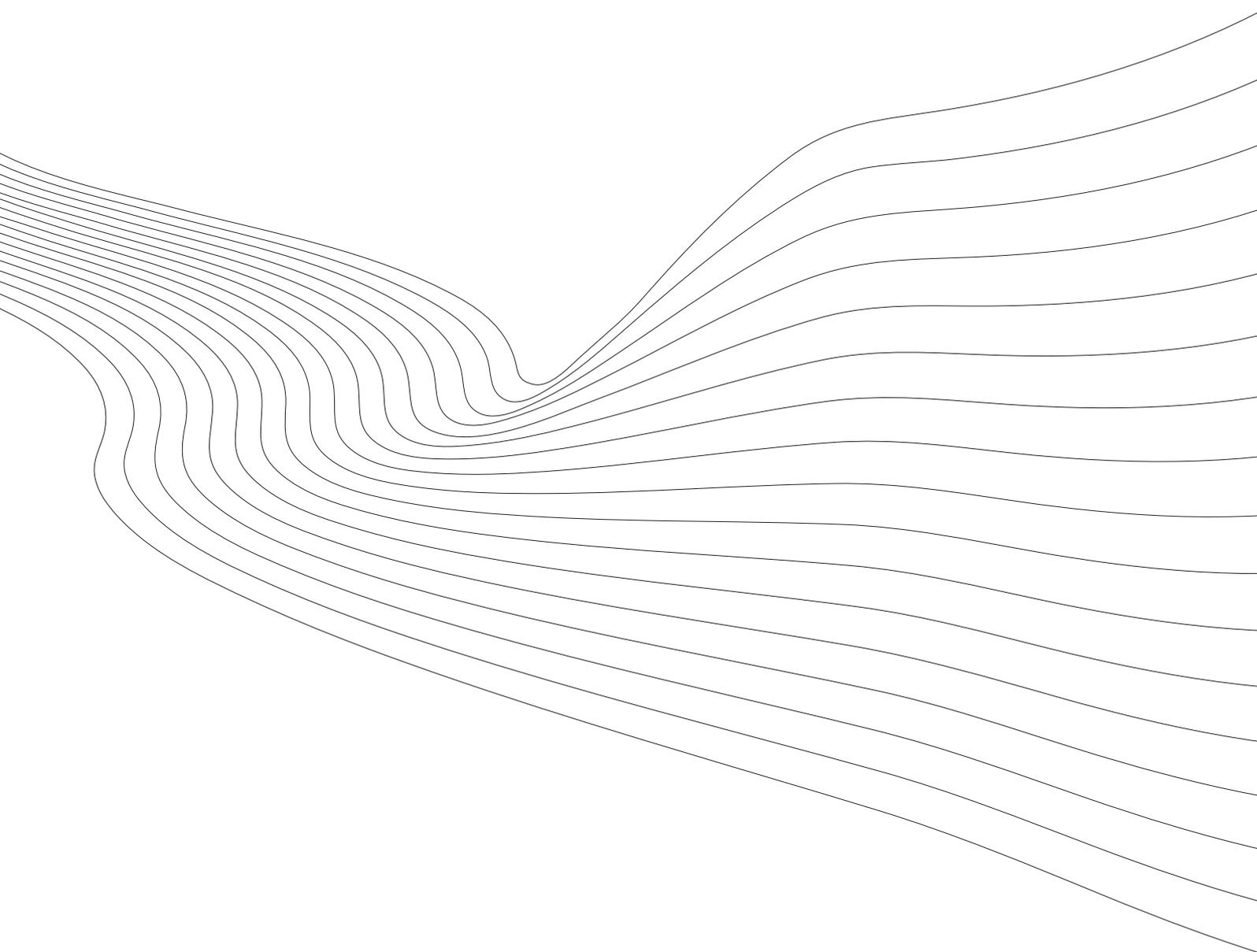


KOF Factbook Education System Switzerland



KOF

KOF Swiss Economic Institute
ETH Zurich
LEE G 116
Leonhardstrasse 21
8092 Zurich
Switzerland

Phone +41 44 632 42 39
Fax +41 44 632 12 18
www.kof.ethz.ch
kof@kof.ethz.ch

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List of Abbreviations

| | |
|--------|---|
| CAS | Certificate of Advanced Studies |
| CET | Adult Education and Continuing Education and Training |
| CVC | Curriculum Value Chain |
| DAS | Diploma of Advanced Studies |
| EDK | Swiss Conference of Cantonal Ministers of Education |
| ETH | Federal Institute of Technology |
| EUI | European Innovation Union Scoreboard |
| FVB | Federal Vocational Baccalaureate Exam |
| GCI | Global Competitiveness Index |
| GDP | Gross Domestic Products |
| HarmoS | Inter-cantonal Agreement on Harmonization of Compulsory Education |
| HEIs | Higher Education Institutions |
| ILO | International Labour Organization |
| ISCED | International Standard Classification of Education |
| KOF | Swiss Economic Institute |
| MAS | Master of Advanced Studies |
| NATO | North Atlantic Treaty Organization |
| NEET | Neither in employment nor in education or training |
| OECD | Organisation for Economic Co-operation and Development |
| PET | Professional Education and Training |
| PPP | Purchasing Power Parity |
| SCCRE | Swiss Coordination Centre for Research in Education |
| SERI | State Secretariat for Education Research and Innovation |
| SES | Swiss Education Server |
| SFIVET | Swiss Federal Institute for Vocational Education and Training |
| SFSO | Swiss Statistical Office |
| TFP | Total Factor Productivity |
| UAS | Universities of Applied Sciences and Arts |
| UAT | University Aptitude Test |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |

| | |
|-------|--|
| UTE | Universities of Teacher Education |
| VET | Vocational Education and Training |
| VPET | Vocational Professional Education and Training |
| VPETA | Vocational and Professional Education and Training Act |
| WEF | World Economic Forum |
| YLMI | Youth Labour Market Index |

FOREWORD

In the last years, vocational education and training has received more and more attention. The increased pressure to upgrade the skills of the workforce through an increasingly competitive world economy, or the high youth unemployment rates in the aftermath of the world economic crises putting pressure on politicians to provide solutions could be part of the reason why. In fact, vocational education has been suggested as one major solution to these problems since it provides an education pathway for those who do not continue with tertiary level education and helps upgrading the skills of those who would have started working immediately and would have received some form of on-the-job training.

The increased attention for vocational education and training was in particular perceptible among policy makers. In Europe, the European Commission defined common objectives for the further development of the vocational education and training systems of the European countries for 2020 and an action plan for the upcoming years in the *Bruges Communiqué on enhanced European cooperation in vocational education and training for 2011-2020* (European Commission, 2010). In the United States, Obama mentioned in a speech that he wanted to increase the investment in vocational education and training system of the United States of America (The White House, 2015). But also many other countries worldwide, such as South Korea or Hong Kong, show increased interest in extending their vocational education system.

Worldwide, only a few countries have a well-elaborated and efficient vocational and professional education and training (VPET) system, among these the Swiss VPET system. It is a good example of how an education system can contribute to the successful matching between market demand and supply. It is highly efficient in getting the adolescents into the labour market (7.7% from 2005-2012, compared to the OECD average of 14.6%, OECD, 2015a).

Though not many countries have VPET system that is comparable to Switzerland, many have a vocational component in their education system. To provide information about the education systems of other countries, with a special focus on the part of the education system teaching vocational skills, is the major purpose of the KOF Factbooks Education System.

SUMMARY

In the KOF Factbook Education System Switzerland, we will describe the vocational system of Switzerland in general and in particular refer to factors which are crucial for the functioning of the system. Among others, these comprise the regulatory framework and the governance of the VPET system, specifying the actors that are involved and which competencies and duties they have. Further, the curriculum development and the actors involved in this process, as well as the financing of the system, etc.

The Factbook is structured as follows. We will refer to Switzerland's economy, labour market, and political system in the first part of this Factbook. The second part is dedicated to the description of the entire formal education system. The vocational part of Switzerland's education system will be explained in the third part. And finally, the last section gives a perspective about the set of reforms Switzerland's education system went through in the past and will face in the future.

EDITING AND ACKNOWLEDGEMENTS

This Factbook is edited by Johanna Kemper. For the elaboration of the contents, we want to thank Marco Büsch, Ricardo Schlatter, Gabriel Gertsch, Lars Brönnimann and Reto Odermatt. Without you all, the realisation of this Factbook would have been impossible!

The KOF Factbook Education System series has to be regarded as work in progress. The authors do not claim completeness of the information which has been collected carefully and in all conscience. Any suggestions for improvement are highly welcome!

Contact: factbook@kof.ethz.ch

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1. The Swiss Economy, Labour Market and Political System

One of the main purposes of an education system is to provide the future workforce with the skills needed in the labour market. The particularities of a country's economy and labour market are important factors determining the current and future demand for skills. Therefore, they will briefly be described in the first part of this Factbook. In addition, this part provides an overview of Switzerland's political system with emphasis on the description of the education politics.

1.1 The Swiss Economy

As a dynamic, market-based economy with well-designed institutions and low levels of labour and product market regulations, Switzerland has one of the highest gross domestic products (GDP) per capita in the world (US\$ 52,079¹, versus US\$ 50,249 of the US, US\$34,101 for the OECD countries on average; all numbers refer to 2013) (OECD, 2014). From 1985 to 2010 Switzerland's GDP grew at a rate of 1.8% per annum. This was largely driven by growth in capital inputs (0.72% p.a.), while labour input growth accounted for around one third (0.56% p.a.) and growth in total factor productivity (TFP) for less than one third (0.48% p.a.) of GDP growth. Compared to other OECD countries, the contribution of labour input growth to overall GDP growth was comparatively high, while the contribution of TFP growth is relatively low (OECD, 2011).

The Swiss economy managed to get through the world economic crisis comparatively well. Also in the time directly after the crisis and despite the constantly weak Euro and respectively strong Swiss Franc which exerted a huge cost pressure on the Swiss economy, the highly innovative and competitive economy grew further (OECD, 2014). Only since the end of the Swiss Franc's one-sided exchange rate band initiated by the Central Bank on January 15th 2015, the growth of the economy slowed down and growth expectation were corrected downwards.

On a per capita basis, labour productivity (GDP per hours worked) accounted for most of Switzerland's GDP per capita growth in the last two decades. However, despite its above OECD average labour productivity levels, the growth rates of labour productivity in Switzerland are relatively low and have even been falling since the 1970s (OECD, 2013a:50 et seq.).

¹ Constant prices, constant purchasing power parity (PPP), reference year 2010.

The role of labour input as an important driver of economic growth of the Swiss economy is also reflected in the fact that sectors with the largest share in the total value added are also those with the highest employment shares. As it can be seen in Table 1, public, health and other services made up the largest share of total value added in 2013 (27.8%), followed by wholesale and retail trade, repairs, hotels and restaurants and transport (24.5%). These were also the sectors, which had the largest share in total employment (29.9% and 26.5% respectively). Compared to the average of the countries of the European Union, Switzerland has a smaller primary sector and a slightly different distribution of the value added within the tertiary sector. As it is a typical attribute of a highly developed country (“knowledge economy”), the largest share of total value added and employment of the Swiss economy is located within the tertiary sector.

Table 1: Value added and employment by sector, 2013

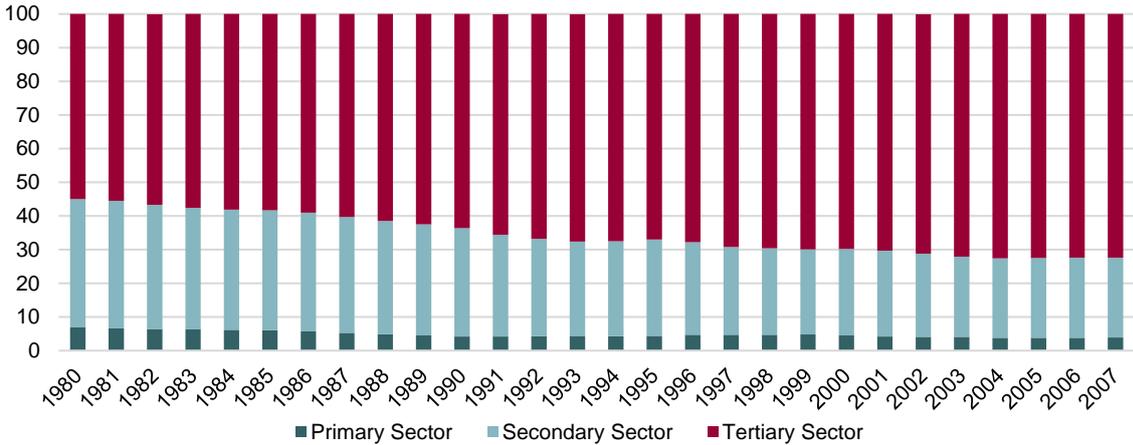
| Sector | Switzerland: Value added (%) | EU-28: Value added (%) | Switzerland: Employment (%) | EU-28: Employment (%) |
|---|------------------------------------|------------------------------|-----------------------------------|-----------------------------|
| Primary sector | 0.7 | 1.7 | 3.5 | 5.0 |
| Agriculture, hunting and forestry, fishing | 0.7 | 1.7 | 3.5 | 5.0 |
| Secondary sector | 25.6 | 24.5 | 22.3 | 22.0 |
| Manufacturing, mining and quarrying and other industrial activities | 20.6 | 19.1 | 15.0 | 15.6 |
| of which: Manufacturing | 18.7 | 15.3 | 14.1 | 14.0 |
| Construction | 5.0 | 5.4 | 7.3 | 6.4 |
| Tertiary sector | 73.6 | 73.8 | 74.2 | 72.9 |
| Wholesale and retail trade, repairs; hotels and restaurants; transport; information and communication | 24.5 | 23.8 | 26.5 | 27.4 |
| Financial intermediation; real estate, renting & business activities | 21.3 | 27.1 | 17.8 | 15.8 |
| Public administration, defense, education, health, and other service activities | 27.8 | 22.9 | 29.9 | 29.7 |

Source: Eurostat (2015a,b).

The increasing importance of the tertiary sector is reflected in Figure 1, which shows the distribution of the relative shares of employment of the sector over time. While the relative share of the primary sector and the secondary sector declined between 1980 and 2007 from 6.9% to 3.9% and from 38.1% to 23.7%, respectively, the share of the tertiary sector increased by 17.4%-points to 72.4%.

According to the WEF Global Competitiveness Index (GCI) rankings 2013-2014 (WEF, 2014), Switzerland is classified as an innovation-driven economy and ranks first among all other countries in the competitiveness ranking since 5 years. Switzerland has a strong position in the global market in a number of industries, in particular in the banking, chemical and pharmaceutical product, watch-making, precision instrument and merchandising sectors.

Figure 1: Employment by sector (as % of total employment), 1980-2007



Source: World Bank (2015).

Swiss firms are among the most innovative in the world. According to the European Innovation Union Scoreboard (EUI) 2013, Switzerland outperformed all European countries in terms of innovation and research performance the fifth year in a row (European Commission, 2013).

1.2 The Labour Market

1.2.1 Overview of the Swiss Labour Market

The high competitiveness and innovation performance of the Swiss economy are closely linked to the labour market. Compared to many other OECD countries, the Swiss labour market is extremely efficient. Labour market regulation is comparatively low. According to the OECD index of employment protection, as a measure for labour market regulation, Switzerland has a below OECD-average level of labour market regulation². Also, the trade union density is low in Switzerland³ and there is no general minimum wage (only in a few sectors). In addition, the income tax level in Switzerland is very low (tax wedge one third lower than the OECD average), as well as the tax level of the business sector. The generally low level of regulation, the flexible labour and product markets, significantly contribute to the competitiveness of the Swiss economy (WEF, 2014).

In 2011, about 82.8% of the Swiss population aged 15-64 years participated in the labour force (Table 2). The labour participation rate was lower for the youth (15-24 years: 68.2%) than for the adults (25-64 years: 85.8%). The rates for all age groups were above the OECD average. The labour force participation rate among the adults was highest for those with tertiary education (91.1%) and lowest for those with less than upper secondary education

² In 2011: index value of 1.6 (since 1990), which is below the OECD average of 2.13 in 2011 (OECD, 2015b).

³ In 2010: 17% of all wage and salary earners, OECD average: 17.6% (OECD, 2015c).

(74.1%). The labour force participation rates by education level were significantly above the OECD average.

One of the major challenges for the Swiss labour market in the upcoming years will be the ageing of the population. To maintain a high labour force participation in the future, Switzerland will be more and more dependent on immigrant labour (all skill levels) and has to increase the integration of women in the labour market.

Table 2: Labour force participation, unemployment by education 2011

| | Labour force participation | OECD average=100 | Unemployment rate | OECD average=100 |
|-------------------------------------|-----------------------------------|-------------------------|--------------------------|-------------------------|
| Total (15-64 years) | 82.8 | 117 | 4.1 | 50 |
| Youth (15-24 years) | 68.2 | 144 | 7.7 | 48 |
| Adults (25-64 years) | 85.8 | 112.7 | 3.5 | 43 |
| Less than upper secondary education | 74.1 | 117 | 7.6 | 60 |
| Upper secondary level education | 85.3 | 107 | 3.3 | 45 |
| Tertiary education | 91.1 | 105 | 2.6 | 54 |

Source: OECD (2013b).

In 2011, the overall unemployment rate was way below the OECD average (4.1%, Table 2). The same was true for the unemployment rate among adults (3.5%), where the risk of becoming unemployed declined with increasing educational attainment. As in other countries with a Swiss-like dual VET system, youth unemployment in Switzerland was with 7.7% significantly below the OECD average (in 2011; but also during the global crisis starting in 2008).

The youth unemployment rates in countries with a VET system are among the lowest worldwide (OECD, 2015a). One hypothesis in the literature is that these systems enhance the school-to-work transition of young people. Thanks to its well-functioning VET system, but also in general, the Swiss education system is highly effective in preparing its youngsters for the labour market. In general, human capital is one of Switzerland's main comparative advantages (OECD, 2013a:65).

1.2.2 The Youth Labour Market

To compare the labour market situation of adolescent across countries, the KOF Swiss Economic Institute developed the KOF Youth Labour Market Index (KOF YLMI) (Renold et al., 2014). The basic idea behind this index is that a single indicator, such as the unemployment rate, does not suffice to describe the youth labour market adequately and to provide enough information for a comprehensive cross-country analysis. To improve the

information content of such an analysis and to foster a multi-dimensional approach, the index consists of twelve labour market indicators⁴, which are summarized in four categories.

The first category describes the *activity state* of the young, specifically of those between 15-24 years old, on the labour market. Therein, the adolescents are classified according to whether they are employed, in education or neither of both (unemployed, discouraged and neither in employment nor in education or training, see info box to the right). The category *working conditions* and the corresponding indicators reflect the

| Dimensions of the KOF YLMI | |
|-------------------------------|---|
| Activity state | - Unemployment rate - Relaxed unemployment rate ⁵ - Neither in employment nor in education or training rate (NEET rate) |
| Working conditions | Rate of adolescents: - with a temporary contract - in involuntary part-time work - in jobs with atypical working hours - in work at risk of poverty ⁶ Vulnerable unemployment rate ⁷ |
| Education | - Rate of adolescents in formal education and training - Skills mismatch rate |
| Transition smoothness | - Relative unemployment ratio ⁸ - Long-term unemployment rate ⁹ |
| Source: Renold et al. (2014). | |

kind and the quality of jobs of the working youth. The *education* category accounts for the share of adolescents in education and training and for the relevance of and need for their skills on the labour market. The fourth category, *transition smoothness*, shall connect the other three categories by capturing the school-to-work transition phase of the youth. Each indicator of the KOF YLMI ranges from 1 to 7. Thereby, a higher score reflects a more favourable situation on the youth labour market and a more efficient integration of the youth in the labour market.

One of the major drawbacks of the KOF YLMI is the data availability. Often, a category is based on a single indicator or no indicator for that category exists at all. This could make comparisons across countries or groups of countries problematic or even impossible. As it can be seen in the following.

The YLM-Index for Switzerland

Figure 2 shows the different dimensions of the KOF YLMI for Switzerland and the OECD average for 2012 in a spider web. The four categories described in the previous section are displayed in the outer part. Unfortunately, not all indicators for are available

⁴ The data for these indicators are collected from different international institutions and cover up to 178 countries for the time period between 1991 and 2012.

⁵ It is calculated as the number of unemployed and discouraged workers as a share of the entire labour force. Discouraged workers have given up the search for work (not actively seeking), although they have no job and are currently available for work (also: "involuntary inactive").

⁶ Those who cannot make a decent living out their earnings, being at risk of poverty as a percentage of the working population.

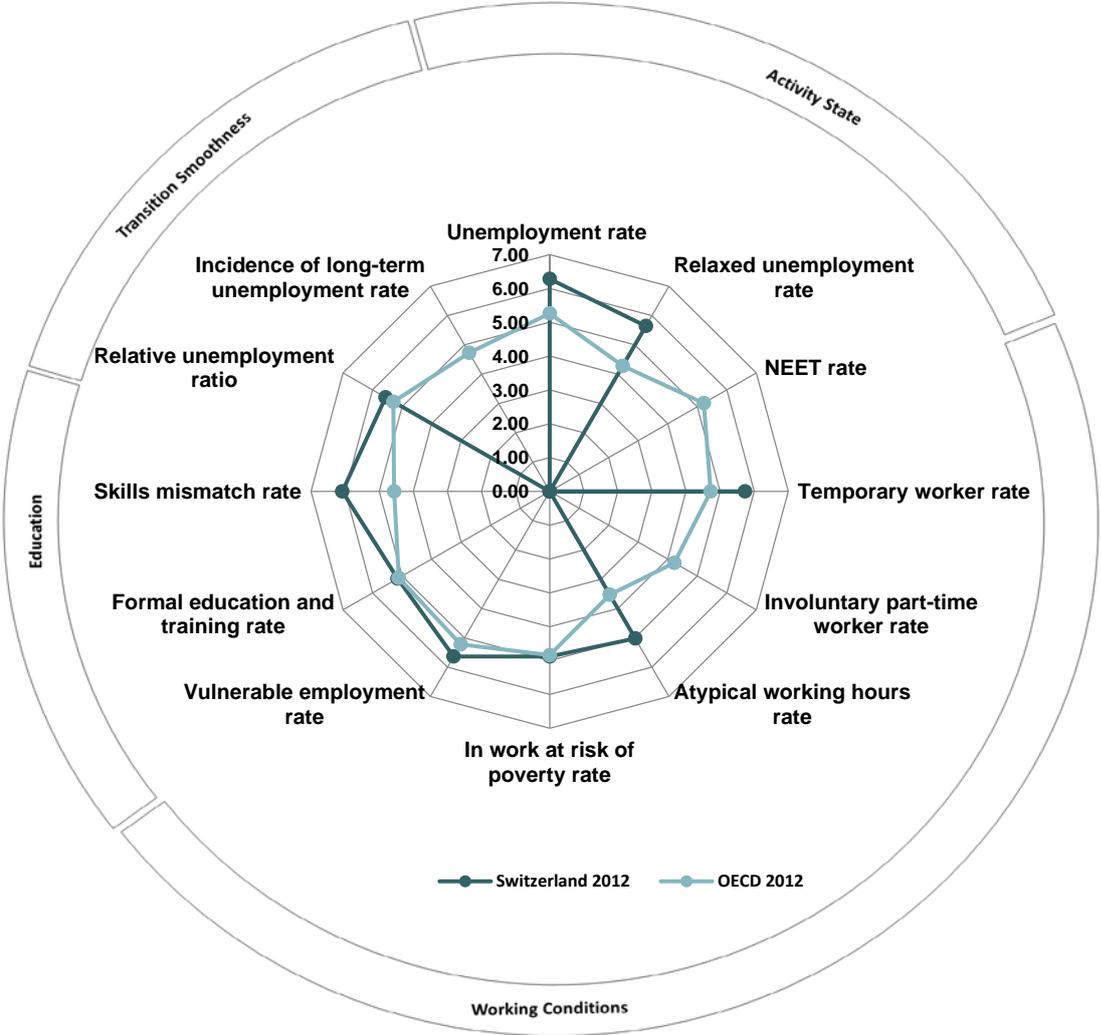
⁷ Share of the employed population working on their own account or those working in their family business and thus contributing to the entire family income. Both are less likely to have formal work arrangements and are therefore less protected by labour laws and more exposed to economic risk.

⁸ Is defined as the youth unemployment rate (15-24 years) as a share of the adult unemployment rate (25+). If the youth cohort is affected in the same way than the adult group with respect to unemployment, then the relative unemployment ratio will be equal to one. If the youth are relatively more affected, then the ratio will be bigger than one.

⁹ Those unemployed for more than one year (52 weeks) in the total number of unemployed (according to the ILO definition).

for Switzerland¹⁰. Therefore, category-based comparisons between Switzerland and the OECD average, for which all indicators exist, cannot be made on equal grounds.

Figure 2: YLM Scoreboard: Switzerland versus the OECD average, 2012



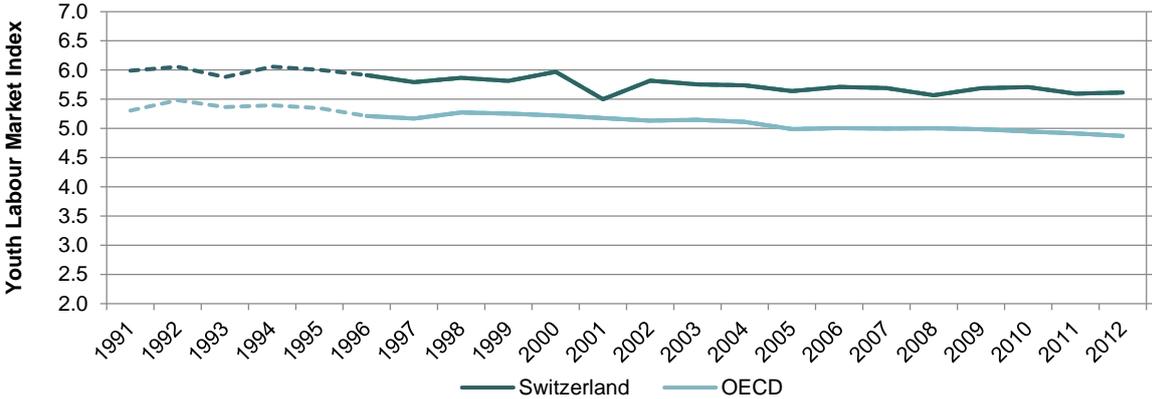
Source: KOF Swiss Economic Institute, 2015.

In all available indicators, Switzerland scored above the OECD average in 2012. As a higher index score represents a more favourable labour market outcome, this implies that Switzerland’s labour market was in a relatively good shape in 2012. Its unemployment rate was lower, also considering the discouraged workers and the relation between youth and adult unemployment. Switzerland also had a relatively lower mismatch rate between demanded and supplied skills on the labour market in 2012. In 2012, young people in Switzerland spent slightly more time in formal education than in other OECD countries on average. Less of them were in precarious employment relations or belonged to the so-called “working poor”, had to work during atypical working hours or on temporary contracts.

¹⁰ That is the long-term unemployment rate, the involuntary part-time working and the NEET rate are lacking.

Figure 3 shows the evolution of the YLM-Index over time (1991-2012). At least since 2003, more than half of the indicators are available for Switzerland and thus can be used for cross-country comparisons¹¹. Figure 3 depicts that Switzerland's strong youth labour market position is not only a recent phenomenon. At least since 2003, Switzerland constantly showed more desirable labour market conditions than the average of OECD countries.

Figure 3: YLM-Index Switzerland versus OECD, 1991-2012



Source: KOF Swiss Economic Institute, 2015.

1.3 The Political System

The Swiss national state was founded in 1848 on the basis of the Federal Constitution. It is a consensus-democracy with a strongly federalist system and unique direct democratic instrument (popular initiative and referendum), making the Swiss people the sovereign of the country.

The Swiss political system is structured into three main levels: the Federal state, the “Confederation”, the 26 cantons and 2408 communes. Federalism and subsidiarity are fundamental principles of the Swiss political system. Therefore, the Federal state only performs the tasks assigned by the Federal Constitution which go beyond the ability of the cantons or require uniform regulation by the Federal state. The rights for every other task belong to the field of competence of the cantons- among these the regulation of the education system. Thus, the primary responsibility for the education system lies with the cantons, except where the Federal Constitution declares the Federal state, or the Federal state and cantons together, to be competent.

¹¹ Note that a comparatively large number of indicators is lacking for Switzerland for all years, which is less the case for the EU28. Thus, comparisons of the overall YLM-Index value between both should be treated with caution.

Switzerland is a neutral state according to international law. Therefore, it is neither a member of the NATO, nor is it part of the European Union. But there are several bilateral treaties between the two parties (as the Schengen Convention for example).

1.3.1 Politics and Goals of the Education System

The educational system in Switzerland is organized in a decentralized manner with no central authority in education. The main part of the educational tasks are within the responsibility of the cantons, which are organized in the Swiss Conference of Cantonal Ministers of Education (EDK). Nevertheless, the Federal Constitution commits the Federal state and the cantons to work together in order to guarantee the two main principles of the Swiss education system at every level or type of education (coherent transition within different types of education): a high quality of education and permeability of the education system (Art. 61a Abs. 1 Federal Constitution). These goals shall ensure the equity, effectiveness and efficiency of the Swiss education system.

In 2011 for the first time, the EDK released an official statement planning the future of the Swiss education system by defining common political goals in coordination with the Federal Council. The purpose of these goals was to harmonise certain parts of the different Cantonal education systems on a national level, but also to improve the coordination between the different levels of education.

1.3.2 “HarmoS” and “Lehrplan 21”

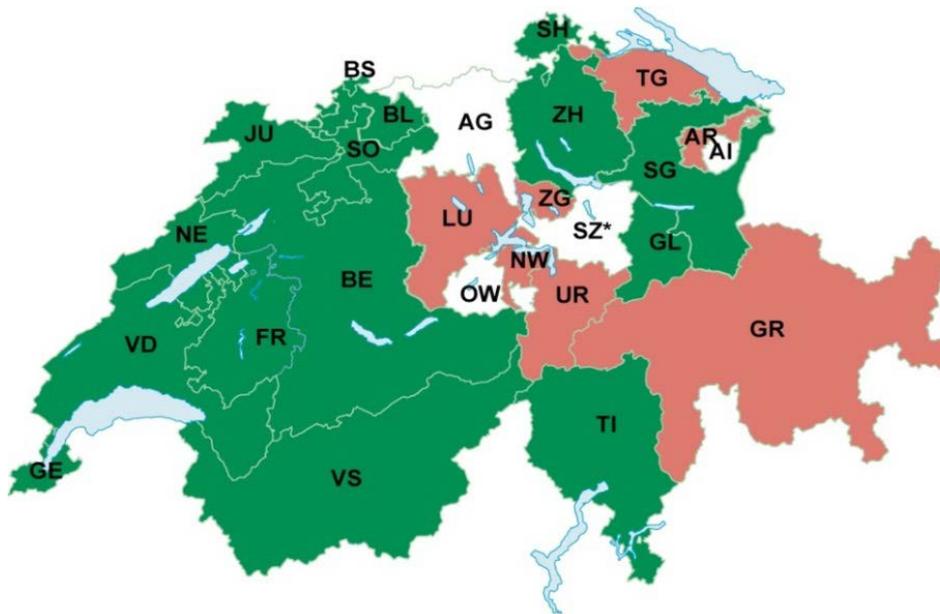
The aim of the Inter-cantonal Agreement on Harmonization of Compulsory Education (HarmoS) harmonises the duration of pre-school (2 years), primary school (6 years) and lower secondary school (3 years), as well as the most important objectives of mandatory education between cantons. It came into effect on 1st August 2009 and applies only to the cantons which have joined the agreement. These cantons must implement HarmoS by the start of the 2015/16 school year at the latest.¹² Figure 4 shows all cantons which agreed to HarmoS by the year 2010. The cantons shaded in green decided to join, the ones in red refused to join and those in white are undecided (EDK, 2015a).

The HarmoS was worked out by the EDK with the objective to secure permeability and to reduce mobility barriers between cantons. As indicated above, each canton has to decide on the accession in accordance with the respective cantonal legislation. In most cantons, this is decision is made by the cantonal parliament but is subject to an optional referendum (EDK, 2010).

¹² Cf. SES (Swiss Education Server) (2015).

In light of the intensified efforts to harmonize the educational system, the German-speaking part of EDK launched a project called “Lehrplan 21”, where the 21 cantons in which German is at least partially spoken decided to develop a common curriculum by the end of 2014. Afterwards, every canton decides on the enactment in accordance with its legislation. The joining of “Lehrplan 21” is independent of the accession to HarmoS¹³.

Figure 4: Cantons which agreed to HarmoS



Source: EDK, 2015a.

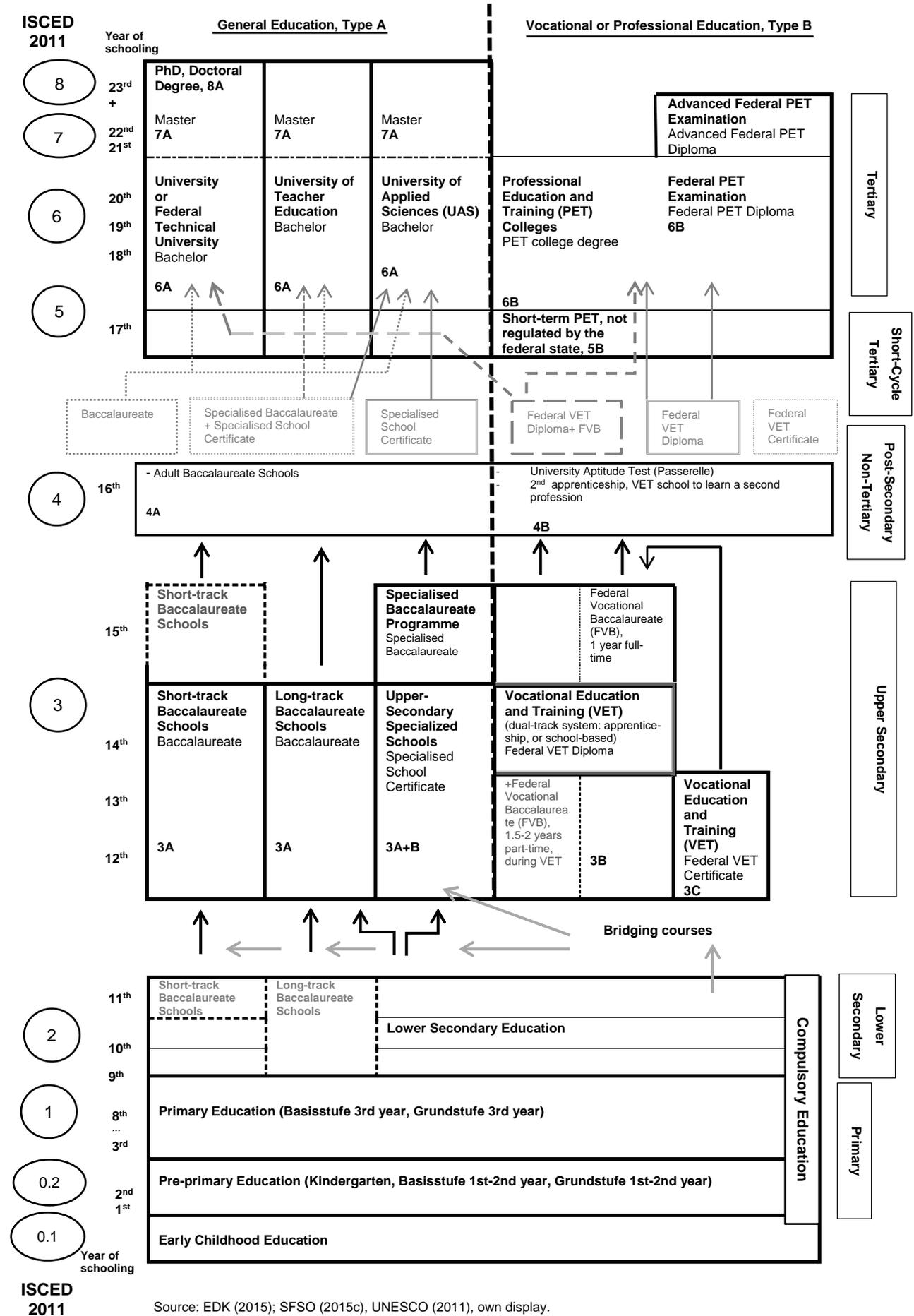
2. Formal System of Education

The Swiss education system can be divided into three levels: primary level, secondary level, and tertiary level. An illustration of the Swiss education system with its various education paths can be found in Figure 5. Compulsory education in Switzerland consists of the primary level and the lower-secondary level, which take around nine years to be completed (completion of the 9th grade). The entry age into the primary education level is on average six.

After compulsory education the Swiss education system provides two major paths to continue education at the upper secondary level: the vocational education and training (VET) path or the general/academic education path. Each path offers multiple options to attain a degree, which qualifies for tertiary level education.

¹³ For more information: <http://konsultation.lehrplan.ch/>.

Figure 5: The Swiss Education System



Education pathways on the tertiary level comprise the conventional universities, universities of applied sciences and arts (UAS), the vocational professional education and training (VPET) colleges, and the option to study for a national professional education and training (PET) examination. Here as well as on the secondary level, the choice of degrees is plentiful independent of the path. In general, the permeability between the education paths is very high.

The Swiss education system is organised at the Cantonal level. Consequently, the 26 different education systems differ in some respects, especially between the Italian (Canton of Ticino), the French and the German speaking parts. Because of the sometimes large heterogeneities between the cantonal systems, Swiss education system had to be abstracted and might not represent the particularities of each system (SES, 2015).

2.1 Pre-Primary Education

According to cantonal regulations, the minimum entrance age to compulsory schooling ranges from 3 to 5 years (average: 4.4 years) (Cantonal Survey, 2012/13). The purpose of preschools/kindergartens differs between the three language regions of Switzerland. Preschool education in the Swiss German part (*Kindergarten*) focusses less on the learning aspect and more on the socio-pedagogical education, while its function in the French (*école enfantine*) and Italian speaking (*scuola dell'infanzia*) parts of Switzerland is to prepare the children for primary school (SES, 2015).

2.2 Primary Education

In most cantons, primary education starts at the age of 6 years¹⁴ and lasts for six years, with the exception of four cantons¹⁵, where primary schools start at the age of 5 years and lasts for five years.

Grundstufe (2+1 years) and Basisstufe (2+2 years): In some schools the two years of pre-school are combined with the first primary school years. All pupils of different ages attend the same class, receiving differentiated teaching according to their developmental status ("team teaching"). The transition between the school levels occurs flexibly (SES, 2015).

The decision whether a child is allowed to enter primary education or not, is made by teachers, parents and school psychologists or medical services. The final decision is based on grounds of the child's age and development stage and taken by the school authorities¹⁶. All children in the public schooling system have to go to the school serving the area/district where they live (with some exemptions).

¹⁴ In most cantons the cut-off day for compulsory school enrolment between April and July (Cantonal Survey 2012/13).

¹⁵ The cantons: Aargau (AG), Basel-Land (BL), Basel-Stadt (BS), Ticino (TI).

¹⁶ Namely, the teacher or supervisory authorities, administration. In case a child does not fulfil all requirements for to be admitted to primary school, some of the German speaking cantons offer a two-years preparatory class ("Einschulungsklasse" or

Table 3: The Swiss education system in numbers

| ISCED 2011 | | 2012/13 | 2002/03=100 | Women (in%) | Foreigners (in%) | Private Schools (in%) |
|--------------|---|----------------|-------------|-------------|------------------|-----------------------|
| | Total | 1551469 | 106 | 48.6 | 23.1 | 6.2 |
| 0.2-3 | Compulsory School | 57.7 | 93 | 48.6 | 24.4 | 3.2 |
| 0.2 | Pre-primary Education (Kindergarten, Basisstufe 1st-2nd year, Grundstufe 1st-2nd year) | 9.9 | 98 | 48.6 | 25.6 | 3.3 |
| 1 | Primary Education (Basisstufe 3rd year, Grundstufe 3rd year) | 27.6 | 91 | 49.0 | 24.0 | 2.7 |
| 2 | Lower Secondary Education | 18.0 | 97 | 49.4 | 21.9 | 4.1 |
| 2 | Special Curriculum* | 2.3 | 70 | 36.3 | 43.4 | 2.6 |
| 3 | Upper Secondary Education | 23.1 | 114 | 47.9 | 17.4 | 7.0 |
| | Bridging courses | 4.5 | 115 | 53.9 | 40.0 | 6.7 |
| 3B | Vocational Education and Training (VET) | 64.3 | 109 | 42.3 | 17.3 | 3.1 |
| 3B | - Federal VET Diploma | 91.3 | 118 | 41.9 | 16.1 | 3.1 |
| 3C | - Federal VET Certificate | 5.4 | 274 | - | - | 1.0 |
| 3B | - Other, non-regulated VET | 0.3 | 4 | 72.1 | 41.6 | 88.7 |
| 3B | - Vocational Commercial and Computer Sciences School | 3.0 | 62 | 45.0 | 17.7 | - |
| 3B | - Federal Vocational Baccalaureate (FVB) | 3.8 | 218 | 49.1 | 8.5 | 2.4 |
| 3A | ...General Education | 25.0 | 118 | 59.6 | 15.2 | 7.8 |
| 3A | - Baccalaureate School | 79.7 | 115 | 56.3 | 12.9 | 7.6 |
| 3A | - Upper-Secondary Specialized Schools | 15.1 | 139 | 74.7 | 20.2 | 6.6 |
| 3A | - Specialised Baccalaureate Programme | 2.7 | - | 79.8 | 15.6 | 1.0 |
| 3A | ...Other General Education Programmes | 0.6 | 351 | - | - | - |
| 4 | ...Additional Education Programmes | 3.7 | 137 | 59.6 | 13.5 | 70.5 |
| 4B | - University Aptitude Test (Passerelle) | 7.0 | 143 | 49.0 | 5.4 | 24.7 |
| 4 A, B | - Other (Transitory) Education Programmes (Adult Baccalaureate Schools, 2nd apprenticeship) | 93.0 | 127 | - | - | - |
| 6.8 | Tertiary level | 18.0 | 152 | 49.5 | 22.8 | 9.1 |
| 6-7B | ...Professional Education and Training (PET) | 20.4 | 139 | 45.1 | 17.7 | 37.8 |
| 6B | - PET Colleges | 43.6 | 217 | 46.9 | 10.1 | 30.2 |
| 6B | - Federal PET Examination | 31.2 | 152 | 38.3 | 8.5 | 26.8 |
| 7B | - Advanced Federal PET Examination | 6.0 | 63 | 25.0 | 10.0 | 35.3 |
| 6B | - Non-regulated PET | 19.3 | 110 | 58.5 | 52.2 | 73.7 |
| 6-8A | ...Universities | 79.6 | 156 | 50.7 | 24.1 | 1.7 |
| 6-8A | - Universities of Applied Science and Arts (UAS), Universities of Teacher Education | 37.7 | 222 | 51.6 | 16.8 | 4.6 |
| 6-8A | - Universities, Technical Universities | 62.3 | 132 | 50.1 | 28.5 | 0.0 |
| | - Non-Classifiable Education Programmes | 1.1 | 203 | 48.5 | 82.3 | 97.3 |

*For the students who cannot follow the normal curriculum.

Source: SFSO, 2015.

“Einführungsklasse”) after pre-school, where the learning content normally taught at the 1st primary class is spread over two years. On the other hand, parents may also take initiative and ask if their child could start schooling earlier or later (SES, 2015).

Reflecting the demographic trend in total compulsory education, the number of pupils in primary education in Switzerland has declined in the last decade. In the school year 2012/13, the amount of pupils in primary education (as %-share of all pupils in total education) was about 9% below the value of 2002/03 (see Table 3). However, this downward trend is expected to vanish in the next decade: from 2012 to 2022 the number of pupils in primary education is expected to rise by 11.3% (see Figure 9 in the appendix).¹⁷

Besides classical subjects such as mathematics and natural science, the teaching of languages at the primary school level is particularly important in Switzerland since its multilingual culture is an important part of the national identity. Besides their mother tongue, which is the language of instruction, all pupils learn a second national language (Swiss-German, French or Italian), and English already from primary level onwards (Eurydice, 2015)¹⁸.

Student's achievement is assessed by means of grades, and, as a particular feature of primary education, by learning reports or other assessment methods. The pupils generally receive their graded reports twice a year at the end of a semester. At the end of each school year, a performance-based decision is made whether pupils can move to the next grade. The decisive factor for this transition is the grade point average either across all subjects or in core subjects. In case of insufficient performance, the pupils can generally repeat grades, but the precise handling varies from canton to canton. In given circumstances, it is further possible that year-end, comparative or standardized tests are conducted in certain grades and subjects (SES, 2015).

2.3 Lower Secondary Education

Lower-secondary education is part of compulsory education. In most cantons, it lasts three years (grades 7 to 9), while it lasts four years (grades 6 to 9) in four cantons¹⁹. With the HarmoS agreement, however, lower secondary education will be compulsory for three years in those cantons which ratified the concordat by the school year 2015/16 at the latest (EDK, 2015b). Pupils typically enter into lower-secondary education at the age of eleven. The decision, to which performance level (ability group) the pupil will be assigned after primary

¹⁷ Looking at the time period from 2002 to 2022, the total number of pupils in primary education will not have changed significantly: it will increase by 0.06% (source: own calculations).

¹⁸ The first foreign language is taught at latest from the 3rd, the second from 5th grade onwards. Throughout compulsory education a third national language must be offered as optional subject. Each canton decides individually which language is taught first.

¹⁹ The cantons: Aargau (AG), Basel-Land (BL), Basel-Stadt (BS), Ticino (TI).

school, depends on his/her performance at the end of primary school, the recommendations of teachers, and sometimes a transition exam.

The lower secondary education system in Switzerland is mainly divided into three different structural models: the streamed, cooperative or integrated model. The streamed model has the lowest permeability. It separates the pupils in different ability groups and places them in different classes or school types, regarding their aptitude. This model is common in the majority of cantons. In a minor part of the cantons, the alternative cooperative model (core classes with few subjects taught in ability groups) and the integrated model (mixed classes with different ability groups all together) are established besides the streamed model²⁰. It is up to the cantons to decide which of these models should be implemented. They may allow the communes to choose between different models (SES, 2015).

As it can be seen Figure 9 in the appendix (and Table 3) also the number of pupils in lower-secondary education has been decreasing since the school year 2001/02. According to the forecasts in these figures, the downward trend in the enrolment rate will reach its minimum point in 2016 and rise thereafter.

There is no national final school examination at the end of compulsory schooling and thus no national school leaving certificate. In a few cantons, pupils have to write a final exam in the core subjects. In order to transition to the next grade, a sufficient grade average (overall or in core subjects) has to be achieved. If insufficient, transition to the next grade does either not take place or there may be a provisional transition. Pupils can generally repeat the previously attended grade or continue at a lower level in the next grade. As in primary school, it is further possible that year-end, comparative or standardized tests are conducted in certain grades and subjects (Eurydice, 2015).

For those who do not enter upper-secondary education directly after compulsory schooling, various cantons offer alternative ways and measures to get as many graduates as possible into upper-secondary education (as for example bridge-year courses, etc.) (ibid.).

2.4 Upper Secondary Education

At this stage, the youngsters need to make up their mind if they either want to continue in the general education track for a further four years in order to get access to university or if they directly want to gain labour market experience by following the vocational education and training (VET) track, which takes three to four years to complete.

²⁰ More information can be found in appendix III iii).

The general education track comprises the Baccalaureate schools and upper-secondary specialized schools. The predominant form of the Swiss VET system is a dual-track model combining work-based training (3 to 4 days a week) and general education (2 days or 1 day respectively); the so-called “apprenticeship”. This is the standard VET model in the German speaking part of Switzerland. The predominant VET system in the French- and Italian-speaking parts are purely school-based (SES, 2015). A particular feature of the Swiss education system is its highly permeability. As such, it allows students of the apprenticeship path to prepare for an exam which allows them to gain access to tertiary education (Federal Vocational Baccalaureate Exam (FVB)).

Due to the changing demand of skills within the labour market, the enrolment rate in Baccalaureate schools expanded significantly during the past decades. Nevertheless, VET is still by far the predominant form of upper-secondary education in Switzerland. In the school year 2012/13, about 23.1% of all pupils were enrolled in upper-secondary education- 14% more than in 2002/03 (see Table 3). Of these, nearly two thirds (65.4%) were in VET programmes, one fourth (25%) in general education. The rest was in transitional education programmes²¹.

While the general education options are described in this section, the VET system will be explained in detail in section 3.1.

2.4.1 Baccalaureate Schools

Most (81%) of the 25% of students in general education programmes at the upper secondary school level were enrolled in Baccalaureate schools in the school year 2012/13. The structure and duration of Baccalaureate schools varies between the cantons. Enrolment typically occurs after the last year of lower secondary education (9th grade) and lasts for four years (short-track Baccalaureate schools; “Kurzzzeitgymnasium”). Alternatively, a quicker path through the Baccalaureate school can be taken. It lasts only three years (enrolment in grade 10). If this route is taken, then preparation must already occur in the last year of lower-secondary school. In the German-speaking parts long-track Baccalaureate schools (“Langzeitgymnasium”) co-exist with the “normal” variant. Here, enrolment takes place already after primary school (7th grade). This track lasts for six years (SES, 2015).

The goal of all Baccalaureate schools, among others, are to help students to achieve the readiness to study at university and to promote individual study and working techniques (ibid.).

²¹ In order to increase the share of pupils below 25 years, having finished upper-secondary school from 90% to 95% to 2015, various measures, such as bridge-year courses for adolescents who do not enrol immediately in upper-secondary education after compulsory education, have been set up (Eurydice, 2015).

Though regulated at the cantonal level, the curricula are based on the Swiss Conference of Cantonal Ministers of Education's core curriculum for Baccalaureate schools. The compulsory subjects comprise: languages (first and second national language, as third language either a third national language, English or an Ancient language), mathematics, biology, chemistry, physics, history, geography, visual arts and/or music²² (SES, 2015).

The assessment of students is oriented towards the learning objectives of the curriculum. The final Baccalaureate examination comprises a written part and may comprise an oral examination²³ (ibid.).

2.4.2 Upper-Secondary Specialised Schools

About 16.2% of all students in general education programmes in 2012/13 were enrolled in upper-secondary specialised schools (see Table 3).

In the past, upper-secondary specialised schools provided a strong general education. Nowadays, they provide an entirely school-based preparation for professional education and training at the tertiary level (oriented towards a particular occupational field), allowing the students to enter tertiary-level B professional education and training (PET) programmes, either at PET colleges or universities of applied sciences. The upper-secondary specialised programmes normally last three years. This allows enrolment at a PET college. Completing a fourth year in specialised school, students receive the Specialised Baccalaureate, which entitles them to enrol in specific courses at universities of applied sciences. Enrolment usually occurs at the age of 14. Admission requirements are regulated at the cantonal level. They typically comprise entrance examinations and/or admission interviews (SES, 2015).

Most of the upper-secondary specialised school programmes can be found in the following occupational fields: health care, social work, education, communication and information, design and art, music and theatre and applied psychology. Besides the occupation-specific content, also general subjects, such as languages, mathematics, natural sciences, arts, sports and social sciences are taught (ibid.).

2.5 Tertiary Education

In the academic year 2012/13, about 18% of all students were enrolled in tertiary (see Table 3). The tertiary education sector in Switzerland can be subdivided in tertiary level A

²² Further, an introductory course in economics and law has to be taken. In addition, the choice of a first and a second specialisation subject (out of eight) and a Baccalaureate essay is compulsory as well.

²³ The examination subjects are: the first language, a second language, mathematics, the main specialisation and one further subject.

institutions and tertiary level B vocational professional education and training (PET) institutions. The latter will be described in section 3.2.

Tertiary A institutions comprise the conventional universities, which offer different academic degree programmes. These include the two technical universities (Federal Institutes of Technology, in Zurich and Lausanne), the cantonal universities and the universities of teacher education (UTE). On the contrary, the universities of applied sciences (UAS), offer study programmes which are less academic and with a larger practical component. To access tertiary level A institutions, a Baccalaureate or a Federal Vocational Baccalaureate is required in general, although there are some exceptions²⁴ (SES, 2015). In 2012/13, the majority of students was enrolled in tertiary level type A institutions (79.6%): almost two thirds in conventional universities (62.3%), the rest in universities of applied sciences (see Table 3). The minor share (20.4%) of students in tertiary education was enrolled in level type B institutions.

2.6 Continuing Education (Adult Education)

Adult education and continuing education and training (CET) in Switzerland is more or less a private matter - with a few exceptions in some cantons, in which they have their own cantonal act on CET or they set the CET under cantonal legislation relating either to general education or more specifically to VET/PET (SCCRE, 2010:258). However, since 2006 the new article 64a of the Federal Constitution gives the Federal state the authority to determine the basic principles of the CET sector and to promote it. In addition, a new Federal Act on Continuing Education and Training is currently being prepared in the Swiss parliament, defining general conditions for the CET system with the goal to improve lifelong learning in Switzerland (SERI, 2015a).

Table 4: Participation in continuing education and training 2011

| Persons aged 24-64 in 2011 (ISCED 2011) | Formal or non-formal | 2007= 100 | Formal | 2007= 100 | Non-formal | 2007= 100 |
|--|----------------------|-----------|--------|-----------|------------|-----------|
| All education levels | 65.5 | 134 | 9.0 | 184 | 63.1 | 135 |
| - Pre-primary, primary and lower secondary education (0-2) | 29.8 | 199 | 2.0 | 167 | 28.6 | 199 |
| - Upper-/post-secondary, non-tertiary education (3&4) | 62.7 | 140 | 6.5 | 155 | 60.5 | 141 |
| - First and second stage of tertiary education (5&6) | 82.6 | 118 | 15.6 | 220 | 79.3 | 117 |
| Employed persons | 70.4 | 131 | 9.3 | 186 | 68.1 | 131 |
| Unemployed persons | 63.4 | 157 | 13.3 | 380 | 57.1 | 148 |

Source: Eurostat, 2015c.

²⁴ Depending on the institution, access with other qualifications is possible.

The Swiss CET sector is highly segmented and takes place in the VET sector, the PET sector, general education sector, infrastructure policy (e.g. CET courses for parents) and continuing education within companies (SCCRE, 2010:258 et seq.). Switzerland depicts a high level of participation in the CET sector: in 2011 about two thirds of all persons in the age between 25 and 64 participated in formal or non-formal education and training, whereof the majority in non-formal education (see Table 4).

Training participation depended highly on the education level of the people: in 2011, only 29.8% of all people with a lower secondary education degree or below were engaged in formal or non-formal education and training, while it was 62.7% for people with an upper secondary and 82.6% with a tertiary education degree. Most of them participated in non-formal education. The participation rate for all education levels increased from 2007 to 2011. The participation in continuing education training also depended on the labour status. About 30.4% of all employed persons took part in formal and non-formal courses, of all unemployed persons round 63.4%. Interestingly, the participation rate in formal education was higher for the unemployed than for the employed²⁵, while for non-formal education it was the other way round. Participation increased for both groups from 2007 to 2011.

About 53.4% of the participation in non-formal CET was job-related, while 26.3% was non job-related. Every person participating in non-formal CET spent on average 39.3 hours per year on educational activities (Eurostat, 2015c).

3. The System of Vocational and Professional Education and Training

In this section of the Factbook, the vocational education and training system at the upper secondary level as well as the professional education and training system at the tertiary level, as well as other important factors of this part of the education system will be described.

3.1 Vocational Education and Training (Upper Secondary Education Level)

In Switzerland, two thirds of the young people decide for vocational education and training (VET) after finishing compulsory education (Table 3). Dual-track programmes, combining professional practice with general education and vocational education subjects, are the most prevalent form of VET in Switzerland, especially in the German-speaking areas. VET programmes dual-track system are called “apprenticeships”. Thereby, students spend one to

²⁵ This could mean that some unemployed acquired a higher degree in order to increase their employment opportunities.

two days a week in vocational schools covering general and vocational subjects and the rest of the week in their host companies where they receive practical training. In the French- and Italian-speaking areas of Switzerland, VET is mostly school-based programmes. In this case, the vocational schools provide full-time general and vocational education courses, as well as practical training based on a full-time curriculum (SES, 2015; SERI 2015b).

VET programmes last either two, three or four years, depending on the set of accumulated diplomas (more details below). All pupils who have completed lower-secondary school and who are at least 14 years old can apply for an apprenticeship in a training company or enrol in a full-time vocational school. Normally, students/apprentices are selected according to their grades from lower-secondary school, the application documents, an interview and, in case the student applies at a training company, some applicants also have to pass an aptitude test (SES, 2015).

The VET sector in Switzerland is organised in a system with three main possibilities to join a VET program (information for this paragraph taken from SES, 2015):

- 1) Two-year VET programmes with Federal VET Certificate (replaces the earlier pre-apprenticeship): It offers a federally recognised professional qualification for those with lower learning performance and prepares pupils to work in a profession with less demanding requirements. Also, it enables students to continue their training directly in a three- or four-year VET programme leading to the Federal VET Diploma. In the school year 2012/13, only 4% of all students in VET programmes took this track (Table 3). Graduates of this track can directly enrol in a three- or four year VET programme leading to the Federal VET Diploma.
- 2) Three- or four-year VET programmes leading to a Federal VET Diploma: In 2012/13, about 90.8% of all students in VET programmes were enrolled in this programme track (Table 3). It provides the students with the competences needed to work in a particular profession. After successful completion, it grants access to the tertiary-level B professional education and training (PET) sector or, in combination with further qualifications, even access to the tertiary level A sector (see e.g. next point).
- 3) Federal Vocational Baccalaureate (FVB) programme (“Berufsmaturität”): This is an extended general education programme designed to supplement the general education part of students with Federal VET Diploma. The programme can be attended either during the three- to four- year VET programme (see previous point) or in a full-time programme after having finished the Federal VET Diploma. The full-time programme takes one year, the part-time programme one-and-a-half years. It is also possible to pass the examinations by preparing on a self-study basis.

The students who have successfully completed the FVB-Certificate can directly enrol in a university of applied sciences and arts, belonging to the tertiary education level A sector. In case students take a further qualification called University Aptitude Test (UAT; so-called "Passerelle Prüfung"), they have even access to the conventional universities, technical universities or universities of teacher education of the tertiary level A sector (for more details, see last paragraph of this section). In any case, having completed a Federal VET Diploma is a necessary prerequisite for getting the FVB.

- 4) Alternatively, a VET qualification can also be earned without having attended a formal VET programme. This option is especially designed for adults. Among other things the adults must have some professional or non-professional practical experience in the particular profession in which they want to earn the qualification as a pre-requisite. In general, the qualification requirements differ by profession and are regulated by specific VET ordinances for each profession.

For the youngsters who have completed compulsory schooling but have not been able to directly enter the upper-secondary level, "bridge" or transitional options are offered. For example, these include a 10th school year, or a so-called "pre-apprenticeships" which allow the potential apprentices to learn about the content of a particular profession (Hoeckel et al., 2009) and are designed to prepare youngsters for enrolment in VET programmes (SERI, 2015b).

VET track students can choose between 230 different professions. Facing such a multitude of possible choices makes it hard to decide for a future profession. In order to help and guide students to decide about their future profession, centers of career guidance and counselling are in place²⁶. Schools and centers work closely together. Already in the 8th grade, it is mandatory for the students to get at least one time in touch with the center. There are numerous optional possibilities for parents, students and schools to get information through these centers. In addition, students are encouraged to do short "trial courses" or pre-apprenticeships (from 1 or 2 days up to a week) at companies to get to know the occupations of their interest. This way, they can compare and align their expectations with reality and make a well-informed career choice. These supporting aids should increase the matching of the students and decrease the drop-out rate from the started program (Hoeckel et al., 2009). In order to find an apprenticeship position, students have to look for open positions offered by the companies and to apply for these. Successful candidates are invited to job interviews and chosen if the company thinks he/she is the most suitable candidate (ibid.).

²⁶ There is a wide network of centers in the regions, which are supervised by the cantons. Each center serves several schools in their region.

Although a lot of help is given to decide on the career path and to find a suitable option, there are students who cannot make up their mind, were not successful in finding a suitable company for apprenticeship training, or did not have enough academic skills to continue with general education. For them, several bridge options are available, as mentioned before (ibid.).

Furthermore, an early support program for young people at risk of dropping out, called Case Management System, was established by the Confederation in coordination with the states in 2006²⁷. Its main purpose is to coordinate the existing support programs to provide the student with a tailor-made solution. All these measures and efforts should prevent a drop-out from the education system (Hoeckel et al., 2009).

Upward Mobility: From Upper-Secondary Level VET to Tertiary Level Education

A particular feature of the Swiss Education System is its high permeability. Therefore, the VET track is not a dead end. Those having successfully completed the Federal VET Diploma and having gained some work experience can enrol in so-called “professional college degree programmes” or prepare for the national professional examinations to earn the Federal PET Diploma, or an Advanced Federal PET Diploma (for more details see the next section) (SERI, 2015b).

Those having successfully completed the FVB and hold the Federal VET Diploma can directly access the Universities of Applied Sciences and Arts (UAS), which belong to the tertiary level A of the education system. However, these students need to have some year of practical experiences before entering the program (ibid.).

In case VET students want to study at a conventional Swiss cantonal university, at the Federal Institute of Technology (ETH), or at the University of Teacher Education, the Confederation together with the cantons launched the University Aptitude Test (“Passerelle Prüfung”) in 2005. This test can be done after having successfully completed the FVB (and holding the Federal VET Diploma). This takes about one year to achieve and grants direct access to conventional type A universities (ibid.).

In the case a student with an academic background wants to continue with PET education, the requirements are mostly of practical nature, like working in the occupation area of the desired study field for one year (ibid.).

²⁷ For further reading concerning Case Management see OECD (2008:13-17) and OPET (2012:17).

To sum up, young professionals finishing their apprenticeship will have an entry ticket to the labour market as well as an entry ticket to further education. All in all, this makes the Swiss VET system very attractive.

3.2 Professional Education and Training (PET) at the Tertiary Education Level

The major purpose of the tertiary level B type institutions is to allow those having obtained VET-degree to specialise in a certain field. It is open for those holding a Federal VET Diploma, having completed an upper-secondary general education or holding an equivalent qualification and having attained some (years of) professional experience (VPETA, Art. 26, Para. 2 and SCCRE, 2014: 246 et seq.). Two track programmes are offered: i) the PET colleges on one hand and the ii) Federal PET Diploma Examinations and Advanced Federal PET Diploma Examinations (or “Meisterprüfungen”) on the other hand. According to the ISCED 2011 classification, these programmes belong to the tertiary level 6B of the education system (SFSO, 2015). In either case, the programmes are run by public, public subsidised or by private providers. Overall, the market share are equally distributed between these three types of providers (SCCRE, 2014: 248). More information on the funding of the VPET system can be found in section 3.4.

3.2.1 PET Colleges

In 2012/13, about 43.6% of all PET students (tertiary level B) were enrolled in PET colleges (Table 3). These programs are thought for people wanting to deepen their knowledge in a particular professional field or aspiring for a management position in a company. Admission requires holding a Federal VET Diploma and, in some cases, having professional experience. Sometimes an aptitude test is demanded in addition. Programmes in various fields are offered²⁸. The programme content is oriented along the lines of the occupational profiles in the different fields. The PET Diploma can be achieved through a full-time or a part-time programme. The former takes about two, the latter three years (SES, 2015).

The Confederation, with the State Secretariat for Education, Research and Innovation (SERI) as its executive organ, is in charge of the strategic management, the quality control and approval and issuing of the core curricula of the PET degree programmes, which are comparable Switzerland-wide. Also, it optionally subsidises the degree programmes. The Cantons supervise and subsidise the programmes (SERI, 2012).

²⁸ Programmes are offered in the following fields: engineering, hotel, restaurant and catering, tourism and hospitality services, economics, agriculture and forestry, healthcare, social care and adult education and training, art and design, traffic and transport.

The PET college degree programmes are based on national core curricula which are developed and drafted by the PET colleges in cooperation with the professional organisations (consisting of trade associations, industry organisations, etc.) (SCCRE 2014: 246 et seq.; SERI, 2012). The minimum degree requirements (number of study hours, etc.) are laid down by law²⁹ and the awarded diplomas are protected by law (SES, 2015).

PET colleges are run either by public providers, public subsidised providers or by private providers. More information on the funding can be found in section 3.4.

3.2.2 (Advanced) Federal PET Diploma Examination

The Federal PET Diploma Examination and the Advanced Federal PET Diploma Examination are designed for people with a Federal VET Diploma having several years of professional experience and wanting to prepare for a leadership role. Since the latter is more demanding as the former, most of the people taking the Federal PET Diploma Examination hold a Federal VET Diploma as their highest educational qualification (ca. 70%), while those taking the Advanced Federal Diploma Examinations have a tertiary level B PET qualification (Federal PET Diploma) or a different tertiary level qualification (also ca. 70%) (SCCRE 2014: 246 et seq.). This corresponds to the entry requirements for either programme. For admission to the Federal PET Diploma Examination, a completed upper secondary education and some years of work experience are required, while holding the Federal PET Diploma Examination and work experience are needed for admission to the advanced diploma (SCCRE 2014: 246). In 2011, 31.2% of all PET students (tertiary level B) completed the Federal PET Diploma Examination and only 6% the advanced one (Table 3).

Despite the large number of possible qualifications for which a Federal PET Diploma can be attained, the number of fields in which these are offered is rather limited³⁰. This trend is even more marked in case of the Advanced Federal PET Diplomas.

There are no rules how students have to prepare for the examinations. They can study by themselves or attend preparatory courses offered by professional associations or privately-run or public colleges. These courses are offered on a part-time basis. In fact, most (~90%) of the students continue working while preparing for the examinations at a workload of 80%-90% (SCCRE 2014: 246 et seq.).

Different from the PET colleges, the Confederation (i.e. the SERI) only recognises the holding and the content of the (Advanced) Federal PET Diploma Examination, not the entire

²⁹ In an ordinance of the Federal Department of Economic Affairs, Education and Research (EAER). For the exact citation, see reference list of appendix iii).

³⁰ In total, around 240 recognised Federal PET Diploma Examinations and 170 Advanced Federal PET Diploma Examinations are offered.

coursework (curriculum, etc.). The Confederation takes on the responsibility to supervise the examinations and to approve their regulations (SCCRE 2014:250). It also acts as a first instance if examination outcomes have to be defended. In addition, it issues PET qualifications and updates these in the register and subsidises examinations. The Cantons subsidise preparatory classes optionally (SERI, 2012).

Instead, the development of (Advanced) Federal PET Diploma Examinations is always initiated by the professional associations, which determine the competency requirements for the content of the examinations, conduct examinations and also draft the examination regulations (ibid.). More details can be found in section 3.3.

3.2.3 Transition Within the Tertiary Education Level

For graduates, who obtained a PET qualification, that is either a i) PET Diploma from a PET college or ii) a (Advanced) Federal PET Diploma Examination, it is possible to access a university of applied sciences. However, admission is decided on a case-by-case basis. Therefore, some additional requirements may be needed for this option.

Likewise a student with a pure academic background is allowed to enrol for an advanced federal PET examination. However, as for the PET graduates, some obligations might be required like having worked in the professional area of interest for several years (Renold, 2016). In both cases prior learning or experiences are recognized.

3.2.4 Overlap Between PET Sector Programmes With Other Comparable Programmes

Some of the programme contents offered at PET colleges or in (Advanced) Federal PET Diploma Examination overlap with training courses or post-training courses offered by higher education institutions (HEIs), which comprise the conventional universities, the technical universities, universities of teacher education and universities of applied sciences. As such, the programmes offered by the HEIs compete directly with the corresponding tertiary-level B programmes and courses offered by the PET sector (SERI, 2012).

The HEIs offer three main qualification programmes, namely the Master of Advanced Studies (MAS), Diploma of Advanced Studies (DAS), Certificate of Advanced Studies (CAS). These programmes are classified as continuing education and training (CET). The design of these courses falls under the autonomy of the university sector. Since the design and content of these programmes is not regulated by law, they do not belong to the formal education sector (ibid.).

Instead, the programmes offered by the PET sector are regulated by law³¹. Hence, they are classified as formal qualifications. This is a relevant fact, since having passed a formal qualification or degree implies that the employer has to pay a higher wage to his employee. This is not the case with non-formal qualifications. Though it might occur, the employer is not obliged to honour the effort of the employee though a higher wage (ibid.).

However, if an employer is not informed about the details of educational qualifications, it is possible that he values a non-formal degree higher than a formal one. For example a MAS cannot be set at the same qualification level as a “normal” Master. However, a non-informed employer might think so and attach a higher value to the MAS than a comparable formal qualification from the PET sector.

3.3 Regulatory Framework and Governance of the VPET System

This section summarises the legal aspects of the vocational education and training sector and describes its governance. It clarifies how the powers and duties are distributed and who has a say in which aspect of the system.

In the following, the term *vocational and professional education and training* (VPET) refers to both, the vocational education and training (VET) at the upper secondary level and the professional education and training (PET) sector at the tertiary level.

3.3.1 Regulatory Framework

The VPET system is defined and organized by the federal Vocational and Professional Education and Training Act (VPETA)³². Thereby, the vocational education and training (upper secondary level) and the professional education and training sector (tertiary level) are regulated separately. The current version is the fourth edition put into effect in 2004. All actors of the Swiss VPET system, at the federal or cantonal level, as well as private actors are bound to the VPETA. It constitutes all important aspects concerning the VPET system, from the structure of the VPET to its implementation, supervision, and funding as well as the requirements, competencies, and duties of the involved actors.

According to Chapter 1, Art. 1, Para.1 of the VPETA: The “Responsibility for upper-secondary level vocational education and training (VET) and tertiary-level professional education and training (PET) shall be shared by the Confederation, the Cantons and professional organisations (social partners, trade associations as well as other organisations

³¹ The Vocational and Professional Education and Training Act (VPETA). More details can be found in section 3.3.

³² An English version of the VPETA without legal force can be found under www.admin.ch/opc/en/classified-compilation/20001860/index.html.

and VET and PET providers) (...)"'. In the following, the regulations for VET and PET will be summarised separately.

Vocational Education and Training

To a large extent, the federal tasks pursuant to the Vocational and Professional Education and Training Act (VPETA), such as strategic supervision of the overall system, ensuring nation-wide comparability of VET programmes, and issuing implementing ordinances to the VPETA, are assigned to the State Secretariat for Education, Research and Innovation (SERI, part of the Department of Economic Affairs, Education and Research), representing the Confederation. However, cantonal authorities and professional organisations play a crucial role in the implementation of the federal provisions, too. Additionally, there is a number of advisory commissions, where trade unions and VET teachers are represented as well.

For every federally recognized upper-secondary VET programme (two year Federal Certificates and three or four year Federal Diplomas) the SERI issues an executive ordinance (on the request of professional organisations). Collectively, these ordinances form the lynchpin of VET administration in Switzerland. Amongst other issues, they:

- lay down the respective minimal education and training contents through learning targets (while some specific contents, such as general education subjects, are mandated by federal law across all VET programmes),
- define the shares of work-based training, classroom instruction segments, and additional training at branch training centres (hence implementing the dual system, i.e. division of the VET mandate between companies and vocational schools),
- and regulate qualification and awarding procedures.

Work and school-based education and training contents are concretized by sectoral professional organisations in the respective VET programme curricula (the involvement of other stakeholders, such as employees or teachers, thus depending on the internal rules of the respective organization), which are to be authorized by the SERI. Cantonal authorities, inter alia, issue training permits for new host companies, supervise VET programmes, issue certificates and diplomas (with nation-wide recognition), appoint examiners for the final examinations, and ensure the provision of the required learning opportunities at vocational schools.

With regard to funding, the classroom instruction segment is fully publicly funded (with the Confederation's share of cantonal VET expenditures planned to reach the level of one quarter), while there is generally no public funding for workplace training. With the exception of collective employment contracts, VET students' salaries are open to contractual bargaining.

VET teachers' education is subject to federal legislation, including various minimal requirements regarding teachers' qualifications, depending on the subjects taught (vocational or general education subjects), and curricula for teachers' education courses.

Professional Education and Training

In the following, the regulations of the VPETA for the PET sector will be summarised. First the regulations concerning the (Advanced) Federal PET Diploma and second those concerning the PET colleges.

Federal PET Diploma or Advanced Federal PET Diploma

Besides defining that having professional experience and expertise are prerequisites in order to take the (Advanced) Federal PET Diploma, the VPETA states that regulations concerning "(...) admission requirements, course content, qualification procedures, qualifications and titles (...)" shall be established by the professional organisations (Ch. 3, Art.28, Para.1-2, VPETA). Thereby, the qualifications the students attained from previous studies shall be taken into account. Once established, the regulations have to be approved by the SERI and must be published in a gazette (Ch. 3, Art.28, Para. 2, VPETA). Thereby, the Federal Council has to define the framework for the approval process (Ch. 3, Art.28, Para. 3, VPETA). The Cantons are allowed to offer preparatory courses for the (Advanced) Federal PET Diploma (Ch. 3, Art.28, Para. 4, VPETA).

PET Colleges

According to the VPETA, everyone who wants to enrol in a PET college must have "(...) sufficient professional experiences, unless such professional experience is included in the course of study (...)" (Ch. 3, Art.29, Para. 1, VPETA). It also specifies the minimum training duration of full-time (2 years including traineeships at host companies) and part-time programmes (min. 3 years) (Ch. 3, Art.29, Para. 2, VPETA). The Education Ministry (Federal Department of Economic Affairs, Education and Research (EAER)) in cooperation with the professional organisations have the responsibility to set up minimum requirements for the federal recognition of the degree programmes, that is the admission requirements, course content, qualification procedures, qualifications and titles (Ch. 3, Art.29, Para. 3, VPETA). The Cantons are allowed to offer own courses of study and have the duty to supervise the PET colleges (Ch. 3, Art.29, Para. 4-5, VPETA).

For more information on the regulatory framework on VET in Switzerland, refer to the table in the appendix iii). It gives a more detailed overview on certain aspects of the VET legislation (not PET) in Switzerland, in particular regarding the overall governance including applicable

statutes and administrative bodies, the role and content of education, the regulation of work-based training, financial attributes, and VET teachers' education.

3.3.2 Governance

As stated in the previous section, the VPET system is settled and regulated in the national Vocational and Professional Education and Training Act (VPETA), where it is stated that the responsibility for the VPET system is split between the i) Confederation, ii) the Cantons and iii) the professional organisations (including social partners, trade associations as well as other organisations and VET and PET providers) (Ch. 1, Art. 1, Para.1, VPETA). In the following, the responsibilities of each actor will be explained.

i) The Confederation

The Confederation is responsible for the strategic steering and development of the VET and PET systems. This responsibility includes- among other things- ensuring training quality, comparability, and transparency nation-wide; enacting VET ordinances; and recognising PET exam ordinances as well as PET framework curricula. The enforcing bodies are two government institutions: the State Secretariat for Education, Research, and Innovation (SERI), and the Swiss Federal Institute for Vocational Education and Training (SFIVET). The SERI is the competence centre for VET and PET, and the SFIVET the academy for training VET and PET teachers and other professionals like vocational trainers, exam experts, or instructors of industry courses.

ii) The Cantons

The 26 cantons implement the legislation, provide VET schools, operate PET schools, control apprenticeship contracts, and establish Career Guidance and Counselling Centres. They also issue education licenses to host companies conditional on technical and personal prerequisites, inspect host companies, and promote VET.

iii) The professional associations

The professional associations, which mainly consist of company members, have the biggest say in the decision on which occupations are needed and what the content of the curriculum should contain. So they, and in particular the host companies, are in the driver seat, telling the other partners what is needed in the labour market and how it is needed. Additionally, the associations are in charge of revising the occupation-specific VPET ordinances every three to five years. Then, the professional organizations also engage in advertisement of apprenticeship places, contribute to establishments and operations of industry courses, prepare training material for host companies, and carry out the workplace-related national

examination processes. They also revise the occupation-specific VET ordinances every three to five years.

Besides the three main actors mentioned above, there are several minor actors in the VPET system.

One is the Swiss Federal Institute of Vocational Education and Training (SFIVET), which is a tertiary level institution specialised on vocational education and training. The SFIVET offers a range of study programmes for those who want to become a teacher in the VPET system.

Other minor actors in the VPET system are researchers, who impact on the VPET system by influencing policy making through their research. In general, research plays an increasingly important role in the control of the VPET system, because knowing where the system can be improved is crucial for the optimization of its efficiency, effectiveness, and equity (see SCCRE, 2010, 2014).

Though the Swiss VPET system is governed by laws and ordinances, it is not rigid or overly regulated. Rather, the Swiss VPET system is highly market-driven: it is governed by the demand of prospective students for apprenticeship positions and the supply of these positions through the firms. The government does not interfere in the market with some exceptions with regard to the mechanisms to support the smoothing function of the market. Instead, the VET system is driven through a partnership arrangement in contrast to the other parts of the education system, which are mainly under the responsibility of the Cantons.

3.4 Educational Finance of the VPET System

According to the VPET Act not only the organisation, but also the financing of the VET system is split between the Confederation, the cantons and professional organizations (Chapter 2 Art. 22 passage 1 and 2 of the VPETA). Thereby, the state finances roughly 40 percent of the expenses, while the private sector contribution is more or less at 60 percent to the overall costs (SFSO, 2015). The contribution of the training firms is mainly the salary of their apprentices and some other expenses related to their training, whereas the government pays the training at the vocational schools (at least of the dual-track VET programmes).

In the last years, Switzerland spent about 5% of GDP for education. This was a little bit lower than the OECD average (~ 6%) (OECD, 2013c). To give an idea of how much of total public education expenditure is devoted to the VET system or to the other branches of the Swiss education system and who of Confederation, cantons or communities has to pay it, Table 5 shows the distribution of these spending.

Table 5: Public education expenditure, 2014

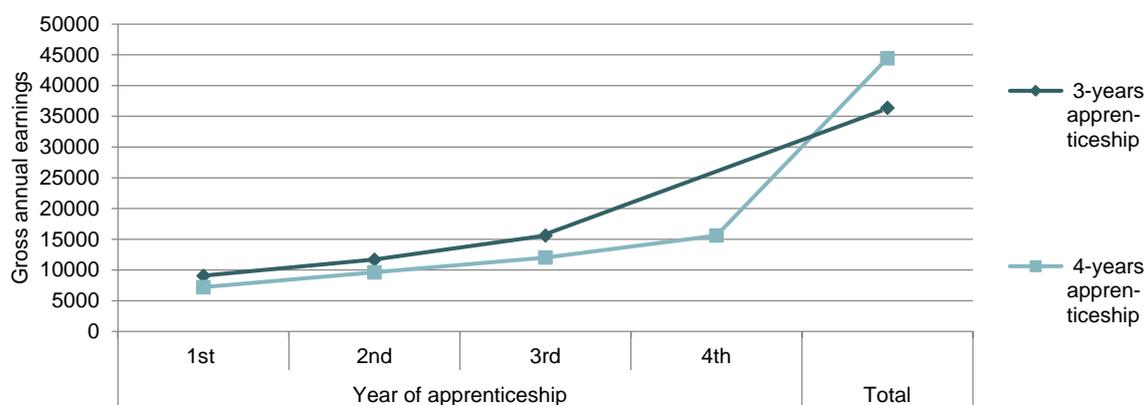
| | Total (%) | Con-federation ¹⁾ (%) | Cantons ¹⁾ (%) | Com-munities ¹⁾ (%) |
|--|-------------|----------------------------------|---------------------------|--------------------------------|
| Compulsory school (inclusive pre-school) | 43.4 | 0.1 | 44.9 | 55.0 |
| Special Curriculum²⁾ | 5.4 | - | 75.6 | 24.4 |
| Upper secondary level | 16.7 | | | |
| Vocational education and training (VET) | 10.1 | 0.7 | 94.0 | 5.2 |
| General education track (Baccalaureate, specialised Baccalaureate schools) | 6.6 | 0.1 | 99.8 | 0.1 |
| Tertiary level | 32.9 | | | |
| Professional education and training (PET) | 0.9 | 30.8 | 69.1 | 0.1 |
| Universities (cantonal, ETH, UAS, teacher educ.) | 21.8 | 12.9 | 86.7 | 0.4 |
| Research | 10.2 | 65.4 | 34.6 | 0.1 |
| Non-divisible expenses | 1.5 | 1.0 | 90.8 | 8.2 |

¹⁾No horizontal transfer payments included. ²⁾For the students who cannot follow the normal curriculum.
Source: SFSO (2015).

Table 5 shows that the largest part of education expenditures (43.4%) was spent for compulsory education and only a low amount of 10.1% was spent for VET (upper secondary level) in 2014. Thereof, the cantons had to pay the major part (94%). Only 0.9% of total education expenditure was spent for PET (tertiary level). Again, the cantons had to pay the largest part of this tranche.

While apprentices are working and learning in the host companies, they earn a small salary. Depending on their year of apprenticeship they earn a monthly wage starting from CHF 600 and rising up to around CHF 1300 in the last year of education (Figure 6)³³. The salaries for apprentices are set through collective bargaining at company level and follow mostly the recommendations of the industry associations.

Figure 6: Gross annual salary of apprentices by teaching year (median), 2009



Source: SFSO, 2015.

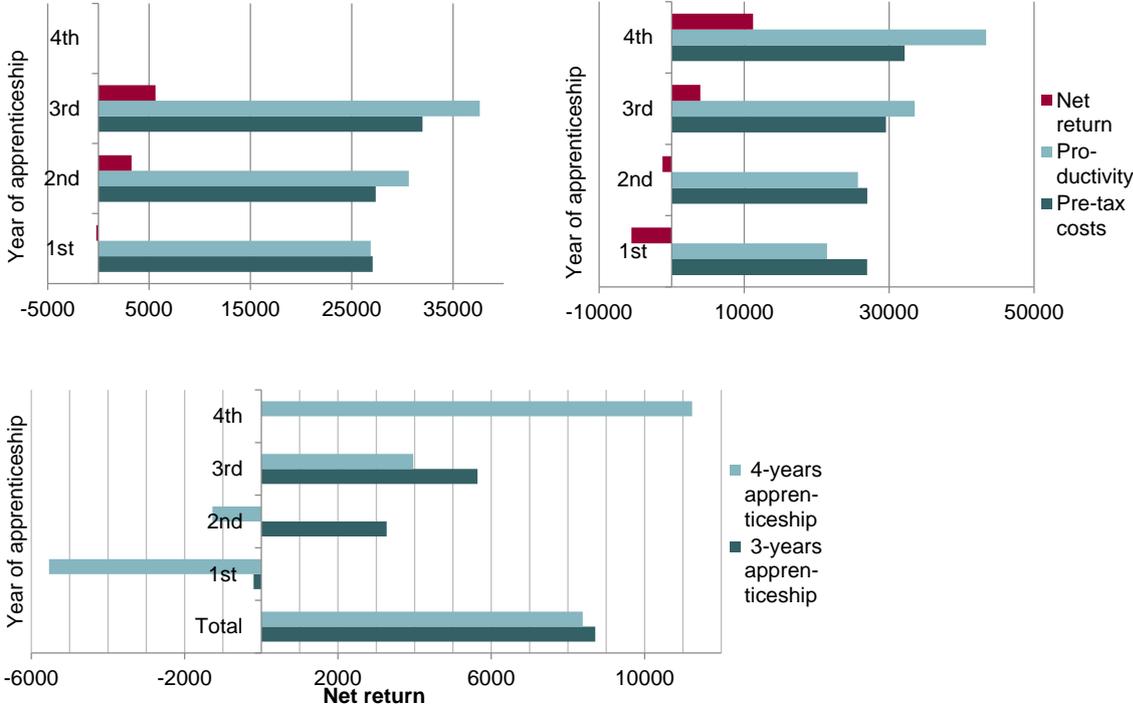
³³ See the following website for salaries of each profession. Salaire Durant l'apprentissage-Etat juin 2014; <http://www.berufsberatung.ch/dyn/46447.aspx>

Although the VET system is costly for employers, it is worthwhile for them to invest in apprentices. Cost-benefit studies of Mühlemann et al. (2007) show, that companies make a net benefit already during the apprenticeship program. The main reason is, that apprenticeship wages are rather low. Another reason is the productivity of apprentices. Whereas they are not so productive in their first year, students make more than up for it in the second and third year, due to the specific syllabus implemented in each host company. In Figure 7 you can see, that a net benefit is the result of an apprenticeship is positive.

In order to reduce free riders in the VET system, like firms that are not willing to train apprentices due to the costs, but then poaching them as soon as they finished their training, a VET fund was introduced, where all the non-training firms are obligated to contribute to the training costs. At the request of corresponding professional organization, the Federal Council may declare the professional organization's VPET fund mandatory for all companies within the given economic branch and require, that each company contributes to the fund (Art. 60 of the VPETA).

In contrast to the VET programmes, the PET programmes are mainly financed by employers and private individuals visiting the program.

Figure 7: Costs and benefits by year of apprenticeship, 2009



Source: Strupler and Wolter (2012).

3.5 Curriculum Development

The curriculum is a central element for the functioning of a VPET system by defining the framework and the (quality) standards for the education. The development of a curriculum can be decomposed in a three-step process, the curriculum design, curriculum application and curriculum outcome phase. This theoretical concept is called the *Curriculum Value Chain* (CVC; for more details see Renold and Rageth, forthcoming).

As the name suggests, in the first phase of the CVC, comprises the design of the curriculum. This can be done by experts from the employer, the state and/or the employee side (representatives). A typical example for the employer side are professional organisations, for the state side school authorities at the central or regional level and for the employee side unions. After development of the curriculum and upon approval of all relevant actors, the curriculum is enacted. For its implementation, all professionals involved in teaching have to be trained with regard to the content and all necessary organizational measures that have to be taken. The design phase also involves the incorporation of innovation or feedback from different sources into the curriculum, especially in case of a curriculum renewal.

In the second phase, the curriculum application phase, the curriculum will be implemented in a particular learning environment. This phase is very important because learning environments differ dramatically between countries. Since workplaces as learning environment are advantageous with regard to the acquisition of particular competences, the coupling factors between the education system and the employment system should be observable in this phase.

Finally, the intended effects of the curriculum should be visible on the youth labor market, constituting the third phase, the curriculum outcomes. In the following, all three phases of the CVC will be applied to Switzerland.

3.5.1 Curriculum Design

The design phase is very important for the whole curriculum process. In order to ensure that the skills taught in the VPET programmes correspond to the needs of the labour market, experts from companies must be involved in defining the qualification standards and learning contents of the curricula. In Switzerland, the employers have the major say in defining the curricula. They are organised in trade associations. As mentioned earlier, the trade associations fall in the category of professional organisations. Besides, the social partners (employer and employee representatives), other organisations and VET and PET providers also belong to this category. However, compared to e.g. Germany, the employee representatives (e.g. through trade unions) play only a minor role in the Swiss VPET system. Hence, when speaking of professional organisations in the Swiss context, we refer for the

most part to the employer-side, i.e. trade associations. Nevertheless, all members of the professional organisations are responsible for the curriculum content (Egg and Renold, forthcoming).

Besides the professional organisations, also the Confederation at the federal and the cantons at the regional level have a say in the development of the curricula. Together with the Confederation, the professional organisations decide which occupations are needed on the labour market and which not. Accordingly, they develop VET or PET programs.

In a joint effort, all three actors, that is professional associations, Confederation and Cantons, prepare the occupation-specific VPET ordinances which form the legal basis for the so-called curriculum frameworks. The occupation-specific content of each VPET programme is laid down in ordinances and the corresponding curriculum framework. The ordinances specify minimal education and training contents through learning targets, and define the shares of work- and school-based training, classroom instruction segments, and intercompany courses (see below for an explanation). In practice, this decision varies by occupational field. Common patterns for apprentices involve spending one day per week in the vocational school and four days in the host company or two days per week at the vocational school and three days at the host company; or, to alternate between spending some weeks at the vocational school attending classes and going to inter-company courses at inter-company training centers. In addition, the ordinances also define occupation-specific qualification standards and procedures (national or local assessments and exams)(SERI, 2015b; Hoeckel et al., 2009).

The main advantage of having this tripartite partnership defining the curricula, is that the qualification standards and learning contents for each profession are determined at the *national level* and hence comparable across Switzerland. By guaranteeing that all students in a certain profession receive the same education, potential employers can be sure that all VET graduates have comparable skills and knowledge of their profession. This makes students mobile, since their credentials are recognised by firms nation-wide (Hoeckel et al., 2009).

3.5.2 Curriculum Application

The way, in which a curriculum is implemented in the learning environment is crucial for the overall outcome effects. In Switzerland, the curriculum of the VET programs at the upper-secondary level is typically implemented in three different learning and training locations. These are the host company, the vocational school, and the industry training center in so-called inter-company courses.

Inter-company courses are organised and run by the professional associations. They consist of supplementary professional courses which aim to enhance the vocational practical skills of the students. These courses take place in inter-company training centres of the professional organisations. In these centers special equipment (machines etc.) is provided that is needed to train particular skills of the students. This allows simulating the real working place situation. For example in the machine industry, there are very expensive machines which cannot be blocked for a hands-on training of the students. Therefore, one model of such a machine might be available in an inter-company training centre for the training of students of an entire industry branch. This renders possible that even students of companies which could not afford buying this equipment or cannot afford reserving it for training purposes receive training with this equipment. In turn, this contributes to the fact that the qualifications of all students are comparable within a particular profession, since all students receive the same training with the same learning goals, the same equipment etc. Some of the training centers are even connected to research institutions which allows that knowledge of the most up-to-date research can be integrated in the inter-company courses (Backes-Gellner and Rupietta, 2015).

In general, the teachers in the VPET system experienced practitioners with some pedagogical training. In general, everybody involved in the Swiss VET system is a professional as explained in section 3 Governance (delivered by the SFIVET) (Egg and Renold, forthcoming).

3.5.3 Curriculum outcome

In this phase of the CVC, the focus is laid on the quantity and quality of vocational education and training. The assessment of the quality of education is regulated by the VPET Act. In addition, the VET ordinances make the creation of a commission for Career Development and Quality in order to ensure high quality in the training plans compulsory. In addition, instruments to monitor and evaluate the quality of the VPET system over time are in place (Egg and Renold, forthcoming).

One such instrument is the apprenticeship market barometer. It was established in 1997 in order to keep track of the developments on the apprenticeship market. Other instruments are the annually organised apprenticeship conferences headed by the SERI, where the apprenticeship market is highlighted and the job entry barometer introduced in 2010, which allows to observe the transition of youngsters from education to work (ibid.).

The quality control of work-based training is the duty of the Cantons. One of their tasks is to issue education licenses to host companies wanting to train apprentices, given that these fulfil the technical and personal prerequisites. When a company does not fulfil the standards,

the Cantons provide coaching to assist them. With the help of the so-called QualiCarte, which pins down the quality criteria to a few points, the companies can assess the quality of their training with a checklist of 28 quality criteria³⁴.

Besides the companies, also the VET schools need to have a quality assurance system, which is mostly done by means of established quality management principles (e.g. through the guideline of the International Organization for Standardization (ISO)). But also students have to prove the quality of their knowledge. This is done by a series of rigorous tests, which they have to take during and at the end of the VPET programmes. These tests cover the school-based component, the knowledge of vocational material, and a practical component. All these tests can be failed. To ensure that all the school-based and work-based learning meets the same quality standards, the assessments are carried out by external agencies that are not related with the vocational schools or with the host companies (Egg and Renold, forthcoming).

3.6 Supplying Personnel for the VET System (Teacher Education)

Vocational Education and Training in Switzerland consists of two parts: theoretical education in vocational schools (Berufsschulen), which is further divided into job-related subjects and general education, and practical training in firms, where the apprentices are instructed by professionals. The following paragraph exclusively describes the education of teachers in vocational schools³⁵.

With regard to job-related subjects, teachers need either a *tertiary level A degree*: usual university or university of applied sciences³⁶ or a *level B degree*: Professional Education and Training (PET)³⁷. PET colleges comprise programmes that prepare students for one of Switzerland's two national professional examinations: the Federal PET Diploma Examination (eidgenössische Berufsprüfung) or the Advanced Federal PET Diploma Examination (eidgenössische höhere Fachprüfung). Or, they could prepare students for a professional college degree (Diplom einer höheren Fachschule). In addition to one of the above mentioned diplomas, teachers have to obtain vocational teaching knowledge (Berufspädagogische Bildung) (Gretler, 1995).

³⁴ The catalogue with the 28 quality criteria can be found under www.qualicarte.ch. For details concerning apprenticeship market barometer and other instruments see OPET (2012, p. 7ff).

³⁵ The requirements for vocational trainers are laid down in Art. 44 of the regulation for vocation education and training ("Verordnung über die Berufsbildung"; <http://www.admin.ch/opc/de/classified-compilation/20031709/index.html>).

³⁶ *Tertiary A* comprises cantonal universities, Switzerland's two federal institutes of technology (ETH of Zurich and Lausanne), teachers colleges (*pädagogische Hochschulen*) and various specialized institutions (cf. www.sbfi.admin.ch).

³⁷ Those *Tertiary B* degrees are a distinctive feature of the Swiss educational system, as in other countries similar degrees are exclusively obtained at university-level institutions.

The Swiss Federal Institute of Vocational Education and Training (SFIVET), which is a tertiary level institution specialized on vocational education and training, offers study programmes for future teachers of the VPET system. It is the main actor for teacher education in the field of VPET and provides basic and continuing training to other VET professionals (mostly vocational trainers, exam experts, or instructors of industry courses, who work part-time).

In addition, also other institutions may offer courses for VET professional studies, provided they first obtain accreditation by the federal government. So, all professionals in the VPET must meet certain standards. For instance, a vocational teacher for upper-secondary level VET programs needs a tertiary degree, at least six month of professional experience, and 1800 hours of preparation in VET pedagogy (SCCRE, 2010).

4. Major Reforms in the Past and Problems for the Future

4.1 Major Reforms between 1990 and 2015

The major reforms in the Swiss educational system since 1990 were as follows (Cf. Babel, 2005):

- In 1994 the Vocational Baccalaureate was established in Switzerland. In the mid-nineties the first universities of applied sciences were introduced. The intention was that they provide greater value to Switzerland's successful upper-secondary level VET sector and tertiary B level PET sector by establishing linkages to the tertiary A sector.
- In 1999 Switzerland signed the Bologna-Declaration, which reformed tertiary A education. Main objectives were to establish a system of comparable qualifications in Europe as well as promote the mobility of students.
- In 2004 the revised Federal Act on Vocational and Professional Education and Training came into force. The main development is the enhancement of the collaboration between cantons (e.g. new financing agreements, coordination in the supply of education possibilities, establishment of competence centers, increased uniformity in regard to quality development and assurance as well as in regard to exams).
- In 2009 HarmoS, which was explained in detail above, came into effect and will be fully implemented by 2015.

4.2 Major problems for the year 2020

With regard to the mandatory education, a challenge for the coming years will be to find a balance between the aim of harmonization and accounting for local differences (Wolter, 2010:54 et seq.).

- In upper secondary school there are significant differences in completion rates between students born in Switzerland and immigrants. The challenge will be to strengthen educational integration (ibid).
- The dual education in VET is to a high degree dependent on companies which are willing to train apprentices and economic downturns may negatively affect firms willingness to invest resources and energy into VET. Therefore, means need to be found to strengthen firms motivation for VET. Moreover, research (Schweri and Müller, 2008) has shown that international companies, which are less aware of Switzerland's dual VET tradition, are less committed to train apprentices (Hoeckel et al., 2009: 26 et seq.).
- Switzerland has a high variance in maturity rates between the cantons. In the year 2008 the rates ranged from 14% to almost 30%. However, these noticeable differences can't solely be explained by varying performances of mandatory school leavers, as PISA shows. In fact, studies (i.e. Eberle et al., 2008) show that the performance of baccalaureate holders is negatively correlated with the respecting cantonal maturity rate. This is particularly worrying in light of the fact that Switzerland is one of few industrial countries where holders of a baccalaureate have almost free access to all universities and disciplines (Wolter, 2010:56).
- As mentioned above, Switzerland may face a shortage of teachers in the forthcoming years for certain grades. Finding a solution to this problem without negatively affecting teaching quality remains a challenge.

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Appendix

i) The “HarmoS Konkordat”

In the course of harmonizing the education system, the “HarmoS Konkordat” made the attendance of two years of preschool/kindergarten obligatory. This way, preschool/kindergarten became part of the compulsory schooling system³⁸ in all cantons which ratified this concordat (15 at present)³⁹. Despite the earlier start of compulsory education, the teaching is still “preschool-/ kindergarten-oriented”, implying that it is still geared towards the needs of the children.

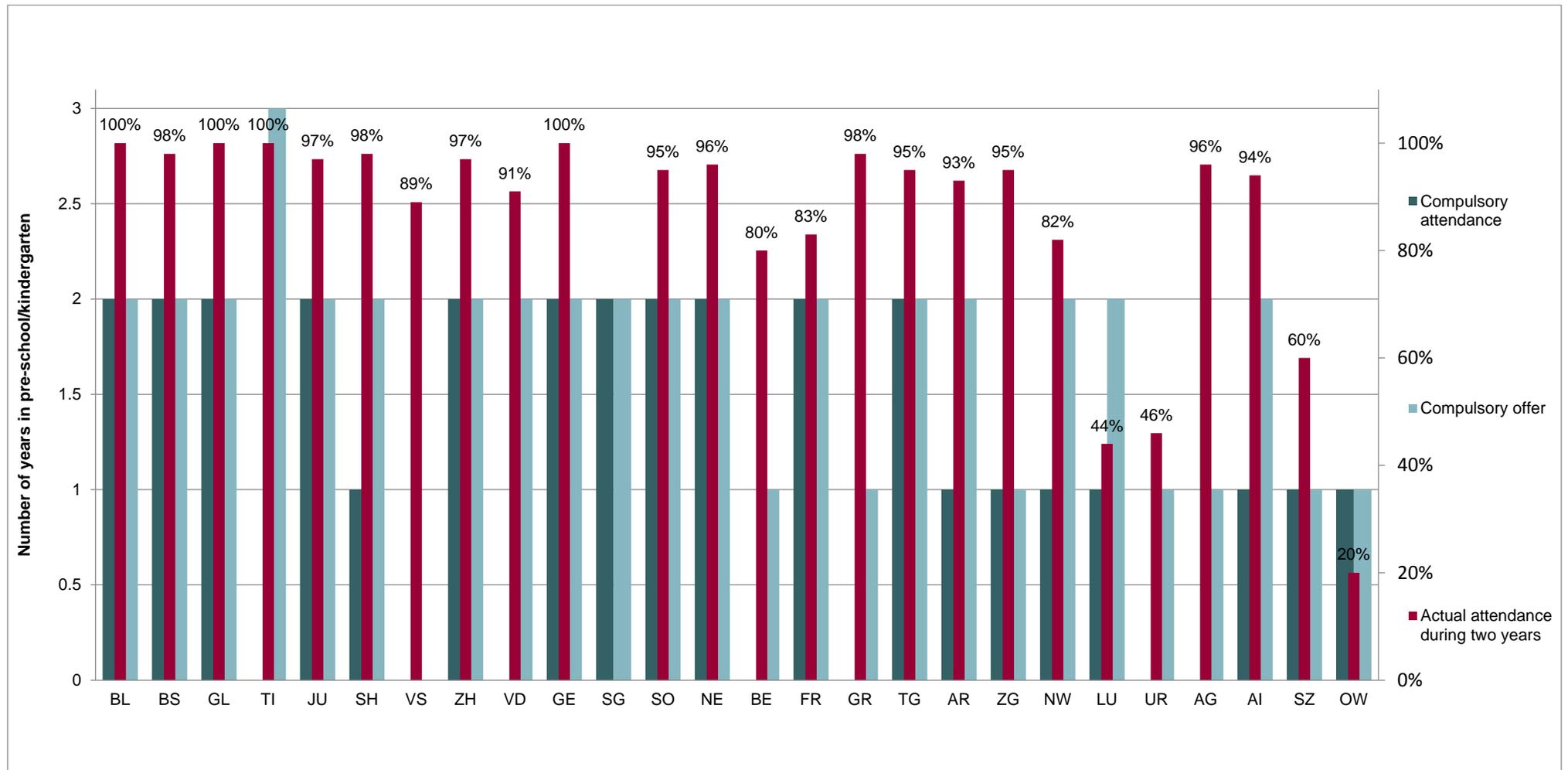
The concordat does not prescribe how these two years should be organized (w.r.t learning content etc.). Instead, it sets national education standards for core competences in different subjects, such as languages (native and foreign), mathematics and natural sciences, which should be reached after the fourth year of compulsory education. Compared to the time before the concordat, where schooling typically started at the age of 6 years, the actual start of “decent” teaching has been made more flexible and can now be set according to the needs of the child.

Compared to the time before the concordat, where schooling typically started at the age of 6 years, the actual start of “decent” teaching has been made more flexible and can now be set according to the needs of the child.

³⁸ This grouping together of preschool/kindergarten with the two first years of primary school is called “Eingangsstufe”. It makes schooling compulsory for all children having their fourth birthday before the cut-off day of the 31th of July.

³⁹ For eventual changes, see: http://www.edudoc.ch/static/web/arbeiten/harmos/liste_rat_df.pdf (accessed:10.03.2014).

Figure 8: Compulsory pre-school/kindergarten attendance and offer and actual attendance, school year 2012/13



Source: Cantonal Survey 2012/13.

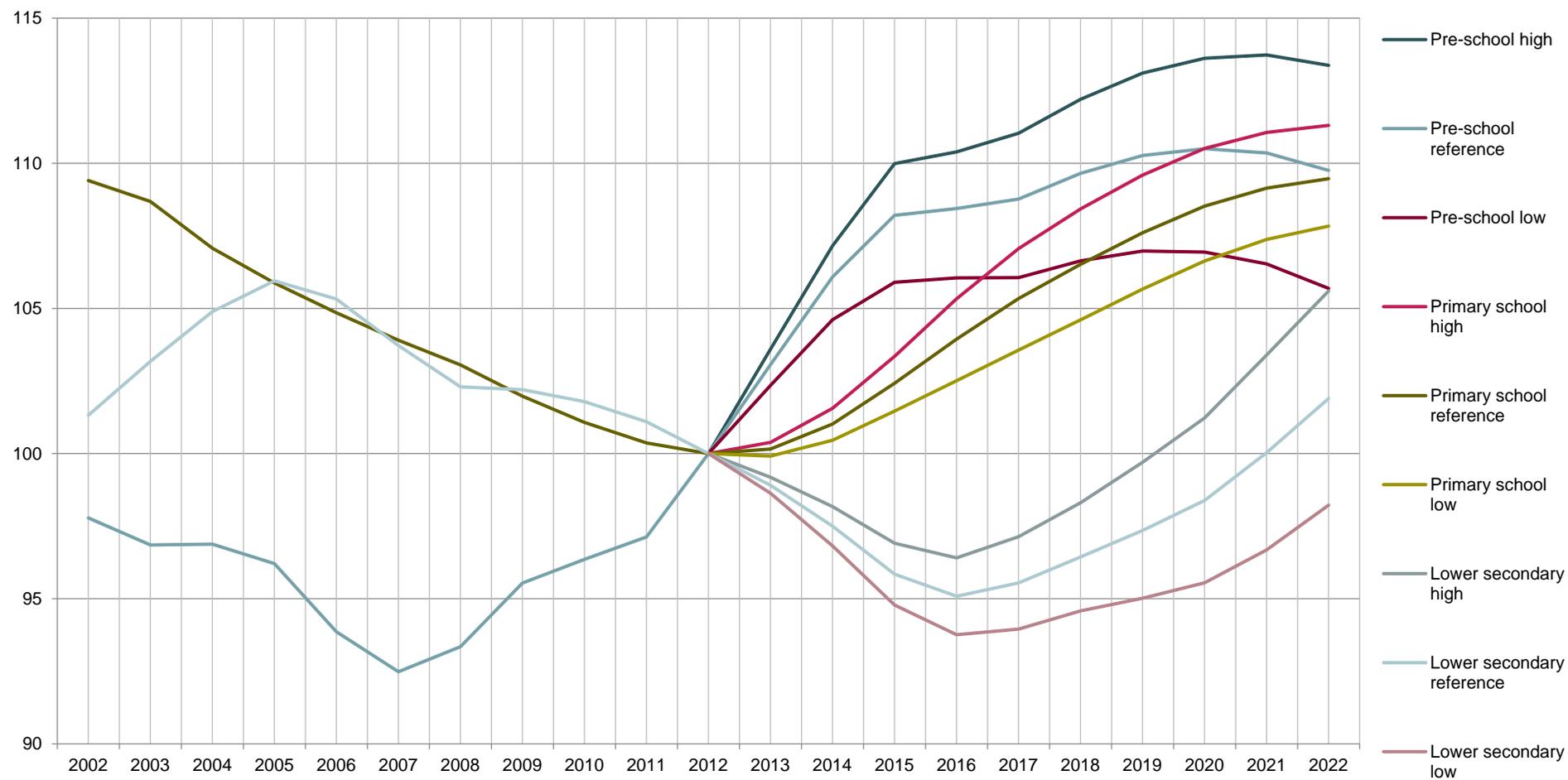
ii) **Three structural models of lower secondary education**

Streamed (or tracking) model: Pupils are placed, according to their skills and needs, in different ability groups. Pupils are taught in separate classes or school types, sometimes with different curricula and teaching materials. In most cantons the streaming model comprises either two (basic- and advanced level performance-based school type) or three (basic-, intermediate- and advanced level performance-based school type) ability groups

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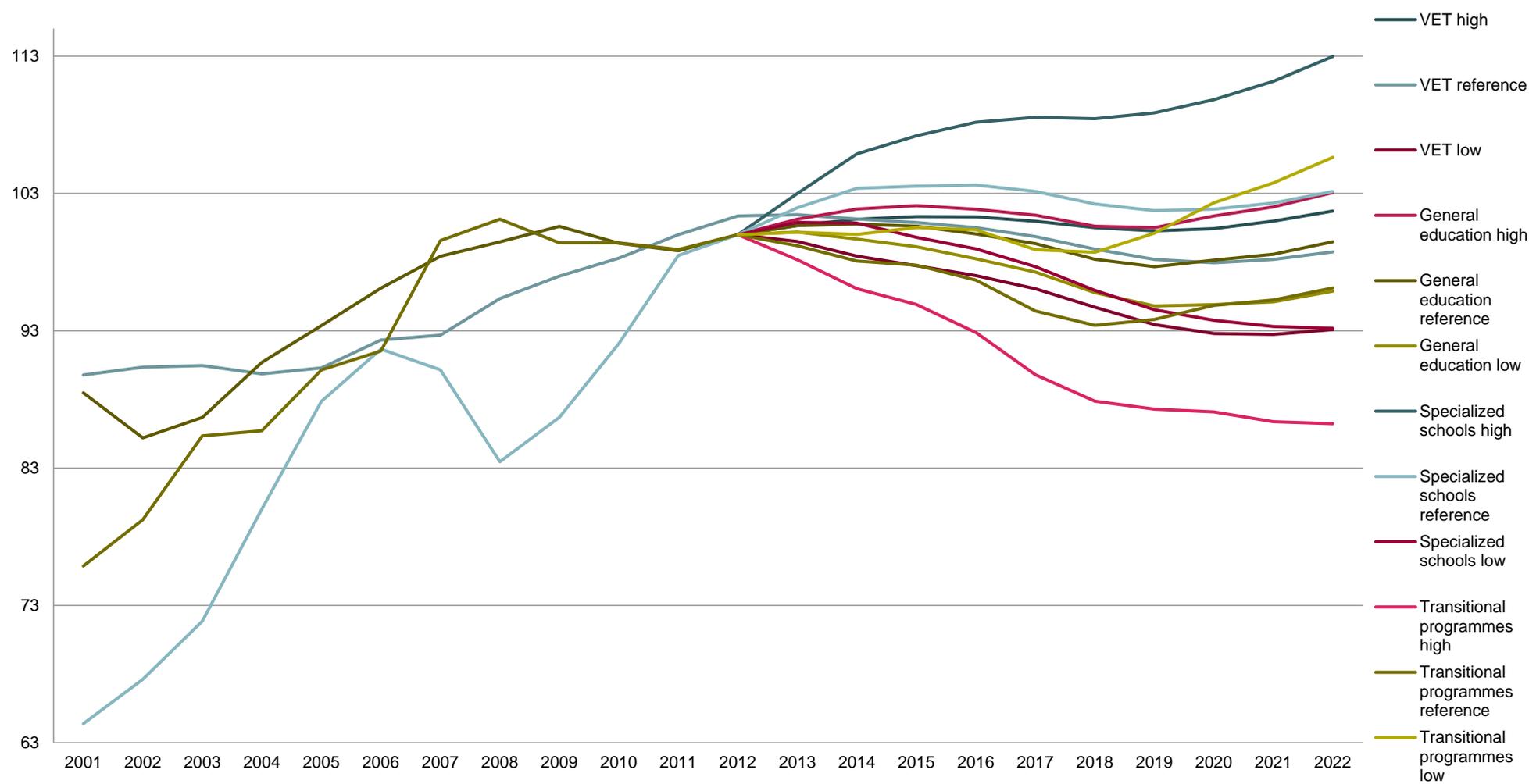
Integrated model: Pupils with different abilities attend the same class. Only in particular subjects, pupils are allocated in different ability groups, according to their individual skills and needs

Figure 9: Scenarios: 2013-2022, number of students in compulsory education (2012=100)



Source: SFSO, 2015.

Figure 10: Scenarios: 2013-2022, number of students in upper-secondary, tertiary education (2012=100)



Source: SFSO, 2015.

iii) Regulatory Framework on Vocational Education and Training in Switzerland

For more information, refer to the table in the appendix VI). It gives a more detailed overview on certain aspects of *initial* VET legislation in Switzerland, in particular regarding the overall governance including applicable statutes and administrative bodies, the role and content of education, the regulation of work-based training, financial attributes, and VET teachers' education.

The following table gives a more detailed overview on certain aspects of *initial* VET ("berufliche Grundbildung" pursuant to Art. 12 ff. VPETA) legislation in Switzerland.

Figure 11: Regulatory Framework on Vocational Education and Training in Switzerland

| Dimension | Explanation | Regulatory framework in Switzerland |
|------------------------------|-----------------------------------|---|
| I. Overall governance | | |
| 1. Principal statute | Reference and year of publication | Vocational and Professional Education and Training Act (VPETA, 2002; applicable in principle to all occupations outside of the higher education sector, see Art. 2 VPETA) ➔ See also Art. 61a, 63, and 63a Federal Constitution of the Swiss Confederation (Cst., 1999) |
| 2. Secondary statutes | Reference and year of publication | <ul style="list-style-type: none"> - Vocational and Professional Education and Training Ordinance (VPETO, 2003) - Federal Vocational Baccalaureate Ordinance (FVBO, 2009) - Ordinance on the Swiss Federal Institute for Vocational Education and Training (SFIVET Ordinance, 2005) - EAER Ordinance on Minimal Requirements for the Recognition of Certificates of PET Colleges (PET Colleges Ordinance, 2005) - SERI Ordinance on Minimal Requirements for the General Education in Upper-secondary Level VET (General Education Ordinance, 2006) - Additionally, there are roughly 195 ordinances on specific VET programmes (some referred to below) and various further ordinances and regulations as well as provisions in other federal acts regarding certain aspects of VET - Intercantonal level: Intercantonal Agreement on the Recognition of Education Certificates (1993) with executing regulations and recommendations of the Swiss Conference of Cantonal Ministers of Education (EDK) <p>Regarding continuing education and tertiary professional education:</p> |

| | | |
|---------------------------------|--|---|
| | | <ul style="list-style-type: none"> Continuing Education and Training Act (2014, not in force yet) Universities of Applied Science Act (FHSG, 1995) Higher Education Funding and Coordination Act (HEdA, 2011) <p>For a detailed look at the statutory sources see Buchser (2009) and Dommann (2006)</p> |
| 3. Responsible ministry | | Federal Department of Economic Affairs, Education and Research (EAER) |
| 4. National organisation | | |
| a. Administration | Who is responsible for the nation-wide administration of VET? | <p>State Secretariat for Education, Research and Innovation (SERI)</p> <p>The Federal Council has mostly delegated VPETA implementation competencies to the SERI (cf. Art. 65 Para. 1 and 2 VPETA), while the administration of some issues is reserved to the EAER, e.g. the regulation of PET colleges (Art. 29 Para. 3 VPETA; Art. 28 and 41 VPETO), or need approval by the State Secretariat for Economic Affairs (SECO; e.g. Art. 12 Para. 3 VPETO) or other non-EAER federal offices (e.g. Art. 12 Para. 6 VPETO)</p> |
| b. Representation, advice | <p>Are there institutions representing groups such as</p> <ul style="list-style-type: none"> the “social partners”, comprising the employees’ as well as the employers’ side, vocational teachers, <p>which submit expert opinions regarding VET to the competent bodies or exercise statutory powers?</p> | <p>Yes</p> <p>Representative institutions of federal law:</p> <ul style="list-style-type: none"> Federal Commission for VPET (EBBK; cf. Art. 69 f. VPETA; Art. 66 Para. 2 VPETO) <i>represents:</i> federal and cantonal levels, professional organisations, academics Federal Commission for VET Professionals (EKBV; cf. Art. 53 f. and Art. 76 Para. 2 VPETO) <i>represents:</i> federal and cantonal levels, professional organisations, training institutions Federal Vocational Baccalaureate Commission (EBMK; cf. Art. 71 VPETA; Art. 33, Art. 29 Para. 4, and Art. 30 Para. 4 FVBO) <i>represents:</i> cantonal level, professional organisations, VET schools, universities of applied science Swiss Commissions for the Purpose of Developing and Improving the Quality of Corresponding VET programmes (EKBBQ; cf. Art. 12 Para. 1^{bis} VPETO and the respective VET programme ordinances), e.g. Swiss Commission for the Purpose of Developing and Improving the Quality of Upper-secondary Level VET in the Machine, Electronic and Metal Industry (cf. Art. 22 SERI Ordinance on Poly-mechanic with Federal VET Diploma, 2008) <i>represents:</i> employers, employees, VET teachers, federal and cantonal levels |

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| | | <ul style="list-style-type: none"> Federal Commission for PET Colleges (EKHF; cf. Art. 29 Para. 3 VPETA; Art. 20 PET Colleges Ordinance) <i>represents:</i> federal and cantonal levels, professional organisations, PET colleges Generally, interested professional organisations and the cantons must be consulted before the enactment of implementing provisions (Art. 65 Para. 3 VPETA); specifically, the participation of professional organisations (and other interested parties) is necessary for the enactment of VET programme ordinances (Art. 13 Para. 3 and 4 VPETO) |
| c. Mandatory representation of: | Do the three groups listed below have a say in the VET system, i.e. legally specified controlling and voting rights? | |
| - Employers | | Yes (see above, I.4.b: EBBK, EKBV, EBMK, EKBQs, EKHF) |
| - Trade unions | | Yes (see above, I.4.b: EKBQs) |
| - Vocational teachers | | Yes (see above, I.4.b: EKBV, EBMK, EKBQs, EKHF) |
| 5. Number of initial VET programmes | Is there a legally specified number of officially recognized apprenticeable/initial VET occupations? | No The number is not fixed by federal legislation; instead, the SERI issues ordinances for each upper-secondary VET programme; professional organisations can request the enactment of a new VET programme ordinance (cf. Art. 19 VPETA; Art. 13 VPETO) As of December 2014, there are VET programme ordinances for <ul style="list-style-type: none"> roughly 45 Federal VET Certificates (EBB) roughly 150 Federal VET Diplomas (EFZ) |
| 6. Minimal skill level for apprenticeships | Is apprenticeship formally reserved for “crafts” and excluded for semi-skilled/routinized work? If not, is there more than one level of skill attainment (e.g. “craft” and “assistant craft”)? | No, apprenticeships are not reserved to a minimal skill level There are two levels of skill attainment (EBB and EFZ; see above, I.5); however, skill attainment levels do not necessarily correspond with specific occupations, i.e. a certain occupation might be apprenticeable on both skill levels (e.g. hairdresser) |
| 7. Training duration (years) | Is there a minimum VET programme duration? | Yes (Art. 17 Para. 1-3 VPETA): <ul style="list-style-type: none"> two years for EBBs three or four years for EFZs However, the duration of VET programmes may be shortened or lengthened to accommodate specially talented learners, learners who have already undergone relevant training, learners with learning difficulties, and learners with disabilities (Art. 18 Para. 1 VPETA); such an arrangement must be authorized by cantonal authorities (Art. 8 Para. 7 VPETO), who also decide on |

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| | | the provision of individual tutoring of learners with learning difficulties in EBB-programmes (cf. Art. 18 Para. 2 and Art. 21 Para. 2 VPETA; Art. 10 Para. 3 ff. VPETO) |
| II. Role and content of education | | |
| 1. Mandatory (part-time) educational segment | | |
| a. In general | Is there a mandatory classroom segment for apprentices additional to the work-based training (dual system)? | Yes (see Art. 16 Para. 1 VPETA) |
| b. Non-adults | If not, is there a mandatory classroom segment for those under the age of legal adulthood? | n/a |
| 2. Shares of the different instruction segments | | |
| a. In general | Is the share of the different instruction segments legally specified? | Yes The share of the three VET education segments (Art. 16 Para. 1 f. VPETA), i.e. <ul style="list-style-type: none"> • work-based training, • classroom instruction, • and additional training at branch training centres, is regulated in the respective VET programme ordinance (Art. 16 Para. 3 VPETA) |
| b. Classroom/off-the-job instruction | What is the share of classroom/off-the-job instruction as % of total time spent in VET? | Depends on the occupation (cf. the respective VET programme ordinance) Generally, classroom instruction accounts for 20-40% of total time spent in VET |
| c. General education | Is the share of general education legally specified? What is the share of general education as % of classroom/off-the-job instruction? | Yes There is a minimum of 120 hours of general education (language, communication, and society subjects) per year (Art. 3 General Education Ordinance); however, the respective VET programme ordinances may mandate a higher share of general education 120 hours per year amount to 17.5-35% of total classroom instruction time, depending on the occupation (see above, II.2.b) Additional general education is mandatory for students combining an EFZ-programme with a Federal Vocational Baccalaureate Examination (FVB; Art. 17 Para. 4 VPETA), which certifies that the holder has the prerequisite knowledge and skills needed to attend a university of applied science (Art. 25 Para. 1 VPETA); the amount of additional general education and educational contents are regulated in the FVBO (cf. Art. 5 and 7 ff. FVBO) |
| 3. Specific mandatory educational contents | Are there legally specified standards regarding the content of the classroom instruction segment? | Yes The minimal education content for each VET programme is laid down in the respective VET programme ordinance through learning targets (cf. Art. 19 Para. 2 VPETA; Art. 12 Para. 1 VPETO), regarding both the classroom |

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| | | <p>instruction segment as well as the work-based training These contents as well as qualification procedures are further concretized by professional organisations in the respective VET programme curriculum; the curricula are to be authorized by the SERI (as an example, see Art. 4-5 and 9 SERI Ordinance on Poly-mechanic with Federal VET Diploma, 2008)</p> <p>Specifically with regards to school-based education, some contents are mandated <i>across all VET programmes</i>:</p> <ul style="list-style-type: none"> • General education (language, communication, and society subjects): regulated in the General Education Ordinance (cf. Art. 19 VPETO; see above, II.2.c) • Sports education: The Federal Council has determined qualitative requirements and the minimal amount of sports lessons at VET schools (cf. Art. 12 Para. 5 Sports Promotion Act, 2011; Art. 51 ff. Sports Promotion Ordinance, 2012; see also Art. 68 Para. 3 Cst.) • Foreign languages: As a general rule, VET programme curricula must include a mandatory foreign language, additional to the respective official language (Art. 12 Para. 2 VPETO) • Musical education: The Confederation and the cantons are obliged to ensure high-quality music teaching in schools, including VET schools (cf. Art. 67a Cst.); as of 2014, this obligation has not yet been implemented in statutory law |
| <p>III. Regulation of work-based training</p> | | |
| <p>1. Relevant bodies</p> | <p>Who has the competency to regulate the content of the work-based training segments?</p> | <p>Sectoral professional organisations; approval by SERI needed</p> <p>Regarding work-based training, the VET programme ordinances (issued by SERI) only set out learning targets; these are concretized by professional organisations in the corresponding VET programme curricula, which are to be authorized by the SERI (see above, II.3)</p> <p>Consequently, the involvement of other stakeholders (such as employees, teachers; see below, III.3) depends on the statute and internal rules of procedure of the respective professional organisation; however, the relevant decision-making bodies are predominantly composed of employer representatives</p> |
| <p>2. Required off-the-job instruction in the company</p> | <p>Is the share of off-the-job instruction time <i>in</i> the company (i.e. the time the student/apprentice spends in the company, but not in productive work, e.g. on company-owned training facilities) legally specified?</p> | <p>Generally not</p> <p>Usually, the VET programme ordinances do not specify a certain share of off-the-job instruction time spent within the company; however, some ordinances specify minimal requirements regarding time spent in different aspects of a given profession (as an example, cf. Art. 8 Para. 2 SERI Ordinance on Metal Constructing Engineer with Federal VET Diploma, 2006: two months minimum each for construction and workshop/factory)</p> <p>Additionally, the Swiss Code of Obligations (OR, 1911) states that the employer may only allocate piece work ("Akkordlohnarbeiten") and work outside the relevant vocational field insofar as such work is related to the vocation in which the apprentice is being instructed and the training is not thereby impaired (Art. 345a OR)</p> |

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| 3. Mandatory representation of: | Are the following three groups involved in the decision-making process about the content of work-based training? | |
| a. Employers | | Yes (see above, III.1) |
| b. Employees | | Not necessarily (see above, III.1) Generally, learners enjoy a “right to be consulted” by host companies and VET schools (Art. 10 VPETA); however, this principle has not been implemented into more specific statutory rights |
| c. Vocational teachers | | Not necessarily (see above, III.1) However, vocational teachers are represented in several expert commissions (see above, I.4.c); also, “interested parties” are to be coordinated with before the enactment of VET programme ordinances (cf. Art. 13 Para. 4 VPETA) |
| 4. Statutory powers | Is the aforementioned body (see above, III.1) competent to: | |
| a. Trainee certification | - hand out training certifications to students/apprentices? | No EBBs and EFZs (both recognized nation-wide) are issued by the local cantonal authorities (Art. 37 Para. 2 and Art. 38 Para. 2 VPETA); cantonal authorities appoint the examiners for the final examinations, professional organisations have the right to propose examiners (Art. 35 Para. 1 and 5 VPETO) |
| b. Validation of employer sponsorship | - validate employer sponsorship (i.e. verify if possible new training companies meet the necessary standards)? | No New host companies must obtain a permit from the local cantonal authorities (Art. 20 Para. 2 VPETA; cf. Art. 14 Para. 3 and Art. 16 VPETO); the cantons are responsible for the overall supervision of VET programmes (Art. 24 VPETA) and may revoke issued licences if necessary (cf. Art. 11 Para. 1 VPETO) |
| IV. Financial attributes | | |
| 1. Public subsidies | Is there public funding for: | |
| a. Classroom instruction? | | Full funding The cantonal authorities shall see to it that VET schools provide training content that corresponds to actual needs (Art. 22 Para. 1 VPETA); mandatory courses are free of charge (Art. 22 Para. 2 VPETA) The Confederation’s share of total public VET expenditures amounts to roughly one quarter (Art. 59 Para. 2 VPETA) |
| b. workplace training? | | No It is suggested, however, that there is a net benefit for the host companies as a whole, i.e. learners generate more productive benefits than gross costs (see SERI 2014: p. 19) Also, ten percent of the Confederation’s share (see above, IV.1.b) are allocated to specific projects that serve the public interest (Art. 59 Para. 2 VPETA), such as measures to promote true gender equality as well as access to education for people with disabilities, measures to help disadvantaged regions and groups, and measures designed to maintain and expand apprenticeship programmes (cf. 55 Para. 1 VPETA) |

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| 2. Cost redistribution among employers | Is there an instrument of mandatory levy-grant finance to redistribute the costs of on-the-job training among employers? | Yes Professional organisations responsible for organising VET examinations may create and maintain their own VET funds, used to fund VET activities of companies in their branch; at the request of corresponding professional organisations, the Federal Council may declare a specific fund mandatory for all companies within the given economic branch and require that each company contribute (Art. 60 Para. 1 and 3 VPETA; Art. 68 ff. VPETO) |
| 3. Regulation of VET students' salaries | How are VET students' salaries/salary scales determined? | Contractual bargaining In principal, apprentices and host companies can freely agree on the salary, there is no statutory minimum; the salary must be stated in the training contract (Art. 344a Para. II OR) In practice, host companies often follow the recommendations given by trade associations, while in some sectors employers' and employees' associations have agreed on collective employment contracts ("Gesamtarbeitsvertrag", see Art. 356 ff. OR), sometimes including minimal salaries for apprentices |
| V. Education of VET teachers | | |
| 1. Regulation of VET teachers' education | Is there regulation on the education of VET teachers? | Yes, federal legislation (Art. 46 VPETA; see Art. 40 ff. VPETO) The Confederation promotes vocational pedagogy by establishing the Swiss Federal Institute for Vocational Education and Training (SFIVET), a higher education institution, which, inter alia, provides training for VET teachers (Art. 48 VPETA; see SFIVET Ordinance) |
| 2. Existence of minimal requirements | Does regulation stipulate minimal requirements regarding the education of VET teachers? | Yes Generally, classroom instruction teachers in VET and FVB programmes must <ul style="list-style-type: none"> • have a teacher's certificate for upper-secondary level general education, • complete a tertiary-level vocational pedagogy training programme, • obtain a tertiary-level degree in a specialized field, • and have six months of work experience (Art. 46 Para. 1 VPETO) On top of that, teachers must meet additional requirements, depending on whether they teach vocational subjects (Art. 46 Para. 2 VPETO) or language, communication, and society subjects (Art. 46 Para. 3 VPETO); to some extent, requirements are lowered for part-time teachers (Art. 46 Para. 2 and Art. 47 VPETO) Based on the course contents set out by Art. 48 VPETO, the SERI establishes core curricula for the qualification of VET teachers (Art. 49 Para. 1 VPETO); these are further concretized by the courses of study set up by the corresponding institutions (Art. 49 Para. 2 VPETO) The EKBV (see above, I.4.b) may issue recommendations regarding the education of VET teachers (Art. 54 Para. 2 VPETO) |

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