

Costs and benefits of dual apprenticeship: Lessons from the Swiss system

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For the past decade the quickening pace of technological change has been causing vocational qualifications to become obsolete more and more rapidly. This affects not only private enterprises but also the public authorities which are responsible for drawing up training policies to maintain or enhance the competitiveness of firms and which are also frequently involved in the administration of training establishments. From initial vocational training onwards, young people confront the need continuously to adapt their qualifications and skills to the needs of enterprises, particularly in the light of the difficulties they experience in entering the labour market. While weaknesses in training systems cannot be held solely responsible for unemployment among young people (Lindley, 1996), innovations to enhance the effectiveness of such systems are worth considering (Grefe, 1997, p. 1).

The comparatively low level of youth unemployment relative to that of other age groups in Germany, Austria and Switzerland has been attributed to the fact that these countries have a dual apprenticeship system (OECD, 1994, p. 11). This accounts for the growing interest in this form of training, which provides practical and theoretical instruction alternately. However, the renewed interest in alternating vocational training systems — notably in France, the United Kingdom and the United States — is probably not prompted solely by a desire better to integrate young people into the labour market. In all industrialized countries, education policy-makers are contending with the dilemma of how to expand educational systems at a time when public budgets are subject to stabilization measures or even cut-backs in spending. Under such circumstances, a financial partnership with the private sector offers new prospects for the development of educational services.

Three models of initial vocational training may be identified, in which the public and private sectors are involved to differing extents. The first model, which prevails in the United Kingdom, the United States and Japan, is a market-based model. Here, state intervention is minimal and the educational system has no direct link with vocational training which is focused on demand by

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enterprises. The second model, which is applied inter alia in France and Spain, features extensive state intervention in planning and regulating vocational training. Such training is closely linked with the educational system and has no direct relationship with the market. The third model, which exists primarily in Germany, Austria and Switzerland, is a market-based model under state control. Although these countries' apprenticeship system is rooted in the educational system through state vocational training schools, it maintains close links with enterprises which provide a significant share of the apprentices' training (Labarca, 1996, p. 57).

Articles on dual apprenticeship typically refer to initial vocational training in Germany. None the less, the dual apprenticeship system that has existed in Switzerland for over a century also provides useful experience and lessons for vocational training policy-makers (see Wettstein et al., 1989, pp. 18-33). Vocational training is highly regarded by young adults in both Germany and Switzerland; three-quarters of young Germans and two-thirds of young Swiss enter initial vocational training upon completion of obligatory schooling (OECD, 1998, p. 169). While a large proportion of young people in Switzerland enter vocational training immediately upon completion of their obligatory schooling, many German students prefer to do so only after obtaining an upper secondary school certificate (*Abitur*). In Germany, basic vocational training thus amounts to a second educational programme for 20.7 per cent of all students enrolled in upper secondary education (OECD, 1996, p. 123). The resulting disparity between the educational backgrounds of German and Swiss apprentices no doubt accounts for the difference between the two countries' rates of university enrolment: 27 per cent rate in Germany as compared to 16 per cent in Switzerland (OECD, 1998, p. 183). Indeed, young Swiss people with an upper secondary-level vocational diploma (who include a large number of former apprentices) cannot in principle enter university. Young people in Germany and Switzerland who wish to undertake initial vocational training can choose between full-time attendance of a vocational training school and alternating periods of training at such a school and in an enterprise. Young people in Switzerland are more likely than their German counterparts to choose the dual apprenticeship system (OECD, 1998, p. 169), thereby demonstrating the active involvement of Swiss enterprises in the initial vocational training system.

In both Switzerland and Germany, however, the number of apprenticeship places has been declining since the mid-1980s, despite the fact that the dual apprenticeship system offers numerous advantages for enterprises, the public authorities and apprentices. Like their German counterparts, the Swiss authorities are concerned with this decline and are seeking ways of encouraging enterprises to become more involved in the training of young people. This article draws on the results of a study¹ of the costs and benefits to Swiss enterprises of training apprentices (Hanhart, Schulz and Bossio, 1998) and is intended to contribute to the debate on how to revive dual apprenticeship.

¹ Conducted in connection with National Research Project 33 on the effectiveness of training systems.

Since the relationship between a country's training system and its labour market is strongly affected by the domestic economic and political framework (Blossfeld, 1992, p. 50), this article will begin by describing how the Swiss dual vocational training system operates and how it interacts with its economic and political environment. It will then examine the gross and net costs of training an apprentice at the expense of an enterprise (after deducting the value of the apprentice's contribution to production). The theory of human capital (Becker, 1964) considers firms' spending on training to be an investment, which raises the question of the economic effectiveness and efficiency of such spending and, more generally, of the reasons which lead enterprises to train apprentices. These issues are also discussed. Dual apprenticeship was long considered to be a particularly effective form of training in terms of enabling young people to enter the labour market and of matching qualifications to the needs of enterprises. But over the last few years, the system has lost much of its appeal to young people and enterprises, with several thousand adolescents in Switzerland now encountering difficulty in obtaining an apprenticeship. The conclusion of the article will endeavour to answer the questions of whether dual apprenticeship has a future in Switzerland and, if so, how this form of training could be revived.

Characteristics of Switzerland's dual apprenticeship system

Constitutional and legal basis

Article 3 of the Federal Constitution states that the cantons have sovereign authority over education. None the less, article 34(ter) of the Constitution gives the Confederation the right to legislate on vocational training in industry, crafts and trades, commerce, agriculture and domestic service. In accordance with the Constitution, the Federal Vocational Training Act sets the framework within which basic and further vocational training are regulated in those sectors subject to the Confederation's authority to legislate. In particular, the Act lays down requirements regarding federal subsidies, reflecting the Confederation's interest in promoting vocational training. Under article 6 of the Act, the objective of the apprenticeship system is to provide apprentices not only with the skills and knowledge needed to carry out a particular job, but also with a sound general education. The Act also specifies the duration, and places of training, the qualifications of trainers and the manner in which examinations should be conducted upon completion of the apprenticeship. Article 3 of the Federal Constitution provides that, since the cantons hold sovereign authority in matters of education, they are responsible for carrying out the necessary steps to implement the Act. Consequently, each canton has its own enabling legislation for vocational training and makes its own decrees and regulations thereunder.

The powers and responsibilities connected with the dual apprenticeship system are exercised in partnership between the federal authorities, the cantons and professional organizations. Acting through the Federal Office of Voca-

tional Training and Technology (OFPT), the Confederation is responsible for setting vocational training standards, monitoring compliance with such standards and allocating subsidies. Through their vocational training offices, the cantons carry out the functions of supervising and organizing final examinations for apprentices. They also administer vocational training schools. The professional organizations are responsible for organizing induction courses for apprentices.

The place of apprenticeship in the educational system

Initial vocational training falls within the ambit of upper secondary education on a par with general education, i.e. schools preparing students to sit the *maturité* university entrance examination, schools awarding diplomas and other general education schools (the qualifications obtained from these schools secure admission to other upper secondary schools and to non-academic courses of tertiary-level education). As stated previously, initial vocational training may take the form of basic training, full-time training in a vocational school or dual apprenticeship. The majority of young people between 15 and 19 years of age in Switzerland opt for vocational training; 69 per cent of upper secondary school students are enrolled in a technical or vocational course.

It is interesting to note that the proportion of students on technical and vocational courses appears to be closely linked to a country's prevailing model of vocational training. The countries which give precedence to dual apprenticeship, including Switzerland and Germany, have the highest percentages of young people attending technical and vocational courses (see table 1). They are followed by the countries which favour the state model of vocational training, such as France or Spain. Countries like Japan, which feature the so-called market-based model have the lowest rates of enrolment in technical and vocational courses.

In Switzerland, a 15- or 16-year old who decides to enter vocational training can opt either for full-time training in a vocational school or for the dual apprenticeship system. The latter form of training prevails both in Switzerland and in Germany, accounting for 87 and 68 per cent respectively of young people enrolled in vocational secondary education. In France and Spain, by contrast, dual apprenticeship takes a distant second place behind the 80 and 95 per cent respectively of students in full-time training at a vocational school. In Japan, the dual training system does not exist (OECD, 1998, p. 169).

In Switzerland, apprentices typically attend theoretical training courses in a vocational school for one or two days per week and practical training within a private or public enterprise for the remaining three or four days. Alternatively, some large enterprises have their own training premises which replace the vocational training school. Following a period of apprenticeship of two, three or four years depending on the chosen occupation, the apprentice sits an examination to obtain a Federal Proficiency Certificate (*certificat fédéral de capacité*). As stated previously, an upper secondary vocational diploma does

Table 1. Distribution of enrolment in public and private upper secondary education, 1996 (percentages)

Country	General programmes	Vocational and technical programmes
Germany	24	76
Switzerland	31	69
France	46	54
Spain	61	39
Japan	72	28
Average	46	53

Source: OECD, 1998, p. 178, table C2.1.

not normally qualify students for admission to university,² but it does allow them to enter further vocational training in the non-academic branch of tertiary education. However, relatively few people who have completed an apprenticeship choose this option, perhaps because they are not aware that such further training is open to them or because they lack information on the wide range of courses available. In recent years, the federal and cantonal authorities responsible for vocational training have sought to give the vocational training option a higher profile by restructuring advanced vocational training. As a result, specialized higher education establishments (HES) are being established in Switzerland on the model of Germany's *Hochschulen*.

Places of training

Under the dual apprenticeship system, during the time the apprentice spends in the enterprise he/she is considered as an employee who is undergoing training and participates in the production process. As such, he/she receives a wage which varies according to the type of apprenticeship, the stage of training and the enterprise.

From the legal standpoint, however, an apprentice is first and foremost considered to be a young person undergoing training. Thus, the Federal Vocational Training Act requires that an apprenticeship master be appointed with the principal function of instructing apprentices within the enterprise. The master also liaises between the enterprise, the vocational training schools, the vocational training offices and the parents of apprentices. This function is typically carried out by the owner in small enterprises, and by an employee in medium-sized and large enterprises. The master is required to hold a Federal Proficiency Certificate (CFC) in his/her specific field and to have completed a course of trainer training.

² Some universities, like that of Geneva, selectively accept candidates who do not hold the *maturité* but who have work experience; however, the number of admissions without the *maturité* is limited.

Apprentices begin their training with several weeks of induction courses, either in the vocational schools (for vocational theory and general education) or in training centres or the apprenticeship workshops of large enterprises (for practical training and production). When it is conducted in such workshops, the apprenticeship is sometimes described as a "tripartite" training system.

Although the place of training may differ, enterprises are the cornerstone of dual vocational training. A federal survey of Swiss enterprises in 1995 revealed that 141,856 jobs were held by apprentices, accounting for 4 per cent of total employment (OFS, 1998). Thirty-six per cent of apprenticeship places were in industry and 64 per cent in the service sector, reflecting the growing preponderance of this sector in the Swiss economy. Although over 300 occupations are open to apprentices, over half the total number of apprentices were concentrated in five branches of activity, namely, construction (21,551 apprentices), retail trade (19,790), services to enterprises (11,992), health and social activities (11,395), and sale and repair of motor vehicles (9,989). In Switzerland, small and medium-sized enterprises account for 99 per cent of employment. Yet the distribution of apprentices by size of firm is finely balanced, with small, medium-sized and large enterprises training 31, 33 and 36 per cent of apprentices respectively.

Although the apprenticeship system has long been a feature of the Swiss economic and educational framework, the fact that it is losing ground is borne out by the 30 per cent drop in the number of apprentices in enterprises between 1985 and 1995. The reasons for this reduction in the number of apprentices relate both to the supply and to the demand sides of training. While the resident population between 15 and 19 years of age has certainly declined, this trend only partially explains the drop in the number of apprentices. Another reason is that young people are increasingly opting for more general types of education as reflected in the consistent increase in the number of young people obtaining the *maturité* certificate. Between 1985 and 1995, the proportion of 19-year-olds who obtained it increased from 12 per cent to 17 per cent (OFS, 1997). This shift appears to be due to a deterioration in the public perception of vocational training. However, a recent survey among a representative sample of apprentices showed that they have a "fairly good" image of themselves and consider their image to be "fairly good" in the eyes of their parents and peers. None the less, they perceive some deterioration of their image in the eyes of the general public (OFPT, 1998).

Given the chronic shortage of apprenticeship places in recent years,³ however, the main explanation for the reduction in the number of apprentices should be sought on the supply side. The possibility that the reduction in the number of apprenticeship places might simply be due to the sluggishness of the labour market can be ruled out in the light of employment trends in Switzerland. The latest federal survey of enterprises revealed that the number of jobs in the Swiss economy dropped by 8 per cent between 1985 and 1995, which is well below

³ According to the OFPT, some 7,000 young people were seeking an apprenticeship place in February 1998.

the reduction in the number of apprenticeship places. A sectoral analysis reveals that only in construction was the drop in the number of jobs greater than that in the number of apprenticeship places. Meanwhile, the sectors of retail trade, services to enterprises, health and social activities, sale and repair of motor vehicles, which have all traditionally trained apprentices, recorded an increase in the number of jobs between 1985 and 1995, while the number of apprenticeship places declined. Thus, the reduction in the number of apprenticeship places has occurred in sectors which are little affected by the economic crisis (OFS, 1996 and 1998).

Given this downward trend in the number of apprenticeship places, it is essential to examine the costs to enterprises of training apprentices and their reasons for deciding for or against such training. Information on these issues will subsequently be helpful in proposing measures to revive dual apprenticeship.

Costs and effectiveness of apprenticeship

Although the dual apprenticeship system has long existed in Switzerland, only recently has a systematic and wide-ranging study been made of the costs of apprenticeship to enterprises, unlike in Austria and Germany where the initial vocational training system is comparable to the Swiss system (von Bardeleben et al., 1995; Stepan, Ortner and Oswald, 1994). The objective of the study was not only to assess availability but also to evaluate the effectiveness of the dual apprenticeship system. The data presented below are from a 1995 survey by questionnaire sent to 17,000 enterprises of different sizes and in different economic sectors. Approximately 20 per cent of the enterprises returned the questionnaire, but of these only 900 provided information regarding the costs of apprenticeship, mostly in the form of spending estimates. Apart from the largest, few enterprises keep analytical accounts of their training costs.

Costs to enterprises

From the point of view of an enterprise, the presence of an apprentice implies both costs — apprentice's wages, time spent on training by the master or employees, administrative costs, costs of using machinery and premises for training, etc. — and income, i.e. subsidies from public authorities and professional organizations, value of the apprentice's contribution to production, etc. A distinction must therefore be made between gross cost and net cost. The gross cost is composed of all the expenses incurred by the enterprise, while the net cost corresponds to the gross cost less the income generated by the training of apprentices. Table 2 shows the annual gross cost per apprentice by enterprise size and sector.⁴

⁴ International comparisons of unit costs (spending per apprentice) have not been made because the definitions of expenses and methods for calculating costs in the various countries with dual vocational training systems are not fully comparable.

Table 2. Average gross annual costs per apprentice by enterprise size and sector, 1994

Enterprise size	Total gross annual cost per apprentice (in Swiss francs)	Enterprise sector of activity	Total gross annual cost per apprentice (in Swiss francs)
2-9 workers	12 400	Non-classified*	37 000
10-99 workers	24 900	Machine-building	28 800
≥100 workers	35 300	Construction	21 900
		Retail trade	25 200

* The enterprises in the "non-classified" category make up a subgroup of the sample, which originally included the 250 largest Swiss enterprises (by number of employees), the 30 largest banking institutions and slightly over 4,000 enterprises distributed among various sectors.

Considerable disparities are apparent in costs by enterprise size. There are two possible explanations for this, the first relating to the apprentices' wages and the second to the structure of costs. The average annual wage of apprentices increases with the size of the enterprise. According to the survey, young people training in small enterprises received an average annual wage of 5,500 Swiss francs, as compared to 11,100 Swiss francs in medium-sized enterprises and 14,400 Swiss francs in large enterprises. Over 70 per cent of the cost of training consists of wages paid to the apprentice and the time devoted by the apprenticeship master and by other part-time in-house trainers. In small and medium-sized enterprises, an apprentice's training is primarily the responsibility of one apprenticeship master. Large enterprises commit additional resources by assigning other full-time in-house trainers. All enterprises, regardless of their size, appear to make only very limited use of outside trainers.

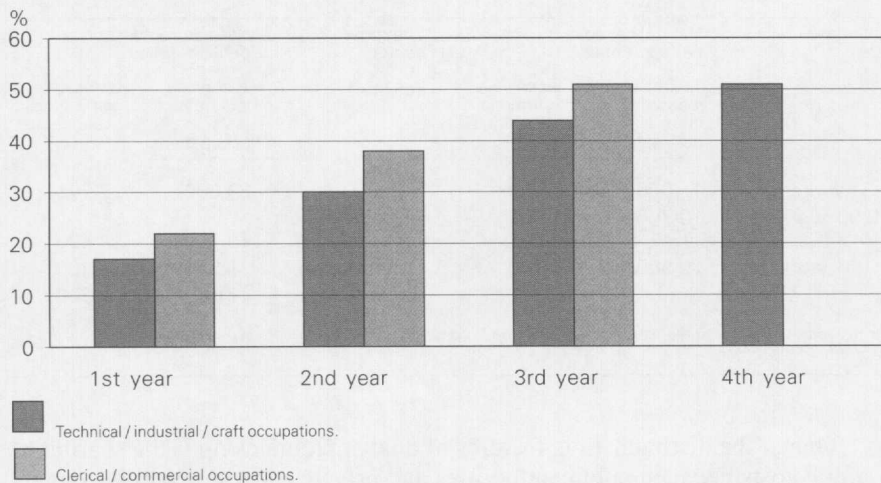
In regard to costs by enterprise sector of activity, relatively high training costs were identified in the "non-classified" category and low costs in the construction sector, which comprised a large number of small enterprises. Costs by sector of activity suggest that technology-intensive enterprises (represented by enterprises in the machine-building sector) spend more on training their apprentices than those operating in less technology-intensive areas.

While enterprises which train apprentices certainly incur expenses, they also profit from the apprentices' contribution to production.⁵ Their contribution to production was assessed on the basis of information provided by the enterprises.

An apprentice's contribution to production, expressed as a percentage of the production of a qualified employee, increases as his/her training progresses. During the final year of apprenticeship, the apprentice's contribution is equivalent to that of a half-time qualified employee. Throughout their training, the contribution to production of apprentices in clerical/commercial occupations is

⁵ Public subsidies are not taken into account since the survey revealed that very few enterprises actually receive any and, where they do, the amounts are generally low. The public authorities primarily grant subsidies to professional organizations to organize apprentice induction courses or to set up exams.

Figure 1. Average contribution of apprentices by year of training



higher than that of their counterparts in technical/industrial/craft occupations. Calculated as an annual average over the total duration of apprenticeship (three or four years depending on the occupation), an apprentice's contribution to production varies between 33 and 37 per cent depending on enterprise size. The value of the contribution has been estimated by applying those percentages to the annual remuneration paid to a worker holding a CFC on completion of an apprenticeship. The net annual cost of an apprentice to an enterprise is determined by deducting the monetary value of the apprentice's contribution to production from the annual gross cost.

As shown in table 3, substantial variations were identified in net apprenticeship costs by enterprise size. In small enterprises, apprentices' contribution to production covered practically all costs ensuing from their training. Medium-sized enterprises incurred a net annual cost of approximately 11,000 Swiss francs and large enterprises of approximately 20,000 Swiss francs. These differences in net costs may be attributed to the very marked variations in gross annual costs, which are three times higher in large enterprises than in small enterprises (see table 2). This could explain at least in part why the percentage of apprentices remaining with an enterprise after completing their apprenticeship increases with the size of the enterprise (60 per cent in the case of enterprises employing 100 or more workers, a little over 30 per cent for those employing between 10 and 99, and a little over 20 per cent for enterprises employing between 2 and 9).

It should be borne in mind that the net costs by sector are strongly influenced by the size of enterprises. In the sample under consideration, the "non-classified" category comprised a substantial number of large enterprises, while the construction sector included a large number of small enterprises.

Table 3. Net annual cost of an apprentice, by enterprise size and sector of activity, 1994

Enterprise size	Net annual cost per apprentice		Enterprise sector of activity	Net annual cost per apprentice	
	Technical/ industrial/ craft occupations	Clerical/ commercial occupations		Technical/ industrial/ craft occupations	Clerical/ commercial occupations
2-9 workers	- 900*	300	Non-classified	23 600	22 700
10-99 workers	10 700	11 600	Machine-building	15 100	14 400
≥100 workers	20 500	20 100	Construction	6 800	8 200
			Retail trade	12 100	12 300

* This negative value indicates that apprentices' contribution to production exceeded enterprises' gross apprenticeship costs.

One of the distinguishing features of dual apprenticeship is the sharing of training costs between public authorities and private economic entities (enterprises, professional organizations). In this respect, it represents an alternative to exclusively public training systems. In conducting this research, special attention was devoted to the financial contribution of the respective partners from a macroeconomic point of view, and an estimate was made of the total amount spent by enterprises on apprenticeships in 1994. The gross spending of enterprises totalled 3.8 billion Swiss francs, while apprentices' contribution to production was estimated at 2.1 billion Swiss francs, giving net spending by enterprises of 1.7 billion Swiss francs.

In 1994, the public authorities allocated 2.9 billion Swiss francs to vocational training (particularly for vocational training schools). Hence, the training of apprentices cost a total of 6.7 billion Swiss francs, of which 43 per cent was borne by the public authorities, 26 per cent by enterprises (net spending) and 31 per cent by apprentices (contribution to production of the enterprises offering training). It should be emphasised that apprentices meet almost one third of the costs of their own training in the form of work for the enterprise.

The net contribution of enterprises to the training of apprentices accounted for 0.5 per cent of gross domestic product (GDP) in 1994. By way of comparison, the net costs of initial training of apprentices incurred by enterprises in 1991 were estimated at 21 billion DM in the former Federal Republic of Germany, i.e. 0.8 per cent of GDP — and at 6 billion Austrian schillings in Austria — i.e. 0.3 per cent of GDP (von Bardeleben et al., 1995, p. 85; Stepan, Ortner and Oswald, 1994, p. 29). The disparity between the percentages in Germany and Switzerland may be attributed to the fact that the German researchers carried out a more detailed compilation and analysis of expenditure. Consequently, the sum of net spending by Swiss enterprises on the training of apprentices (1.7 billion Swiss francs) may be taken as a minimum estimate.

The large amounts spent by enterprises on training raise two questions: How efficient and effective are these investments? And, why do enterprises train apprentices? The two questions will now be taken up in turn.

The efficiency and effectiveness of the dual apprenticeship system in Switzerland

The efficiency concept relates to the use of factors of production and may be considered in terms of returns on investment. Specifically, the efficiency of an educational system may be assessed by comparing the costs of the services it offers to those of other educational systems. Effectiveness is measured in terms of the achievement of an objective which might be internal or external to the training system (internal or external effectiveness). Using indicators, an attempt will be made to assess the efficiency and the internal and external effectiveness of dual apprenticeship in Switzerland.

As stated earlier, dual vocational training in Switzerland takes place at the upper secondary level of education, which also includes young people in full-time training at vocational schools and those pursuing general studies. Once the apprenticeship costs borne by enterprises are known, it is possible to compare costs in the different branches of training. In Switzerland these costs vary between cantons, and the following discussion is based on costs in the canton of Geneva. In the case of dual apprenticeship, the public costs per apprentice should be added to the net costs borne by enterprises, as appearing in table 3.

The cost of a dual vocational training course is substantially lower than that of a full-time course at a vocational training school. The cost of an apprentice in commerce or in the construction sector is comparable to that of a pupil pursuing general studies (preparation for the *maturité*). While the cost of training an apprentice in the machine-building industry is higher than in other sectors, it is still substantially lower than the cost of full-time attendance at a vocational training school. The efficiency of dual vocational training lies to a large extent in the contribution apprentices make to production.

The internal effectiveness of dual apprenticeship will now be considered in terms of the success rate in the Federal Proficiency Certificate (CFC) examinations and of the drop-out rate. In the course of the above-mentioned research, details were obtained from enterprises regarding the number of apprentices who obtained the CFC, those who dropped out of training, and those who failed their final examinations, between 1990 and 1994. The proportion of apprentices who obtained a CFC over that five-year period ranges from 87 per cent in small enterprises to 93 per cent in large enterprises, revealing a slightly higher success rate in larger enterprises. There may be two explanations for this. Firstly, large enterprises have better processes for selecting their future apprentices and, secondly, as revealed by analyses of spending, the cost per apprentice increases with the size of enterprises. Moreover, the structure of costs was found to be different in large enterprises, particularly as regards spending on full-time trainers in addition to apprenticeship masters and other costs. It is suggested that this additional spending may also have a positive influence on the success rate in large enterprises.

No over-hasty inference should be drawn from data on drop-out rates. Information is not available on the history of apprentices who dropped out of their training. It is known, however, that the majority of the 7 per cent of

Table 4. Annual costs per pupil/apprentice in different branches of upper secondary education in the Canton of Geneva in Swiss francs, 1994

Branches of education/ training	Annual costs per apprentice			Annual costs per pupil in other branches of education
	Public spending	Net spending by enterprises	Total spending	
Commerce	8 500	12 300	20 800	
Construction	13 100	6 800	19 900	
Machine-building	13 100	15 100	28 200	
Full-time vocational schooling				33 100
General education preparing pupils for the <i>maturité</i>				21 700

Source for public spending in Geneva: Hutmacher and Sauberli, 1995.

candidates who failed their final examinations in 1989-90 were successful at their second attempt. Moreover, the drop-out rate was not constant, ranging between 7 and 13 per cent (Borkowsky, 1991, pp. 45-46).

It is also of interest to compare the success rate of apprentices in this sample with that of students between 16 and 19 years of age pursuing general education studies leading to the *maturité*. No figures are available regarding the *maturité* success rate by cohort, for which reason an estimate was made based on the statistical data provided by the OFS. Students who began their *maturité* studies in 1990 and completed them in 1993 achieved a success rate of 85 per cent, which is slightly lower than the success rate of the apprentices in the sample.

Despite the above-mentioned statistical and methodological limitations, the high success rate in obtaining the CFC suggests that dual apprenticeship is an effective form of training. An attempt has also been made to assess the internal effectiveness of the dual vocational training system expressed in terms of the number of apprentices who obtained a CFC. This criterion, however, evaluates only the knowledge and skills that are certified by a diploma, and success is measured exclusively in terms of precise training objectives (outputs). It is indeed quite possible that a person who has dropped out of a vocational training course or who has failed the final examinations will none the less acquire occupational know-how and social skills (outcomes).

The external effectiveness of a system or branch of training is measured primarily in terms of the employment rate of those who have successfully completed the course. In other words, when a large number of people completing a course of vocational training rapidly obtain and keep a job related to their qualifications, the training may be considered to be externally effective. If, on the contrary, a large number of those who have completed a course of training remain unemployed for a considerable period of time, then the training is externally ineffective.

An estimate may be made of the external effectiveness of apprenticeship in Switzerland by comparing the proportion of the jobless who have completed an apprenticeship (the highest level of training) and the proportion of the resi-

dent population having undergone some form of vocational training at the upper secondary level.⁶ In 1995, 49.4 per cent of the resident population had completed a vocational training course at the upper secondary level without having undertaken any further training or studies. Notwithstanding marked variations between 1991 and 1995, the proportion of the jobless holding a CFC (or a comparable vocational qualification), remained consistently below that figure (OFS, 1992, 1993, 1994, 1995 and 1996). Thus, while not totally protected from unemployment, those with a CFC appear none the less to be less exposed to the risk of joblessness. The analysis can be refined by concentrating on the 19-24 year age group. Most apprentices are in this age group when they first enter the labour market after obtaining the CFC. Between 1991 and 1995, over one fifth of the unemployed were under 25 years of age (OFS, 1992, 1993, 1994, 1995 and 1996). In absolute terms, young people without qualifications were the hardest hit by unemployment throughout this period. However, between 1990 and 1995, the number of former apprentices who were unemployed rose substantially. Moreover, it is interesting to note that the rate of unemployment among former apprentices continued to rise in 1994, while the unemployment rate of young people without qualifications declined from 1993 onwards.⁷ However, this should not lead to any over-hasty conclusion about the external ineffectiveness of apprenticeship since the actual duration of unemployment is shorter for those who have completed an apprenticeship. Indeed, the prospects of finding a job are better for job-seekers holding a CFC (Cornioley, 1994).

Why enterprises decide for or against training apprentices

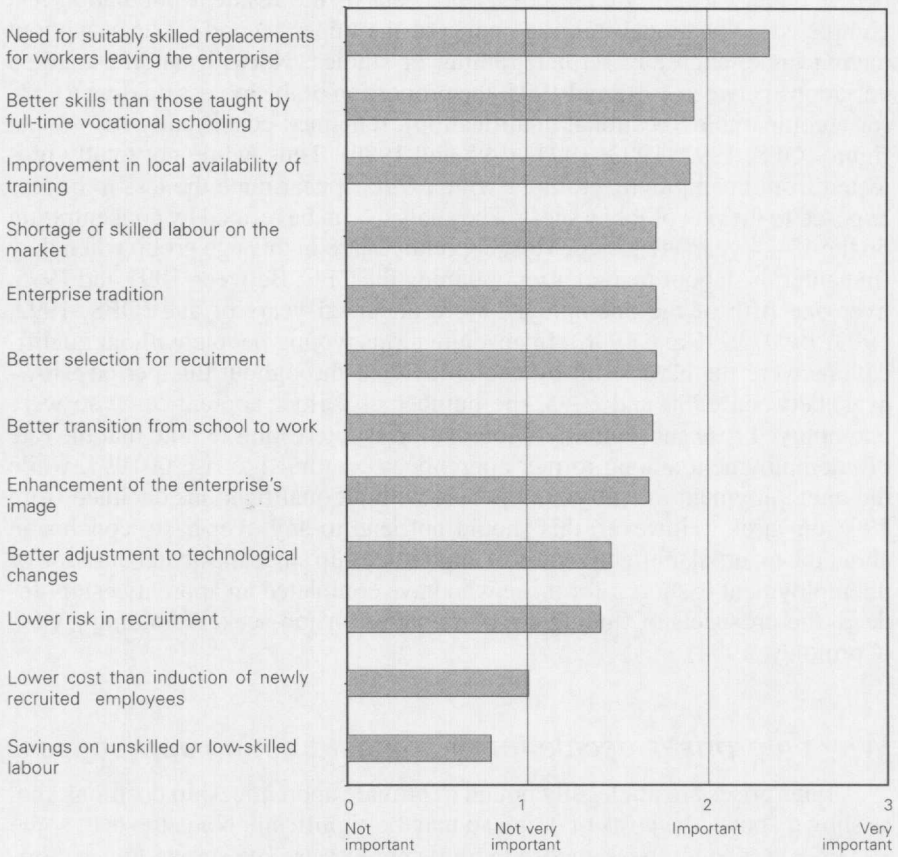
Enterprises are not legally bound to provide apprenticeship positions and, as shown above, the costs of doing so may be significant. None the less, some 30 per cent of enterprises choose to train apprentices. The survey focused primarily on enterprises which trained apprentices but, for methodological reasons, it also included enterprises which never had or no longer trained apprentices. In the circumstances, it is interesting to look at the reasons for which firms decide for or against training apprentices.

Enterprises were asked: "What are the reasons leading your enterprise to train apprentices rather than to seek qualified employees on the labour market?".

⁶ This gives only an approximation because one of the indicators — i.e. level of training of the resident population — covers vocational training (of which apprenticeship is only one form, albeit the predominant one), while the other indicator — i.e. level of qualification of the unemployed — is confined to apprenticeship and excludes other forms of vocational training (full- or part-time training in a vocational school).

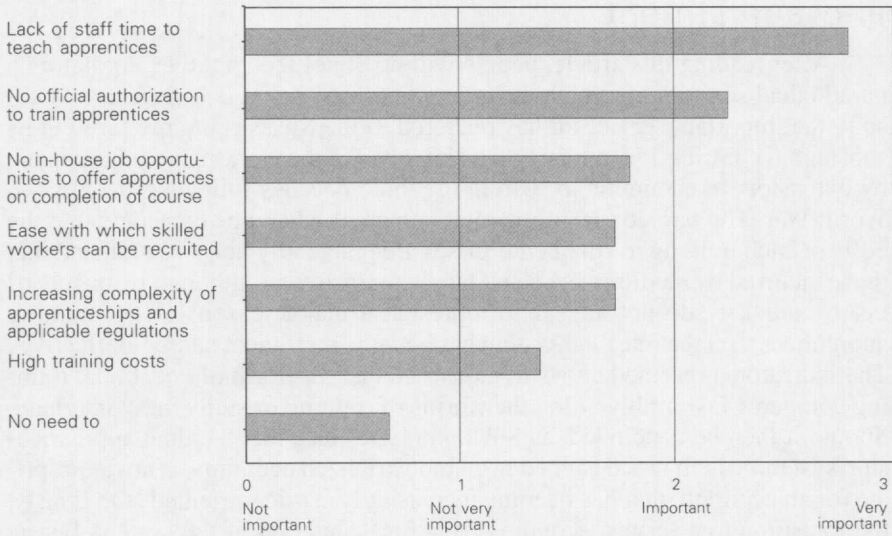
⁷ It is difficult to make a comparison between the situations of apprentices and students on the labour market, since some students have not yet completed their university courses at the age of 24.

Figure 2. Enterprises' arguments for training apprentices



Enterprises stated that their main objective in training apprentices was to secure labour with skills which exactly matched their needs. Indeed, they considered that dual training yielded better quality skills than those acquired in full-time vocational training schools. For instance, it allowed apprentices more readily to adjust to technological advances and had the added advantage of remedying shortages of qualified workers on the labour market. Hence, the quality of apprenticeship lies in that it enables enterprises to meet their needs for particular skills. A lesser advantage is that enterprises hiring apprentices they have helped train thereby reduce the risk of making mistakes in recruiting new employees; they are familiar with the performance of their former apprentices and can select those who most closely meet their needs. Contrary to popular belief, enterprises do not appear to hire apprentices as a means of cutting their unskilled labour costs, although — as shown in the earlier section on

Figure 3. Enterprises' reasons for ceasing to train apprentices



expenditure — small enterprises tend to recover their training costs through the contribution of apprentices to production.

In addition to purely economic motives, social considerations also come into play in enterprises' decisions to train apprentices, such as improving the training available in a region and facilitating the transition between school and work. Last but not least, some enterprises have a tradition of training apprentices which enhances the enterprise's corporate image.

Why is it then that, despite the advantages that enterprises appear to gain from training apprentices, the number of apprenticeship places is declining? Interesting possibilities are suggested by an analysis of enterprises' replies to the question: "What are your main reasons for ceasing to train apprentices?".

Two points should be emphasised here. Firstly, enterprises state that they do not have time for training. Although the research showed that enterprises do not systematically evaluate the cost of time spent in training an apprentice (master and other trainers), they do appear to be aware of the time invested in such training. Some enterprise managers who seek short-term productivity gains may well consider that training apprentices is a "waste of time", particularly since there are trained apprentices currently seeking employment on the labour market. Secondly, the argument that fewer apprentices are hired because of the excessively high cost of apprenticeship does not appear to be decisive. Although research has shown that training costs are by no means insignificant, particularly for medium-sized and large enterprises, cost considerations do not feature prominently in enterprises' decisions as to whether or not to train apprentices.



Dual apprenticeship: A time for reappraisal and adjustment

After reading this article, people will no doubt feel that they are before a paradoxical situation in which the apprenticeship system is losing ground despite the important services it has rendered to the Swiss economy through its substantial contribution to raising the skill level of the working population and, by extension, to economic growth in the three decades following the Second World War. The paradox is all the more apparent when one considers that the costs of such training to small enterprises are practically non-existent, and that those incurred by medium-sized and large enterprises — although by no means insubstantial — do not appear to represent a major reason for not training apprentices. Is it that the dual system has become inefficient and/or ineffective? The indicators presented above demonstrate that this form of vocational training compares favourably with other forms of training or study in Switzerland. Should it then be concluded, as Sheldon (1998) has, that the dual apprenticeship system, which was designed in an industrialized economy, is not appropriate for an economy that has become increasingly service-oriented? Obviously, the transition to a service economy calls for adaptation of the system, but its basic principle — i.e. shared responsibility between the public and private sectors (enterprises, professional organizations) should be retained. Yet this does imply that a few minor adjustments would suffice to revive dual apprenticeship. For instance, emergency policy measures alone — like those introduced by federal order in 1997^{*} — will not suffice to achieve that objective. In addition to such emergency measures, dual apprenticeship should be substantially reorganized, with the participation of representatives of the traditional partners in this form of training (Sieber, 1998). Such action must be taken without delay, lest a growing number of young people should fail to find apprenticeship places and face unemployment at the age of 15 or 16.

In this connection, attention is drawn to the conclusion that has emerged from this research to the effect that the reduction in the number of apprenticeship places does not appear to have been the result of dissatisfaction with the quality or relevance of the training given to apprentices. Rather, it has occurred, first, because young people have been losing interest in this particular form of training and, second, because enterprises are questioning the ways in which such training is acquired. Enterprises frequently cite lack of time as the reason why they do not or no longer train apprentices. This argument no doubt reflects the increasingly difficult economic conditions confronting many small and medium-sized enterprises in Switzerland. The short-term requirements of

* This emergency federal order on apprenticeship places (AF, 1997) granted funding of 60 million francs for a period of three years to cantons, professional organizations, trade schools and training institutions. The order emphasizes the active administration of apprenticeship places, notably through information and promotional measures. The decree provides for direct assistance to enterprises, including reimbursement of the costs of obligatory induction courses and the establishment of shared training facilities so that enterprises unable to provide all the training required by apprenticeship regulations can none the less train apprentices.

productivity are coming to prevail over all other considerations, including the training of replacement labour for the medium term. Besides, an apprenticeship involves a commitment over three or four years, depending on the duration of the course. The managers of many small and medium-sized enterprises may not feel in a position to make such a long-term commitment. Dual apprenticeship could no doubt be adjusted in such a way as to alleviate the training burden borne by enterprises without sacrificing two major advantages of such training, namely, alternating attendance at a vocational school and enterprise-based training, and the quality of the training. This is a sensitive issue since extensive deregulation could turn the apprenticeship system into on-the-job training. It would be interesting, for example, to extend the practice whereby a number of enterprises share responsibility for training apprentices, or to examine the possibility of entrusting part of the enterprise-based training to external trainers so as not to overburden the apprenticeship masters. Significantly, concrete proposals have also been made with a view to reorganizing the time apprentices spend in vocational training schools and in enterprises (Dubs, 1994, pp. 6-7). Finally, an improvement should be made in the linkage between the school curriculum for the years leading up to the start of apprenticeship and the skills required of new apprentices by employers. The transition might be improved by establishing forums for consultation between heads of schools, vocational training offices and representatives of trades associations.

Clearly, dual vocational training has a real future, because it offers numerous advantages, including the direct involvement of enterprises in defining the profile of workers' qualifications, easier entry of young people into the labour market, and shared financing by enterprises, public entities and apprentices. These advantages offer good prospects for expanding the educational system without exclusive reliance on public funding. However, the further development of dual vocational training needs to take account of the production conditions that firms will be dealing with in the coming years. In other words, both enterprises and the public authorities should be more sensitive to changes in the socio-economic environment (e.g. in markets for goods and services, in modes of production, in employment, in enterprise-based training, etc.) and find means of adapting to those changes rapidly.

In concluding, it should be recalled that the relationship between a country's training system and its labour market is strongly influenced by domestic economic and political conditions. Yet, the comparatively low rates of youth unemployment relative to adult unemployment in countries that have adopted the dual apprenticeship system, coupled with the system's relatively low net cost, have prompted other industrialized countries to show renewed interest in this form of training. Spanning nearly a century, Switzerland's experience with dual apprenticeship may offer those countries some useful lessons.

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