

# Can Knowledge about the Education System increase the Social Status of Vocational Education and Training?

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## Abstract

Due to a lack of appropriate data, little is known about the social status of education tracks or its determinants. Hence, this paper proposes a new approach to measure changes in the social status of education tracks. Our basic idea is to exploit the information in observed educational choices. We argue that a change in the probability of choosing an education conditional on cognitive ability reflects a change in the social status of the corresponding education track, *ceteris paribus*. Approximating cognitive ability with PISA scores, we apply this approach to test whether an increase in the level of knowledge about the education system rises the social status of Vocational Education and Training (VET) in Switzerland. Our results focusing on foreign adolescents confirm that foreigners' perception of the social status of dual VET increases with their length of stay in Switzerland, reflecting their learning process about the Swiss education system.

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# 1. Introduction

The dual Vocational Education and Training (VET) system has recently received substantial attention across Europe due to high youth unemployment rates emerging in the wake of the financial crisis. This growing interest was motivated by descriptive evidence that countries known to have a strong dual VET path, namely Switzerland, Austria and Germany, also show comparably low youth unemployment rates. In the German-speaking countries, the dual VET system is part of the post-compulsory education system and provides an alternative education track to general education. In contrast to only school-based VET, dual VET is thereby based on a co-existence of different learning and training locations, namely the company and the vocational school, thus ensuring the labour market orientation of the acquired skills (Wolter/Ryan, 2011).

However, while politicians and researchers show growing interest in the dual VET system as an export product, the successful introduction of this system also depends on the valuation of VET in a country. Behind this background, a lively debate about the social status of VET has been started in Europe in order to shed light on the question how young people can be attracted to this education track (e.g. Cedefop, 2014). Accordingly, many countries recognise the need for higher quality and status of VET to combat the traditional wake of academic education. Thus, the parity of esteem (“Gleichwertigkeit”) of vocational and general education was set on the political agenda for VET of the European Union (Lasonen/Manning, 2001).

Even in Switzerland, where the majority of post-compulsory students participate in VET, the discussion circles around the questions whether the social status of VET is decreasing and whether there is a stigma against choosing a vocational track. As the following excerpt from the speech of the Federal Councillor at the International Vocational and Professional Education and Training Congress 2014 illustrates, lack of knowledge and prejudices are assumed to be one reason for the low valuation of VET:

*“It is nonetheless clear that there is still insufficient or only superficial awareness of what VPET [Vocational and Professional Education and Training] involves, even in Switzerland itself. Introversion and a failure to think outside the box can be found in the world of education too.”*

(Federal Councillor Johann N. Schneider-Ammann, 15.9.2014)

In order to address this issue, *this paper analyses whether an increase in the knowledge about the education system can enhance the perceived social status of dual VET.*

There exist a broad literature regarding the social status of individuals or occupations, i.e. the relative standing of individuals within a society. However, little is known about the social status of education tracks, i.e. the social status of dual VET as the relative position of this education in comparison to other education tracks on the same level. Exceptions include Cattaneo/Wolter (2013), Cedefop (2014) and Mourshed et al. (2014), who exploit the rare survey information that measures the social status of

education tracks. Beside of limited data availability, relying on survey data might further suffer from social desirability bias, especially occurring if people are answer questions which are related to prejudices (e.g. Diekmann, 2004). In addition, survey data often collect information regarding particular aspects, e.g. expected career perspectives or social prestige, whereat it remains an open question how to aggregate these aspects into a measure of social status.

Consequently, few research has been conducted on the determinants of the social status of education tracks. Nevertheless, some authors point to the fact that the information might thereby play a role (cf. Depner/Atze, 2000; Lasonen/Manning, 2001; OPET, 2011; Cedefop, 2014), but they do not show the causal impact of the level of knowledge on the social status of VET.

Firstly, this paper contributes to the existing literature by *proposing a new approach to measure changes in the social status of education tracks*. Concretely, we suggest that a change in the probability of choosing a particular education conditional on cognitive ability reflects a change in the social status of this education track, *ceteris paribus*. We thereby assume that educational choices not only depend on objective cost and benefit considerations (cf. Becker, 1974) based on institutional context and ability but also on the subjectively perceived costs and benefits which additionally depend on cultural and social origin as well as the perceived valuation of an education track (cf. Boudon, 1974; Breen/Goldthorpe, 1997; Becker/Hecken, 2009). Hence, the approach builds upon the idea to survey educational preferences (Cattaneo/Wolter, 2013) but circumvents the social desirability bias by relying on observed educational choices. Concretely, we suggest that a change in the probability of choosing a particular education conditional on ability reflects a change in the social status of this education track. Equivalently, the change in the social status can be expressed by the average relative ability of adolescents choosing an education track, thereby referring to the composition of adolescents in a certain education track with regard to their ability.

Secondly, in order to answer our research question, we look at whether an increase in foreigners' knowledge about the education system rises the social status of dual VET in their perception, as evidence shows that foreigners in Switzerland show a lower valuation of VET than Swiss (Cattaneo/Wolter, 2013). We thereby look at educational choices of foreign adolescents in Switzerland at the end of compulsory education, thus shortly before their transition to post-compulsory education. Approximating their knowledge about the Swiss education system by the length of stay in Switzerland allows us to analyse the impact of the knowledge on the perceived social status of dual VET, reflected in their educational choice conditional on ability.

Exploiting PISA test scores to approximate ability firstly allows us to confirm existing evidence that foreign adolescents perceive a lower social status of dual VET than Swiss adolescents. Our causal analysis reveals that foreigners' perception of the social status of dual VET increases with their time spent in Switzerland. This suggests that the stigma of dual VET declines as foreigners live longer in Switzerland, reflecting their increased knowledge about the Swiss education system and the value of dual VET. These results hold if controlling for a large vector of observable characteristics, such as

gender, socioeconomic background of the parents and living conditions. In addition, we control for unobserved heterogeneity across cantons and country of birth to capture unobserved heterogeneity across migration waves, e.g. regarding non-cognitive skills. Finally, our Difference-in-Difference setting shows that the perceived social status of dual VET increases more for adolescents born in countries without a dual VET system than for adolescents that are familiar with dual VET as they are born in Germany or Austria. In addition, we can demonstrate that the increase in the perceived social status of dual VET with the length of stay in Switzerland is lower for foreign adolescents with a mother and/or father born in Switzerland, compared to adolescents without Swiss origin.

Building on the existing literature regarding the social status of education tracks as well as on theoretical concepts explaining educational choices, the next section introduces our new approach to measure changes in the social status of education tracks and develops hypotheses regarding the social status of dual VET in Switzerland. Section 3 describes the data and section 4 explains the empirical methodology applied in section 5. Finally, section 6 concludes.

## **2. The Social Status of Vocational Education and Training**

### **2.1. The Social Status of Education tracks**

In sociology, *social status* describes a position in a hierarchical order or social rank and thus refers to the relative standing of an individual in the society. In accordance with this concept, a number of studies analyse the social status of individuals with a particular educational attainment or with an occupation which is based on a certain education. Particularly in the economic literature, the prevalent, objective way of measuring the social status of occupations is by the relative income or measures of socioeconomic status. Recent studies building on the subjective approach try to operationalise the perceived social status with the help of rankings of occupations (e.g. Van Praag, 2009). In this micro perspective, the image of an occupation or educational attainment is closely related to the relative (hierarchical) standing of an individual in the society.

In order to analyse the social status of a certain institution, e.g. education tracks, we can transfer this sociological concept of social status and define the social status of an education track for instance as the relative position of an education in comparison to other education tracks on the same level, rather than the relative position of individuals with this education. However, studies analysing the social status of education tracks are rare. In addition, a lot of different concepts are used in existing research. Cedefop (2014) offers a diverse picture of the *attractiveness of initial VET* in the European Union. They use various indicators which represent three different aspects of attractiveness: participation in initial VET, image of VET and relative esteem compared to general upper secondary education. The first aspect is covered by an indicator on participation as a percentage of all participants in upper secondary level education (Eurostat/UOE), while the image and relative esteem of initial VET are measured by different indicators on attitudes towards VET from the Special Eurobarometer Survey 369 in

2011 (European Commission, 2011). The following two questions are thereby used by Cedefop (2014): “Do you think that VET has a very positive, fairly positive, fairly negative or very negative image in this country?” and “Nowadays, which of the following would you recommend to a young person who is finishing compulsory education?” whereat measuring attractiveness by the first question shows a very high level, while the second question reflects less positive attitudes towards VET. The indicator of relative esteem is based on the difference between the percentage of people recommending VET and the percentage of people recommending general education. However, comparing the participation rates with the indicators on attitudes from the Special Eurobarometer Survey, Cedefop (2014) reveals no statistically significant correlation.

Another recent study covering the subject of the *image of VET* among others was published by the McKinsey Center for Government (Mourshed et al., 2014). Based on their survey of over 8'000 young people, education providers and employers around the world, they come to the conclusion that, despite the demand from both employers and young people, social bias and unclear pathways limit vocational enrolment. The former is reflected by the fact that young people believe in a *stigma against VET* as academic education seems to be valued more by the society (ibid; see also Koulaidis et al., 2006; Billett, 2014). In five of the seven countries covered by the survey, students taking an academic course said they *believed society valued that kind of education more than VET*. But even these students believed that VET was probably more useful in finding work. Moreover, the bias against VET even appears to dissuade young people from following pathways that can lead to jobs they want.

Also for Switzerland, some efforts have been carried out to measure the social status of VET in surveys among individuals, firms and VET experts. In their representative public survey in Switzerland, Cattaneo/Wolter (2013) included different questions related to the social status of VET. The first question addresses the *desired education track for own children* and reveals that for about 61% of the respondents, both education tracks, baccalaureate schools as well as VET, are considered, depending on the individual ability and interest. The share of respondents selecting either general education or VET includes in both cases around 16%. However, the authors disclose that this question might possibly be driven by social desirability, thus the results might overestimate the share of respondents without clear preference. In addition, the results reveal that foreigners clearly show a stronger preference for general education than Swiss respondents. If looking at the *employment outlook*, about one third of the respondents think that young people are better prepared with VET, while nearly half of the respondents states that both education tracks, baccalaureate school and VET, prepare equally well for the labour market. Furthermore, Cattaneo/Wolter (2013) also analyse the individual assessment of quota and accessibility of baccalaureate schools whereat again differences between Swiss and foreigners become evident: the quota for baccalaureate schools is assessed as too low by more than 60% of the foreign respondents, but only half of the Swiss. In contrast, the share of respondents supporting entrance examinations for baccalaureate schools is significantly higher among Swiss. A study carried out by the former Federal Office for Professional Education and Technology (OPET), based on a survey among

firms and VET experts in Switzerland, Germany and the UK, aimed at getting insight into the performance of the Swiss VET system as well as possibilities for its international position (OPET 2011). The results show that VET is an important location and competitive factor in all three countries. The respondents acknowledge the dual VET as a success story and the Swiss model even leaves the best impression. However, the assessment of different aspects shows that the Swiss VET system also has its shortcomings and the experts especially highlight the lack of recognition in other countries.

Taken together, this literature review shows that *little is known about the social status of VET systems*, especially due to the lack of appropriate data. Furthermore, the existing information rely on survey data, which often suffers from social desirability bias (see e.g. Diekmann 2004), occurring if adolescents and their parents are directly questioned about educational preferences. Moreover, surveys questions capture single aspects of educational choices, e.g. expected career perspectives or social prestige, which lead to different results. It remains unclear how these aspects can be combined in a measure of social status of education tracks.

Looking at the *determinants of the social status of VET*, even less evidence can be found so far. Nevertheless, some studies highlight the role of information and prejudices in influencing the valuation of an education track. One attempt to conceptually capture and measure factors affecting the image of VET was made by Depner/Atze (2000) for the case of the Südtirol. For this region, they find negative stereotypes presumably caused by prejudice and insufficient information, which is in line with the above presented findings of Mourshed et al. (2014). Besides, the former OPET reveals a positive relationship between the knowledge about VET and the general attitude towards VET in their survey, also using descriptive methods. Cedefop (2014) identified different drivers influencing the attractiveness of initial VET (IVET), taking into consideration various national and cultural contexts. Looking at exogenous drivers, they show significant correlations of expenditures on VET and of the labour market composition on the attractiveness of IVET. But due to lack of quantitative data, they are not able to confirm the impact of endogenous drivers, such as labour market relevance, accessibility, provision of guidance, assured quality of education offered, and self-development choices. Moreover, they state that viewpoints and perceptions around VET are also likely to influence attractiveness. Furthermore, the authors conclude that outcomes (e.g. relatively high wages and employment prospects) of IVET should not be equated with its attractiveness, due to the need for communicating outcome and information about VET systems.

## **2.2. Social Status Based on Observed Educational Choices**

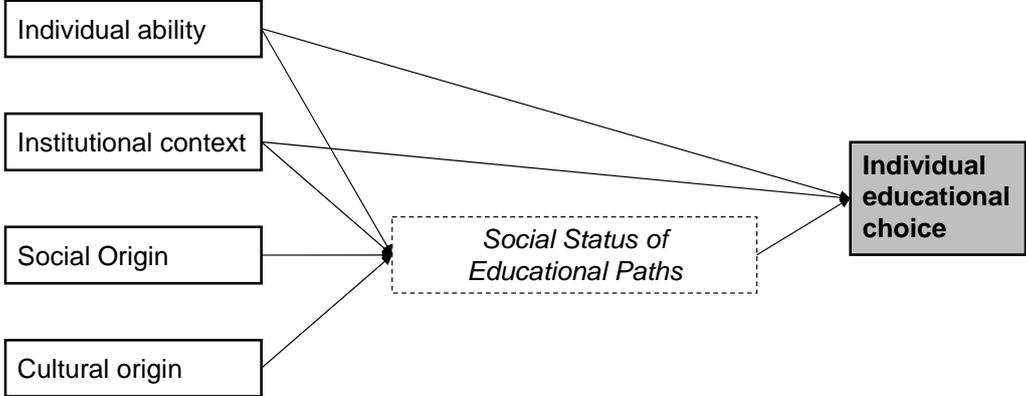
The basic idea of the new approach to measure changes in the social status of education tracks builds upon educational choices. However, instead of surveying individuals regarding their preferences, e.g. “If you could wish an education track for your children after compulsory schooling, what should it

be?” (Cattaneo/Wolter, 2013: 13), our approach exploits the information provided by observed educational choices.

Many scholars have attempted to identify the relevant drivers and mechanisms behind this decision in theoretical and empirical research. The determinants identified to influence education choices mainly include social class, father's occupation, parental education, family income, national-ethnic and religious background, place of residence, and sex which are associated both with vocational and educational choice. In addition, there are such psychological determinants as talent, cognitive and non-cognitive skills, i.e. personality traits (e.g. Dole, 1964). Broadly speaking, these determinants can be grouped into *individual characteristics* and *institutional context* as well as *social and cultural origin* whereat the social origin has not only a direct effect on the adolescents’ ability, but also an indirect effect on the educational choice (Erikson/Goldthorpe, 2002). Figure 1 provides an overview of this educational choice process.

Looking at the mechanism, educational choices can be considered as a result of a cost-benefit consideration based on the above mentioned determinants. Though, this consideration happens not only based on a rational choice involving *objective expectations* regarding the costs and benefits (cf. Becker, 1974), but also on the *subjective perception* of own abilities and expected earnings (cf. Boudon, 1974; Breen/Goldthorpe, 1997; Becker/Hecken, 2009). This subjective expected costs and benefits are a results of individual’s viewpoint which is also affected by individual characteristics, institutional context (e.g. different education systems) in addition to the social and cultural origin (e.g. social norms, socio-economic status of parents). In this process, the society’s valuation of an education track also influences the individuals’ perception of costs and benefits. Different authors thereby assume that there is a stigma against VET in many countries (Koulaidis et al., 2006; Billett, 2014; Cedefop, 2014; Mourshed et al., 2014), resulting in a low valuation of this education track. This leads to a discrimination effect involving biased assessments of VET which has also an impact on subjective perceptions and thus individual educational choices.

**Figure 1: Theoretical Framework**



The theoretical framework depicted in Figure 1 illustrates the factors determining individual educational choices. Hence, the social status of dual VET not only related to attitudes but also influences the behaviour of adolescents, namely their educational choices. This framework suggests that an increase in the social status of an education track increases the probability of selecting a particular education for a given individual ability, institutional context as well as social and cultural origin. Hence, the change in the social status of the education track can be captured by a change in the probability of selecting a particular educational choice conditional on the other factors:

$$\Delta \text{Social Status} = \Delta p(\text{Educational Choice} \mid \text{Ability, Context}) \quad (1)$$

Within an institutional context, this relationship can also be expressed by the relative ability of adolescents selecting a particular education track. Hence, an increase in the social status of an education track results in a change in the composition of adolescents in a certain education track with regard to their ability, expressed by the average relative ability of adolescents choosing an education track compared to the whole cohort, *ceteris paribus*. If looking at the change in the social status of dual VET, this can be expressed as follows:

$$\Delta \text{Social Status} = \Delta \frac{\text{Ability Apprentices}}{\text{Ability Cohort}} \quad \text{cet. par.} \quad (2)$$

While this approach allows to analyse differences in the perceived social status of education tracks across time and groups, no interpretation of the level of the social status of education tracks can be made. As we do not dispose of any reference for interpreting a certain level of the social status of education tracks, we can only build upon comparisons (over education tracks, time etc.).

### 2.3. Hypotheses

In this paper, we aim at applying the above introduced approach for measuring changes in the social status of education tracks to get a deeper understanding of the social status of *dual VET in Switzerland*. We therefore focus on adolescents choosing a dual vocational track, the so called apprenticeship, for post-secondary education in Switzerland. We thereby analyse one specific determinant leading to a change in the educational choices which reflect a change in the social status of VET, *ceteris paribus*, namely the *knowledge about the education system*. Based on our theoretical framework, we can thereby assume that an increase in the level of knowledge leads to a less biased assessment of education tracks, namely dual VET. Also in line with some authors stating that the level of information might play a crucial role in determining the valuation or social status of educational choices (cf. Depner/Atze, 2000; OPET, 2011; Cedefop, 2014), we hypothesise that *growing knowledge about the education system leads to an increase in the perceived social status of dual VET*.

In addition, we build on the claim that foreigners living in Switzerland have a lower social status of dual VET than Swiss individuals, as recently shown by Cattaneo/Wolter (2013). This lower valuation of foreigners can be based on several reasons: Firstly, foreigners might stem from a country with lower valuation of VET and therefore prefer general education which leads to better prospects on the la-

bour market in their country of origin. The valuation of a certain education track outside Switzerland can be assumed to be even more important if they think about returning to their country of birth or migrating to another country which might be weakened with the time spent in Switzerland. Secondly, foreigners coming from a country without a dual VET system do not know this system at all and will therefore never have experienced this kind of education themselves. This might also have an impact on their valuation, as even Swiss show a higher preference for VET if they have completed a vocational track themselves (Busemeyer et al., 2011; Cattaneo/Wolter, 2013). Against this background, we can assume that with the time that foreigners spend in Switzerland, their knowledge about the education system and career prospects increases which leads them to less biased assessments of the dual VET. In addition, with the time spent in a country, adolescents get socialised to the local norms and values, e.g. the valuation of dual VET. From this, we can reformulate our hypothesis as follows: *The social status of dual VET increases as foreigners live longer in Switzerland thanks to their growing knowledge about the education system.*

Consequently, focusing on the group of foreigners and approximating the change in knowledge by an increasing length of stay in Switzerland allows us to test whether a higher level of knowledge about the education system might lead to a rise in the perceived social status of dual VET. However, due to the reasons introduced above, we are not able to directly prove that this change results from growing knowledge.

### **3. Data**

In the empirical analysis, we operationalise ability by the cognitive ability, thus neglecting other individual parameters as non-cognitive skills or personality traits. We thereby measure cognitive ability by the plausible reading and mathematics test scores (OECD 2009, and, e.g., von Davier et al., 2009) of the Swiss Programme for International Student Assessment (PISA) for Switzerland. Due to missing values in key variables in the wave of 2006, we analyse the PISA waves 2000, 2003 and 2009, pooled across time. The sample of PISA is representative of the 9th grade student cohort, thus adolescents at the end of compulsory schooling and just selecting their further education track, in both the country as a whole and in its three main language regions, namely the German, French and Italian speaking region (Nationale Programmleitung PISA.ch, 2008). We restrict our sample to German-speaking regions to ensure cultural homogeneity as well as to account for different patterns of educational choices for upper secondary education in these regions, e.g. the share of apprentices being much lower in French- and Italian-speaking Switzerland than in the German-speaking part (BFS, 2014).

In addition to the test scores, the PISA data contain information on the upper secondary education track the adolescents plan to pursue after mandatory schooling. In Switzerland, these education tracks can be mainly divided into general education and VET. The latter include education and training programmes designed for, and typically directly leading to, a particular (type of) occupation. These pro-

grammes combine practical training at either workplace or school with learning of occupation-specific theory and some degree of general skills. In contrast to only school-based VET, dual VET is thereby based on a co-existence of different learning and training locations, namely the company and the vocational school, thus ensuring the labour market orientation of the acquired skills (Wolter/Ryan, 2011). In Switzerland, VET is seen as own system (“Berufsbildungssystem”) defined in Art. 3 Abs. a of the Federal Act on Vocational and Professional Education and Training, VPETA, 13 December 2002 (SR 412.10). Consequently, the VET curriculum for each occupation is defined in a national training ordinance and graduates receive a federally recognised degree.

In the PISA data, the possible future activities for post-compulsory education can be grouped in the following categories: Grade 8-9 / gap year (school or practical; 20.30%), Apprenticeship (education track of dual VET; 48.19%), School-based vocational education (5.07%), General education (“Gymnasium”; 22.62%), other education or paid job (2.28%) and don’t know yet (1.54%). The use of data from TREE<sup>1</sup>, which is a longitudinal follow-up study to PISA 2000, allow us to test in how far the information on the prospective education track given by the adolescents in the PISA wave 2000 corresponds with the actually chosen education. This can be confirmed for the main groups of our analysis, the apprentices (correlation of 0.813) and the students in general education (correlation of 0.856).

In our analysis, we only include adolescents choosing an education track after mandatory education, thus including solely adolescents which plan to attend an apprenticeship, school-based vocational education or general education. We thereby exclude one group of adolescents of considerable size, namely around 20% of adolescents planning to attend an 8-9/ gap year. Based on the TREE data, we know that a large share of these adolescents choose to make an apprenticeship after the bypass. Therefore, including those adolescents in the sample would bias our estimates. In particular, preliminary analysis has shown that the social status of dual VET increases for this group of 8-9/ gap year students. This suggests that omitting these students from our data set leads to an underestimation of the impact of interest. Furthermore, including the full cohort in our estimation yields qualitatively the same results, which can be obtained from the authors upon request.

Based on background questionnaires, PISA further provides detailed information on the adolescents and their families. In the multivariate analysis, we control for different observable factors which have been proven to influence educational decisions at this stage, particularly age and gender (see chapter 2.2). We measure the social origin of the adolescents by the socio-economic status and educational background of the parents, the number of books at home and the family structure. The cultural origin of the adolescents will be considered with the country of birth together with the parents’ birth country and for the institutional context we use the residence canton as well as living area. Table A-1 in the appendix provides descriptive statistics for all variables.

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<sup>1</sup> The Swiss youth panel study TREE (Transitions from Education to Employment; [www.tree-ch.ch](http://www.tree-ch.ch)) has been running since 2000 and has since been funded by the Swiss National Science Foundation, the University of Basel, the Swiss Federal Office of Statistics, the Federal Office of Professional Education and Technology, and the cantons of Berne, Geneva and Ticino. Distribution: Data service, FORS, Lausanne.

## 4. Methodology

In a first step, we implement the new approach to measure the social status of dual VET as an education track by calculating the ability ratio of apprentices and the whole upper secondary education cohort based on formula (2). This allows to analyse differences in the social status of dual VET descriptively.

In order to analyse the statistical significance of observed differences in these ability ratios, we complement the descriptive approach by a multivariate analysis that further allows to account for potential endogeneity of the estimates due to unobserved heterogeneity.

Concretely, based on formula (1), we estimate the probability that adolescent  $i$  selects a dual VET over the alternative upper secondary educational choices conditional on observed cognitive abilities measured by PISA reading and mathematics scores with the following probit model:

$$App_i = \beta_1 \ln PISA_i + \beta_2 \ln Length_i + \gamma_1 X_i + \varepsilon_i \quad (3)$$

where  $App_i$  is a dummy variable indicating whether an adolescent chooses an apprenticeship.  $\ln Length_i$  denotes the natural logarithm of the number of years an adolescent has spent in Switzerland, thereby allowing to test hypothesis (2) suggesting that the longer an adolescent lives in Switzerland, the higher the perceived social status of dual VET, thus the higher the probability of selecting an apprenticeship. Hence, the coefficient of main interest is  $\beta_2$ , for which we hypothesise a positive sign, i.e. the probability of selecting an apprenticeship conditional on ability increases as an adolescent lives longer in Switzerland.

We expect a negative sign for  $\beta_1$  as the relationship between individual ability and participation in dual VET is supposed to be negative (cf. Bertschy et al., 2009).

$X_i$  is a vector of observable characteristics capturing age, gender, socio-economic status, educational background and country of origin of the parents, number of books at home, family structure, residence canton and urban area.

The main concern regarding the identification of  $\beta_2$  is that there is unobserved heterogeneity across migration waves, e.g. in terms of non-cognitive abilities. Therefore,  $X_i$  further contains dummy variables for cantons and country of birth to capture unobserved heterogeneity in settlement patterns and characteristics of migration waves.

In order to improve the identification strategy, we further exploit the fact that we observe educational choices of foreigners born in Germany or Austria, where a dual VET system also exists. Hence, we expect that these adolescent are familiar with the dual VET system and the value of dual VET. Therefore, we hypothesise that the social status of dual VET should increase less for foreigners born in Germany or Austria than for foreigners born in other countries that have no dual VET system.

This approach allows us to test our hypothesis in a Difference-in-Difference (DiD) identification strategy (Legewie, 2012):

$$App_i = \beta_1 \ln PISA_i + \beta_2 \ln Length_i + \beta_4 Similar_i + \beta_5 Similar_i * \ln Length_i + \gamma_1 X_i + \varepsilon_i \quad (4)$$

This estimation holds the same variables as (3) plus the variable  $Similar_i$  which denotes a dummy that takes the value 1 if the adolescent is born in a country with a similar education system than Switzerland, namely Germany or Austria. The DiD coefficient of interest is the interaction  $Similar_i * \ln Length_i$  which captures whether the increase in the relative ability of apprentices born in a country with a similar education system with the time spent in Switzerland is lower for apprentices from DE/AT than for apprentices from other countries.

A second approach which helps to test our hypothesis can be based on the parents' country of origin of the foreign adolescents. We thereby exploit the fact that we observe education choices from foreign adolescents with and without a mother and/or father born in Switzerland. This leads us to the expectation that foreign adolescents with Swiss origin already has a better knowledge about the Swiss education system at the time of immigration, thus the social status of dual VET should increase less for these foreigners compared to foreigners without Swiss parents. Hence we can apply a second DiD identification strategy in order to test our hypothesis:

$$App_i = \beta_1 \ln PISA_i + \beta_2 \ln Length_i + \beta_4 Swiss_i + \beta_5 Swiss_i * \ln Length_i + \gamma_1 X_i + \varepsilon_i \quad (5)$$

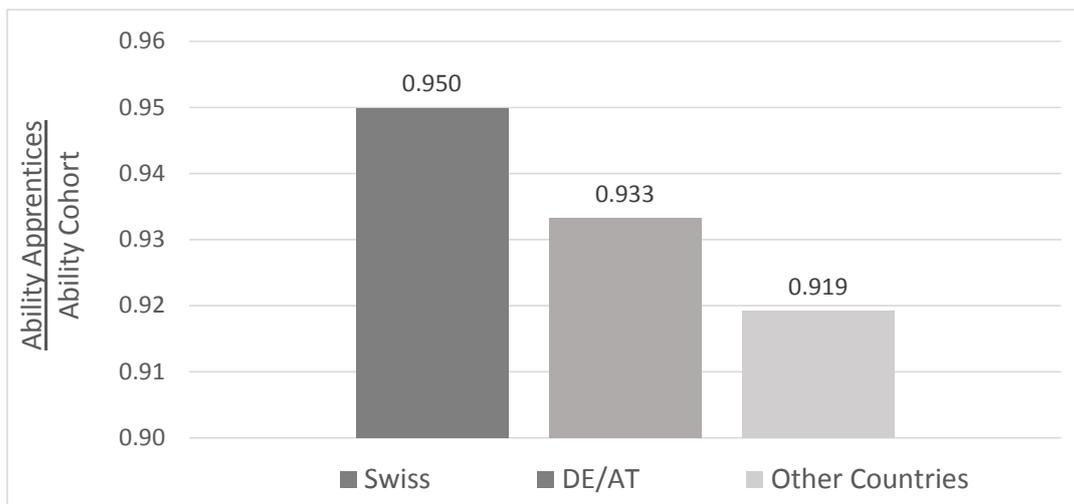
This estimation holds the same variables as (4) except for  $Swiss_i$  which is a dummy variable that takes the value 1 if the mother and/or father of the adolescent is born in Switzerland. Importantly, we look at the interaction  $Swiss_i * \ln Length_i$  which indicates a variation in probability change of selecting an apprenticeship, given a certain ability, with the time spent in Switzerland between adolescents with and without Swiss origin. Unlike the first DiD approach, this estimation even allows to include country-specific trends to capture differences in migration waves.

## 5. Results

### 5.1. Descriptive Analysis

This section provides a descriptive analysis of hypotheses H1 and H2 by showing the average ability ratio for different subgroups. Concretely, Figure 2 displays average PISA scores of dual VET students relative to the average PISA scores of the whole upper secondary education cohort, separately for Swiss adolescents, adolescents from Germany and Austria and adolescents from other countries.

**Figure 2: Average ability ratios of Swiss and foreigners**



*Data: Own calculations based on Swiss PISA data of waves 2000, 2003, 2009; N=20'458*

Figure 2 suggests that the social status of dual VET is perceived higher by Swiss than by foreigners. Moreover, foreigners coming from a country with a similar VET system than Switzerland, i.e. Germany/ Austria, show a higher valuation of the social status of dual VET than adolescents from other countries.

In addition, the following figure 3 shows the average ability ratio of reading and mathematics as a function of the years an adolescent has lived in Switzerland. The figure suggests that the average ability ratio increases with the time spent in Switzerland.

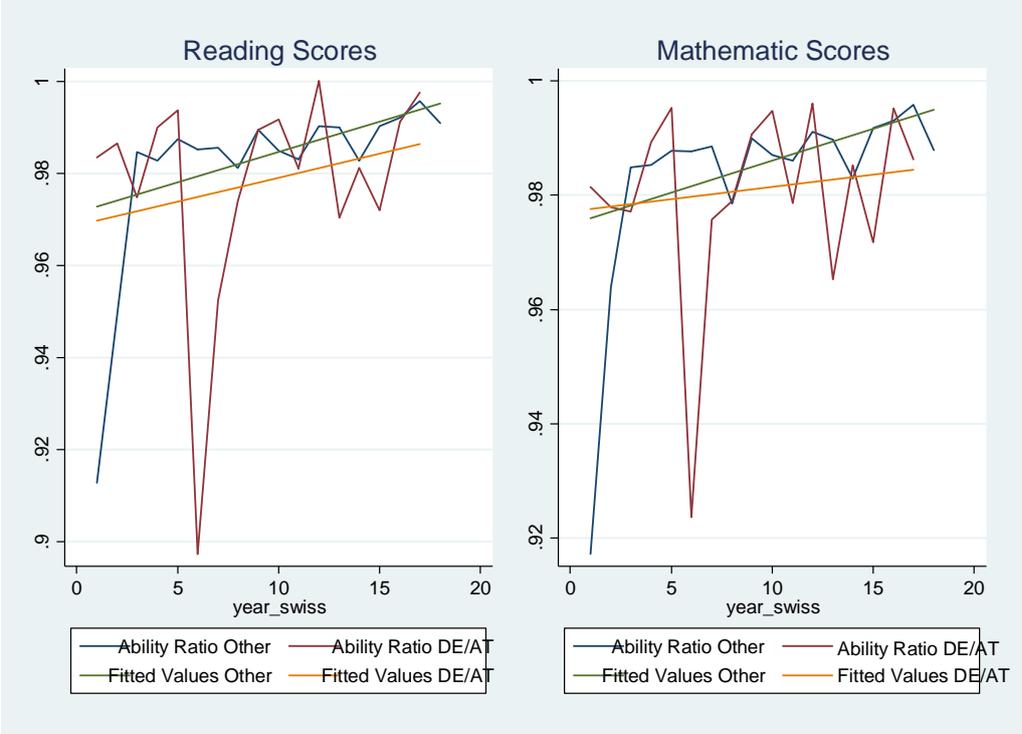
**Figure 3: Change of ability ratios with time spent in Switzerland (Baseline Approach)**



*Data: Own calculations based on PISA data of waves 2000, 2003, 2009; N=1'378*

Furthermore, Figure 4 shows that the average ability ratio increases less for foreigners from Germany or Austria than for foreigners born in a country where no dual VET system exists.

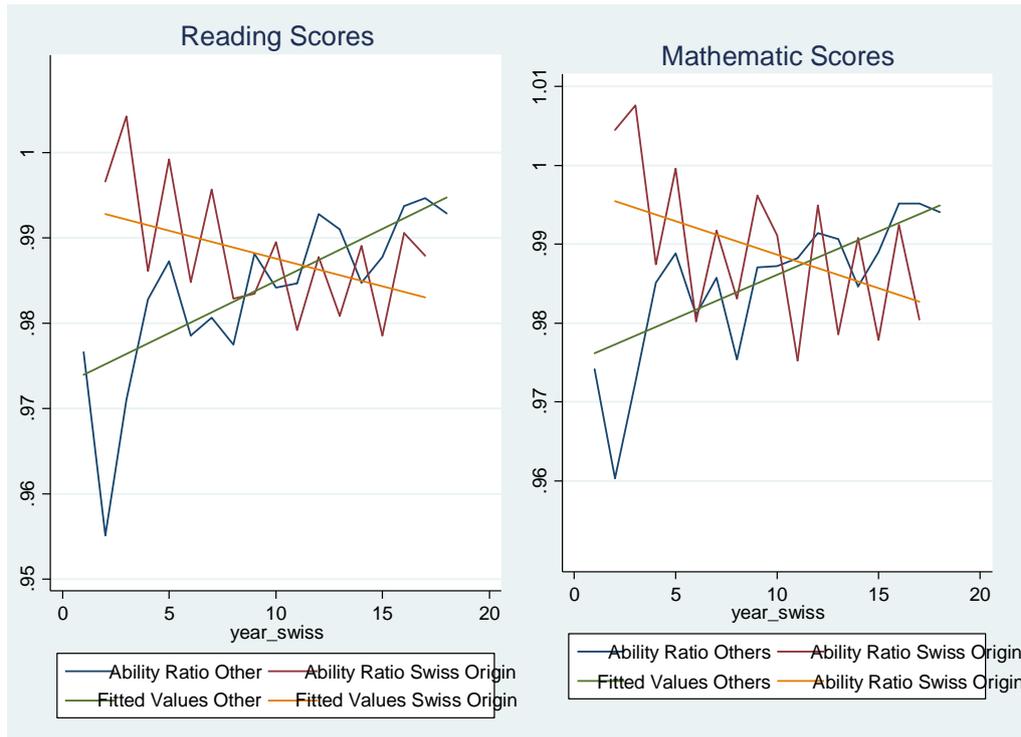
**Figure 4: Change of ability ratios with time spent in Switzerland and birth country**



Data: Own calculations based on PISA data of waves 2000, 2003, 2009; N=1'373

Lastly, figure 5 shows that the average ability ratio only increases for foreign adolescents without Swiss origin, compared to foreigners with a mother and/or father born in Switzerland.

**Figure 5: Change of ability ratios with time spent in Switzerland and Swiss origin**



*Data: Own calculations based on PISA data of waves 2000, 2003, 2009; N=1'357*

Hence, figures 4 and 5 provide descriptive evidence that the social status of dual VET increases as foreigners live longer in Switzerland, reflecting the learning process regarding the Swiss education system and the true value of an apprenticeship.

## 5.2. Multivariate Regression Results

This section shows our results from the multivariate regressions, analysing whether living in Switzerland longer increases the social status of dual VET. Table 1 provides an overview on the baseline results following equation (3), whereat Tables 2 and 4 show the DiD estimates following equation (4) and equation (5), respectively. The full estimates of the corresponding estimations are shown in Tables A-2 until A-5 in the appendix. Additionally, table 3 provides a placebo test on the results of the first DiD estimates.

The first estimates of Tables 1 and 2 show the simple correlation of the length living in Switzerland on the probability of choosing an apprenticeship conditional on PISA reading and mathematics scores. The second model further controls for observable characteristics. Models three to six account for unobserved heterogeneity across cantons (Model 3), plus own country of birth (Model 4), plus country of birth of father and mother (Model 5), plus country of birth trends (Model 6) for the baseline approach and second DiD.

**Table 1: Baseline approach for the probability of selecting a dual VET**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>	<b>Model 6</b>
Reading Scores (ln)	<b>-0.783***</b> (0.125)	<b>-0.324**</b> (0.136)	<b>-0.308**</b> (0.136)	<b>-0.363***</b> (0.137)	<b>-0.340**</b> (0.136)	<b>-0.363***</b> (0.135)
Mathematics Scores (ln)	<b>-0.747***</b> (0.127)	<b>-0.895***</b> (0.135)	<b>-0.831***</b> (0.136)	<b>-0.822***</b> (0.135)	<b>-0.857***</b> (0.135)	<b>-0.830***</b> (0.134)
Years in CH (ln)	<b>0.094***</b> (0.025)	<b>0.077***</b> (0.024)	<b>0.075***</b> (0.023)	<b>0.088***</b> (0.023)	<b>0.090***</b> (0.023)	<b>0.083*</b> (0.043)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	No	Yes	Yes	Yes	Yes	Yes
Canton Dummies	No	No	Yes	Yes	Yes	Yes
Country of Birth Dummies	No	No	No	Yes	Yes	Yes
Country of Birth of Father and Mother Dummies	No	No	No	No	Yes	Yes
Country of Birth Trend Dummies	No	No	No	No	No	Yes
N	955	955	952	952	952	952

Notes: The table displays marginal effects of probit estimations and robust standard errors in parentheses. \*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% level, respectively.

Table 1 shows that the marginal effect for the cognitive ability measures, namely reading and mathematics scores, have the expected sign. Concretely, higher test score lead to a lower probability of choosing an apprenticeship. This effect is even higher for mathematics than for reading scores when controlling for observables, whereby an increase of 1% in the mathematics test scores reduces the probability of choosing an apprenticeship by 0.83% in the final model. In comparison, an increase of 1% in the reading test scores reduces the probability of choosing an apprenticeship by only 0.36%.

Furthermore, Table 1 shows that living in Switzerland longer increases the probability of selecting an apprenticeship conditional on cognitive ability measures. This results hold for all specifications of control variables and remain remarkably stable by introducing fixed effects for canton, country of birth and country of birth trends. In the final model, a 1% increase in the time spent in Switzerland leads to a 0.083% increase in the probability of choosing an apprenticeship instead of school-based VET or general education, holding the other variables constant. *Consequently, the results of our baseline models confirm our hypothesis that living in Switzerland longer increases the social status of dual VET.*

Table 2 shows the results of the first DiD approach, which exploits the fact that foreign adolescents come from countries with varying education systems, thereby providing variation in the initial knowledge regarding dual VET. As Germany and Austria are the two immigration countries with the most similar education system compared to the Swiss one, thereby also providing a comparable dual apprenticeship, this groups is analysed separately from immigrants with other countries of birth.

**Table 2: First DiD approach (birth country) for the probability of selecting a dual VET**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
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Reading Scores (ln)	<b>-0.823***</b> (0.131)	<b>-0.363***</b> (0.135)	<b>-0.386***</b> (0.135)	<b>-0.407***</b> (0.135)	<b>-0.361***</b> (0.135)
Mathematics Scores (ln)	<b>-0.780***</b> (0.130)	<b>-0.810***</b> (0.135)	<b>-0.879***</b> (0.135)	<b>-0.875***</b> (0.134)	<b>-0.836***</b> (0.134)
Years in CH (ln)	<b>0.127***</b> (0.034)	<b>0.117***</b> (0.031)	<b>0.122***</b> (0.032)	<b>0.123***</b> (0.032)	<b>0.118***</b> (0.032)
<b>DE /AT</b>	<b>0.214**</b> (0.107)	<b>0.281***</b> (0.097)	<b>0.314***</b> (0.101)	<b>0.326***</b> (0.101)	<b>0.250**</b> (0.116)
<b>Years in CH (ln) * DE/AT</b>	<b>-0.059</b> (0.046)	<b>-0.077*</b> (0.042)	<b>-0.086**</b> (0.044)	<b>-0.088**</b> (0.044)	<b>-0.076*</b> (0.044)
Year Dummies	Yes	Yes	Yes	Yes	Yes
Control Variables	No	Yes	Yes	Yes	Yes
Canton Dummies	No	No	Yes	Yes	Yes
Country of Birth Dummies	No	No	No	Yes	Yes
Country of Birth of Father and Mother Dummies	No	No	No	No	Yes
N	955	955	952	952	952

Notes: The table displays marginal effects of probit estimations and robust standard errors in parentheses. \*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% level, respectively.

Table 2 shows that the estimated effect of living in Switzerland longer remains significant in all estimations and even increases in magnitude until the inclusion of country of birth of the parents. In addition, the new dummy variable indicating whether a foreign student was born in Germany/Austria or in another country shows the expected sign, specifically that immigrants from a country with a similar education system have a higher conditional probability of nearly 0.30% of selecting an apprenticeship.

Importantly, we are now interested in the interaction term of the DE/AT dummy with years spent in Switzerland which provides evidence on whether the social status of dual VET changes with the country of origin and length of residence in Switzerland. The significantly negative estimates additionally support our hypothesis as it suggests that the expected effect that foreigners coming from a country with a similar education system show a lower effect on the probability of choosing an apprenticeship with longer residence in Switzerland, compared to other foreign adolescents.

In order to test our evidence, a placebo-test can be applied whereat instead of looking at the group of adolescents coming from Germany and Austria compared to foreigners from other countries, other groups of foreigners based on their country of birth can be formed.

**Table 3: Placebo test for first DiD approach for the probability of selecting a dual VET**

	<b>Model FR/BE</b>	<b>Model IT/ES/PT</b>	<b>Model YU/AL/KO</b>	<b>Model Other</b>
Reading Scores (ln)	<b>-0.326**</b> (0.136)	<b>-0.357**</b> (0.138)	<b>-0.350**</b> (0.134)	<b>-0.340**</b> (0.136)
Mathematics Scores (ln)	<b>-0.862***</b> (0.134)	<b>-0.844***</b> (0.136)	<b>-0.849***</b> (0.132)	<b>-0.857***</b> (0.135)

Years in CH (ln)	<b>0.088***</b> (0.023)	<b>0.085***</b> (0.024)	<b>0.074***</b> (0.025)	<b>0.093***</b> (0.028)
<b>Group of Birth Country</b>	<b>-1.822***</b> (0.658)	<b>-0.621***</b> (0.228)	<b>0.488***</b> (0.178)	<b>-0.049</b> (0.138)
<b>Years in CH (ln) *</b>	<b>0.719***</b> (0.273)	<b>0.120</b> (0.117)	<b>0.054</b> (0.056)	<b>-0.009</b> (0.052)
Year Dummies	Yes	Yes	Yes	Yes
Control Variables	Yes	Yes	Yes	Yes
Canton Dummies	Yes	Yes	Yes	Yes
Country of Birth Dummies	Yes	Yes	Yes	Yes
Country of Birth of Father and Mother Dummies	Yes	Yes	Yes	Yes
N	952	952	952	952

Notes: The table displays marginal effects of probit estimations and robust standard errors in parentheses. \*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% level, respectively.

As we do not assume any variation in the gain of knowledge regarding the Swiss education system with the time spent here between the different groups of countries of origin, there should be no effect of the interaction term country of origin with length of stay in Switzerland. Table 3 supports this assumption except for the adolescents born in France or Belgium for which the probability of choosing an apprenticeship with the time spent in Switzerland increases significantly compared to adolescents from other countries. Nevertheless, the results of our models and approaches (tables 1, 2, 4) hold if we exclude all adolescents which are born in France or Belgium (only 14 observations) Besides, table 3 shows that the probability of selecting an apprenticeship given a certain ability varies between adolescents from different birth countries. In doing so, only adolescents from former Yugoslavia, Albania and Kosovo show a higher probability of entering an apprenticeship in comparison to the others. Lastly, Table 4 shows the results of the second DiD approach, which exploits the fact that adolescents with Swiss origin, meaning that either their father and/or their mother are born in Switzerland, are to know the Swiss education system better than other foreign adolescents.

**Table 4: Second DiD approach (Swiss origin) for the probability of selecting a dual VET**

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>	<b>Model 6</b>
Reading Scores (ln)	<b>-0.788***</b> (0.125)	<b>-0.365***</b> (0.134)	<b>-0.347**</b> (0.135)	<b>-0.369***</b> (0.136)	<b>-0.350**</b> (0.135)	<b>-0.365***</b> (0.136)
Mathematics Scores (ln)	<b>-0.753***</b> (0.127)	<b>-0.897***</b> (0.133)	<b>-0.824***</b> (0.134)	<b>-0.818***</b> (0.134)	<b>-0.851***</b> (0.133)	<b>-0.824***</b> (0.134)
Years in CH (ln)	<b>0.105***</b> (0.029)	<b>0.116***</b> (0.027)	<b>0.116***</b> (0.027)	<b>0.116***</b> (0.027)	<b>0.119***</b> (0.027)	<b>0.195***</b> (0.063)
<b>Swiss Origin</b>	<b>0.139</b> (0.151)	<b>0.289**</b> (0.133)	<b>0.308**</b> (0.124)	<b>0.307**</b> (0.123)	<b>0.292**</b> (0.135)	<b>0.430***</b> (0.163)
<b>Years in CH (ln)</b>	<b>-0.050</b>	<b>-0.103*</b>	<b>-0.110**</b>	<b>-0.108**</b>	<b>-0.118**</b>	<b>-0.176***</b>

* Swiss Origin	(0.063)	(0.056)	(0.052)	(0.053)	(0.054)	(0.066)
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Control Variables	No	Yes	Yes	Yes	Yes	Yes
Canton Dummies	No	No	Yes	Yes	Yes	Yes
Country of Birth Dummies	No	No	No	Yes	Yes	Yes
Country of Birth of Father and Mother Dummies	No	No	No	No	Yes	Yes
Country of Birth Trend Dummies	No	No	No	No	No	Yes
N	955	955	952	952	952	952

Notes: The table displays marginal effects of probit estimations and robust standard errors in parentheses. \*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% level, respectively.

Once more, Table 4 shows that the estimated effect of living in Switzerland longer remains significant in all estimations and highly increases in magnitude. The latter also applies to the new dummy variable reflecting whether an adolescent has Swiss origin or not, which shows that *adolescents with a mother and/or father born in Switzerland have a higher probability of selecting an apprenticeship*.

Moreover, the interaction effect of time spent in Switzerland and Swiss origin has the expected sign. This interaction effect provides evidence whether a stronger change of the perceived social status of dual VET can be observed with the length of residence in Switzerland for foreign adolescents without Swiss origin. Hence, the results provide additional evidence for our hypothesis showing *the expected effect that foreigners with a mother and/or father born in Switzerland show a lower effect on the probability of choosing an apprenticeship with longer residence in Switzerland*, compared to other foreign adolescents.

Taken together, the results of our multivariate analyses *confirm our hypothesis that with the time spent in Switzerland, the perceived social status of VET increases and thus more able student select into an apprenticeship*. The first DiD approach moreover provides evidence that with the time that foreigners spend in Switzerland, their knowledge about the education system and career prospects of individual education tracks increases which leads them to less biased assessments of these options. This is supported by the fact that foreigners born in a country with a similar education system show a lower increase in the perceived social status of VET with the length of residence in Switzerland, as the vocational path already has a higher valuation in their birth countries. In addition, our second DiD approach demonstrates that foreign adolescents with a mother and/or father born in Switzerland already know more about the Swiss education system at the time of immigration, thus their increase in the perceived social status of VET with the time spent in Switzerland is lower than for other foreigners.

## 6. Conclusion

The aim of this paper was to get a deeper understanding of the phenomenon of the social status of education tracks. As existing research does not provide a satisfactory concept for measuring the social status of education tracks, we propose a new approach *to measure changes in the social status of education tracks*. We thereby assume that a change in the probability of choosing a particular education, conditional on cognitive ability, social and cultural origin as well institutional context, reflects a change in the social status of this education track. Equivalently, the change in the social status can be expressed by the average relative ability of adolescents choosing an education, thereby referring to the composition of adolescents in a certain education track with regard to their ability.

Due to globalisation, leading not only to an increase in looking abroad but to also to rising immigration, the social status of dual VET in Switzerland more and more also depends on the perception of VET in other countries. Hence, we apply our approach to investigate the social status of dual VET perceived by foreigners living in Switzerland, as previous surveys have shown that they have a substantially lower valuation of VET than Swiss (Cattaneo/Wolter, 2013). Our approach extends the existing literature firstly by relying on observed education choices. With that, we offer an alternative to questioning adolescents and their parents about educational preferences and thus circumvent the social desirability bias. In addition, such an ability ratio, reflecting the change in the social status of an education track, can be calculated based on available data measuring the cognitive ability of adolescents in upper secondary education, hence at the time of the individual educational choice. Moreover, such a concept does not only refer to single aspects of educational choices, e.g. expected career perspectives or social prestige, but rather considers all these aspects in one measure

Our results confirm our main hypotheses that the social status of dual VET is perceived lower by foreigner than Swiss adolescents and at the same time increases as foreigners live longer in Switzerland. We can on the one hand provide descriptive evidence by looking at the average PISA scores of dual VET students relative to the average PISA scores of the whole upper secondary education cohort. In addition, foreign adolescents coming from a country with a similar education system as Switzerland, mainly also including a dual VET path, ascribe a higher social status to this education track than foreigners from other countries. Our multivariate analysis shows that as expected, a higher cognitive ability leads to a lower probability of choosing an apprenticeship. However, the probability of choosing an apprenticeship, conditional on cognitive ability, increases with the time spent in Switzerland, as expected in our hypothesis. Hence, with the time that foreigners spend in Switzerland, their knowledge about the education system and career prospects of individual education tracks increases which leads them to less biased assessments of this option.

Unfortunately, we are not able to directly measure the determinants of the demonstrated change in the social status of dual VET in the perception of foreigners with the time spent in Switzerland. In addition, the decreasing probability of returning home or migrating to another country with a longer stay in Switzerland might also have the effect that the valuation of dual VET in other countries plays a weaker role with regard to educational choices with the time spent in Switzerland. Nevertheless, we assume

that the measured change results either from socialisation or a higher level of knowledge about the education system and career possibilities of dual VET. The latter is supported by the fact that foreigners born in a country with a similar education system show a lower increase in the perceived social status of dual VET with the length of residence in Switzerland, as the dual vocational path does also exist there. In addition, we can provide support for this assumption by showing that for adolescents without a mother and/or father born in Switzerland, the perceived social status of dual VET rises more with the time spent in Switzerland. Moreover, a so far unpublished survey conducted by the Swiss Association of Mechanical and Electrical Engineering Industries (Swissmem) confirmed that young people in Switzerland would like to receive more information on initial VET and the opportunities afterwards.

An additional limitation of the study is given by the fact that our skills indicators are restricted to cognitive skills, thus neglecting other individual parameters as non-cognitive skills or personality traits which might also have an impact on individual educational choices. Moreover, we are not able to measure the influence of peers, which should be considered if adolescents adapt their preferences to those of their friends, and of teachers who can effect adolescents educational decisions both directly and indirectly. Another influence factor identified in the literature which we cannot account for in this study is the interest as an important motivational base of educational choices. Regarding the methodology, we further have to bear in mind that we are not able to control for unobserved heterogeneity between Germany/Austria and other countries which is not related to differences in the national education systems.

Finally, we will include the PISA wave 2012 as soon as this data is available for Switzerland. Moreover, we aim at expanding our paper by applying our new measurement to different education tracks, determinants as well as regions (e.g. language region). The problem of the social status or attractiveness of VET is mediated by the specific history and institutions of each country, however, they reflect global trends, creating challenges for post-compulsory education and training systems around the world.

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## Appendix

### A-1 Summary Statistics

	Obs	Mean	Std. Dev.	Min	Max
<b>MAIN VARIABLES</b>					
<b>Future apprenticeship</b>	955	0.628	0.484	0	1
<b>Reading score</b>	955	485.230	94.740	175.138	753.549
ln of reading score	955	6.164	0.207	5.166	6.625
<b>Mathematics score</b>	955	523.526	95.171	274.864	784.943
ln of mathematics score	955	6.243	0.187	5.616	6.666
<b>Years in Switzerland</b>	955	10.994	4.081	1.000	18.000
ln of years in Switzerland	955	2.294	0.520	0.000	2.890
<b>DiD1: Birth country with dual VET system (DE/AT)</b>	955	0.156	0.363	0	1
<b>DiD1: Birth country with dual VET system x ln of years in Switzerland</b>	955	0.322	0.806	0.000	2.833
<b>DiD2: Swiss origin</b>	955	0.222	0.416	0	1
Mother and/or father born in CH	955	0.222	0.416	0	1
<b>DiD2: Swiss origin x ln of years in Switzerland</b>	955	0.521	1.001	0.000	2.890
<b>CONTROL VARIABLES</b>					
<b>Year (PISA wave)</b>					
2000	955	0.173	0.378	0	1
2003	955	0.542	0.498	0	1
2009	955	0.285	0.452	0	1
<b>Canton</b>					
ZH	955	0.208	0.406	0	1
BE	955	0.098	0.298	0	1
SH	955	0.041	0.198	0	1
SG	955	0.230	0.421	0	1
AG	955	0.139	0.346	0	1
D-Rest	955	0.202	0.402	0	1
FR	955	0.003	0.056	0	1
VS	955	0.077	0.268	0	1
<b>Country of birth</b>					
DE/AT	955	0.156	0.363	0	1
FR / BE	955	0.010	0.102	0	1
IT	955	0.035	0.183	0	1
ES	955	0.009	0.097	0	1
PT	955	0.035	0.183	0	1
YU	955	0.352	0.478	0	1
AL / KO	955	0.107	0.309	0	1
TR	955	0.031	0.175	0	1
Other countries	955	0.265	0.442	0	1

<b>Country of birth of father</b>					
CH/FL	955	0.173	0.378	0	1
DE/AT	955	0.102	0.302	0	1
FR / BE	955	0.005	0.072	0	1
IT	955	0.045	0.207	0	1
ES	955	0.009	0.097	0	1
PT	955	0.031	0.175	0	1
YU	955	0.356	0.479	0	1
AL / KO	955	0.106	0.308	0	1
TR	955	0.031	0.175	0	1
Other countries	955	0.141	0.349	0	1
<b>Country of birth of mother</b>					
CH/FL	955	0.128	0.334	0	1
DE/AT	955	0.132	0.339	0	1
FR / BE	955	0.007	0.085	0	1
IT	955	0.026	0.160	0	1
ES	955	0.007	0.085	0	1
PT	955	0.031	0.175	0	1
YU	955	0.356	0.479	0	1
AL / KO	955	0.108	0.310	0	1
TR	955	0.030	0.172	0	1
Other countries	955	0.174	0.379	0	1
<b>Country of birth trends</b>					
DE/AT x ln of years in CH	955	0.322	0.806	0	2.833
FR / BE x ln of years in CH	955	0.024	0.237	0	2.773
IT x ln of years in CH	955	0.087	0.465	0	2.890
ES x ln of years in CH	955	0.023	0.239	0	2.773
PT x ln of years in CH	955	0.076	0.411	0	2.773
YU x ln of years in CH	955	0.840	1.165	0	2.890
AL / KO x ln of years in CH	955	0.249	0.733	0	2.833
TR x ln of years in CH	955	0.073	0.411	0	2.833
Other countries x ln of years in CH	955	0.600	1.035	0	2.890
<b>Number of books at home</b>					
0-10 books at home	955	0.237	0.425	0	1
11-100 books at home	955	0.460	0.499	0	1
101-500 books at home	955	0.223	0.417	0	1
>500 books at home	955	0.081	0.272	0	1
<b>Age in months</b>	<b>955</b>	<b>193.694</b>	<b>8.716</b>	<b>169</b>	<b>233</b>
ln of age in months	955	5.265	0.045	5.130	5.451
<b>Male</b>	<b>955</b>	<b>0.545</b>	<b>0.498</b>	<b>0</b>	<b>1</b>
<b>ln of age in months x male</b>	<b>955</b>	<b>2.868</b>	<b>2.625</b>	<b>0.000</b>	<b>5.451</b>
<b>ISEI of father</b>	<b>955</b>	<b>42.889</b>	<b>17.766</b>	<b>16</b>	<b>88</b>
ln of ISEI of father	955	3.677	0.401	2.773	4.477

<b>Highest education of mother</b>					
ISCED 2 and lower	955	0.464	0.499	0	1
ISCED 3B,C	955	0.183	0.387	0	1
ISCED 3A, 4	955	0.089	0.285	0	1
ISCED 5A, B, 6	955	0.264	0.441	0	1
<b>Living area</b>					
Village (<3'000)	955	0.111	0.314	0	1
Small town (3'000-15'000)	955	0.573	0.495	0	1
Town (15'000-100'000)	955	0.194	0.395	0	1
City (100'000-1'000'000)	955	0.123	0.328	0	1
<b>Family structure</b>					
Single	955	0.082	0.274	0	1
Nuclear	955	0.850	0.357	0	1
Mixed	955	0.047	0.212	0	1
Other	955	0.021	0.143	0	1

Notes: The table shows descriptive statistics for all variables based on pooled PISA data of 2000, 2003, 2009

## A-2 Regression Results: Baseline approach for the probability of selecting a dual VET

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Reading Scores (ln)</b>	<b>-0.783***</b>	<b>-0.324**</b>	<b>-0.308**</b>	<b>-0.363***</b>	<b>-0.340**</b>	<b>-0.363***</b>
	(0.125)	(0.136)	(0.136)	(0.137)	(0.136)	(0.135)
<b>Mathematics Scores (ln)</b>	<b>-0.747***</b>	<b>-0.895***</b>	<b>-0.831***</b>	<b>-0.822***</b>	<b>-0.857***</b>	<b>-0.830***</b>
	(0.127)	(0.135)	(0.136)	(0.135)	(0.135)	(0.134)
<b>Years in CH (ln)</b>	<b>0.094***</b>	<b>0.077***</b>	<b>0.075***</b>	<b>0.088***</b>	<b>0.090***</b>	<b>0.083*</b>
	(0.025)	(0.024)	(0.023)	(0.023)	(0.023)	(0.043)
<b>Years</b>						
<b>2000 (Ref.)</b>	-	-	-	-	-	-
	-	-	-	-	-	-
<b>2003</b>	0.070**	0.050	0.057*	0.047	0.049	0.049
	(0.035)	(0.033)	(0.033)	(0.033)	(0.033)	(0.032)
<b>2009</b>	0.031	0.021	0.021	0.002	0.003	0.003
	(0.039)	(0.038)	(0.039)	(0.039)	(0.038)	(0.037)
<b>Canton</b>						
<b>ZH (Ref.)</b>			-	-	-	-
			-	-	-	-
<b>BE</b>			-0.105**	-0.106**	-0.100**	-0.104**
			(0.044)	(0.043)	(0.044)	(0.046)
<b>SH</b>			-0.040	-0.046	-0.048	-0.052
			(0.058)	(0.058)	(0.057)	(0.058)
<b>SG</b>			-0.076**	-0.077**	-0.081**	-0.082**
			(0.035)	(0.035)	(0.035)	(0.035)
<b>AG</b>			-0.162***	-0.158***	-0.165***	-0.156***
			(0.045)	(0.046)	(0.046)	(0.044)
<b>Other cantons</b>			-0.099***	-0.111***	-0.113***	-0.108***
			(0.035)	(0.035)	(0.035)	(0.035)
<b>FR</b>			0.000	0.000	0.000	0.000
<b>VS</b>			-0.286***	-0.286***	-0.275***	-0.270***
			(0.048)	(0.048)	(0.048)	(0.049)
<b>Country of Birth</b>						
<b>DE / AT (Ref.)</b>				-	-	-
				-	-	-
<b>FR / BE</b>				-0.144**	-0.170	-0.610***
				(0.073)	(0.112)	(0.065)
<b>IT</b>				-0.112*	-0.085	-0.405
				(0.063)	(0.097)	(0.225)
<b>ES</b>				0.070	0.451***	-0.618***
				(0.068)	(0.054)	(0.065)
<b>PT</b>				-0.080	-0.380***	-0.501**
				(0.067)	(0.097)	(0.122)
<b>YU</b>				-0.076**	0.116	-0.082
				(0.033)	(0.074)	(0.127)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>AL / KO</b>				-0.134***	0.486***	0.364***
				(0.047)	(0.043)	(0.065)
<b>TR</b>				-0.187***	0.366***	0.262**
				(0.059)	(0.039)	(0.068)
<b>Other</b>				-0.118***	-0.069	-0.134
				(0.031)	(0.064)	(0.114)
<b>Country of Birth Father</b>						
<b>1.for_coun</b>					0.025	0.026
					(0.071)	(0.072)
<b>2.for_coun</b>					0.049	0.029
					(0.057)	(0.057)
<b>3.for_coun</b>					0.054	0.066
					(0.120)	(0.131)
<b>4.for_coun</b>					0.108	0.115
					(0.079)	(0.084)
<b>5.for_coun</b>					-0.021	-0.835***
					(0.144)	(0.099)
<b>6.for_coun</b>					0.269	0.266
					(0.167)	(0.174)
<b>7.for_coun</b>					0.196*	0.197*
					(0.107)	(0.105)
<b>8.for_coun</b>					-0.227*	-0.332***
					(0.132)	(0.134)
<b>9.for_coun</b>					0.071	0.047
					(0.134)	(0.142)
<b>10.for_coun (Ref.)</b>					-	-
					-	-
<b>Country of Birth Mother</b>						
<b>1.mor_coun</b>					-0.003	-0.001
					(0.051)	(0.051)
<b>2.mor_coun</b>					0.035	0.035
					(0.065)	(0.063)
<b>3.mor_coun</b>					0.057	-0.020
					(0.119)	(0.133)
<b>4.mor_coun</b>					-0.135	-0.178
					(0.104)	(0.118)
<b>5.mor_coun</b>					-1.137***	-4.614***
					(0.094)	(0.372)
<b>6.mor_coun</b>					0.195	0.126
					(0.163)	(0.197)
<b>7.mor_coun</b>					-0.351***	-0.348***
					(0.091)	(0.091)
<b>8.mor_coun</b>					-1.331***	-1.446***
					(0.120)	(0.116)
<b>9.mor_coun</b>					-0.853***	-0.953***

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
					(0.182)	(0.206)
<b>10.mor_coun (Ref.)</b>					-	-
					-	-
<b>Country of Birth Trends</b>						
<b>DE / AT</b>						-0.041
						(0.052)
<b>FR / BE</b>						0.712***
						(0.253)
<b>IT</b>						0.139
						(0.149)
<b>ES</b>						6.814***
						(0.647)
<b>PT</b>						0.096
						(0.163)
<b>YU</b>						0.055
						(0.072)
<b>AL / KO</b>						0.016
						(0.089)
<b>TR</b>						-0.059
						(0.118)
<b>Other (Ref.)</b>						-
						-
<b>Observables</b>						
<b>0-10 books at home</b>		0.209***	0.196***	0.194***	0.183***	0.181***
		(0.056)	(0.053)	(0.054)	(0.054)	(0.053)
<b>11-100 books at home</b>		0.169***	0.165***	0.171***	0.168***	0.166***
		(0.049)	(0.044)	(0.044)	(0.044)	(0.043)
<b>101-500 books at home</b>		0.101**	0.093**	0.104**	0.107**	0.107**
		(0.050)	(0.045)	(0.044)	(0.044)	(0.043)
<b>&gt;500 books at home (Ref.)</b>		-	-	-	-	-
		-	-	-	-	-
<b>Age (ln)</b>		-0.336	-0.199	-0.139	-0.163	-0.179
		(0.345)	(0.349)	(0.335)	(0.330)	(0.336)
<b>Male</b>		1.220	0.578	-0.380	-1.395	-1.381
		(2.551)	(2.513)	(2.479)	(2.394)	(2.375)
<b>Age*male (ln)</b>		-0.212	-0.093	0.088	0.280	0.277
		(0.485)	(0.478)	(0.471)	(0.455)	(0.451)
<b>ISEI of father (ln)</b>		-0.012	-0.025	-0.022	-0.031	-0.038
		(0.035)	(0.033)	(0.034)	(0.034)	(0.034)
<b>ISCED 1 mother (ln)</b>		0.064**	0.054*	0.067**	0.071**	0.061**
		(0.032)	(0.030)	(0.030)	(0.030)	(0.031)
<b>ISCED 2 mother (ln)</b>		0.095***	0.088***	0.087**	0.094***	0.084**
		(0.035)	(0.034)	(0.034)	(0.034)	(0.034)
<b>ISCED 3 mother (ln)</b>		0.011	0.011	0.018	0.023	0.019
		(0.044)	(0.042)	(0.042)	(0.042)	(0.042)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>ISCED 4 mother (ln)</b> <i>(Ref.)</i>		-	-	-	-	-
		-	-	-	-	-
<b>Village (&lt;3'000)</b> <i>(Ref.)</i>		-	-	-	-	-
		-	-	-	-	-
<b>Small town (3'000-15'000)</b>		-0.026	-0.057	-0.066	-0.078*	-0.081**
		(0.039)	(0.039)	(0.039)	<b>(0.039)</b>	(0.039)
<b>Town (15'000-100'000)</b>		-0.098**	-0.178***	-0.185***	<b>-0.204***</b>	-0.205***
		(0.045)	(0.047)	(0.046)	(0.046)	(0.047)
<b>City (100'000-1'000'000)</b>		-0.175***	-0.296***	-0.297***	-0.313***	-0.307***
		(0.050)	(0.055)	(0.055)	(0.056)	(0.056)
<b>Single family type</b>		0.051	0.046	0.033	0.057	0.052
		(0.093)	(0.095)	(0.090)	(0.089)	(0.089)
<b>Nuclear family type</b>		0.073	0.073	0.067	0.086	0.084
		(0.084)	(0.087)	(0.083)	(0.083)	(0.082)
<b>Mixed family type</b>		0.089	0.075	0.056	0.078	0.074
		(0.094)	(0.095)	(0.089)	(0.090)	(0.089)
<b>Other family type</b> <i>(Ref.)</i>		-	-	-	-	-
		-	-	-	-	-
<b>Swiss Origin</b>		0.040	0.044*	0.058*	0.052	0.054
		(0.028)	(0.027)	(0.031)	(0.075)	(0.076)
<b>Observations</b>						
<b>N</b>	955	955	952	952	952	952

Notes: The table displays marginal effects of probit estimations and robust standard errors in parentheses (\*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% level, respectively); pooled PISA data 2000, 2003, 2009

### A-3 Regression Results:

#### First DiD approach (birth country) for the probability of selecting a dual VET

	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Reading Scores (ln)</b>	<b>-0.823***</b>	<b>-0.363***</b>	<b>-0.386***</b>	<b>-0.407***</b>	<b>-0.361***</b>
	(0.131)	(0.135)	(0.135)	(0.135)	(0.135)
<b>Mathematics Scores (ln)</b>	<b>-0.780***</b>	<b>-0.810***</b>	<b>-0.879***</b>	<b>-0.875***</b>	<b>-0.836***</b>
	(0.130)	(0.135)	(0.135)	(0.134)	(0.134)
<b>Years in CH (ln)</b>	<b>0.127***</b>	<b>0.117***</b>	<b>0.122***</b>	<b>0.123***</b>	<b>0.118***</b>
	(0.034)	(0.031)	(0.032)	(0.032)	(0.032)
<b>Birth country with apprentice- ship system (DE/AT)</b>	<b>0.214**</b>	<b>0.281***</b>	<b>0.314***</b>	<b>0.326***</b>	<b>0.250**</b>
	(0.107)	(0.097)	(0.101)	(0.101)	(0.116)
<b>Birth country DE/AT *Years in CH (ln)</b>	<b>-0.059</b>	<b>-0.077*</b>	<b>-0.086**</b>	<b>-0.088**</b>	<b>-0.076*</b>
	(0.046)	(0.042)	(0.044)	(0.044)	(0.044)
<b>Years</b>					
<b>2000 (Ref.)</b>	-	-	-	-	-
	-	-	-	-	-
<b>2003</b>	0.077**	0.043	0.038	0.036	0.044
	(0.036)	(0.033)	(0.033)	(0.032)	(0.032)
<b>2009</b>	0.035	-0.001	-0.001	-0.005	-0.003
	(0.041)	(0.038)	(0.037)	(0.037)	(0.037)
<b>Canton</b>					
<b>ZH (Ref.)</b>			-	-	-
			-	-	-
<b>BE</b>			-0.100**	-0.106**	-0.103**
			(0.044)	(0.043)	(0.044)
<b>SH</b>			-0.038	-0.048	-0.051
			(0.057)	(0.058)	(0.057)
<b>SG</b>			-0.077**	-0.077**	-0.083**
			(0.035)	(0.035)	(0.035)
<b>AG</b>			-0.154***	-0.158***	-0.165***
			(0.045)	(0.045)	(0.046)
<b>Other cantons</b>			-0.103***	-0.109***	-0.113***
			(0.034)	(0.035)	(0.035)
<b>FR</b>			0.000	0.000	0.000
<b>VS</b>			-0.278***	-0.285***	-0.276***
			(0.048)	(0.049)	(0.049)
<b>Country of Birth<sup>1</sup></b>					
<b>DE / AT (Ref.)</b>				-	-
				-	-
<b>FR / BE</b>				0.000	0.000
				(0.000)	(0.000)
<b>IT</b>				0.000	0.000
				(0.000)	(0.000)
<b>ES</b>				0.000**	0.000***

	Model 1	Model 2	Model 3	Model 4	Model 5
				(0.000)	(0.000)
<b>PT</b>				0.000	0.000**
				(0.000)	(0.000)
<b>YU</b>				0.000	0.000**
				(0.000)	(0.000)
<b>AL / KO</b>				0.000	0.000***
				(0.000)	(0.000)
<b>TR</b>				0.000	0.000***
				(0.000)	(0.000)
<b>Other</b>				0.000	0.000
<b>Country of Birth Father</b>					
<b>1.for_coun</b>					0.020
					(0.072)
<b>2.for_coun</b>					0.027
					(0.057)
<b>3.for_coun</b>					0.052
					(0.118)
<b>4.for_coun</b>					0.100
					(0.083)
<b>5.for_coun</b>					-0.024
					(0.142)
<b>6.for_coun</b>					0.265
					(0.166)
<b>7.for_coun</b>					0.196*
					(0.105)
<b>8.for_coun</b>					-0.211*
					(0.131)
<b>9.for_coun</b>					0.032
					(0.145)
<b>10.for_coun (Ref.)</b>					-
					-
<b>Country of Birth Mother</b>					
<b>1.mor_coun</b>					-0.012
					(0.051)
<b>2.mor_coun</b>					0.031
					(0.063)
<b>3.mor_coun</b>					0.048
					(0.117)
<b>4.mor_coun</b>					-0.152
					(0.106)
<b>5.mor_coun</b>					-1.139***
					(0.094)
<b>6.mor_coun</b>					0.175
					(0.164)

	Model 1	Model 2	Model 3	Model 4	Model 5
<b>7.mor_coun</b>					-0.353***
					(0.090)
<b>8.mor_coun</b>					-1.331***
					(0.119)
<b>9.mor_coun</b>					-0.814***
					(0.191)
<b>10.mor_coun (Ref.)</b>					-
					-
<b>Observables</b>					
<b>0-10 books at home</b>		0.218***	0.235***	0.225***	0.190***
		(0.051)	(0.054)	(0.056)	(0.053)
<b>11-100 books at home</b>		0.181***	0.188***	0.189***	0.172***
		(0.042)	(0.046)	(0.048)	(0.044)
<b>101-500 books at home</b>		0.101**	0.111**	0.117**	0.107**
		(0.043)	(0.047)	(0.048)	(0.043)
<b>&gt;500 books at home (Ref.)</b>		-	-	-	-
		-	-	-	-
<b>Age (ln)</b>		-0.107	-0.233	-0.253	-0.140
		(0.348)	(0.338)	(0.330)	(0.329)
<b>Male</b>		-0.015	0.598	0.233	-1.339
		(2.465)	(2.495)	(2.505)	(2.398)
<b>Age*male (ln)</b>		0.018	-0.096	-0.026	0.269
		(0.469)	(0.474)	(0.476)	(0.456)
<b>ISEI of father (ln)</b>		-0.038	-0.026	-0.011	-0.030
		(0.033)	(0.035)	(0.035)	(0.034)
<b>ISCED 1 mother (ln)</b>		0.061**	0.070**	0.075**	0.069**
		(0.029)	(0.032)	(0.033)	(0.030)
<b>ISCED 2 mother (ln)</b>		0.082**	0.086**	0.088**	0.091***
		(0.034)	(0.035)	(0.035)	(0.034)
<b>ISCED 3 mother (ln)</b>		0.019	0.019	0.020	0.024
		(0.041)	(0.043)	(0.043)	(0.042)
<b>ISCED 4 mother (ln) (Ref.)</b>		-	-	-	-
		-	-	-	-
<b>Village (&lt;3'000) (Ref.)</b>		-	-	-	-
		-	-	-	-
<b>Small town (3'000-15'000)</b>		-0.070*	-0.039	-0.043	-0.082**
		(0.039)	(0.039)	(0.039)	(0.039)
<b>Town (15'000-100'000)</b>		-0.185***	-0.108**	-0.112**	-0.208***
		(0.046)	(0.044)	(0.045)	(0.046)
<b>City (100'000-1'000'000)</b>		-0.291***	-0.172***	-0.173***	-0.312***
		(0.055)	(0.049)	(0.049)	(0.056)
<b>Single family type</b>		0.037	0.046	0.038	0.051
		(0.095)	(0.091)	(0.089)	(0.090)
<b>Nuclear family type</b>		0.070	0.073	0.067	0.081
		(0.088)	(0.083)	(0.081)	(0.083)

	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>	<b>Model 5</b>
<b>Mixed family type</b>		0.058	0.071	0.068	0.073
		(0.094)	(0.092)	(0.090)	(0.090)
<b>Other family type (<i>Ref.</i>)</b>		-	-	-	-
		-	-	-	-
<b>Swiss Origin</b>		0.060**	0.057**	0.060*	0.062
		(0.027)	(0.028)	(0.031)	(0.075)
<b>Observations</b>					
<b>N</b>	955	955	952	952	952

Notes: The table displays marginal effects of probit estimations and robust standard errors in parentheses (\*,\*\* and \*\*\* denote significance at the 10%, 5% and 1% level, respectively); pooled PISA data 2000, 2003, 2009

<sup>1</sup>margin effects not estimable

#### A-4 Regression Results:

##### Placebo test for first DiD approach for the probability of selecting a dual VET

	Model DE/AT	Model FR/BE	Model IT/ES/PT	Model YU/AL/KO	Model OTHER
<b>Reading Scores (ln)</b>	<b>-0.361***</b>	<b>-0.326**</b>	<b>-0.357**</b>	<b>-0.350**</b>	<b>-0.340**</b>
	(0.135)	(0.136)	(0.138)	(0.134)	(0.136)
<b>Mathematics Scores (ln)</b>	<b>-0.836***</b>	<b>-0.862***</b>	<b>-0.844***</b>	<b>-0.849***</b>	<b>-0.857***</b>
	(0.134)	(0.134)	(0.136)	(0.132)	(0.135)
<b>Years in CH (ln)</b>	<b>0.118***</b>	<b>0.088***</b>	<b>0.085***</b>	<b>0.074***</b>	<b>0.093***</b>
	(0.032)	(0.023)	(0.024)	(0.025)	(0.028)
<b>Group of Birth Country</b>	<b>0.250**</b>	<b>-1.822***</b>	<b>-0.621***</b>	<b>0.488***</b>	<b>-0.049</b>
	(0.116)	(0.658)	(0.228)	(0.178)	(0.138)
<b>Years in CH (ln) * Group of Birth Country</b>	<b>-0.076*</b>	<b>0.719***</b>	<b>0.120</b>	<b>0.054</b>	<b>-0.009</b>
	(0.044)	(0.273)	(0.117)	(0.056)	(0.052)
<b>Years</b>					
<b>2000 (Ref.)</b>					
<b>2003</b>	0.044	0.048	0.048	0.047	0.049
	(0.032)	(0.033)	(0.033)	(0.032)	(0.033)
<b>2009</b>	-0.003	0.005	0.003	0.000	0.004
	(0.037)	(0.038)	(0.038)	(0.037)	(0.038)
<b>Canton</b>					
<b>ZH (Ref.)</b>					
<b>BE</b>	-0.103**	-0.100**	-0.098**	-0.101**	-0.100**
	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)
<b>SH</b>	-0.051	-0.050	-0.046	-0.052	-0.048
	(0.057)	(0.057)	(0.057)	(0.058)	(0.057)
<b>SG</b>	-0.083**	-0.081**	-0.079**	-0.082**	-0.081**
	(0.035)	(0.035)	(0.035)	(0.034)	(0.035)
<b>AG</b>	-0.165***	-0.163***	-0.160***	-0.165***	-0.164***
	(0.046)	(0.046)	(0.046)	(0.046)	(0.046)
<b>Other cantons</b>	-0.113***	-0.113***	-0.110***	-0.112***	-0.112***
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
<b>FR</b>	0.000	0.000	0.000	0.000	0.000
<b>VS</b>	-0.276***	-0.275***	-0.272***	-0.276***	-0.275***
	(0.049)	(0.048)	(0.049)	(0.048)	(0.048)
<b>Country of Birth<sup>1</sup></b>					
<b>DE / AT (Ref.)</b>					
<b>FR / BE</b>	0.000	0.000	0.000	0.000	0.000
	(0.000)		(0.000)	(0.000)	(0.000)
<b>IT</b>	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<b>ES</b>	0.000***	0.000***	0.000***	0.000***	0.000***

	Model DE/AT	Model FR/BE	Model IT/ES/PT	Model YU/AL/KO	Model OTHER
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<b>PT</b>	0.000**	0.000***	0.000	0.000***	0.000**
	(0.000)	(0.000)		(0.000)	(0.000)
<b>YU</b>	0.000**	0.000	0.000	0.000***	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<b>AL / KO</b>	0.000***	0.000***	0.000***	0.000***	0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
<b>TR</b>	0.000***	0.000***	0.000***	0.000	0.000***
	(0.000)	(0.000)	(0.000)		(0.000)
<b>Other</b>	0.000	0.000	0.000	0.000	0.000
		(0.000)	(0.000)	(0.000)	
<b>Country of Birth Father</b>					
<b>1.for_coun</b>	0.020	0.033	0.027	0.027	0.026
	(0.072)	(0.072)	(0.071)	(0.071)	(0.071)
<b>2.for_coun</b>	0.027	0.048	0.048	0.042	0.051
	(0.057)	(0.057)	(0.057)	(0.057)	(0.058)
<b>3.for_coun</b>	0.052	0.078	0.049	0.057	0.054
	(0.118)	(0.134)	(0.121)	(0.121)	(0.120)
<b>4.for_coun</b>	0.100	0.117	0.115	0.103	0.109
	(0.083)	(0.081)	(0.078)	(0.081)	(0.079)
<b>5.for_coun</b>	-0.024	-0.017	-0.032	-0.022	-0.021
	(0.142)	(0.143)	(0.142)	(0.144)	(0.145)
<b>6.for_coun</b>	0.265	0.277	0.261	0.268	0.268
	(0.166)	(0.175)	(0.169)	(0.167)	(0.167)
<b>7.for_coun</b>	0.196*	0.195*	0.194*	0.197*	0.196*
	(0.105)	(0.107)	(0.107)	(0.107)	(0.107)
<b>8.for_coun</b>	-0.211*	-0.224*	-0.231*	-0.205	-0.226*
	(0.131)	(0.132)	(0.132)	(0.135)	(0.132)
<b>9.for_coun</b>	0.032	0.067	0.068	0.054	0.072
	(0.145)	(0.133)	(0.135)	(0.140)	(0.134)
<b>10.for_coun (Ref.)</b>					
<b>Country of Birth Mother</b>					
<b>1.mor_coun</b>	-0.012	0.000	-0.003	0.003	-0.001
	(0.051)	(0.051)	(0.051)	(0.051)	(0.052)
<b>2.mor_coun</b>	0.031	0.036	0.032	0.038	0.036
	(0.063)	(0.065)	(0.065)	(0.065)	(0.065)
<b>3.mor_coun</b>	0.048	0.011	0.036	0.067	0.057
	(0.117)	(0.132)	(0.117)	(0.121)	(0.119)
<b>4.mor_coun</b>	-0.152	-0.140	-0.166	-0.129	-0.135
	(0.106)	(0.104)	(0.109)	(0.104)	(0.104)
<b>5.mor_coun</b>	-1.139***	-1.134***	-1.134***	-1.135***	-1.137***
	(0.094)	(0.094)	(0.095)	(0.091)	(0.094)
<b>6.mor_coun</b>	0.175	0.190	0.118	0.208	0.193

	<b>Model DE/AT</b>	<b>Model FR/BE</b>	<b>Model IT/ES/PT</b>	<b>Model YU/AL/KO</b>	<b>Model OTHER</b>
	(0.164)	(0.164)	(0.183)	(0.164)	(0.164)
<b>7.mor_coun</b>	-0.353***	-0.349***	-0.353***	-0.349***	-0.350***
	(0.090)	(0.091)	(0.091)	(0.091)	(0.091)
<b>8.mor_coun</b>	-1.331***	-1.326***	-1.330***	-1.333***	-1.331***
	(0.119)	(0.120)	(0.120)	(0.118)	(0.120)
<b>9.mor_coun</b>	-0.814***	-0.836***	-0.845***	-0.821***	-0.851***
	(0.191)	(0.182)	(0.182)	(0.188)	(0.181)
<b>10.mor_coun (Ref.)</b>					
<b>Observables</b>					
<b>0-10 books at home</b>	0.190***	0.182***	0.182***	0.186***	0.182***
	(0.053)	(0.054)	(0.053)	(0.054)	(0.054)
<b>11-100 books at home</b>	0.172***	0.167***	0.169***	0.169***	0.168***
	(0.044)	(0.044)	(0.044)	(0.044)	(0.044)
<b>101-500 books at home</b>	0.107**	0.107**	0.107**	0.110**	0.108**
	(0.043)	(0.043)	(0.043)	(0.044)	(0.044)
<b>&gt;500 books at home (Ref.)</b>					
<b>Age (ln)</b>	-0.140	-0.166	-0.200	-0.122	-0.162
	(0.329)	(0.330)	(0.330)	(0.338)	(0.331)
<b>Male</b>	-1.339	-1.326	-1.654	-1.215	-1.390
	(2.398)	(2.390)	(2.364)	(2.393)	(2.392)
<b>Age*male (ln)</b>	0.269	0.267	0.329	0.246	0.279
	(0.456)	(0.454)	(0.449)	(0.455)	(0.455)
<b>ISEI of father (ln)</b>	-0.030	-0.034	-0.032	-0.034	-0.032
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
<b>ISCED 1 mother (ln)</b>	0.069**	0.069**	0.068**	0.071**	0.071**
	(0.030)	(0.031)	(0.030)	(0.031)	(0.030)
<b>ISCED 2 mother (ln)</b>	0.091***	0.092***	0.092***	0.091***	0.094***
	(0.034)	(0.034)	(0.034)	(0.034)	(0.034)
<b>ISCED 3 mother (ln)</b>	0.024	0.024	0.021	0.023	0.023
	(0.042)	(0.042)	(0.042)	(0.042)	(0.042)
<b>ISCED 4 mother (ln) (Ref.)</b>					
<b>Village (&lt;3'000) (Ref.)</b>					
<b>Small town (3'000-15'000)</b>	-0.082**	-0.081**	-0.077*	-0.081*	-0.078*
	(0.039)	(0.039)	(0.039)	(0.040)	(0.039)
<b>Town (15'000-100'000)</b>	-0.208***	-0.206***	-0.202***	-0.206***	-0.204***
	(0.046)	(0.046)	(0.047)	(0.046)	(0.046)
<b>City (100'000-1'000'000)</b>	-0.312***	-0.314***	-0.309***	-0.314***	-0.313***
	(0.056)	(0.056)	(0.057)	(0.056)	(0.056)
<b>Single family type</b>	0.051	0.057	0.058	0.056	0.057
	(0.090)	(0.089)	(0.089)	(0.088)	(0.089)

	<b>Model DE/AT</b>	<b>Model FR/BE</b>	<b>Model IT/ES/PT</b>	<b>Model YU/AL/KO</b>	<b>Model OTHER</b>
<b>Nuclear family type</b>	0.081	0.085	0.087	0.084	0.086
	(0.083)	(0.083)	(0.083)	(0.081)	(0.082)
<b>Mixed family type</b>	0.073	0.079	0.078	0.073	0.078
	(0.090)	(0.089)	(0.089)	(0.088)	(0.089)
<b>Other family type (Ref.)</b>		0.000	0.000	0.000	0.000
<b>Swiss Origin</b>	0.062	0.042	0.050	0.049	0.050
	(0.075)	(0.076)	(0.075)	(0.074)	(0.075)
<b>Observations</b>					
<b>N</b>	***	***	***	***	***
		952.000	952.000	952.000	952.000

Notes: The table displays marginal effects of probit estimations and robust standard errors in parentheses (\*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% level, respectively); pooled PISA data 2000, 2003, 2009

<sup>1</sup>margin effects not estimable

### A-5 Regression Results:

#### Second DiD approach (Swiss origin) for the probability of selecting a dual VET

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>Reading Scores (ln)</b>	<b>-0.788***</b>	<b>-0.365***</b>	<b>-0.347**</b>	<b>-0.369***</b>	<b>-0.350**</b>	<b>-0.365***</b>
	(0.125)	(0.134)	(0.135)	(0.136)	(0.135)	(0.136)
<b>Mathematics Scores (ln)</b>	<b>-0.753***</b>	<b>-0.897***</b>	<b>-0.824***</b>	<b>-0.818***</b>	<b>-0.851***</b>	<b>-0.824***</b>
	(0.127)	(0.133)	(0.134)	(0.134)	(0.133)	(0.134)
<b>Years in CH (ln)</b>	<b>0.105***</b>	<b>0.116***</b>	<b>0.116***</b>	<b>0.116***</b>	<b>0.119***</b>	<b>0.195***</b>
	(0.029)	(0.027)	(0.027)	(0.027)	(0.027)	(0.063)
<b>Swiss Origin</b>	<b>0.139</b>	<b>0.289**</b>	<b>0.308**</b>	<b>0.307**</b>	<b>0.292**</b>	<b>0.430***</b>
	(0.151)	(0.133)	(0.124)	(0.123)	(0.135)	(0.163)
<b>Years in CH (ln)</b>	<b>-0.050</b>	<b>-0.103*</b>	<b>-0.110**</b>	<b>-0.108**</b>	<b>-0.118**</b>	<b>-0.176***</b>
<b>* Swiss Origin</b>	(0.063)	(0.056)	(0.052)	(0.053)	(0.054)	(0.066)
<b>Years</b>						
<b>2000 (Ref.)</b>					0.000	0.000
					(0.000)	(0.000)
<b>2003</b>	0.074**	0.045	0.050	0.050	0.052*	0.052*
	(0.035)	(0.033)	(0.033)	(0.033)	(0.032)	(0.032)
<b>2009</b>	0.035	0.009	0.008	0.005	0.006	0.008
	(0.039)	(0.037)	(0.038)	(0.038)	(0.038)	(0.037)
<b>Canton</b>						
<b>ZH (Ref.)</b>					0.000	0.000
					(0.000)	(0.000)
<b>BE</b>			-0.095**	-0.100**	-0.094**	-0.101**
			(0.044)	(0.044)	(0.045)	(0.047)
<b>SH</b>			-0.042	-0.051	-0.052	-0.057
			(0.059)	(0.060)	(0.058)	(0.058)
<b>SG</b>			-0.079**	-0.079**	-0.084**	-0.089**
			(0.035)	(0.035)	(0.034)	(0.034)
<b>AG</b>			-0.156***	-0.159***	-0.165***	-0.161***
			(0.045)	(0.045)	(0.046)	(0.044)
<b>Other cantons</b>			-0.106***	-0.111***	-0.114***	-0.114***
			(0.034)	(0.035)	(0.035)	(0.035)
<b>FR</b>			0.000	0.000	0.000	0.000
<b>VS</b>			-0.282***	-0.288***	-0.276***	-0.273***
			(0.048)	(0.048)	(0.048)	(0.050)
<b>Country of Birth</b>						
<b>DE / AT (Ref.)</b>					0.000	0.000
					(0.000)	(0.000)
<b>FR / BE</b>				0.000	0.000	0.000***
				(0.000)	(0.000)	(0.000)
<b>IT</b>				0.000	0.000	0.000
				(0.000)	(0.000)	(0.000)
<b>ES</b>				0.000**	0.000***	0.000***

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
				(0.000)	(0.000)	(0.000)
<b>PT</b>				0.000	0.000***	0.000
				(0.000)	(0.000)	(0.000)
<b>YU</b>				0.000	0.000**	0.000
				(0.000)	(0.000)	(0.000)
<b>AL / KO</b>				0.000	0.000***	0.000***
				(0.000)	(0.000)	(0.000)
<b>TR</b>				0.000	0.000***	0.000***
				(0.000)	(0.000)	(0.000)
<b>Other</b>				0.000	0.000	0.000
<b>Country of Birth Father</b>						
<b>1.for_coun</b>					0.044	0.043
					(0.069)	(0.070)
<b>2.for_coun</b>					0.038	0.005
					(0.055)	(0.055)
<b>3.for_coun</b>					0.049	0.074
					(0.125)	(0.125)
<b>4.for_coun</b>					0.105	0.102
					(0.075)	(0.079)
<b>5.for_coun</b>					-0.030	-0.765***
					(0.142)	(0.097)
<b>6.for_coun</b>					0.260	0.269*
					(0.159)	(0.161)
<b>7.for_coun</b>					0.150	0.130
					(0.112)	(0.109)
<b>8.for_coun</b>					-0.255*	-0.333**
					(0.135)	(0.140)
<b>9.for_coun</b>					0.086	0.064
					(0.129)	(0.142)
<b>10.for_coun (Ref.)</b>					0.000	0.000
<b>Country of Birth Mother</b>						
<b>1.mor_coun</b>					0.027	0.018
					(0.052)	(0.051)
<b>2.mor_coun</b>					0.047	0.038
					(0.063)	(0.060)
<b>3.mor_coun</b>					0.067	-0.054
					(0.121)	(0.129)
<b>4.mor_coun</b>					-0.146	-0.210*
					(0.101)	(0.116)
<b>5.mor_coun</b>					-1.113***	-4.124***
					(0.092)	(0.364)
<b>6.mor_coun</b>					0.216	0.177
					(0.151)	(0.184)

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<b>7.mor_coun</b>					-0.336***	-0.333***
					(0.091)	(0.089)
<b>8.mor_coun</b>					-1.319***	-1.363***
					(0.119)	(0.119)
<b>9.mor_coun</b>					-0.842***	-0.900***
					(0.176)	(0.206)
<b>10.mor_coun (Ref.)</b>					0.000	0.000
<b>Country of Birth Trends</b>						
<b>DE / AT</b>						-0.130**
						(0.064)
<b>FR / BE</b>						0.714***
						(0.238)
<b>IT</b>						0.077
						(0.136)
<b>ES</b>						5.953***
						(0.636)
<b>PT</b>						-0.016
						(0.166)
<b>YU</b>						-0.057
						(0.085)
<b>AL / KO</b>						-0.099
						(0.099)
<b>TR</b>						-0.141
						(0.122)
<b>Other (Ref.)</b>						0.000
<b>Observables</b>						
<b>0-10 books at home</b>		0.223***	0.209***	0.197***	0.188***	0.191***
		(0.056)	(0.054)	(0.056)	(0.056)	(0.055)
<b>11-100 books at home</b>		0.180***	0.175***	0.173***	0.174***	0.177***
		(0.049)	(0.045)	(0.046)	(0.046)	(0.045)
<b>101-500 books at home</b>		0.110**	0.103**	0.108**	0.113**	0.110**
		(0.049)	(0.045)	(0.046)	(0.046)	(0.045)
<b>&gt;500 books at home (Ref.)</b>					0.000	0.000
<b>Age (ln)</b>		-0.297	-0.162	-0.159	-0.168	-0.222
		(0.339)	(0.348)	(0.336)	(0.331)	(0.335)
<b>Male</b>		0.437	-0.134	-0.487	-1.454	-1.598
		(2.488)	(2.457)	(2.460)	(2.393)	(2.388)
<b>Age*male (ln)</b>		-0.065	0.041	0.108	0.291	0.318
		(0.473)	(0.467)	(0.467)	(0.455)	(0.454)
<b>ISEI of father (ln)</b>		-0.028	-0.042	-0.026	-0.036	-0.038
		(0.035)	(0.033)	(0.033)	(0.033)	(0.033)
<b>ISCED 1 mother (ln)</b>		0.069**	0.059**	0.065**	0.069**	0.060*

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
		(0.031)	(0.029)	(0.030)	(0.030)	(0.030)
<b>ISCED 2 mother (ln)</b>		0.088***	0.083**	0.084**	0.090***	0.082**
		(0.034)	(0.033)	(0.033)	(0.033)	(0.033)
<b>ISCED 3 mother (ln)</b>		0.014	0.013	0.014	0.020	0.018
		(0.043)	(0.042)	(0.042)	(0.043)	(0.043)
<b>ISCED 4 mother (ln) (Ref.)</b>					0.000	0.000
<b>Village (&lt;3'000) (Ref.)</b>					0.000	0.000
					(0.000)	(0.000)
<b>Small town (3'000-15'000)</b>		-0.033	-0.065	-0.066	-0.076*	-0.079**
		(0.039)	(0.039)	(0.039)	(0.039)	(0.038)
<b>Town (15'000-100'000)</b>		-0.107**	-0.188***	-0.190***	-0.208***	-0.212***
		(0.045)	(0.046)	(0.046)	(0.046)	(0.046)
<b>City (100'000-1'000'000)</b>		-0.178***	-0.301***	-0.303***	-0.317***	-0.312***
		(0.049)	(0.055)	(0.055)	(0.056)	(0.056)
<b>Single family type</b>		0.056	0.048	0.037	0.056	0.047
		(0.089)	(0.092)	(0.088)	(0.087)	(0.088)
<b>Nuclear family type</b>		0.085	0.083	0.073	0.088	0.085
		(0.080)	(0.084)	(0.080)	(0.080)	(0.081)
<b>Mixed family type</b>		0.059	0.044	0.036	0.054	0.044
		(0.089)	(0.090)	(0.086)	(0.087)	(0.087)
<b>Other family type (Ref.)</b>					0.000	0.000
<b>Swiss Origin</b>		0.135***	0.124***	0.134***	0.084	0.396**
		(0.031)	(0.030)	(0.032)	(0.064)	(0.163)
<b>Observations</b>						
<b>N</b>	955	955	952	952	952	952

Notes: The table displays marginal effects of probit estimations and robust standard errors in parentheses (\*, \*\* and \*\*\* denote significance at the 10%, 5% and 1% level, respectively); pooled PISA data 2000, 2003, 2009

<sup>1</sup>margin effects not estimable