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Skill Needs and Continuing Vocational Training in Sweden

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Abstract

The main purpose of this paper is to explore whether and how the amount of firm-sponsored Continuing Vocational Training (CVT) provided in Sweden from 1999 onwards was influenced by institutional conditions. The Swedish labour market is characterised by a relatively large amount of publicly subsidised CVT. How this affects the incidence of firm-sponsored CVT ultimately depends on whether publicly financed training is a substitute for, a complement to or is independent from company training. Recent Swedish research and descriptive data suggest that elements of all three cases exist. If the two were complements, the phenomenon of underinvestment in CVT – which is frequently considered to exist – would be attenuated by the provision of publicly financed CVT. Support for this view hinges on the notion that public CVT evens out human capital accumulation within the labour force, that this in turn contributes to a compressed wage structure and that compressed wages have a positive influence on the provision of firm-sponsored CVT.

Zusammenfassung

Anliegen des vorliegenden Papiers ist die Untersuchung des Einflusses von institutionellen Faktoren auf die Häufigkeit betrieblicher Weiterbildung in Schweden. Hierbei wird der Zeitraum ab dem Jahr 1999 betrachtet. Der Arbeitsmarkt in Schweden ist durch ein relativ hohes Niveau öffentlicher Subventionen in berufliche Weiterbildung geprägt. Der Zusammenhang zwischen einem hohen Niveau öffentlich geförderter beruflicher Weiterbildung und betrieblicher Weiterbildung hängt davon ab, ob die beiden Finanzierungsformen substitutiv, komplementär oder unabhängig voneinander sind. Aktuelle Forschungsergebnisse deuten darauf hin, dass Elemente aller drei Wirkmechanismen existieren. Bei Komplementarität kann der oft beschriebenen Unterinvestition in betriebliche Weiterbildung begegnet werden, indem öffentlich geförderte berufliche Weiterbildung die Unterschiede in der Verteilung des Humankapitals in der Erwerbsbevölkerung ausgleicht. Dieses wiederum würde zu einer Verringerung der Lohnspreizung führen, welche dann einen positiven Einfluss auf betrieblich finanzierte Weiterbildung ausübt.

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1 Introduction

This paper analyses firm-sponsored Continuing Vocational Training (CVT) in Sweden from 1999 onwards. The main purpose is to explore if and how the amount of firm-sponsored CVT carried out is influenced by institutional conditions. This is done by describing the most important public training institutions in Sweden and by presenting recent Swedish research on how the institutional, legal and financial frameworks influence the incidence of CVT in the private sector.

The Swedish labour market is characterised by a large public sector and strong labour unions. The amount of CVT provided in the private sector is presumably influenced by both these features. The public sector's primary impact is through partial or full subsidisation of CVT in the private sector. The interrelationship between the supply of publicly financed CVT and firm-sponsored CVT ultimately depends on whether they are substitutes for, complements to, or independent of one another. Intuitively, one would perhaps think that the amount of public CVT has a moderating effect on the amount of private CVT, especially given that the private sector is often involved in the decision-making regarding the provision of publicly funded CVT. However, even though the large public contribution means the average direct costs of courses are relatively low in Sweden (see Mytzek-Zühlke and Nitsche, 2006), the figures on training expenditure as a percentage of total labour costs reported in Bassanini et al. (2005), show that Sweden is in the top three European countries as regards the amount of CVT provided. A potential explanation for the observed pattern is that the public support mostly concerns individuals in the lower half of the wage-income distribution who would not receive training without the subsidies. Another possible explanation is related to the strong labour unions. The collective agreements between the unions and the employers have for the last fifty years contributed to making the wage-income distribution in Sweden relatively compressed. Several empirical studies have found wage compression to be associated with an increasing amount of firm-sponsored CVT. However, not all studies have found such a link, and economic theory predicts that wage compression will have an ambiguous effect on the amount of CVT.

This overview consists of three main parts. Section 2 provides an outline of the institutional, legal and financial frameworks of the Swedish training system for the employed. It gives a brief account of the public authorities involved in the decisions as to what programmes to offer and presents some major policy programme changes since 1999. The third section describes recent research on CVT in Sweden. It includes evaluations of subsidised CVT, evaluations of proposed methods to stimulate firms to provide training and a study of the effects of sector-specific wage compression on the supply of CVT. The fourth section contains an extended discussion on the interaction between public and private provision of CVT and also presents data from Statistics

Sweden on the incidence of private-sector CVT for the period 1999–2003. Section 5 concludes with a summary and an attempt to clarify under what circumstances we should expect public and private provision of CVT to be substitutes for, complements to, or independent of one another.

2 Overview of the training system for the employed in Sweden

The aim of this section is to provide a brief overview of the largest public training institutions that may influence the provision of CVT in the private sector in Sweden. The discussion is mainly centred on the Swedish Labour Market Administration, AMS (*Arbetsmarknadsstyrelsen*), which is pivotal for understanding how the public supply of vocational training is determined in Sweden. Other important institutions are the komvux adult education centres, which mainly provide general training, and EU funding, which in this section is represented by the European Union Objective 3 programme.

It is important to note that public policy measures are primarily targeted at individuals in the bottom half of the wage-income distribution. A standard result in studies on the incidence of firm-sponsored CVT appears to be that it is predominantly offered to individuals with wage earnings in the top half. An important function of the public institutions presented here is thus to even out differences in the accumulation of human capital.

2.1 The Swedish Labour Market Administration

The labour market policy of the government is translated into operational aims by the AMS.¹ The AMS distributes financial support across counties and also between various types of labour market programmes, most of which concern vocational training. There are 21 counties in Sweden and in each of them a County Labour Board represents the AMS. Of the nine members on each board, at least one is recommended by representatives from the private sector. The supply of public CVT is based on the forecasts of these boards, which in turn are based on surveys sent to representative employers, mostly from the private sector. Each county also has a Regional Skills Committee comprised of representatives from the business sectors and from a host of public bodies, who all have a say in the decisions that concern the scope and the direction of the supply of public CVT. Since 2000, the Skills Committees have been charged with identifying bottlenecks on the regional labour markets; this has resulted in analyses that are frequently quoted in the political process to highlight areas with recruitment needs. On the municipal level, the AMS is represented by 230 Local

¹ This paragraph builds largely on Linskog (2003), Section 3.5.

Employment Service Committees, which include local representatives of the trade unions and local enterprises.

The public supply of CVT is thus influenced by the needs of the private sector but is primarily aimed at unemployed individuals. To what degree this influences the firm-sponsored supply of CVT is theoretically an open question, and evidence from survey data does not give clear answers. Section 4 presents a detailed discussion of this topic.

Skill Enhancement Training (Bristyrkesutbildning för redan anställda)

In 2000, the AMS launched a pilot project called “Skill Enhancement Training” (*Bristyrkesutbildning för redan anställda*), which provided training for *employed* individuals. The aim was to forestall potential staff shortages. The project was prolonged and was continued until December 2005. The education offered was not intended to be basic, rather the idea was to enhance the skills of qualified individuals within their fields of expertise or to offer a complementary qualification to one already held. There was a particular focus on individuals with foreign university degrees who were overqualified for their current working assignments and/or had degrees in areas where the situation on the labour market was tight. Applications to participate were made to the local employment office and if it was assumed that the employee would return to his/her employer, then his/her wages were paid as normal. If, on the other hand, the employee planned to change employer on conclusion of the programme, then he/she was paid the equivalent of unemployment insurance benefit. AMS (2002b) evaluated this measure with ambiguous results. In general, the employers were more satisfied with its outcomes than the employees (for further details, see Section 3.1).

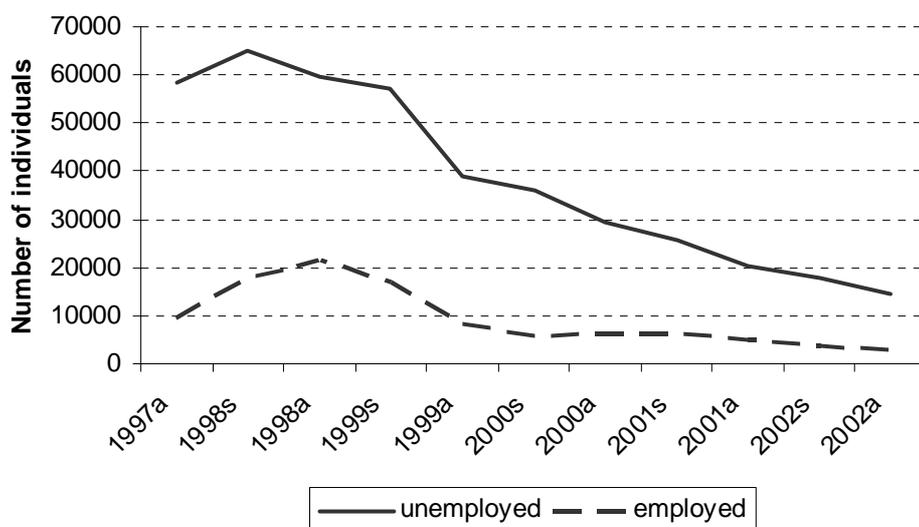
2.2 Komvux

Since the early 1970s it has been mandatory for each municipality in Sweden to offer comprehensive education for adults at compulsory and upper-secondary level. Since then, the municipal adult education centres, “komvux”, have been an established part of the Swedish education system. Between 1997 and 2002, when the Adult Education Initiative (AEI) was in force, the number of participants was particularly high. The AEI offered individuals a year of comprehensive adult education at compulsory or upper-secondary level accompanied by financial aid in the form of a “special grant for education and training” (UBS) equal in amount to the unemployment insurance benefit. The municipalities organised the courses and, as always, no course costs were paid by the participants. The arrangement was primarily targeted at unemployed individuals, but the employed were also eligible if their employer agreed to hire a long-term unemployed person as a replacement. Enterprises could thus send their employees for a year of comprehensive education at no extra cost than that of a potential decrease in productivity as the employee on the AEI had to be replaced by a long-term unemployed person. Such conditions seem very favourable and one could perhaps expect this

initiative to have affected the amount of firm-sponsored general training provided in the adjacent years.

Figure 1 shows the number of people (from the autumn semester of 1997 until 2002) in receipt of UBS and attending komvux who were employed and unemployed prior to enrolment. Those employed were on training leave under the conditions stated above. The numbers enrolled remained relatively high during the first two years. This is primarily explained by the fact that those who enrolled in 1997 were offered the special UBS grant for another year of study, 1998–1999, and that this was accepted by about 40% of the participants. In the years that followed, the numbers decreased each year. Most likely this reflects the fact that there was a contained demand that was gradually saturated. In 2002, the number of employed with UBS attending komvux was less than 5,000. An interesting question here is to what extent the employed individuals returned to their employers after completing one (or two) year(s) of studies at komvux. Unfortunately, no such follow-up study has been carried out, although the relevant survey data exists.

Figure 1 The number of unemployed and employed receiving the special UBS grant, spring (s) and autumn (a) semesters, 1997–2002.



Source: Statistics Sweden.

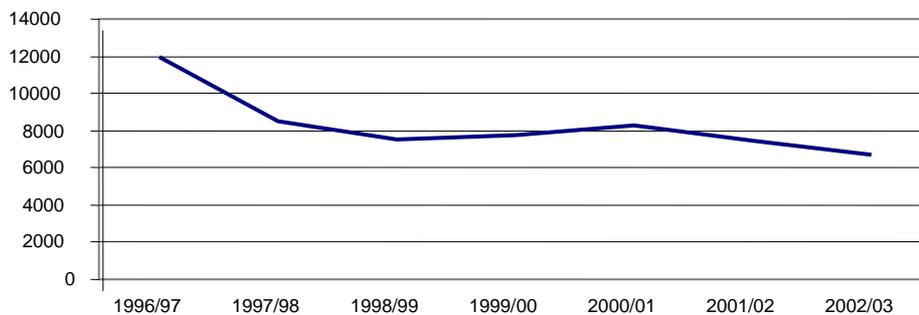
Supplementary Courses

Supplementary Courses (*Påbyggnadsutbildning*) is a component of the overall education provided by the komvux and constitutes a post-secondary vocational education that usually lasts between six and twelve months. Some 10,000 individuals have enrolled in these courses annually since 1993. The Supplementary Courses have

historically been approved and organised by the municipalities, but since 2005 the government has been financing around 20 different national study programmes in 50 different locations. These are expected to be administered in accordance with additional regulations in 2006. The supply of courses is very heterogeneous across regions and municipalities with respect to content, providers and conditions of admission, and these characteristics are also partly influenced by regional growth targets.

Figure 2 presents the number of participants in Supplementary Courses from 1996/97 onwards. The number decreased in 1997 when the AEI was introduced but subsequently remained fairly stable.

Figure 2 Number of participants in Supplementary Courses, 1996/97 to 2002/03.



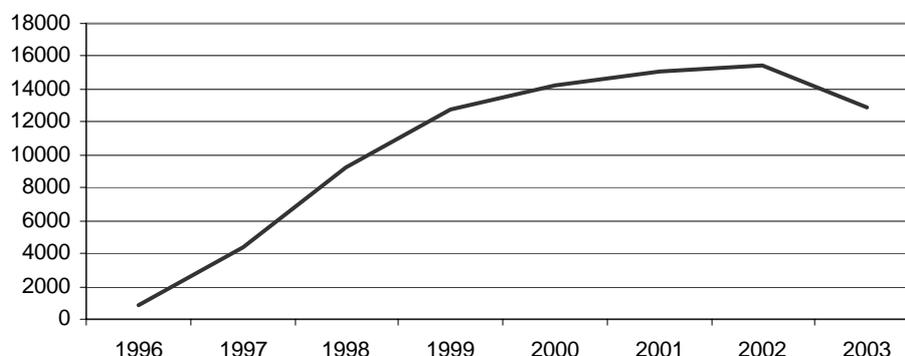
Source: Statistics Sweden.

2.3 Advanced Vocational Education

Advanced Vocational Education (*Kvalificerad yrkesutbildning*) started as a pilot project in 1996 and became a permanent programme in 2002. Since 1998, more than 10,000 individuals have enrolled each year. This scheme offers post-secondary education with one third of the training taking place on a working site. The on-the-job training is financed entirely by the companies that offer the positions and is intended to entail practical application of what has been learned during the theoretical part of the programme. The courses are designed to correspond to real needs on the labour market. The National Agency for Advanced Vocational Education (*Myndigheten för kvalificerad yrkesutbildning*) monitors the scheme and cooperates with representatives from the government, higher education, municipalities and the private sector.

Figure 3 shows how the number of participants in Advanced Vocational Education developed between 1996 and 2003. Note that in 2003 only the participants in the autumn semester are reported. Following a strong positive trend, the numbers subsequently seem to have stabilised around 15,000.

Figure 3 Number of participants in Advanced Vocational Education, 1996–2003.



Note: In 2003, only participants in the autumn semester are reported.

Source: Statistics Sweden.

2.4 The European Union Objective 3 programme

The European Union Objective 3 programme aims to promote the “modernisation of education, training and employment policies”. It was launched in 2000 and will remain in force until 2006. In an agreement between the representatives on the Swedish labour market and the government it was decided that the emphasis should be on the development of skills among employees in enterprises, rather than on the unemployed, and more than half the funds are being channelled in this direction.

The Swedish European Social Fund (ESF) Council is responsible for the implementation of the Objective 3 programme. The Council consists of a central office and 20 regional offices and cooperates with the organisations on the labour market and various interest groups at both national and regional level. The AMS is responsible for the auditing and administration of these funds. The allocation of resources is partly based on criteria that were found to be successful in the implementation of the Objective 4 programme (see Section 3.2), which was in force between 1996 and 1999. To apply for funding, a place of work must carry out an analysis of employee skills development and a plan of action that encompasses all employees. The purpose is, inter alia, to stimulate the willingness or openness among both the employees and the employers to accept organisational changes. The analysis should then be followed by the actual training of the employees combined with modifications at the organisational level.

2.5 Summary

In Sweden, the public funding of CVT is dominated by the AMS. This administration's resources are apportioned by their representative authorities at a central, regional and local level. The private sector influences the contents of the public supply of CVT both through their representation on the decision-making bodies and by responding to surveys, which form the basis of many of the analyses of skill needs. However, the public aim of redistribution is presumably at odds with the efficiency targets of the private sector. How this affects the private-sector supply of CVT will be discussed in detail in Section 4, but if firms tend to offer CVT to high earners, as has been suggested in the economics literature, then the relatively large-scale public provision of CVT in Sweden may only have a modest influence on the amount of firm-sponsored CVT. Moreover, if the supply of CVT to the low- and high-skilled labour force are complementarities, this may even be a partial explanation for the relatively substantial private supply of CVT in Sweden compared with other countries in Europe.

Differences between regions are structurally inherent because disadvantaged regions get a higher share of labour market programmes, while differences between sectors are exacerbated by forecasts of recruitment needs, most notably those of Statistics Sweden (see Section 4). A question that has not been discussed is the use of a certification system. It seems that there is no example of a well-functioning certification system outside those in the public education system. In the case of Skill Enhancement Training, the issue has been up for discussion, but it seems more strongly advocated by the representatives of the AMS than by the private sector.

3 **Recent research on the determinants of firm-sponsored training in Sweden**

This section presents a brief review of recent research related to the institutional, legal and financial frameworks that may influence the provision of firm-sponsored CVT in Sweden. Research on these topics is important for our understanding of how, for example, the conditions described in the previous section might interact with the incidence of firm-sponsored CVT.

The first subsection presents results from an evaluation of the AMS pilot project Skill Enhancement Training mentioned in the previous section. Also closely related to the previous section is an evaluation of the companies involved in the European Union Objective 4 programme, which received a 50% subsidy towards their CVT expenses. Other subsections deal with various propositions that have aimed to encourage companies to invest more resources in their personnel. One such proposal is that of "individual learning accounts" (*individuellt kompetenssparande*), which would create substantial resources earmarked for CVT. More indirectly linked to the private-sector

supply of CVT is a proposal to introduce legislation that would render it mandatory for firms to give an account of the skill structure of their personnel in the annual accounts. A third proposal concerns the effects of using tax relief as a tool to encourage CVT. These descriptions are followed by an examination of whether sector-specific wage compression influences the supply of firm-sponsored CVT—a question that is related to one of the traditional labour market characteristics of Sweden.

3.1 Skill Enhancement Training

AMS (2002b) evaluates Skill Enhancement Training, a pilot project launched in 2000 that provided training for employed individuals in areas with a potential risk of staff shortages (see Section 2.1.2). IT training and technical education were only provided at advanced levels, while almost 50% of the participants availed of training in different craft occupations and in machine-operating. Surveys conducted in 2001 indicate that the employers were more satisfied with the outcome of the project than the employees. Of the employees, 85% stated that their professional knowledge had increased and 44% said they had been given more qualified working tasks compared with before the training. This figure is considered to be low by the evaluators and one explanation they bring forward is the lack of an established certification system. The employers, on the other hand, stated that the project had contributed in a number of ways to avoiding bottlenecks and skill shortages, most notably because it was only thanks to the project that the training had taken place at all. One interpretation of the discrepancy in the replies is that the employers were satisfied if their trained employees became more productive while carrying out their old duties, while the employees were disappointed if they were not rewarded with some form of promotion. Of course, it is also possible that there is a bias in the employers' replies as it would be in their interest to maintain a public system that provides training for their employees.

3.2 The European Union Objective 4 programme

The public authority ITPS (2003) evaluated the European Union Objective 4 programme, which provided funds for CVT in firms with between 5 and 49 employees during the period 1996 to 1999.² The arrangement in practical terms was that the firms would first motivate their need for CVT in writing and, if approved, they would receive a 50% subsidy on presenting the receipts of their CVT expenses.

The study is based on registry data from 1996 and 2000 regarding 280 companies that participated in the Objective 4 programme in 1998, and a random sample of 200 companies that did not participate. The effects found for the participating firms were divided into two parts. First, for an average firm with 17 employees, the returns to

² ITPS: Swedish Institute for Growth Policy Studies.

investment in CVT were in the region of 15% when the costs of foregone production were taken into account. Second, during the evaluation period, the change in the average number of employees in the firms on the Objective 4 programme was not larger than in the control-group companies, but the number of new recruits was higher in 1999 and in 2000.

A slightly surprising finding is that there is only a modest difference between the number of employees involved in CVT from the firms in the Objective 4 programme and from the firms in the control group. This is not what one would expect as it indicates an insensitivity to the kind of supportive financial frameworks that have been found influential elsewhere (see Mytzeck-Zühlke and Nitsche, 2006). The authors suspect a problem in the definition of CVT used, which does not encompass both the incidence of participation and the amount of CVT. Another explanation might be that small firms are more time restricted than money restricted. The report then seeks to explain the increased productivity (15%) of the firms in the Objective 4 programme. Three main characteristics of the firms in the Objective 4 group emerge, of which two are in a sense secondary effects of being part of the programme.

- The amount of CVT per employee may have been higher in the firms on the Objective 4 programme. Survey data, albeit with very low response frequencies, indicated that this may have been the case.
- The firms on the Objective 4 programme linked their investments in CVT to changes in the organisation.
- The firms on the Objective 4 programme linked their investments in CVT to the enhancement of their competitiveness.

The last two points draw attention to some characteristics of the implementation of the Objective 4 programme in Sweden. First, before carrying out the CVT it was required that the firms made an analysis of their skill needs. Two details were emphasised. First, the personnel should be involved in the skill-needs analysis with key persons being trained to support the analysis process. Second, it was mandatory to present the analysis in a written document.

It is possible that these compulsory elements of the application process significantly improved the content of the CVT and/or increased the productivity of the employees by increasing their motivation. Previous Swedish research on firms in the Objective 4 programme has indicated that this could be the case (see Hultmann et al., 2002), and similar evidence was also found in Mytzeck-Zühlke and Nitsche (2006) in their study based on data from Denmark, Germany, Sweden and the UK. Of course, it is also possible that the results are the outcome of other, unobserved characteristics.

3.3 Individual learning accounts

A proposal that has been investigated and discussed numerous times in Sweden, but never really caught on, is the introduction of individual learning accounts (*individuell kompetenssparande*). The idea is that a sum of money should be collected in an account so as to provide every working individual with the possibility to enhance his or her skills at a given moment. In fact, it was decided in 1999 that such accounts would be introduced, and a final report even proposed 2002 as the starting year. However, nothing has so far been implemented and for a number of years now the idea has rarely been mentioned.

The learning accounts could partly be seen as a tool to reduce differences in the accumulation of skills by earmarking funds for this purpose. The purpose of the accounts is that the amount saved by the public and/or the private sector and/or the individual (the precise shares were never defined) would compensate for an inherent market failure which makes firms underinvest in education. If the funds from the accounts served as a substitute for the present expenses, they would decrease the amount of firm-sponsored CVT, while the opposite would apply if they were complements.

Mellander and Savvidou (2001) used survey data collected in March and April 2000 from private companies in manufacturing industry and the service sector that addressed the issue of how companies would react to the introduction of individual learning accounts.

Their findings suggested that companies in both manufacturing industry and the service sector saw the savings as a complement to rather than a substitute for firm-sponsored CVT, indicating that the savings accounts would not create inefficiencies in spending on CVT. Related questions revealed that individuals with low levels of education were underrepresented in CVT – a well-known pattern in this type of study (see, for example, Leuven and Oosterbeek, 1999; Goux and Maurin, 2000). This confirms that CVT strengthens educational differences between employees and in this case also between the service sector and manufacturing industry. In relation to firm size, the educational level of employees, as well as new recruits, was found to be U-shaped. The largest and smallest firms were more strongly associated with the highly educated. The only exception to this pattern were the newly employed in the service sector, where the relation between education and firm size was positive.

The educational level of newly hired personnel was considerably higher than the average for the stock of employees within the companies. In 1999, employees with a post-secondary education were over 70% more common among the employed than the average employee, and these figures were almost identical across sectors. Even though the authors acknowledge that differences in competence between the newly hired and other employees should be smaller than what is observed in terms of formal education, they interpret the size of the discrepancy as indicating a great need for education within

the companies. The presence of such a market failure would support the introduction of the savings accounts.

The arguments raised against the concept of the learning accounts concerned not least the potentially large costs they would engender. Obviously, the debate was about who should pay, but there were also disagreements about the precise form of the savings and the usage of the funds. The accounts were also questioned on the grounds of economic efficiency and as to whether they would really serve their intended purposes.

3.4 Personnel skills accounting

Johansson and Mellander (2001) proposed that companies and organisations should be obliged to officially render account of their personnel by reporting an already existing index-based “competence indicator” when balancing their books at the end of each year. According to survey data collected from some 200 companies in 1997 and 2001, less than 3% of firms kept accounts of this type on their personnel, but between 40% and 50% of the companies reported that they used simplified versions of such accounts in their internal revisions. The authors argue that mandatory personnel skills accounting would be relatively simple to implement, would put pressure on companies to improve the working environment of the employees and would turn the spotlight on the need for skill improvements. As a side effect, it would also become easier for researchers to evaluate measures that improve the atmosphere at workplaces.

The idea presented in Johansson and Mellander was not a new one. A government report from 1991 also proposed this legislation, but without effect. In 2000, another government report proposed that the legislation be applied to the public sector, but in 2001 a similar report abstained from any such proposal. Thålin (2001) remarked that this retraction may be a sign that the implementation of the personnel accounts is not as easy as one may have thought. He also pointed out that an undesired consequence of indicators—namely, records regarding days of sick leave taken—could have the effect that employers would discriminate against individuals with weaker health.

3.5 Tax concessions to encourage CVT

One way of encouraging firms to invest more in CVT is to offer tax relief. Håkansson et al. (2002) warn that, given a progressive tax scheme, tax concessions carry the risk of inciting firms to effect their education expenses in economic boom times when the relief increases for a given amount. This would mean that CVT would be carried out in those periods where the opportunity cost in terms of foregone production are at their highest, something that in turn could lead to briefer training courses than would otherwise have been the case. In this sense, the tax system is not neutral as it may influence both the

timing and the amount of training. Bassanini et al. (2005) present a more detailed discussion of why investments in CVT may be procyclical.

3.6 Wage compression and the supply of CVT

According to human-capital theory, wage compression is a potential influence on the incidence and the extent of CVT. On the one hand, more compressed wages could discourage workers from participating in training. On the other hand, assuming imperfect competition on the labour market, a more compressed wage structure could also weaken the incentive to switch jobs and thereby give employers a stronger incentive to finance training. If wage compression increases the amount of training, this also implies that employers are aware of external effects from training that spill over to other employers. The policy-maker would then encourage employers to organise training so that the costs are shared across companies.

Empirical studies of correlations between wage compression and CVT have been conducted on European data, not including Sweden, by Bassanini and Brunello (2003) and by Almeida-Santos and Mumford (2004). These studies find that compressed wages increase CVT. In contrast, Ericson (2004a) finds no such pattern in Sweden, neither on the incidence of CVT nor on the intensity of training.³ Instead, there is weak evidence of a negative relationship between wage compression and CVT for males in the private sector, indicating that the private incentives for investing in training are more important than those of the employer.

Ericson's study is based on detailed descriptive data regarding who received CVT in 2001 according to the Swedish labour force survey. He combines these data with three measures of wage compression made separately in 2000 for 146 occupations and reported separately for males and females. In his measure of CVT received, he concentrates on general training.

Ericson suggests that the diverging results may be a consequence of the different definitions of CVT, which in his study is limited to "mainly general training", while the earlier studies to a larger extent also included firm-specific training. Also, the average duration of training is shorter in Ericson's study. If general training is less intensive than firm-specific training, this generates lower costs and may therefore also be more insensitive to changes in wage compression. Of course, even at a given training intensity, general training may be less costly than firm-specific training.

Another possibly important aspect not discussed is the fact that the AEI (Adult Education Initiative) had just offered employed as well as unemployed individuals general training under favourable financial conditions (see Section 2.2). The numbers involved in the AEI as well as the high level of subsidisation could well have influenced

³ In all of these studies, wage compression is measured, inter alia, as the log of the ratio of the 90th percentile wage to the 10th percentile wage.

the results of Ericson's study, which was conducted with data from 2001 when the AEI was still ongoing.

Probit estimations were used to analyse the probability of incidence of training conditioned on a number of observable characteristics. The data at hand included controls for tenure, experience and type of working contract, in other words whether part-time, full-time and/or fixed-term contracts, as well as eight different occupations. Private-sector firm size is strongly positive in its relationship to incidence of CVT. The probability of incidence of CVT was found to be 70% in companies with more than 1,000 employees, compared to around 35% in firms with less than 10 employees. Some notable divergences from the results of other studies were that for females in the private sector, none of the coefficients associated with the dummy variables for level of education were significantly different from zero. There was a higher probability of CVT for men with university studies in the private sector, but other dummies for level of education were insignificant.⁴ The only sample that showed the expected positive relation between educational level and CVT throughout was the one with females in the public sector.

3.7 Summary

This section reviews studies of various institutional characteristics in Sweden and their relations with the amount of firm-sponsored CVT. Skill Enhancement Training was a pilot project that provided training for employed individuals in areas with staff shortages. An evaluation by the AMS shows that 44% of the employees were entrusted with working tasks requiring higher skills following participation in the programme. This share is conceived as disappointingly low by the authors from the AMS. Meanwhile, the employers were more positive towards the project. The reactions leave the question unanswered as to whether Skill Enhancement Training served as substitute for, a complement to, or was independent of the supply of firm-sponsored CVT. The evaluation of the European Union Objective 4 programme also gave ambiguous indications as to whether it made firm-sponsored CVT increase or decrease. Despite the subsidisation of CVT, only small differences in the incidence of CVT were found between the companies involved and a control group. The government's report stated that the lack of data on the intensity of CVT conducted in the companies may be at the root of this finding.

This section also deals with three suggested policies to stimulate the incidence of firm-sponsored CVT in Sweden. The idea of individual learning accounts seems at present to be politically buried, but the surveys conducted on the issue indicated that firms in both the manufacturing and the service sector would see the subsidies as complements rather than as substitutes for the supply of private-sector CVT. The idea of

⁴ The dummies for level of education were compulsory level (reference group), two years at upper-secondary level, three years at upper-secondary level, at least three years of university studies and more than three years of university studies.

legislation requiring mandatory personnel accounting has generated less discussion but at the moment has been either delayed or suspended. The use of tax concessions as a way to encourage CVT in the private sector may be intuitively appealing but it has been shown to create inefficiencies over the business cycle. Finally, in contrast to a few international studies, a study of Swedish sector-specific wage compression was not found to increase CVT. The same study also revealed a surprisingly weak correlation between level of education and the incidence of CVT. It is possible that both these results were generated by the definition of CVT as “mainly general”.

As regards future research, what is needed are by and large general evaluation studies of the effects of CVT. Pischke (2005) provides an elegant summary of some major problems of this literature – empirically, theoretically and policy-wise. One aspect of the empirical literature is that there is an inherent problem in the measurement of training because while informal on-the-job training is a major source of human capital accumulation, it is typically very hard to measure. Short spells of CVT have been found to generate very high returns, possibly reflecting a positive correlation between the incidence of formal training and informal training. If one applies this idea to the current case, and assumes that participation in publicly provided CVT has a weaker link to informal on-the-job training (which seems reasonable, given the different target groups), the relative amount of public CVT would be exaggerated. This is a potentially important aspect that a more ambitious study of the interrelationship between publicly and privately supplied training should seek to take into account.

4 The influence of skill-needs analyses on firm-sponsored training in Sweden

Section 2 above presented a basic overview of the provision of publicly provided CVT in Sweden, while Section 3 focused on recent research on the causal relationship between institutional settings and firm-sponsored CVT. The focus of this section is on the actual supply of firm-sponsored CVT in Sweden. It provides a brief overview of the skill-needs analyses conducted by Statistics Sweden and discusses how these influence the amount of CVT supplied by the private sector.

The section will unfold as follows. First, the skill-needs analyses published by Statistics Sweden are presented, including a more detailed account of the Labour Market Tendency Survey conducted in 2003 concerning short-term skill needs. This is followed by a discussion on the interrelationship between the supply of public-sector CVT and the amount of CVT in the private sector. The third subsection contains descriptive data regarding the amount of firm-sponsored CVT between 1999 and 2003.

4.1 Skill-needs analyses in Sweden

Statistics Sweden produces three different types of forecast. “Trends and forecasts” (*Trender och prognoser*) focuses on the long term and makes demographic as well as labour market forecasts for the coming 20 years. These forecasts concern around 50 educational categories and are published every three years. In the years when “Trends and forecasts” is not issued, a complementary forecast is published in “Education and the demand for labour” (*Utbildning och efterfrågan på arbetskraft*), which makes predictions essentially for five years hence. The third forecast is the Labour Market Tendency Survey (*Arbetskraftsbarometern*). It presents short-term forecasts based on surveys sent to a selection of firms whose employees represent those educational groups that are considered most interesting. In 2003, this survey covered 74 different educational and training categories.⁵

The Labour Market Tendency Survey conducted in 2003 presents the short-term projections of future skill needs. The surveys were sent to 7,600 places of work, of which some received more than one questionnaire if they were chosen to represent the employees in more than one educational category. The total number of questionnaires was 11,094 and the response rate was 79%. The employers were asked to indicate, on a continuous scale, whether they felt there was a shortage or an abundance of newly graduated and experienced workers within their selected educational category. In the presentation of the results, Statistics Sweden divides the answers into 43 different educational categories, of which most (32 categories) come under the grouping of technical education.

Even a cursory look at the reported replies shows that shortages of experienced workers are much more common than shortages of new graduates. In 21 of the educational categories, or 49%, experienced workers were reported to be in scarce supply. New graduates were reported to be in scarce supply in only 7, or 16%, of the categories. Of course, this places restrictions on the possibility of supplying the required human capital within the short term. The classification of educational categories is much more meticulous here than the classification described below regarding the actual supply of CVT in the private sector.

4.2 The relationship between predictions and actual supply

The various predictions made by Statistics Sweden have a very complicated relationship with the supply and demand of CVT in the private sector. Because the forecasts presumably influence the direction of the supply of public provision of training, this may also alter the provision of private training in these areas. The conflict of interest between the public and the private sector lies mainly in the fact that the public sector

⁵ For a more comprehensive description of the various forecasts, including a brief account of the Labour Market Tendency Survey conducted in 2001, see Lindskog (2003), Section 1.

seeks to alleviate differences in human capital accumulation by providing training for individuals in the lower half of the wage-income distribution; the private sector, by contrast, would prefer to direct the public supply of training towards the employed in the upper half of the income distribution.

There are several possible scenarios. The supply of CVT in the private sector could be independent of the training provided by the public sector. This would be the case if, for example, the private sector only wants to offer CVT to individuals with a high level of education and high earnings, whereas the public sector only supports the CVT needs of those in the lower half of the earnings distribution. On the other hand, if the public supply of training for those in the lower half serves as a complement to firm-sponsored CVT, the amount of CVT paid by the private sector should increase. Mellander and Savvidou (2001) found support for this scenario (see Section 3.3). In contrast, if the publicly provided training is a substitute for private-sector CVT, this should decrease the amount of the latter.

Looking at predictions of where shortages will appear and comparing them with the private-sector supply in the years that follow will only give us a rather weak indication of how these quantities interact. Besides the mechanisms discussed, there are also exogenous influences on the relationship, such as macroeconomic fluctuations. We would need detailed data and quite an ambitious study to analyse how the public provision of training in a sector influences the supply of private-sector CVT in the same area.

Public provision of CVT for the unemployed and its influence on private-sector provision

In recent years, the AMS has provided vocational labour market training (LMT) with a very broad focus (AMS, 2002a). In 2001 and 2002, manufacturing was the largest category, accounting for around 30%, followed by health care at around 20% and then 11 different categories represented by 8% of the participants or less. A general trend has been that IT-related training has decreased due to falling demand for such courses.

Private-sector companies may recruit labour from the unemployed workforce (who are then perhaps partly trained within the company itself). Thus, the public supply of LMT would serve to decrease the level of firm-sponsored CVT in these areas. The Confederation of Swedish Enterprise (*Svenskt Näringsliv*) reports that from a survey of 80 enterprises, 44% had employed an individual coming from LMT. However, more than 70% stated that this was something that rarely happened, and of those that actually hired someone from LMT, only 7% said that the content of the LMT had influenced their choice. These figures are somewhat surprising considering that the AMS, on the basis of numerous follow-up studies carried out six months after programme completion, has reported that two thirds of the participants in LMT work within, or close to, the professions they were trained for (see, for example, AMS, 2002a). Of course, these contrasting results may partly stem from the fact that the AMS has an interest in presenting advantageous findings regarding their own programmes and that,

on the other side of the coin, the Confederation of Swedish Enterprise may have an interest in criticising the supply of CVT within LMT so as to gain greater influence on the direction of its future supply.

Despite the apparently differing views on the degree of success of vocational training provided by LMT, it remains clear that it influences the accumulation of human capital within the private sector. But the answer to the question as to how strong is this influence depends partly on who one asks. And it is not possible to conclude whether this has any effect on the provision of firm-sponsored CVT. It may seem tempting to conclude that the amount of CVT offered in the private sector is reduced by the recruitment of skilled labour from the unemployed workforce. However, as pointed out above, the effects hinge on whether public- and private-sector CVT are substitutes for, complements to or independent of one another.

As regards general training, the AEI was concluded in 2002 and the need for general training should reasonably have been more subdued in the years that followed. The Confederation of Swedish Enterprise argued that the AEI was too large and was carried out at the expense of more specialised vocational training (Svenskt Näringsliv, 2001; 2002). Several studies have also found that the AEI was less efficient as a policy tool than vocational training within the framework of LMT (see, for example, Axelsson and Westerlund, 2004; Stenberg, 2005).

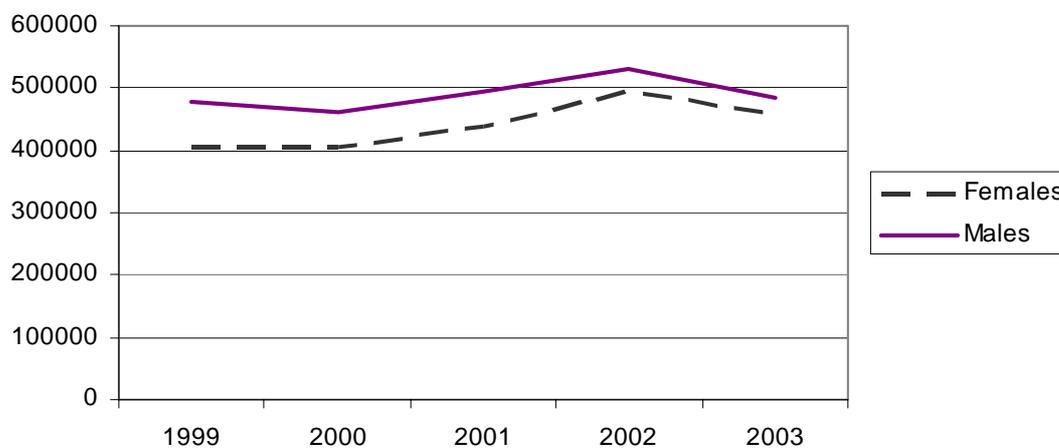
4.3 Private-sector provision of CVT in Sweden from 1999 onwards

The illustrations and figures presented in this section were taken from the Staff Training supplement to the labour force surveys conducted by Statistics Sweden. The figures are based on interviews conducted twice a year, in June and in December, based on both occasions on questions regarding the preceding six-month period. The samples consist of a rotating panel of around 13,000 members of the labour force aged between 16 and 64. The response rate is around 80%. The structure of the questionnaires means that they in principle measure training that has been paid for at least partially by the employer.

Figure 4 shows the number of participants in CVT that lasted six days or more, annually from 1999 to 2003. The figures reported correspond to slightly more than 20% of the total labour force. Females show a slight upward trend overall, and especially between 2000 and 2002 when male participation also increased. Interestingly, the gap between men and women was 18.6% in 1999, but fell gradually to 5.9% in 2003.

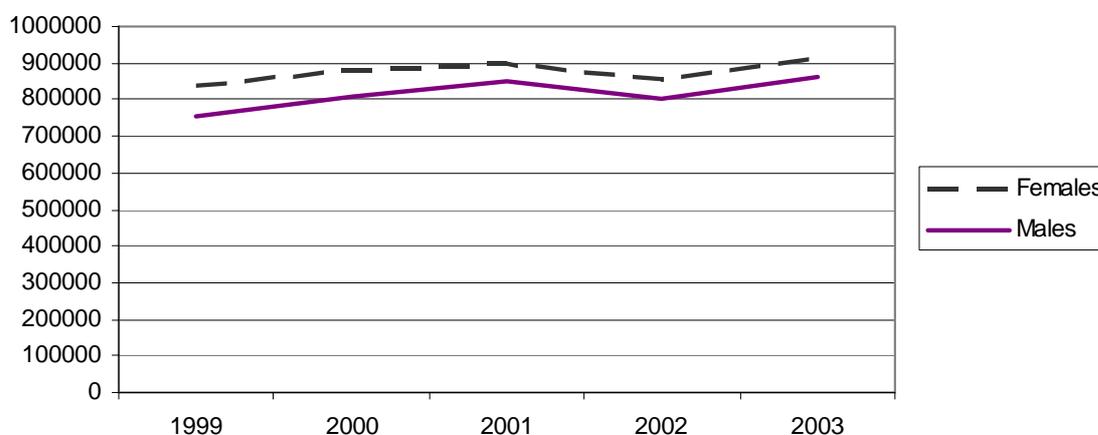
Figure 4 Number of participants in private-sector courses lasting six days or more.

Source: Statistics Sweden.



In Figure 5, the corresponding figures are displayed annually for those who participated during the year in courses lasting five days or less. Again there is a slight upward trend, but this time it applies to both males and females. Contrary to Figure 4, the incidence of CVT is higher for females in this case. This difference – that females are relatively more likely to attend shorter CVT courses than longer ones – is also reported in Ericson (2004b) on the basis of data collected in 1996 from 15 European Union countries. His explanation for this pattern is that females on average have jobs with lower qualifications. The gender gap diminishes over time, from 11% in 1999 to around 6% at the end of the observed period.

Figure 5 Number of participants in private-sector courses lasting five days or less.



Source: Statistics Sweden.

Another way to measure the amount of training is to relate it to total working time. This statistic is displayed in Figure 6, separately for men and women. The upward trend is only evident for females, whose amount of training has increased considerably in relation to men. In 1999 and 2000, the two categories were very similar, but since 2001 the share for females has been around twice as high as for males. Judging from Figure 4 and Figure 5, the relative increase for females is a result of participation in courses lasting longer than six days. Although in line with the other data shown above, the gender discrepancy in Figure 6 appears quite substantial and should probably be interpreted with caution. Problems with measurements of the amount of CVT were already discussed above (see Section 3.2).

Figure 6 Time in CVT as a share of total working time, men and women in the private sector.

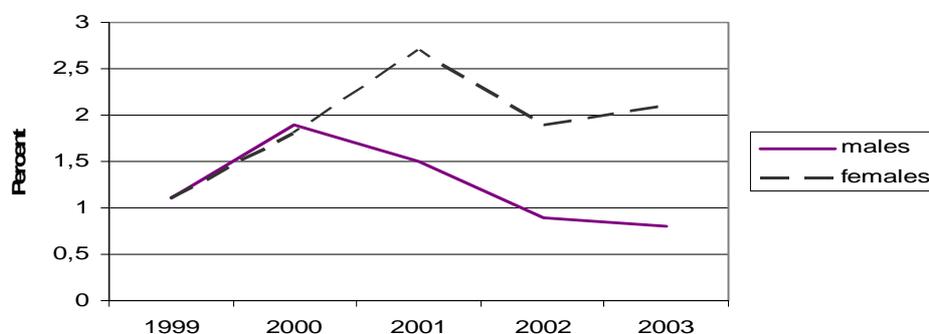


Figure 7 presents time spent in CVT as a share of working time in seven different sectors. Although some time series show more fluctuations than others, there are only minor differences in the percentages in 1999 compared with 2003. “All” (sectors) show a fairly stable pattern, with the figure reported in 2003 slightly below that from 1999 (2.4% against 2.7%). The R & D sector shows the strongest change, decreasing from 4% in 1999 to 2.9% in 2003.

Figure 7 Time in CVT as a share of total working time, percentages in various sectors.

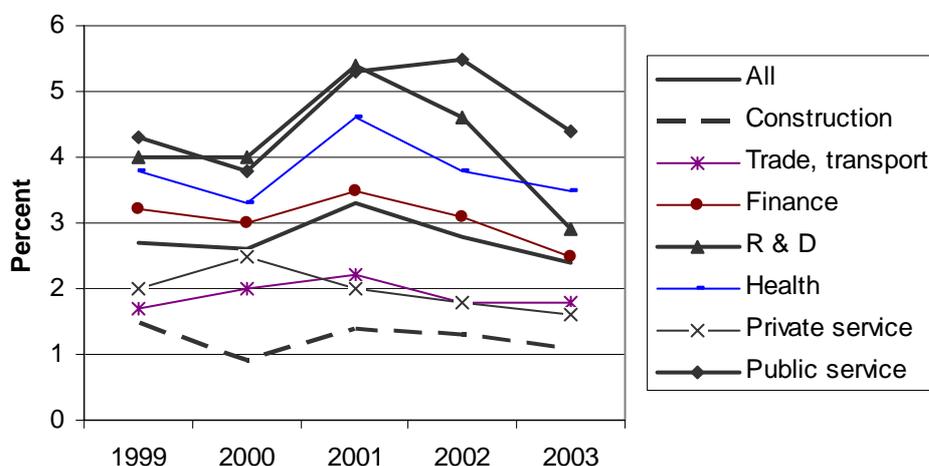


Table 1 shows the amount of CVT provided in various different subject areas in the years 1999 to 2003. Most subjects do not show any significant changes during this period. The most striking trend is the decline in CVT dedicated to information technology. This is more or less the only time series that shows a clear pattern over the years and it is presumably caused by the collapse in the IT sector that occurred in 2000. This trend is also in line with the decline in the public supply of CVT in IT-related training (see Section 4.2.1). It is also interesting to note the relatively modest percentages of CVT provided in manufacturing-related subjects. These may of course be influenced by the high amount of publicly provided training in this sector but, as pointed out above, it is not possible to deduce a causal relationship from these descriptive figures.

Table 1 CVT percentage shares by subject area.

	1999	2000	2001	2002	2003
Pedagogy	5.6	5.2	4.8	5.4	6.7
Arts	3.6	3.4	3.8	3.0	3.9
Business adm.	11.7	11.2	11.8	12.2	13.4
Management	7.8	8.8	9.4	9.4	9.0
Working life	9.8	9.2	9.4	9.4	7.9
Social sciences	6.2	6.3	5.4	5.4	5.8
IT	15.9	14.6	12.4	11.5	9.8
Science, maths	0.7	1.5	1.3	1.1	0.9
Manufacturing	8.2	9.0	9.9	9.3	8.8
Farming	1.1	0.9	0.8	0.9	0.9
Medicine, health care	10.7	10.7	11.8	11.7	12.3
Social services	1.8	2.0	2.1	2.4	2.2
Environmental studies	6.2	6.8	6.5	7.1	6.4
Commercial services	5.8	6.1	6.0	7.0	7.8

The figures in Table 2 illustrate the percentages of men and women that participated in various forms of training. For IT-related courses, the share of men participating was 50% higher than that of women in 1999 but only 10% higher in 2003, indicating a more

equal investment across genders. Despite some considerable fluctuations, it is striking how often the 1999 figures are similar to those for 2003. In a way, this is expected as gender patterns usually change rather slowly. Exceptions include IT and courses in sciences and mathematics, but the latter shares are very low, with the result that small variations cause the quotas to show relatively large fluctuations.

Table 2 Training participants, male / female percentage shares in various subjects.

	1999	2000	2001	2002	2003
General education	0.625	0.573	0.696	0.829	0.637
Pedagogy	0.294	0.279	0.360	0.314	0.320
Arts	0.569	0.573	0.433	0.600	0.696
Business adm.	1.218	1.160	1.228	1.132	1.172
Management	1.037	1.200	1.099	1.196	1.448
Working life	1.110	0.889	1.036	1.131	1.109
Social sciences	0.435	0.458	0.382	0.429	0.453
IT	1.502	1.452	1.387	1.473	1.104
Science, maths	1.303	0.810	0.668	0.866	0.662
Manufacturing	5.723	4.415	6.040	6.078	5.884
Farming	3.821	3.509	3.070	2.263	3.404
Medicine, health care	0.242	0.315	0.259	0.274	0.300
Social services	0.314	0.255	0.240	0.259	0.545
Environmental studies	1.410	1.521	1.276	1.341	1.584
Commercial services	1.308	1.563	2.291	1.627	1.433

Tables 3a, 3b and 3c illustrate how the incidence of CVT provided in the private sector was distributed across age groups. The shares for participation in Table 3a are strongly linked to the overall representation of each age group among the employed, which is presented in Table 3b. Table 3c shows the shares reported in Table 3a divided by the shares reported in Table 3b. If these shares are stable over the observed period, as they are for most groups, this means that their share of CVT related to their share of employed did not change in any substantial way between 1999 and 2003. For the 55–64 age group, there is a notable increase in the amount of CVT compared with the share they make up of the employed. However, most of this increase can be attributed to the figure for 2003, when the 45–54 age group also increased its share of training. Given

the fluctuations observed in the other groups, it is therefore too early to talk of any type of change in the pattern.

Table 3a Shares of participants in private-sector CVT by age group.

Age	1999	2000	2001	2002	2003
16–24	6.1	6.7	6.6	7.1	5.9
25–34	25.0	24.7	23.5	22.8	21.6
35–44	26.0	26.8	27.8	27.0	25.5
45–54	28.7	26.9	25.7	25.7	27.1
55–64	14.3	14.9	16.4	17.4	19.9

Table 3b Age groups as percentage shares of labour force.

Age	1999	2000	2001	2002	2003
16–24	10.0	10.2	10.4	10.2	10.1
25–34	24.1	23.7	23.3	22.7	22.1
35–44	24.5	24.9	24.9	25.1	25.3
45–54	26.1	25.3	24.6	24.2	23.9
55–64	15.2	15.9	16.7	17.8	18.6

Table 3c Relationship between shares in Tables 3a and 3b.

Age	1999	2000	2001	2002	2003
16–24	61.2	65.5	63.5	69.2	58.2
25–34	103.5	104.0	100.7	100.5	97.5
35–44	105.9	107.8	111.7	107.4	100.8
45–54	109.8	106.2	104.4	106.4	113.5
55–64	93.6	94.0	97.8	97.8	107.2

4.4 Summary

The question as to whether and how the amount of firm-sponsored CVT is influenced by skill-needs analyses and subsequent public provision of CVT boils down to whether the respective supplies are substitutes for, complements to, or independent of one another. There are arguments for all three cases. Evidence from the Labour Market Tendency Survey indicates that skills shortages concern experienced workers rather than new graduates, implying that the role of CVT as a short-term supplier of required human capital is somewhat limited. This plausibly weakens the relationship between publicly and privately supplied CVT. Nevertheless, there was a simultaneous decrease in the supply of CVT in the IT sector and in the public supply of IT-related CVT. At face value, this would imply that the provisions by the private and the public sectors complement each other. However, the public supply of CVT in manufacturing was constantly about three times larger than the private-sector supply in the same area, indicating, again at face value, that it served as a substitute for firm-sponsored CVT.

Some other patterns revealed by the descriptive data call for more research. During the period 1999 to 2003, it appears that the share of women participating in CVT in the private sector increased and particularly so in the case of courses that lasted six days or longer. There were also signs that the oldest segment of the labour force, aged 55–64, increased its relative share of participants in firm-sponsored CVT.

5 Concluding remarks: Public and private provision of CVT – complements, substitutes or independent?

The Swedish labour market is characterised by a large public sector and a relatively substantial amount of publicly subsidised CVT. The contents of the public supply of CVT are influenced by the private sector, both by way of its representation on the decision-making bodies and as a result of the fact that employer surveys are the tool used most commonly to determine the public supply. In what manner the public supply of CVT influences the amount of firm-sponsored CVT is theoretically dependent on whether they are substitutes for, complements to or independent of each other. Empirical studies of the interrelationship between them are scarce and often suffer from the fact that they are conducted by organisations with financial interests, which may influence the results these choose to emphasise. There are arguments for all three cases, plausibly indicating that elements of all three exist. Proceeding from some simplifying assumptions based on some of the findings in this paper, a highly stylised scenario will illustrate an arguably relevant example of how the Swedish institutions may interact with firm-sponsored CVT.

Publicly provided CVT in Sweden is mainly intended for low-wage earners with a low level of education and in particular for the unemployed. According to a typical

result, firm-sponsored CVT is targeted instead at highly educated individuals with high wages (Leuven and Oosterbeek, 1999; Goux and Maurin, 2000; Mellander and Savvidou, 2001). If public and private CVT were targeted at entirely different groups, this would exclude the possibility that they are substitutes, in other words, the public provision would not have a negative influence on firm-sponsored supply. In line with this reasoning, Mellander and Savvidou (2001) found that employers saw the hypothetical individual learning accounts as a complement to the existing amount of CVT, indicating a positive relationship between public and private spending on CVT. Descriptive statistics on the actual supply of CVT offer some further support to this view as IT-related training decreased between 1999 and 2003 in both the private and the public sector. However, there is also evidence for the opposite view: The public provision of CVT in manufacturing was at a much higher level than private provision, implying that the public supply is either a substitute for or independent of the private-sector supply. Also, the Labour Market Tendency Survey of 2003 reveals that the demand for skills mostly concerns labour with experience, something which would decrease the role of CVT in the short term, and contribute to making its public and private supply mutually less sensitive.

Indeed, it is highly probable that public provision is sometimes independent of or a substitute for firm-sponsored CVT. In order to simplify, let us concentrate on circumstances that would make them complements. This is an interesting case as it would provide a strong argument for additional expenses on CVT by European governments (research that contradicts these circumstances will follow). Let us assume that public provision of CVT contributes to compressing wages on the labour market (by reducing differences in human capital within the labour force). Given that the private supply of CVT increases when wages are more compressed, as indicated for example in Bassanini and Brunello (2003) and Almeida-Santos and Mumford (2004), this would mean that the public supply is a complement to firm-sponsored CVT. The implication that public and private CVT are complements is driven by three assumptions here: that the public supply evens out differences in human capital within the labour force, that this in turn contributes to a compressed wage structure, and that compressed wages have a positive influence on the provision of firm-sponsored CVT.

However, as we have seen, the evidence that compressed wages contribute to an increased supply of CVT has been questioned by the results found by Ericson (2004a). This is particularly interesting because an institutional characteristic of the Swedish labour market is the presence of strong labour unions, which contributes to keeping wages relatively compressed. In Ericson's study, sector-specific wage compression in Sweden is not found to influence the amount of "mainly general" training in the private sector. Potential explanations for this diverging result are that it concerns general rather than vocational training and also that the data collected were from 2000 when the Adult Education Initiative had been in force for two and a half years, possibly saturating the need for general training.

ITPS (2003) also contradicts the above scenario. Evaluating the European Union Objective 4 programme, which included subsidisation of CVT, it was found that the subsidised CVT only generated small differences in the incidence of CVT. This may

indicate that public subsidisation is a substitute for private supply of CVT, but the authors of the report point out that data on the intensity of the CVT provided are needed to clarify this issue.

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