economic competencies and the educational aspirations of Swiss FVB students will be reported in more detail. In addition, we will also control for the following relevant variables: gender, migration background, academic background, school profile, FVB type and school grades.

There are also approaches where economic competencies play a fundamental role for social participation (Eberle and Schumann 2011; Dubs 2001, 2011). Against this background, students with higher economic competencies might also be more likely to wish to have a higher education and a responsible position within the society. Moreover, studies show that these students act more responsible regarding their future planning, e.g., finances and investment of personal resources (e.g., Davis et al. 2006; Mandell 2008; Mandell and Klein 2009; Navickas et al. 2014). This increases their personal expectations of being successful and therefore they might be more likely to wish to choose a higher educational track than students with lower economic competencies. Especially the study of Davis et al. (2006) identified financial literacy as an important factor which positively interrelates with intentions to follow higher educational tracks in general and not only within a certain domain such as economics or a related subject.

### Research question

Against the outlined background in the last chapters, the aim of the study is to gain more insight into how economic competencies interrelate with educational aspirations in general—not only within a certain domain (like economics or a related field). Because the research in this field is rather rudimentary, we follow an explorative approach. Keeping this in mind, the research question of the study is how FVB students' economic competencies interrelate with their educational aspirations.

## Methods

### Design

The following analyses are based on data from the cross-sectional SNSF-Study "Economic Competencies of Students at Matura Level" (OEKOMA; Schumann and Eberle 2014).[5] This study was conducted in the German-speaking part of Switzerland in sum-

[5] Project number: 130301, Duration: 01.05.2010–31.07.2012, Swiss National Science Foundation (SNSF).

mer 2011. The main aim of the study was to test the economic competencies of Swiss students from BS and FVB schools in their last school year, shortly before they gained their (Federal Vocational) Baccalaureate. Amongst others, the students were asked about their educational aspirations.

### Sample

The first step for the sampling procedure was to designate the basic population. The population was built from all the school classes of FVB students in the German-speaking part of Switzerland who were about to obtain their final certificate in summer 2011 (417 classes in total; Angelone and Berger 2011). From this population, 100 school classes were drawn randomly and subdivided into the following two explicit strata: (1) FVB students who belong to a commercial profile and (2) FVB students who belong to another vocational profile (ibid.). Within the sample both FVB students who followed the integrated model and FVB students who followed the consecutive model were considered. In addition to these explicit strata, there were also implicit strata that were built according to gender, canton and class size.

Altogether, 1051 students from 71 classes participated in the study, which corresponds to a participation rate of approximately 71 % (with respect to the school classes) and 58 % (with respect to the students). Considering the explicit strata, the classes that dropped out of the study did not differ systematically from the classes that participated (e.g., Schumann et al. 2013). The total participation of students for each class varied strongly between 4 and 22 students per class.

Table 1 provides an overview of the sample by differentiating between the two explicit strata (rows) on the one hand and number of classes, number of students, gender and age on the other hand (columns).

Altogether, approximately 50 % of the students belong to the commercial school profile. Such a distribution can also be found within the population (FSO 2014). With regard to gender and age, the distribution is also similar to the distribution in the population and, therefore, is represented adequately. Besides, approximately 53 % of all FVB students in the sample belong to the integrated model, whereby about 47 % belong to the parallel model.

**Table 1 Characteristics of the sample**

| | School classes | Students | Gender | | Age | |
|---|---|---|---|---|---|---|
| | *n* | *n* | Female | Male | MV | SD |
| Commercial profile | 35 | 525 | 307 (59 %) | 218 (41 %) | 19.6 | 2.3 |
| Other profiles | 36 | 526 | 148 (28 %) | 378 (72 %) | 20.8 | 2.3 |
| Total | 71 | 1051 | 455 (43 %) | 596 (57 %) | 20.2 | 2.3 |

*MV* mean value, *SD* standard deviation

### Instrument

The instrument comprises an achievement test that measure economic knowledge and skills in addition to a questionnaire to gather data on further variables. Table 2 shows the instrument that was used to measure economic competencies.

The following sections will describe the instrument that was used in more detail.

#### *Economic knowledge and skills*

Because the OEKOMA-study is based on a multidimensional understanding of economic competencies, different instruments were used to measure this variable (see Table 2). To measure the cognitive dimension of economic competencies (knowledge and skills), an internally developed test was used. This test comprises 111 items from three different fields: economics, business administration and accounting. In this study, economic knowledge and skills were scaled on one dimension with sufficient reliability (EAP/PV = 0.75; see Table 2). To gain more information about the construction and implementation of the test instrument, see Schumann and Eberle (2014), Schumann and Eberle (2011), Schumann et al. (2011) and Schumann et al. (2010).

#### *Non-cognitive dimensions of economic competence*

To measure the non-cognitive dimensions of economic competencies (interest, intrinsic motivation, value-oriented disposition and attitude), a questionnaire was used. The instrument used to measure interest in and intrinsic motivation for solving economic problems was based on the considerations of Prenzel et al. (1996) and was adapted to the economic school subject of the FVB students in Switzerland, with sufficient reliability (interest: three items, Cronbach's alpha = 0.77; intrinsic motivation: four items, Cronbach's alpha = 0.82; see Eberle et al. 2008; exemplary item (translated): "Within lessons in economics, business or accounting, I often find interesting topics that I want to talk about with others"/"Within lessons in economics, business or accounting, time often sails by"). The construct for value-oriented disposition originates from Eberle et al. (2009; exemplary item (translated): "Lessons in economics, business or accounting help me to find my own point of view regarding socio-economic problems within society") and comprises nine items (Cronbach's alpha = 0.76). For these three scales, a four-layered format was used (1 = "does not apply" to 4 = "does apply"). Against these scales, the construct "Attitude towards economics" follows a five-layered format (1 = "disagree" to 5 = "agree"). To measure attitude towards economics, the instrument from Beck (1993) was used (exemplary item (translated): "Learning economics is a waste of time"). This instrument is based on the "Attitudes towards Economics" (ATE) Scale from Walstad and Soper (1983), which was translated and adapted to German. It comprises 14 items with good reliability (Cronbach's alpha = 0.90).

**Table 2 Instruments to measure economic competencies**

| Variable | Items | Reliability | Source |
|---|---|---|---|
| Knowledge and skills | 111 | 0.75 | Internal development (Schumann and Eberle 2014) |
| Interest | 3 | 0.77 | Eberle et al. (2009); Prenzel et al. (1996) |
| Intrinsic motivation | 4 | 0.82 | Eberle et al. (2009); Prenzel et al. (1996) |
| Value-oriented disposition | 9 | 0.76 | Eberle et al. (2009) |
| Attitude | 14 | 0.90 | Beck (1993) |

#### *Educational aspirations*

To measure educational aspirations, different aspects were assessed. First, students' aspiration to study after graduation was assessed using a four-layered format (1 = "definitely yes", 2 = "probably yes", 3 = "probably no" and 4 = "definitely not"). If a student definitely or probably wished to study, a follow-up question asked which field of study he or she wished to study the most and second most (open-ended question). Within the analysis, only the most preferred field was considered. Otherwise, students were asked whether they want to work after graduation, again using a four-layered format. For such students, a question asked whether they wanted to stay in their current field of work. Because the study was paper-and-pencil-based, the students were able to answer all the questions. Therefore, students could indicate that they definitely wished to both study and work. The last question on educational aspirations covered the case in which students wanted to neither study nor work. In that case, an open-ended question asked about their alternative future plans.

The following results are based on the first and third questions, which refer to students' aspiration to study and work. These questions highlight the intersection between the academic and vocational tracks that FVB students face after graduation. Because there are also many FVB students who wish to do both (study and work), three groups were created: (1) FVB students who wish to study but not work (study group), (2) FVB students who wish to work but not study (work group) and (3) FVB students who wish to work and study (mixed group). The two variables (aspiration to study and aspiration to work) were dichotomised (1 and 2 = "wish to study/work", 3 and 4 = "don't wish to study/work").

#### *Control variables*

In addition to economic competencies and educational aspirations, additional variables were measured as control variables. Therefore, information on students' gender, age, migration background, academic background and school grades (in Mathematics, German and Economics/Business/Accounting) was collected. It is important to note that school grades in Switzerland differ from those in other countries, such as Germany or Austria. Namely, in Switzerland, school grades range from 6 (very good) to 1 (very bad). Migration background focuses on a linguistic understanding of the migration background; thus, a student is considered to have a migratory background if he or she usually speaks a language other than German with a parent or his friends in daily life (0 = "no migration background", 1 = "migration background"). Academic background describes whether FVB students have parents with an academic degree. Therefore this variable is dichotomised (0 = "no parent has an academic background", 1 = "at least one parent has an academic background"). FVB type describes whether the FVB students follow the integrated or consecutive model (0 = "integrated", 1 = "consecutive"). Finally, the school profile is also dichotomised (0 = "commercial school profile", 1 = "other school profile").

### Analysis process

Because a representative sample was drawn, no weighting was necessary (for more information about weighted data, see Behnke et al. 2010). With regard to the considered variables, there were only a few missing values. Thus, the decision was made to use raw data and not to impute the missing values. Instead of more valid test results, school grades had to be used as substitutes for school performance. The test score for economic knowledge and skills was analysed and built on the basis of item response theory (IRT) using the software program "ConQuest" (Wu et al. 2007). For the current analysis, WLE estimators (see Warm 1989) for the specific personal abilities are used. Furthermore, the test scores were standardised using a mean value of 500 and a standard deviation of 100. Moreover, school grades were adjusted to the mean value of the school class to control for any class-specific differences and to assure the comparability of individual school grades. Because of the nested data with 71 school-classes, standard errors of the multinomial logistic regressions were adjusted by clustering the data using Mplus (Muthén and Muthén 2007), which considers this stratification. Therefore, school-classes are used as cluster variable within these analyses. The estimators within the multivariate analyses were calculated by using MLR (maximum likelihood parameter estimation; ibid., p. 484).

## Results

### Descriptive statistics and interrelations

The present section will provide an overview of the variables used and their interrelations. Table 3 shows the mean values and standard deviations for economic competencies for all the FVB students. The mean value of the economic knowledge and skills is—as described before—standardised using the value of 500 and a standard deviation of 100. For the other variables, except for value-oriented disposition, the mean values are close to the theoretical midpoint of 2.5 (for intrinsic motivation and interest) and 3.0 (for attitude). With regard to value-oriented disposition, the results show a stronger tendency towards the value 3.0.

**Table 3 Descriptive statistics for economic competencies**

| | Mean value | Standard deviation |
|---|---|---|
| Economic knowledge and skills | 500.0 | 100.0 |
| Intrinsic motivation (in economics) | 2.47 | 0.67 |
| Interest (in economics) | 2.44 | 0.65 |
| Value-oriented disposition (in economics) | 2.83 | 0.50 |
| Attitude towards economics | 3.23 | 0.73 |

With regard to school grades, the mean values tend to be 4.5 or 5, indicating that students usually achieve very good or at least good grades in school (see Table 4). Therefore, school grades do not appear to be normally distributed. Especially in German, students tend to achieve very good school grades. In contrast, school grades in mathematics are lower with a larger deviation across the sample. School grades in economics/business/accounting lie between school grades in mathematics and German.

Table 5 shows the interrelations between the cognitive variables (economic knowledge and skills, school grades in mathematics, German and economics/business/accounting) and non-cognitive variables for economic competencies (interest, intrinsic motivation, value-oriented disposition and attitude) of the FVB students.

As the interrelations between the different cognitive and non-cognitive variables show, there is a relatively small interrelation between economic knowledge and skills and the non-cognitive dimensions of economic competence. Nevertheless, the interrelations are generally significant and positive. Furthermore, there is a relatively strong interrelation between the non-cognitive dimensions of economic competence, especially between intrinsic motivation and interest. The other interrelations are rather small or non-existent. Furthermore, there is also a positive interrelation between economic competencies and school grades in economics. Besides, only the cognitive dimension of economic competencies interrelates positively with school grades in German and mathematics. The other dimensions of economic competence do not interrelate with these two school grades. In addition, there are also positive interrelations between economic knowledge and skills and the other variables. However, these interrelations are also very small.

Focussing on educational aspirations, 21 test persons (approximately 2 %) provided no information about their future plans. Four students indicated that they would neither study nor work after graduation. These students were excluded from the following analysis. Of the remaining sample, 602 students (approximately 57 %) intend to study but not

**Table 4 School grades in different subjects**

| | Mean value | Standard deviation |
|---|---|---|
| Mathematics | 4.45 (1.02) | 0.82 (0.19) |
| German | 4.73 (1.02) | 0.50 (0.11) |
| Economics/business/accounting | 4.69 (1.02) | 0.56 (0.13) |

Number in brackets relate to relative school grades (revised by mean value of school class)

**Table 5 Interrelations between the considered cognitive and non-cognitive variables**

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Economic knowledge and skills (1) | 1 | 0.19* | 0.23* | 0.23* | 0.38* | 0.15* | 0.16* | 0.21* |
| Intrinsic motivation (in economics) (2) | | 1 | 0.73* | 0.50* | 0.65* | 0.00 | 0.03 | 0.22* |
| Interest (in economics) (3) | | | 1 | 0.64* | 0.69* | −0.00 | 0.05 | 0.20* |
| Value-oriented disposition (in economics) (4) | | | | 1 | 0.52* | −0.04 | 0.06 | 0.13* |
| Attitude towards economics (5) | | | | | 1 | −0.02 | 0.03 | 0.30* |
| School grade in mathematics (6) | | | | | | 1 | 0.22* | 0.23* |
| School grade in German (7) | | | | | | | 1 | 0.28* |
| School grade in economics/business/accounting (8) | | | | | | | | 1 |

* $p < 0.01$

to work, 198 students (approximately 19 %) intend to work but not to study, and 226 students (approximately 22 %) intend to both work and/or study after graduation. For this mixed group it is less clear, whether they will choose an academic, a vocational track or even a mixed track.

#### Educational aspirations: work or university?

To empirically explain the transitions at the end of the upper secondary education to the tertiary level (vocational vs. academic track), different analyses are conducted. The first analysis examines the effects of school profile, gender and migration background. This analysis is followed by a bivariate analysis, which considers differences in cognitive characteristics between FVB students who wish to study and those who wish to work. Finally, a multivariate analysis that includes all the cognitive, non-cognitive and contextual variables provides an overview of the overall effects.

##### *Effects of profile, FVB type, gender, academic and migration background*

As indicated in Table 6, several differences in educational aspirations can be found when the sample is subdivided based on school profile, gender and migration background. Specifically, FVB students who belong to the commercial school profile are more likely to wish to work (in comparison with students who belong to another school profile).

**Table 6 Educational aspirations with respect to school profile, FVB type, gender, migration background and parent's educational background**

| | Profile | | FVB type | | Gender | | Migration background | | Academic background | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Commercial | Other | Integrated | Consecutive | Male | Female | Yes | No | Yes | No |
| Study | 53 | 65 | 57 | 62 | 64 | 52 | 62 | 59 | 32 | 68 |
| Study and work | 22 | 22 | 20 | 23 | 21 | 23 | 25 | 21 | 34 | 66 |
| Work | 25 | 14 | 23 | 15 | 15 | 25 | 13 | 20 | 21 | 79 |

Values in percentage

Consequently, FVB students with other school profiles are more likely to wish to study (Chi square = 22.23, p = 0.000). With regard to FVB type, students who belong to the integrated model are more likely to wish to work after graduation than FVB students who belong to the consecutive model (Chi Square = 9.92, p = 0.007). In addition, gender effects can be identified. Therefore, according to literature (e.g., Neuenschwander 2012; Schmid and Gonon 2011a, b) and the official statistics (FSO 2013c), male FVB students more likely wish to study than female FVB students (who are more likely to wish to work or to do both; Chi Square = 19.68, p = 0.000). Differentiated by school profile, there is no longer a (strong) significant dependence of educational aspirations on gender anymore (commercial school profile: Chi Square = 4.90, p = 0.086; other school profile: Chi Square = 5.901, p = 0.052). Moreover, no significant effects of migration background were found (Chi Square = 3.74, p = 0.154). Finally, there are significant effects regarding to the educational background of the FVB students' parents: FVB students who have parents with an academic degree are more likely to wish to study than FVB students who have no parents with an academic degree (Chi Square = 10.26; p = 0.006).

#### *Bivariate analysis*

With respect to the cognitive characteristics of FVB students with unequal educational aspirations, some significant differences can be found. As shown in Table 7, a variance analysis was calculated by comparing the three groups identified by the instrument (educational aspirations). The primary differences are observable between the work group and both the study and mixed groups. The only difference between the study and mixed groups concerns economic knowledge and skills, where the study group shows significantly better performance. With regard to value-oriented disposition and attitude towards economics, the study and mixed groups have higher reported values than the work group. Additionally, no significant difference amongst school grades was identified. The variables were also tested for variance homogeneity. The only variables for which variance homogeneity did not apply are attitude towards economics and school grades

**Table 7 Variance analysis of the educational aspirations of FVB students**

| | Study | Mixed | Work | F value | p | Cohen's d |
|---|---|---|---|---|---|---|
| Economic knowledge and skills | 509 | 488 | 491 | 4.95 | 0.018[a] | 0.18[a] |
| Intrinsic motivation (in economics) | 2.48 | 2.50 | 2.42 | 0.64 | 0.527 | – |
| Interest (in economics) | 2.46 | 2.46 | 2.35 | 2.07 | 0.126 | – |
| Value-oriented disposition (in economics) | 2.85 | 2.88 | 2.73 | 4.30 | 0.031[b] | 0.23[b] |
| | | | | | 0.019[c] | 0.30[c] |
| Attitude towards economics | 3.30 | 3.24 | 3.07 | 6.28 | 0.000[b] | 0.32[b] |
| | | | | | 0.049[c] | 0.25[c] |
| Mathematics (grade) | 1.03 | 1.01 | 1.02 | 3.16 | 0.5471 | – |
| German (grade) | 1.02 | 1.01 | 1.02 | 0.64 | 0.724 | – |
| Economics (grade) | 1.02 | 1.02 | 1.01 | 3.95 | 0.834 | – |

p and Cohen's d relates to the respective groups in which differences could be found (see a, b and c)

[a] Study-Both

[b] Study-Work

[c] Both-Work [Bonferroni and Tamhane (for Attitude)]

in economics. Here, the Tamhane test was used, while for the other variables, the Bonferroni test was used.

The study and work group show the most notable differences. Therefore, t-tests and Mann–Whitney U tests were calculated to analyse differences particularly between these two groups. Differences can be observed for interest ($t = 2.09$; $p = 0.038$; $d = 0.17$) and grades in mathematics ($t = 2.23$; $p = 0.026$; $d = 0.18$), where the FVB students who wish to study show better results than the FVB students who wish to work. However, the effects are relatively small.

#### *Multivariate analysis*

For multivariate analysis we calculated a multinomial logistic regression (see Table 8, work group is used as the reference group). With regard to multi-collinearity, no collinearities were found for the included variables.

**Table 8 Prediction of FVB students' educational aspirations (logistic regression)**

| | B | SE | p | EXP (B) |
|---|---|---|---|---|
| *Study*[a] | | | | |
| Economic knowledge and skills | 0.32 | 0.14 | 0.025 | 1.38 |
| Intrinsic motivation (in economics) | −0.55 | 0.29 | 0.055 | 0.58 |
| Interest (in economics) | −0.26 | 0.29 | 0.372 | 0.77 |
| Value-oriented disposition (in economics) | 0.34 | 0.25 | 0.169 | 1.40 |
| Attitude towards economics | 0.96 | 0.21 | 0.000 | 2.61 |
| Mathematics (grade) | 0.97 | 0.87 | 0.265 | 2.64 |
| German (grade) | 0.90 | 1.34 | 0.501 | 2.46 |
| Economics (grade) | −0.30 | 1.16 | 0.799 | 0.74 |
| Gender *(0 = female; 1 = male)* | −0.40 | 0.23 | 0.079 | 0.67 |
| Migration background *(0 = no; 1 = yes)* | −0.46 | 0.50 | 0.354 | 0.63 |
| Academic background *(0 = no; 1 = yes)* | −0.54 | 0.25 | 0.030 | 0.58 |
| FVB Type *(0 = integrated; 1 = consecutive)* | −0.39 | 0.28 | 0.153 | 0.68 |
| Profile *(0 = commercial; 1 = other)* | −0.91 | 0.33 | 0.006 | 0.40 |
| *Study and work*[a] | | | | |
| Economic knowledge and skills | 0.05 | 0.17 | 0.771 | 1.05 |
| Intrinsic motivation (in economics) | −0.77 | 0.36 | 0.003 | 0.46 |
| Interest (in economics) | 0.28 | 0.36 | 0.430 | 1.32 |
| Value-oriented disposition (in economics) | 0.47 | 0.36 | 0.190 | 1.60 |
| Attitude towards economics | 0.69 | 0.27 | 0.011 | 1.98 |
| Mathematics (grade) | 0.78 | 0.91 | 0.393 | 2.18 |
| German (grade) | −0.26 | 1.26 | 0.835 | 0.77 |
| Economics (grade) | 0.04 | 1.11 | 0.972 | 1.04 |
| Gender *(0 = female; 1 = male)* | −0.27 | 0.29 | 0.355 | 0.76 |
| Migration background *(0 = no; 1 = yes)* | −0.28 | 0.49 | 0.572 | 0.76 |
| Academic background *(0 = no; 1 = yes)* | −0.74 | 0.31 | 0.016 | 0.48 |
| FVB Type *(0 = integrated; 1 = consecutive)* | −0.12 | 0.23 | 0.596 | 0.88 |
| Profile *(0 = commercial; 1 = other)* | −0.69 | 0.31 | 0.026 | 0.50 |
| $R^2$ (Nagelkerke) | 0.11 | | | |

[a] Reference group is the group of students who wish to work; B Regression coefficient; SE Standard Error; p Significance level; parameters were estimated by using MLR (maximum likelihood parameter estimation); school-classes are used as cluster variable to adjust SE to the stratification of the data using Mplus (Muthén and Muthén 2007)

As has been demonstrated, economic knowledge and skills, attitude towards economics, academic background and school profile significantly affect educational aspirations. Therefore, students who have higher economic knowledge and skills (test results), have a higher attitude towards economics, have parents with an academic degree or attend a school with a profile other than the commercial profile are more likely to wish to study.

Similar results can be found for the mixed group. Here, FVB students with higher attitude towards economics, students who have parents with an academic degree and students with a school profile other than the commercial profile are more likely to wish to both, work and study. In contrast, FVB students with higher intrinsic motivation are more likely to wish to work.

When both parts of the regression are considered, the gender effect is no longer observable and grades do not show any explanatory power. Furthermore, interest in economics no longer plays a significant role. Besides, knowledge and skills in economics plays a significant role for the study group, but not for the mixed group, and the effect also is rather small; therefore, it can be assumed that the effects of economic knowledge and skills are mostly influenced by students' attitude towards economics. Interestingly, intrinsic motivation exhibits opposite effects.

In addition to these direct effects, indirect effects of school performance and economic competencies were also examined. It was found that (with the exception on intrinsic motivation) all dimensions of economic competencies mediate the strong effect of the FVB-profiles. However, no indirect effects of school performances (school grades) could be found.

In summary, attitude towards economics and school profile show the strongest interrelations in the regression model (Table 8). Therefore, FVB students who have a higher attitude towards economics and students who belong to school profiles other than the commercial profile are more likely to wish to study after graduation or at least study at some point in their lifetime. However, most of the dimensions of economic competencies cannot directly predict educational aspirations, but they mediate the strong profile effect. In contrast, school grades cannot explain educational aspirations. Notably, several of the bivariate effects can be explained by other variables, such as FVB students' attitude toward economics and school profile. As there is a high proportion of FVB students who wish to study in economics, business, accounting or another subject which relates to them (around 23 %) the resulting deduction that economic competencies mainly influence the aspiration to study within this field should be controlled. Therefore, another regression model was calculated (see Table 9). Within this model only FVB students who intend to study in economics or a related field, and those who intend to work as well as FVB students who intend to do both are considered ($n = 439$). Results show a significant gender effect, which indicates that male students are more likely to wish to study in economics or a related field than female students. Considering economic competencies, there is a stronger effect of economic knowledge and skills and of attitude towards economics. The negative effects of the migration background and the profile effect for the juxtaposition of study vs. work group ($p < 0.10$) are not significant.

**Table 9 Prediction of educational aspirations of FVB students who intend to study in economics or a related field (logistic regression)**

| | B | SE | p | EXP (B) |
|---|---|---|---|---|
| *Study*[a] | | | | |
| Economic knowledge and skills | 0.42 | 0.18 | 0.021 | 1.52 |
| Intrinsic motivation (in economics) | −0.19 | 0.44 | 0.664 | 0.83 |
| Interest (in economics) | −0.54 | 0.40 | 0.176 | 0.58 |
| Value-oriented disposition (in economics) | 0.14 | 0.40 | 0.343 | 1.15 |
| Attitude towards economics | 2.18 | 0.36 | 0.000 | 8.84 |
| Mathematics (grade) | 1.14 | 0.99 | 0.252 | 3.12 |
| German (grade) | 0.39 | 2.18 | 0.859 | 1.47 |
| Economics (grade) | −1.14 | 1.83 | 0.534 | 0.32 |
| Gender *(0 = female; 1 = male)* | −0.76 | 0.31 | 0.014 | 0.47 |
| Migration background *(0 = no; 1 = yes)* | −1.17 | 0.64 | 0.069 | 0.31 |
| Academic background *(0 = no; 1 = yes)* | −0.37 | 0.40 | 0.355 | 0.69 |
| FVB Type *(0 = integrated; 1 = consecutive)* | −0.11 | 0.38 | 0.744 | 0.90 |
| Profile *(0 = commercial; 1 = other)* | 0.83 | 0.43 | 0.053 | 2.29 |
| *Study and work*[a] | | | | |
| Economic knowledge and skills | −0.01 | 0.30 | 0.987 | 0.99 |
| Intrinsic motivation (in economics) | −0.72 | 0.63 | 0.253 | 0.49 |
| Interest (in economics) | 0.59 | 0.53 | 0.267 | 1.80 |
| Value-oriented disposition (in economics) | 0.04 | 0.54 | 0.942 | 1.04 |
| Attitude towards economics | 2.17 | 0.59 | 0.000 | 8.75 |
| Mathematics (grade) | 1.13 | 1.66 | 0.469 | 3.10 |
| German (grade) | −3.18 | 2.56 | 0.213 | 0.04 |
| Economics (grade) | −0.89 | 2.65 | 0.803 | 0.52 |
| Gender *(0 = female; 1 = male)* | −0.21 | 0.53 | 0.692 | 0.81 |
| Migration background *(0 = no; 1 = yes)* | −1.44 | 0.86 | 0.094 | 0.24 |
| Academic background *(0 = no; 1 = yes)* | −0.80 | 0.56 | 0.149 | 0.45 |
| FVB Type *(0 = integrated; 1 = consecutive)* | 0.17 | 0.68 | 0.799 | 1.19 |
| Profile *(0 = commercial; 1 = other)* | 1.48 | 1.01 | 0.143 | 4.41 |
| $R^2$ (Nagelkerke) | 0.50 | | | |

[a] Reference group is the group of students who wish to work; B Regression coefficient; SE Standard Error; p Significance level; parameters were estimated by using MLR (maximum likelihood parameter estimation); school-classes are used as cluster variable to adjust SE to the stratification of the data using Mplus (Muthén and Muthén 2007)

Furthermore, we calculated a similar regression model only considering FVB students who wish to study in another field than economics or a related field, those who wish to work and those who wish to do both (see Table 10). Now, the effects of economic competencies are much smaller. Nevertheless, value-oriented disposition has a positive effect ($p = 0.013$), whereas intrinsic motivation has a negative effect ($p = 0.018$). Regarding to the mixed group no positive effects of economic competencies can be identified. Besides, students with parents who have an academic degree and students with a school profile other than the commercial school profile are more likely to wish to study (or to do both) than to work.

**Table 10 Prediction of educational aspirations of FVB students who intend to study in other fields than economics or related to economics (logistic regression)**

| | B | SE | p | EXP (B) |
|---|---|---|---|---|
| *Study*[a] | | | | |
| Economic knowledge and skills | 0.26 | 0.16 | 0.096 | 1.30 |
| Intrinsic motivation (in economics) | −0.70 | 0.28 | 0.018 | 0.50 |
| Interest (in economics) | −0.20 | 0.30 | 0.518 | 0.82 |
| Value-oriented disposition (in economics) | 0.60 | 0.24 | 0.013 | 1.82 |
| Attitude towards economics | 0.45 | 0.23 | 0.052 | 1.57 |
| Mathematics (grade) | 1.03 | 0.87 | 0.238 | 2.80 |
| German (grade) | 1.22 | 1.34 | 0.371 | 3.39 |
| Economics (grade) | −0.13 | 1.20 | 0.911 | 0.87 |
| Gender *(0 = female; 1 = male)* | −0.16 | 0.26 | 0.525 | 0.86 |
| Migration background *(0 = no; 1 = yes)* | −0.15 | 0.51 | 0.761 | 0.86 |
| Academic background *(0 = no; 1 = yes)* | −0.55 | 0.27 | 0.040 | 0.58 |
| FVB Type *(0 = integrated; 1 = consecutive)* | −0.42 | 0.31 | 0.182 | 0.66 |
| Profile *(0 = commercial; 1 = other)* | −1.43 | 0.34 | 0.000 | 0.24 |
| *Study and work*[a] | | | | |
| Economic knowledge and skills | −0.01 | 0.20 | 0.955 | 0.99 |
| Intrinsic motivation | −0.66 | 0.39 | 0.087 | 0.52 |
| Interest (in economics) | 0.07 | 0.39 | 0.852 | 1.08 |
| Value-oriented disposition | 0.70 | 0.39 | 0.073 | 2.01 |
| Attitude towards economics | 0.18 | 0.29 | 0.546 | 1.19 |
| Mathematics (grade) | 0.28 | 1.06 | 0.795 | 1.32 |
| German (grade) | 0.90 | 1.57 | 0.568 | 2.45 |
| Economics (grade) | −0.23 | 1.22 | 0.850 | 0.79 |
| Gender *(0 = female; 1 = male)* | −0.31 | 0.34 | 0.356 | 0.73 |
| Migration background *(0 = no; 1 = yes)* | 0.24 | 0.65 | 0.717 | 1.27 |
| Academic background *(0 = no; 1 = yes)* | −0.64 | 0.33 | 0.050 | 0.53 |
| FVB Type *(0 = integrated; 1 = consecutive)* | −0.22 | 0.31 | 0.478 | 0.80 |
| Profile *(0 = commercial; 1 = other)* | −1.01 | 0.38 | 0.008 | 0.37 |
| $R^2$ (Nagelkerke) | 0.14 | | | |

[a] Reference group is the group of students who wish to work; B Regression coefficient; SE Standard Error; p Significance level; parameters were estimated by using MLR (maximum likelihood parameter estimation); school-classes are used as cluster variable to adjust SE to the stratification of the data using Mplus (Muthén and Muthén 2007)

Viewing the different regression models on the whole it becomes clear, that economic competencies are mostly influence the decision to study in economics. However, there are some positive, but rather small, effects of economic competencies regarding educational aspirations in general.

## Discussion and conclusions

To explore the role of economic competencies with regard to educational aspirations, this study examines FVB students with hybrid qualifications in Switzerland. Up to now, there has been almost no empirical data on this matter.

First, the analysis demonstrates that FVB graduates who intend to study have higher economic knowledge/skills and attitude towards economics than those who intend to work after FVB-graduation. It is remarkable that FVB students with a higher intrinsic motivation are more likely to wish to work after graduation. An explanation could be

that the character of job activities in general often is based on an economic context. Additional analyses show that economic competencies mainly predict the aspirations to study in economics or a related field. Nevertheless, some facets of economic competencies (such as value-oriented disposition) can predict aspirations in non-economic fields of study, too. This finding supports the assumption that economic competencies are prerequisites of students' aspirations in general and in the long run of ambitions for social participation.

In addition to economic competencies, other variables could be identified. In this regard, the FVB profile was found to play an important role, as students with the commercial profile are more likely to wish to work and follow the vocational track than students with another profile. This effect is mediated by economic knowledge and skills, interest, attitude towards economics and value-oriented disposition, which demonstrates that economic competencies have a significant indirect effect on educational aspirations. The observed mediation effects also offer some new insights. Therefore, it can be assumed that economic competencies (similar to school performance) are mediating "structural" effects, such as school profile. With regard to educational aspirations in general, one more reason to claim economic competencies as a relevant competence can be make.

Furthermore, school grades do not affect the educational aspirations of FVB students. Against the background that school performance is reported as a good predictor in other studies (e.g., Bieri Buschor et al. 2008; Heine et al. 2008; Denzler 2013; for mathematics: Aeschlimann et al. 2015), this finding is unexpected at first glance. Nevertheless, these results are limited by different factors. First, in many studies, school grades are used to predict academic success, not educational aspirations (e.g., Trapmann 2008; Geiser and Santelices 2007; Gasser 2014). And second, owing to the Swiss grading system, school grades vary little (usually ranging between 6.0 and 4.0); therefore, there is a lack of variance between students' school grades.

These results offer some implications and prompt some questions for future research.

With regard to the substantial lack within the current state of research this study is providing some new insights and we recommend to deeper analyse (long-term) effects of economic competencies. In future studies this interrelation should be analysed in more detail.

Moreover, consistent with the literature, it could be demonstrated that the educational background of FVB students' parents also influences the students' educational aspirations. When assuming that the educational background of parents also influences their educational expectations (e.g., Sewell and Shah 1968a, b; Jacob 2010; Rockwell 2011), the effect of these expectations and the function of parents as role models can also be identified within the data. There are almost no effects of the migration background. As mentioned in the theoretical chapter of this paper, the reason for this result is not very surprising: In highly stratified educational systems, such as in Switzerland, transitions from the upper-secondary to the tertiary level mostly are influenced by other factors, not by social background (e.g., Denzler 2013). The strong profile effect represents an interesting result that is consistent with data of the FSO (2013a, b, c). The authors identify different possibilities to explain this effect. The first possibility is that FVB students with a commercial school profile may face better job conditions and better career prospects

than FVB students at schools with other profiles, such as the technical or natural science profiles, or they are more satisfied with their employer. The second possibility is that studying is more attractive especially for FVB students at schools with profiles other than the commercial school profile than continuing to work in their jobs, and it may offer them better career prospects. Third, the reason could be a mixture of both possibilities. Nevertheless, these are just assumptions and should be analysed more deeply in the future. Taking a look at the FVB type, FVB students who are following the integrated model are more likely to wish to study than FVB students who are following the consecutive model. This might be, because these FVB students are "closer" to a school-based full-time apprenticeship with a longer period of a "pure" theoretical training. Therefore, taking the vocational track after graduation might be out of question for more FVB students following this model. The structural effects of the FVB type are also a research question which should be analysed in more detail. Finally, the effects of the educational background of parents are consistent with the findings of other studies (e.g., Sewell and Shah 1968a, b; Hyman and Voydanoff 1978; Teachman 1987; Jacob 2010; De Haan 2011; Vryonides and Gouvias 2012).

Substantial limitations regarding the "simple" measurement of educational aspirations and the lack of (control) variables which are important to further explain educational aspirations must be noted. Aspects such as parents' educational aspirations, students' perceptions regarding the costs and benefits of education, effects of status maintenance or values and expectations of students regarding different educational alternatives were not gathered. Therefore, the study is not able to extensively explain the role of economic competencies. The missing of these aspects may explain the relatively low explained variance of the estimated model (see Table 8). The implementation of an extensive theoretical explanatory model is an essential desideratum for future research in this field. Furthermore, there are some other relevant aspects that lead to deficits within the regression model, e.g., using school grades instead of test results and the dichotomisation of variables such as educational aspirations, among others. Another question is, whether it is practical to combine educational and occupational aspirations in one outcome variable, as was performed in the study. Because the FVB students were not asked to describe their occupational aspirations in detail, the results of this study could be biased.

Finally, although this study provides some new insights with regard to the effects of economic competencies on the educational aspirations, it cannot explain students' realised educational decisions or their academic and vocational success. Therefore, a follow-up study is currently ongoing to measure students' realised decisions and academic success and to integrate the current results into a theoretical model that can explain the transition from the upper secondary to the tertiary level more appropriately.

**Authors' contributions**

All authors contributed substantially to this work. MJ and AJ conceptualized the research questions and analysed the dataset with regard to different aspects. MJ works with a special focus on transitions of the sample and is analysing educational aspirations. FE and SSC conceptualized, managed and carried out the OEKOMA study in 2011. They developed the competence model as well as the instrument to measure economic competencies of students at upper-secondary level. All authors read and approved the final manuscript.

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**Competing interests**

The authors declare that they have no competing interests.

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