

THE RESEARCH INSTITUTE OF INDUSTRIAL ECONOMICS

Working Paper No. 592, 2003

**Employer-Sponsored Training in Stabilisation and
Growth Policy Perspectives**

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March 10, 2003

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ABSTRACT

In Europe, accounting standards prevent larger expenditures on employer-sponsored training from being treated as investments. Using Sweden as example, we discuss two consequences for training.

First, the *timing*: training will be conducted when income is large enough for training costs to be deducted without loss. This is more often possible during booms than recessions, providing a stabilisation policy dimension to training.

Second, the *volume*: the training opportunity cost (foregone production) is largest during booms. Hence, training tends to be smaller than if conducted during downturns, possibly limiting growth.

We formulate two proposals that can make training more counter-cyclical and increase the amount of training.

Keywords: Training, Accounting system, Timing, Growth

JEL Codes: D21, E32, H25, M41, M53

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Financial Support from the Commission on Stabilisation Policy for Full Employment and from the Swedish Agency for Innovation Systems is gratefully acknowledged. We have benefited from comments on earlier versions of this paper, especially from Antje Mertens and Roope Uusitalo, and also from participants in seminars at IFAU, IUI and Stockholm University, the conference on Personnel Economics, organized by the French Economic Association, in Lyon, France, May 2002, the conference on Adapting Education and Training for the Enhancement of Low-Skilled Jobs, organized by ETLA and LoWER in Helsinki, May 2002, and the International Labour Market conference, organised by the Robert Gordon University in Aberdeen, June 2002.

1. Introduction

The discussion in this paper lies on the borderline between economics and business administration. It is motivated by an institutional characteristic, namely the norms and standards determining how firms' training expenditures are treated in the accounting system. This is a business administration consideration. Our interest in this institutional characteristic stems from the fact that it is most likely to affect both the timing and the volume of employer-sponsored training, *i.e.* training that is partly or wholly paid for by the employer. These effects are aspects of economics, via their connections to stabilisation and growth policy issues.

Stern and Ritzen (1991) and Booth and Snower (1996) consider various market failures in training, implying that the amount of training conducted is smaller than the socially optimal amount. Acemoglu and Pischke (1999a,b) extend that discussion and, more importantly, develop a framework explaining why employers pay for both general and firm-specific training, not just for firm-specific training as argued by Becker (1964). That employers do indeed pay for both kinds of training has been empirically documented by, *e.g.*, Barron *et al.* (1997) and Leuven and Oosterbeek (1999). Obviously, to the extent that the accounting system constitutes a constraint on employer-sponsored training, affecting this constraint can increase the amount of training provided. And, we will argue, it can also affect the allocation of training over the business cycle.

While we focus on Sweden, the discussion in many respects applies to Europe in general; accounting standards are similar in many other European countries, because of harmonisation through international standards. Indeed, to the extent that accounting standards do effect employer-sponsored training in Sweden our discussion should be most relevant for other European countries because, according to the Continuing Vocational Training Survey (CVTS2) conducted by the EU, the incidence of employer-sponsored training is *lower* in other European countries than in Sweden, Denmark being the only exception.

Why, then, should accounting standards be a problem? The problem is that although the effects of the training in many cases extend over several years, the firm has to take up the entire expenditure as a cost directly, during the same year that the training is carried out. And these expenditures can often be quite large, covering instructional material, facilities, teachers, and, not least, wages for stand-ins for the employees in training.

To bring out the implications of this feature, it is instructive to compare with the treatment of real capital expenditures, *i.e.* equipment and buildings, in the accounting system. As a rule, expenditures on real capital can be entered as assets on the balance sheet. Put differently, they can be treated as investments. This has several implications. Most importantly, the total cost needs not be written off immediately; it can be divided across several years as depreciations. As a consequence, also larger investments can be made during a year with relatively low income without inflicting a loss on the firm, because only a portion of the cost directly affects income negatively. The spending opportunities are thus not as limited as they would have been if the total investment had to be written off during the year of the investment. Moreover, the fact that costs are divided over several years leads to less variation over time in the firm's reported results.

Human capital expenditures, by contrast, are not considered valid balance sheet items. This means that the entire expenditure affects the result during the year in which the expenditure is made. Thus, when it comes to larger training expenditures, companies will have to wait for years with good income, so that the costs can be deducted without risk of loss. Good years generally fall into boom periods. The fact that human capital investments cannot be entered on the balance sheet thus tends to make them pro-cyclical. The timing of the cycle may, of course, vary somewhat across industries, and even firms. Still, firm training will aggravate the swings in employment over the (average) business cycle of the economy through this mechanism, instead of dampening the fluctuations, as would have been the case, had the training been conducted during economic downturns.

During boom periods the cost for training in terms of foregone production – the opportunity cost of training – is at its highest. This will have a restraining effect on the volume of firm training. Accordingly, the fact that training expenditures cannot be entered on the balance sheet will also tend to decrease the amount of training, because of the high opportunity costs, *ceteris paribus*. And when companies do carry out training during recessions, they are most likely to restrict themselves to smaller training programs, because the income against which the training cost is written off is lower.

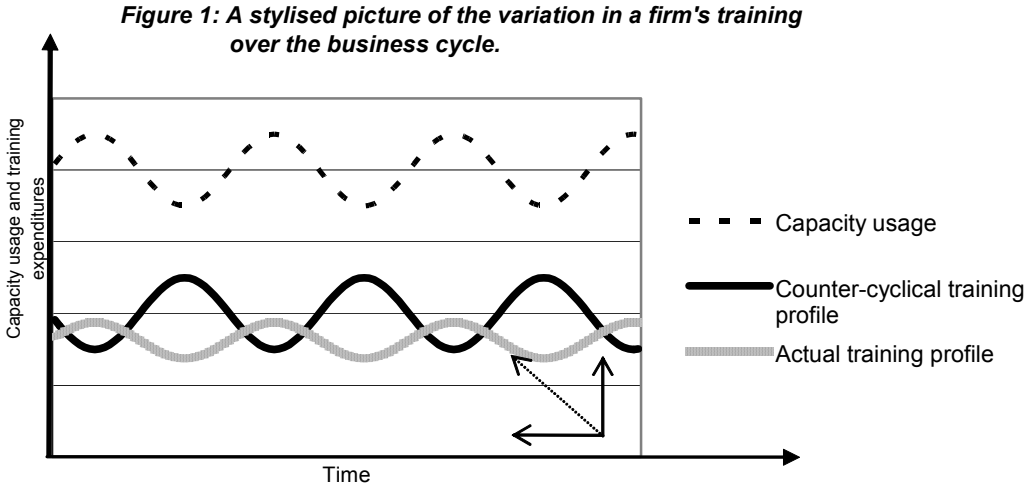
The effects on the timing and the volume of firm training are strengthened by a cash-flow constraint: unlike investments in real capital, training investments do not create their own collateral (Piore, 1968). Accordingly, the firm will have to finance its training expenditures by internally generated cash, which is usually in more ample supply during years with good income than during downturns. Due to the cash-flow constraint, firms will generally have

very limited possibilities to make use of the fact that the opportunity cost of training is relatively low during recessions.

The company tax system also affects firm training. It will be shown in the next section that there are opportunities within the tax system to mitigate the effects caused by the accounting standards.

What makes the problems that we have pointed to quite important, from a practical point of view, is the fact that employer-sponsored training is certainly not a negligible phenomenon. In Sweden, employer-sponsored training is the type of adult education that currently reaches the most people. During the first half of 2001, two million individuals participated in some kind of employer-sponsored training (Statistics Sweden, 2001a). Komvux, a state-sponsored educational program aimed at providing older, low-educated, workers with qualifications corresponding to upper secondary school, is the country's second largest adult education operation in terms of number of participants. Komvux served only about one-tenth as many people as those engaged in firm training, however. (Statistics Sweden, 2000).

Figure 1 illustrates the stabilisation and growth aspects of firm training that we described.



The top-most curve illustrates how capacity usage varies over the business cycle. The middle curve illustrates a *counter-cyclical* time profile for training, *i.e.* it is most encompassing when the business cycle hits bottom, and then successively declines until it reaches its lowest level when the business cycle reaches its peak. The bottom curve is drawn so as to illustrate that the business-cycle variation of *actual* training is not very large, but when existing, the variation is *pro-cyclical*, *i.e.* training expenditures are largest during booms and smallest during recessions. In the figure we have also taken into account that the actual training volume tends to be lower than it would have been under different institutional

conditions. This is indicated by the positioning of the actual training profile below the counter-cyclical training profile.

We do not think that employers act irrationally; they adapt to institutional conditions that restrict their activities. Therefore, this paper has a normative aim, too; we suggest changes in the institutional conditions that we believe should have positive effects on training.

We believe that training is an example of an instance in which two effects can be reached with one and the same measure. The changes we propose are likely to affect training in a positive direction both from a stabilisation policy perspective (by making training more counter-cyclical) and from a growth policy perspective (by increasing training volume).

The paper unfolds as follows. In section 2 we take a closer look at the accounting and tax aspects of firm training. Sections 3 and 4 provide empirical support for our claims about the timing and the volume of training. Section 5 discusses two proposals for shifting training toward recession periods and increasing the amount of training. One proposal focuses on the accounting standards, the other on the company tax system. In the final section we summarise our results and argue in favour of one of our proposals, the one working via the company tax system.

2. Accounting and tax aspects of training

When considering accounting regulations, it's important to make a distinction between the legislation itself and how the laws are applied.¹ According to Sweden's Annual Accounts Act (AAA), companies' annual reports must be based on good accounting practices, which constitute a legal standard founded on accounting laws, the preparatory documents underlying these laws, and on the accounting standards.² Companies are thus required to follow both the accounting legislation *and* the accounting standards.

The formation of accounting standards to a large extent takes place through general advice and recommendations from standard-setting organisations. In Sweden, there are both private standard-setting organizations, such as Swedish Financial Accounting Standards Council, and public organizations, like the Accounting Standards Board (ASB). Similar arrangements exist in other European countries. The recommendations provided by domestic standard-setting

¹ Our review of legislation and standard setting focuses on requirements for corporations. Here, the word *company* means corporation. To the best of our knowledge, differences do not exist with respect to the treatment of training expenditures in other forms of association.

² Annual Accounts Act (1995:1554), chapter 4, paragraph 1.

organisations are, in turn, greatly influenced by the work of the International Accounting Standards Board (IASB).³

In the following subsections we first consider the Annual Accounts Act statements about training, then the corresponding accounting standards, and, finally, tax-related issues.

2.1 Annual Accounts Act (AAA)

The relevant legislation here is that which affects fixed assets, *i.e.*, assets that are permanently used or contained within an operation. Chapter 4, paragraph 2 of the AAA states:

“Expenditures for R&D and similar work that is of considerable value for the operation during years to come may be reported as intangible fixed assets.”

where “similar work” includes employer-sponsored training, according to the preparatory documents of the AAA. Further, in a review of the AAA, the AAA committee interpreted the paragraph as follows:⁴

“Any hindrances (formally or in practice) from treating this type of expenditure in a similar way (i.e. as expenditures for R&D, our comment) do not exist. The AAA and Accounting Standards Act, which allow expenditure capitalisation – not just for R&D but for similar work – support such treatment.”

Accordingly, the AAA does *not* specify limitations regarding companies’ opportunities to capitalise costs for training.

The AAA committee also pointed out that valuations on income statements and balance sheets must be reported with reasonable care (the prudence principle) and that only revenues and costs relevant to the financial year should be reported, regardless of the time of payment (the accruals principle). According to the committee, companies may not go overboard when it comes to precautionary measures by booking expenditures that enable financial benefits in periods that follow. Adapted to training expenditures, this means that the entire training expenditure should be taken up as a cost during the same year that the training occurred *only* if the financial effects from the training are confined to that year.

We can thus conclude that the accounting legislation allows capitalisation of training expenditures and even prescribes that this opportunity should be used, if the effect of the expenditure spans several years. As we shall see, the problem lies in the accounting standards, rather than in the accounting legislation.

³ Previously the International Accounting Standards Committee (IASC). See www.iasb.org.uk

⁴ SOU 1996:157, Översyn av redovisningslagstiftningen – Slutbetänkande från Redovisningskommittén. (Review of the Annual Accounts Act – Final Report from the Annual Accounts Committee)

2.2 Accounting standards

The accounting standards are based on interpretations of the criteria that define what is meant by an asset, *i.e.* an item that can be entered on the balance sheet. An asset must fulfil three criteria: 1) it must be *identifiable*, 2) the company must *control* the asset as a result of events and transactions, and 3) the asset must be expected to *yield future financial benefits* for the company.⁵ In addition to these criteria, expenditures for the asset must be measurable in a reliable way.

The asset is considered *identifiable* if it can be separated. This means that the company can rent, sell, exchange, or distribute income or financial benefits that are linked to the asset without losing any future financial benefits that are generated by other assets in the operation. When *controlling* an asset, the company can enjoy financial benefits generated by that asset and simultaneously prevent others from enjoying these benefits. This quote from Swedish Financial Accounting Standards Council illustrates that the *control* criterion was a given far-reaching interpretation in the standards developed for training expenditures:

“... a company with skilled personnel often considers increased knowledge via training as a source of future financial benefits ... but in general a company can not control how long employees (including executives) remain with the company. So normally, the asset-control criterion can not be fulfilled...”

This statement agrees with the general practice that historically has specified companies’ opportunities to capitalise training expenditures. So in reality, companies have had limited opportunities to capitalise training expenditures – despite the committee’s intentions in its review of the Annual Accounts Act.⁶

Strangely enough, the discrepancy between the accounting legislation and its implementation increases – rather than decreases – over time. As of 1 January 2002, the following recommendation from the Swedish Financial Accounting Standards Council applies:

⁵ See, for example, Belkaoui (1992).

⁶ It’s interesting to compare the requirements that allow training expenditures to be entered on the balance sheet with comparable requirements for tangible assets, *i.e.* real capital. The *Financial Accounting Standards Council recommendation 12*, issued in December 1999, item 4, states: “A tangible asset *must* (our italics) be reported as a balance sheet asset when:

- on the basis of available information, future financial benefits that are linked to possession of the asset are likely to be advantageous for the company, and
- the purchase value for the asset can be calculated in a reliable way.”

These requirements are considerably weaker than those that must be fulfilled if training expenditures are to be activated on the balance sheet.

“All research expenditures must be reported as costs when the expenditures are incurred. According to the recommendation, other examples of expenditures that must be reported as costs when incurred are expenditures for ... training ...”⁷

Formally, this means a further tightening of previous recommendations. In reality, it will not have a significant effect on companies' accounting practices, however, because even historically (larger) training expenditures have seldom been capitalised.⁸

2.3 The tax system

In its review of the AAA, the AAA committee stated that company tax rules work against opportunities to capitalise training expenditures, as specified in the AAA.⁹ The committee argued that by taking up training as a cost, companies can directly receive the entire tax reduction. If, instead, training expenditures were capitalised, only a smaller proportion of the tax deduction would benefit the company immediately; the major proportion of the benefits would accrue in future periods. Because companies can expect to have a positive time preference for money, *i.e.* they value money today higher than money in the future, this makes the direct write-off more advantageous.

However, the committee's reasoning apparently builds on the implicit assumption that time preference for money is the only relevant issue in this situation. For example, the committee's argument assumes that the company will always be *able* to choose if it wants to immediately write off or capitalise the training expenditures. This need not be the case for larger training expenditures; during recession years, income can be so small that larger training expenditures would lead to loss if they were to be written off immediately which, in turn, would mean that the company could not use the entire tax discount. The committee's interpretation also disregards that fact that the opportunity cost of training can vary over time. If the company, by capitalising training expenditures, could carry out the training during a recession rather than a boom, then the negative effect that could occur – due to the positive time preference for money – could be compensated and perhaps more than balanced by the lower opportunity cost.

These objections make it difficult to believe that tax legislation is the primary reason why companies don't capitalise their training expenditures. Instead, we believe that it is the

⁷ *Financial Accounting Standards Council recommendation 15 Intangible Assets*, August 2000, “Introduction”, item 6.

⁸ The future of this recommendation is somewhat uncertain. The underlying international recommendation – *IAS 38, Intangible Assets* (IASB, 1998) is expected to change; most likely, this will also lead to changes in Sweden's standards for intangible asset accounting.

⁹ SOU 1996:157, page 426-27.

accounting standards described in the previous subsection that have prevented companies from capitalising these expenditures.

It's interesting to note that within the tax legislation framework, an opportunity exists for mitigating the effects of the accounting standards. Since the 1995 fiscal year, companies have had the possibility to use tax allocation funds, whose purpose is to give companies opportunities to spread income over time by transferring portions of the income from good years to years with less income.¹⁰ Companies can each year reserve up to 25 percent of their net income before taxes in the funds. The reserves must be brought back into the books within six years after they were set aside.

It is probable, however, that the tax allocation funds only to a limited extent have been used for training purposes, because of the relatively high risks that are perceived to be associated with training expenditures.¹¹ As companies can select the way in which they will use the extra spending opportunities that the funds create, the companies will prioritise projects with low risk, all else equal. Training expenditures are then likely to be given rather low priority.¹²

3. Training variation over the business cycle

We will now examine whether the actual time profile of firm training really tends to be procyclical, as indicated in *Figure 1*. Analyses of how training varies over the business cycle require special data. We need data on training and business cycle situations that *apply to the same companies*. Such data are unavailable in official statistics.¹³ However, a survey administered by the Confederation of Swedish Enterprise and the Research Institute of Industrial Economics (IUI), the *Plan survey*, contains such information. The Plan survey is a rotating panel survey covering large firms or, more correctly, large workplaces in the Swedish

¹⁰ Similar systems have existed earlier, e.g., tax equalisation reserves. Comparable constructions can also be found in other European countries.

¹¹ These risks are of two kinds. The first type is similar to the risk facing companies making R&D investments, i.e. that it is highly likely that the endeavour may prove unsuccessful. The second risk, which is specific to training, is that companies cannot be sure that they will receive the returns even on successful training programs because there is always a risk that those who have undergone training will leave the company. The fact that the companies cannot insure themselves against these two kinds of risk leads to market failures in training; see, e.g., Stern and Ritzén (1991) and Booth and Snower (1996).

¹² Of course, a high risk can be weighed against a high expected return. But the available information on the return to training expenditures is mixed. For Sweden, a study of comparatively large Swedish companies suggested that the returns can be very high (Kazamaki Ottersten et al., 1999), while preliminary results from a study of small firms points toward very weak effects (Bager-Sjögren and Gustafsson, 2001). Unfortunately, to the best of our knowledge there exists no information on to what extent the tax allocation funds are used for training purposes.

manufacturing sector. More than 90 percent of the firms covered in *Plan survey* have at least 100 employees.¹⁴

Using the Plan survey data, we can shed light on training's business-cycle variation in two different ways.

1. On two occasions (1997 and 2001), the companies were asked about whether they thought that, historically, their training expenditures had been related to two business-cycle indicators: capacity usage and profit level. The responses provide a general picture of the degree to which training is pro-cyclical, counter-cyclical, or independent of the business cycle. But the information is relatively weak because it is based on the companies' perceptions of their actions, rather than on their actual behaviours.
2. For the years 1996 and 2000 there are data on the companies' training expenditures, capacity usage, and profits. These data are of great interest by themselves; in addition, they give us an opportunity to study whether the companies' responses to the retrospective questions in 1. agree with their actual behaviours. Specifically, if responses to the retrospective questions indicate that the historical variation of training has been pro-cyclical, then there should be a positive relationship between actual training expenditures and capacity utilisation (profit) among the companies in the previous year. We can thus check the collective result of the companies' perceptions about their actions over a longer period by comparing these perceptions with variation between companies' actual behaviours at a specific point in time. What we do is that we exploit the fact that the (average) business cycle for the whole economy is made up of firm-specific cycles. In principle, every firm faces its own business cycle and the cycles of different firm will depart somewhat from one another. Thus, even though our data pertain to a fixed point in time, we get observations on training relating to different phases of the business cycle. Of course, some of this variation will be due to heterogeneity across firms. Therefore, at the end of this section, we will also control for several firm-specific factors, to focus on differences between firms stemming from exogeneous shocks, such as local variations in labor supply and product demand.

Before proceeding, we should say a few words about the definition of the training expenditures. The companies were asked state their expenditures on training, carried out either by the company itself or financed by the firm (but conducted by someone else). The

¹³ Statistics Sweden provides individual-level training data and aggregate business-cycle indicators such as capacity usage in the manufacturing sector.

¹⁴ See Mellander and Savvidou (2001) for information about the *Plan survey's* structure and representativeness.

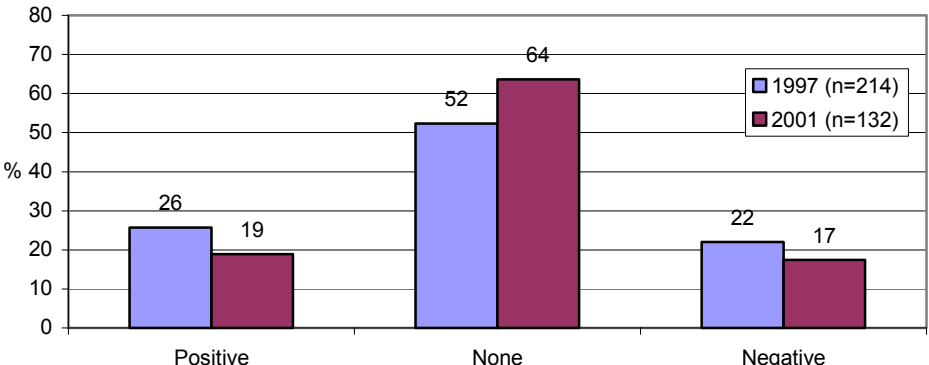
sums stated can safely be taken to include direct expenditures – salaries for instructors, rents, teaching materials, and wages for stand-ins for those participating in the training. However, costs of foregone production are, in general, not included.¹⁵ Accordingly, the training expenditures recorded are generally downward biased.

In principle, inclusion of costs for foregone production should be preferable from an economic point of view, in the sense that it gives a better account of the resources that have to be sacrificed to conduct the training. This presupposes, however, that companies are capable of providing good estimates of the cost of foregone production. In general, this presupposition is not justified; costs of foregone production are commonly estimated to be equal to hourly wage costs times the number of hours in training. While this will be a satisfactory estimate when the firm works at full capacity, it will over-estimate the cost when the firm does not make full use of its workes.

In the present context, there is also an argument to be made for excluding costs of foregone production. The reason is that we want to examine whether accounting standards constrain firm training. And accounting standards can only constrain training expenditures that result in payments, which costs of foregone production do not.

We start by studying relationships between training and capacity usage. *Figure 2* shows how in 1997 and 2001, companies regarded this relationship from a historical perspective. For both years, the response given by the *least* number of companies is the response that indicates a negative relationship, i.e. that training variation was counter-cyclical.

Figure 2. "How have training expenditures varied historically with the company's capacity usage?" Larger industrial companies, proportion of answers in %



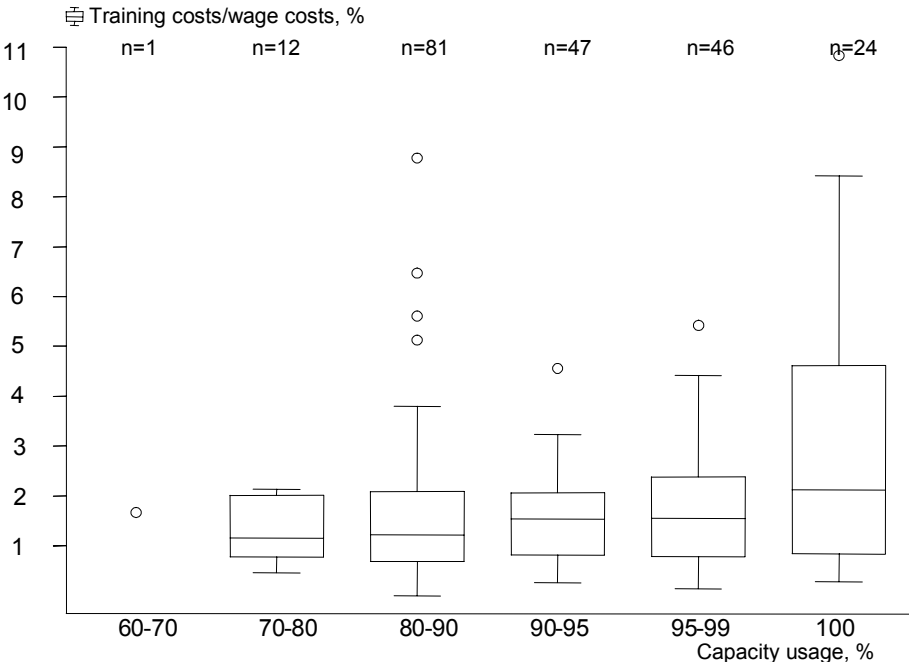
Source: Plan survey 1997, 2001

¹⁵ The reason why we know this is that on two occasion, 1996 and 2002, the companies in the Plan survey have been asked directly whether they include costs of foregone production in the training expenditures they report.

Both in 1997 and 2001, most companies selected the “no relationship” answer option. Nevertheless, for both years *Figure 2* gives the impression that the business cycle does not seem to affect training especially much, but if a correlation exists, it seems to be positive, indicating a pro-cyclical relationship. The difference between the positive and negative answers is not statistically significant, however.

The impression from *Figure 2* agrees well with how the relation between actual training and capacity utilisation varied between companies in 1996 and 2000. On the vertical axes in *Figures 3a and 3b*, training expenditures are measured in relation to total wage costs, in percent. By measuring training in this way, we account for the obvious fact that training expenditures should be larger, in nominal terms, in large firms than in small firms. Capacity utilisation is specified on the horizontal axes and is defined as the proportion of used

Figure 3a. Training expenditures relative to total wage costs, in %, by capacity usage (stratified), larger industrial companies, 1996



Source: Plan survey 1997

capacity of maximum capacity, in percent. Capacity utilisation is specified in intervals. The distributions of training expenditures are reported for each interval, by means of box plots.¹⁶ The number of firms observed in each capacity interval is given at the top of the figure.

On both occasions about 80 percent responded that they did include costs of foregone production.
¹⁶ The box plots are constructed as follows. The horizontal line inside the box represents the median. The boxes encompass observations that lie between the 25th and 75th percentiles. The line that extends up from the box has

Figure 3a, which covers 1996, indicates a positive relation between training expenditures and capacity utilisation. The median values in the boxes increase with the degree of capacity usage and as we move to the right in the diagram, the boxes (encompassing 50 percent of the observations in each class) also move upward.¹⁷

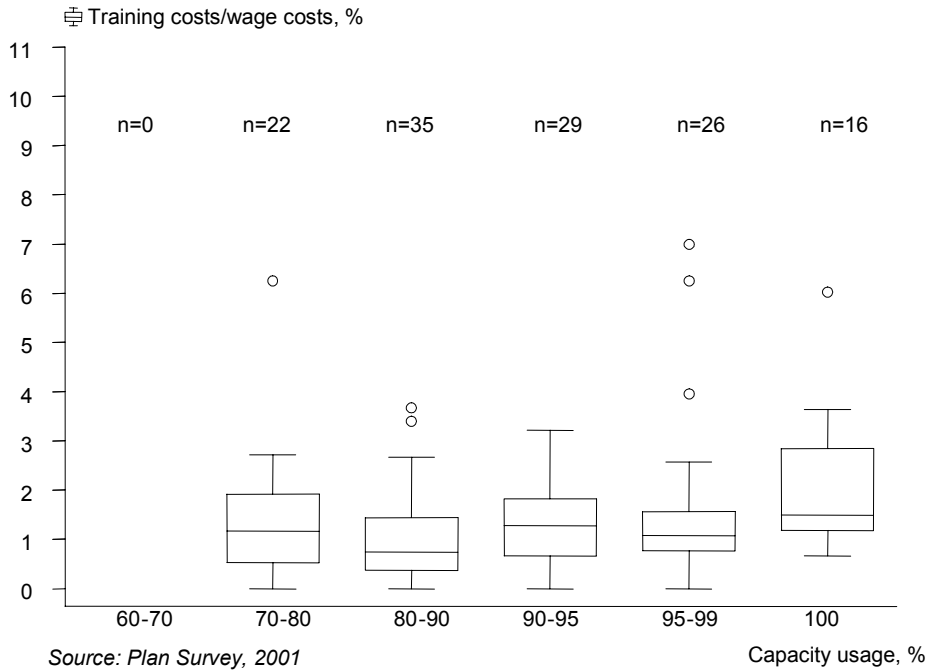
In *Figure 3b*, the positive correlation is weaker. The median values increase with the degree of capacity utilisation but not monotonously; a similar effect occurs for the box movements. It could be that the less clear-cut pattern in *Figure 3b* is due to the difference in the definition of training expenditures in 2000, as opposed to 1996; cf. above. As argued there, the definition of training expenditures used for the year 2000 will in general have the effect of over-estimating training costs at low levels of capacity utilisation.¹⁸

as its upper limit the largest observation that fulfils the criterion for lying, at most, 1.5 times the “box distance” from the box’s top edge. The line that extends down is defined in a corresponding way. Possible observations outside these demarcations are plotted as separate points.

¹⁷ The same pattern can be verified by means of regression analysis; regressing training costs over wage costs on dummy variables indicating the capacity intervals we obtain monotonously increasing point estimates. The estimate for the topmost interval is significantly larger than the other estimates.

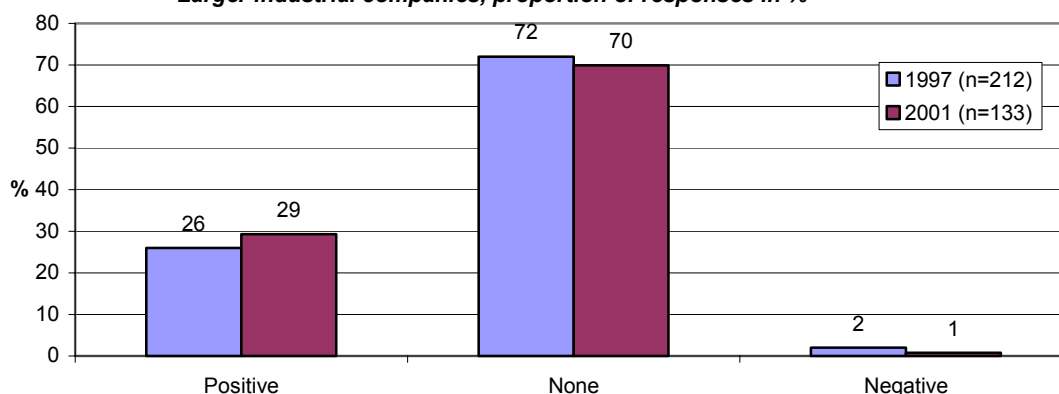
¹⁸ To check if our results are sensitive to the choice of measure of capacity utilisation, we also constructed diagrams similar to *Figures 3a* and *3b*, but where capacity usage is measured in terms of the proportion of the workforce that the company could do without while still maintaining the same level of production. The resulting pattern differ slightly from those observed in *Figures 3a* and *3b*, but the conclusion remains: training costs in relation to wage costs are higher when companies have less workforce reduction capability, *i.e.* when their capacity usage is higher. These diagrams are not included but are available upon request.

Figure 3b. Training expenditures relative to total wage costs, in %, by capacity usage (stratified), larger industrial companies, 2000



We now look at the relationship between companies' training efforts and profits. *Figure 4* shows what the companies think the relationship between training and profits has been historically. In both 1997 and 2001, a clear majority of the companies said that training and profit levels were not related to each other. But because the proportion of companies that claimed the relationship to be negative was totally negligible in both years, a considerable proportion of companies still said that the correlation between training and profit levels is positive – 26 percent in 1997 and 29 percent in 2001.

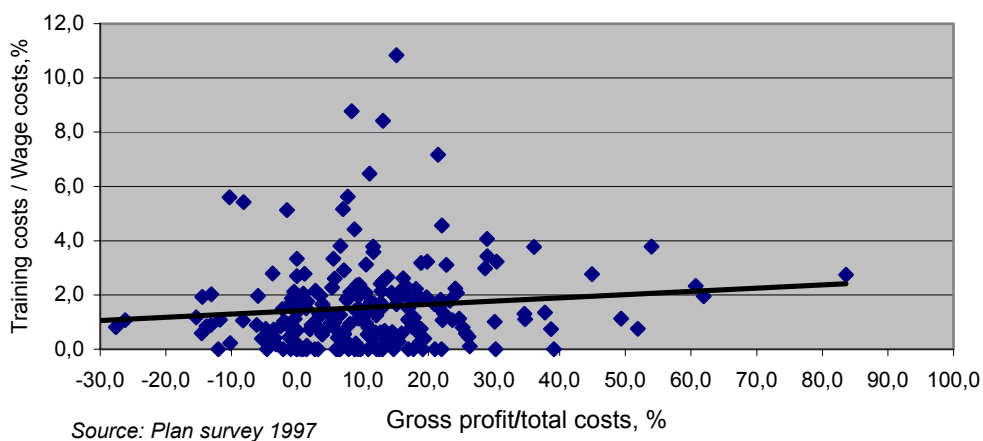
**Figure 4. "How have training expenditures varied historically with company profits?"
Larger industrial companies, proportion of responses in %**



Source: Plan survey 1997, 2001

Also in this case, the companies' responses to the retrospective questions agree with their actual behaviour the year before. In *Figures 5a-b* training expenditures are measured relative to total wage costs on the vertical axes, in percent. Gross profit in relation to total costs is measured on the horizontal axes, in percent.¹⁹ Each point in the diagrams represents one company. The solid lines are regression lines showing the linear relationship between the two variables. Both regression lines show a positive, albeit insignificant, trend, indicating a pro-cyclical relationship.²⁰

Figure 5a. Training expenditures relative to total wage costs in%, by gross profits relative to total costs in%, larger industrial companies, 1996

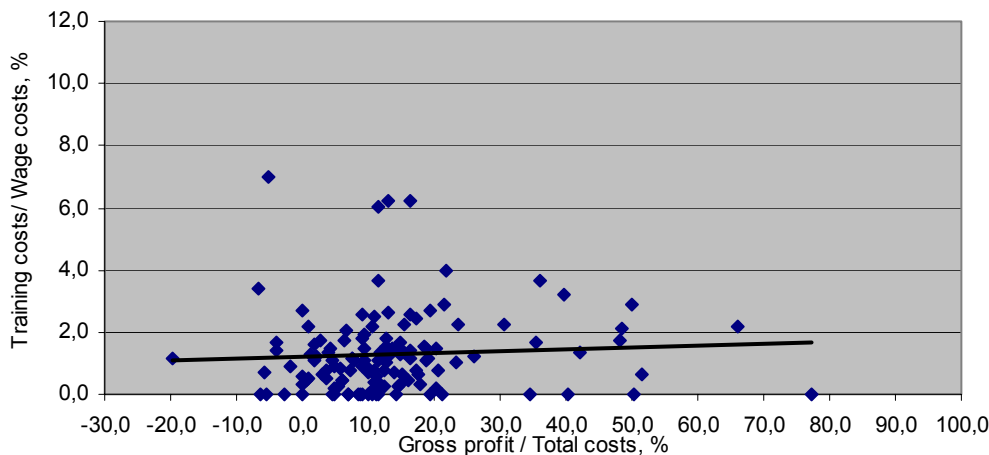


Source: Plan survey 1997

¹⁹ We define gross profit as: gross profit = total invoicing – total costs, which should correspond to the company's operating income before financial items.

²⁰ From visual inspection of the diagrams it might look as if quite a few observations lie on the horizontal axis, indicating that no training at all is conducted. However, this is an optical illusion. In the 1996 sample there is only one observation with zero training and in the 2000 sample there are eight. Deletion of the zero observations

Figure 5b. Training expenditures relative to total wage costs in %, by gross profits relative to total costs in %, larger industrial companies, 2000



Source: Plan survey 2001

One thing to note about *Figures 5a-b* is that there are several observations for which training costs are positive in spite of gross profits being negative. Our theoretical arguments in the previous section seems to imply that we should expect positive training expenditures only if gross profits are positive, too.

There are (at least) two explanations to the apparent anomalies in *Figure 5a-b*. A partial explanation is that in the diagrams gross profits are defined *net* of training expenditures, rather than before deductions for training expenditures, which would have been more in line with our discussion. A more important explanation is that our theoretical arguments concern *expected* profits, whereas the diagram show realized profits. The observations with negative profits and positive training expenditures may thus correspond to companies that, e.g., have experienced negative shocks to demand, making revenues smaller than expected.

In addition to these considerations it is important to emphasize that *Figures 5a-b* merely correspond to simple bivariate correlations. Controlling for some relevant firm-specific characteristics would be much desirable. As a first step in that direction, we have run regressions where training expenditures are regressed on gross profits²¹, controlling for, *i.a.*, investments in real capital, firm size and industry. Investments in real capital are included as they can either crowd out training or be in a complementary relation to training. Firm size is an obvious control variable as we know that training is more common and more extensive in

has very small effect on the slope of the trends. In fact, the trends are barely affected even if all observations are deleted for which training makes up less than 0,5 percent of total salary costs.

²¹ In the regressions, gross profits are defined *before* deductions for training expenditures, following the above discussion. Beside making more clear the interpretation of the gross profit variable as an indicator of the scope for training expenditures, this should decrease the risk for simultaneity bias in the gross profit coefficient.

larger firms than in smaller ones; see, e.g., Leuven and Oosterbeek (1999). Further, training varies across industries, making it necessary to control for the industry the firm belongs to.

Regarding other control variables, we noticed in Section 2 that the firm's (lack of) cash flow can be an important restriction on its training expenditures. Unfortunately, the Plan survey provides no information about the firm's cash flow. However, cash flow should be positively correlated with gross profits. The impact of cash flow on training expenditures will thus be partly captured by the coefficient for gross profits.²²

We do, however, have information about two other factors that should be important determinants of the company's training, namely the occupations and the (formal) education of the employees. Specifically, for 1996 we know the distributions over skilled white-collar workers, skilled blue-collar works and unskilled workers. For the year 2000, we have information on how the firm's employees are distributed over educational levels; elementary, upper-secondary and post-secondary.

To avoid negative estimated training expenditures we have specified the regressions to be log-linear. As is well-known, this also has the added advantage that the estimated coefficients can be interpreted as elasticities.

From a statistical point of view, there is a potential problem with using ordinary least squares (OLS), as we do here, since it means that only companies with positive training expenditures are included in the regression. This will bias our estimates to the extent that there is a fundamental difference between companies with zero training expenditures, on the one hand, and very small training expenditures, on the other hand. In the present context there are no *a priori* grounds for this to be the case. Moreover, as noted in footnote 20 the number of observations with zero training expenditures is very small. Nevertheless, as a simple check on whether these observations matter for the results we have estimated the regressions in levels (rather than in logs) with and without the observations with zero training costs. This turns out to have negligible effects on the results.²³

A similar issue concerns the explanatory variable of primary interest, i.e. the gross profit profit variable. Gross profits can be zero or negative, in which case the log of gross profits is not defined. As a result, companies that have zero or negative profits but nevertheless positive training expenditures will not be included in the estimation of the log-linear regressions. Even when gross profits are defined before training expenditures there are 21 such observations in

²² This is a standard case of omitted variable bias; see, e.g., Greene (1993, p. 246-247). Here, this bias will have the effect of over-estimating the effect of gross profits on training expenditures.

²³ These results are available on request.

the 1996 sample, out of a total of 171 observations, and in the 2000 sample we find 6 out 100. If these observations are manifestations of cases where negative shocks have resulted in realized profits being (considerably) lower than the expected profits that we are interested in, as we conjectured above, then it does not seem unnatural to disregard them. However, it is still important to try to establish whether doing so matters for the results. Below, we will therefore briefly report on a sensitivity analysis of this issue.

Table 1a shows the results for the year 1996. The first regression includes only the explanatory variables that are available for the year 2000 as well. The coefficient for the gross profit variable is positive, as expected, and significant at the 1 percent level. The estimated coefficient indicates that 1 percent increase in gross profits will increase training expenditures by 0.19 percent. Investments in real capital also has a strongly significant effect on training expenditures. The coefficient is positive, indicating a complementary relation between real capital investments and company training. This seems quite natural – training is often required in connection with real capital investments in order to enable efficient use of the new equipment.

As expected, the number of employees has a positive and very significant effect on training expenditures. The magnitude of the effects is very similar to the impact from real capital investments; in both cases increases of 1 percent increase results in approximately 0.3 percent increases in training expenditures. The five industry-specific intercepts are significant at the 1 percent level, too.²⁴ The regression explains more than two thirds (68 percent) of the variation in training expenditures, indicating that the simple model performs quite well.

When including the shares of skilled blue-collar workers and skilled white-collar workers [regression (2)] we find that the latter has a significant positive effect on training, compared to the reference category, *i.e.* unskilled workers. The effect of the share of skilled blue-collar workers is not significantly different from the share of unskilled workers, however. These results are in line with the previous empirical findings showing that skilled personnel, especially white-collar workers, get more training than unskilled workers; see, *e.g.*, Leuven and Oosterbeek (1999). Furthermore, it is reassuring that including information about the firm's occupational structure has a negligible effect on the estimate of the impact of gross profits on training expenditures.

²⁴ The industry dummies are based on the five industry categories defined in the Plan survey.

Table 1a: Regression of training expenditures on gross profits, controlling for firm characteristics, 1996

Dependent variable: ln training expenditures				
Explanatory variables	(1)		(2)	
	Est.	Std .err.	Est.	Std .err.
ln gross profits ^a	0.190***	0.067	0.202***	0.070
ln real capital investments	0.290***	0.067	0.264***	0.074
ln # employees	0.319***	0.113	0.346***	0.001
ln share of skilled blue-collar	-	-	-0.005	0.104
ln share of skilled white-collar	-	-	0.228**	0.103
Industry dummies:				
Raw materials	-2.869***	0.554	-2.418***	0.615
Construction materials	-3.176***	0.560	-2.792***	0.608
Intermediate goods	-3.163***	0.515	-2.802***	0.553
Investment goods	-2.821***	0.534	-2.53.3***	0.575
Consumption goods	-3.153***	0.546	-2.720***	0.597
	R2: 0.68		R2: 0.69	
	n=150		n=130	

^a Gross profits = total invoicing – total costs, net of training.

Training expenditures, gross profits and real capital investments are all in millions of SEK.

*, **, and *** denote significant at 10, 5, and 1 % respectively.

Table 1b shows the results for 2000. In the first regression, the gross profit variable is significant at the 1 percent level and similar in magnitude to the 1996 coefficient. The estimated coefficients for the firms real capital investments and number of employees are also positive and significant. Compared to the corresponding estimates for 1996 the magnitudes of the point estimates are different, however. In particular, the coefficient for the # of employees is considerably larger than in the 1996 sample. However, the confidence intervals for the 1996 and 2000 estimates overlap, indicating that the difference in the point estimates is not statistically significant.

Like in 1996, all the industry dummies are strongly significant. The goodness of fit is even better than in 1996; the model explains more than 80 percent of the variation in training expenditures. However, this probably partly due to the number of observations being smaller in 2000, due to a lower response rate in 2000 than 1996.

In the second regression, where information on the share of workers with upper-secondary and post-secondary education is included the number of observations is smaller still, as these variables have many missing values. Somewhat surprisingly, these variables do not have significant impacts on training expenditures, compared to workers with elementary school – as noted above, previous research suggests that large shares of highly skilled / educated workers are often associated with large training expenditures. Also, the estimated effects of

gross profits, real capital investments and # employees changes quite a bit when the educational variables are included. With respect to real capital investments the change is significant, too. It's hard to judge to what extents the changes are due to multicollinearity problems or to the reduction in the number of observations. Due to these considerations, it does not seem justified to attach too much importance to this regression.

Table 1b: Regression of training expenditures on gross profits, controlling for firm characteristics, 2000

Dependent variable: ln training expenditures				
Explanatory variables	(1)		(2)	
	Est.	Std. err.	Est.	Std. err.
ln gross profits ^a	0.227***	0.068	0.315***	0.085
ln real capital investments	0.203**	0.086	0.071	0.112
ln # employees	0.672***	0.142	0.808***	0.195
ln share upper-secondary educ.	-	-	-0.075	0.178
ln share post-secondary educ.	-	-	0.216	0.142
Industry dummies:				
Raw materials	-4.968***	0.643	-5.508***	0.937
Construction materials	-5.885***	0.710	-6.419***	1.038
Intermediate goods	-5.098***	0.614	-5.520***	0.881
Investment goods	-4.884***	0.645	-5.255***	0.899
Consumption goods	-5.283***	0.630	-5.822***	0.921
	R ² : 0.83		R ² : 0.87	
	n=94		n=66	

^a Gross profits = total invoicing – total costs, net of training.

Training expenditures, gross profits and real capital investments are all in millions of SEK.

*, **, and *** denote significant at 10, 5, and 1 % respectively.

To what extent are the results in *Table 1a-b* sensitive to the omission of observations for which gross profits are zero or negative while training expenditures are positive? One way to shed light on this issue is to change the regressions very slightly, by substituting gross profits for ln gross profits. Given this change in the specification, the regressions can be rerun on i) the same companies as in *Table 1a-b* and ii) an extended set of observations, including companies that reported zero or negative profits. In these regressions, the coefficients for gross profits are as easily interpreted as when gross profits are in logarithms. This is not important here, however. The interesting question is whether the coefficient estimates obtained under i) and ii) are different. We have tested this on the number (1) regressions, i.e. those for which the explanatory variables are the same in both 1996 and 2000.

For both 1996 and 2000 the estimates obtained under i) and ii) are very close, the differences are not anywhere near significant. Moreover, neither of the estimates for 1996 are

significantly differ from any of the two estimates for 2000.²⁵ We thus conclude that the fact that observations with zero or negative profits are excluded from the regressions reported in *Table 1a-b* has not affected our results.

To sum up: we have now studied in several different ways how training in larger industrial companies' varies over the business cycle. Training has been related to two different business-cycle indicators, capacity usage, and profits. And each of these two relations were investigated by means of alternative methods. Without exception, we find that training has varied pro-cyclically rather than counter-cyclically.

With respect to the discussion of tax allocation funds in section 2.3, these results are consistent with our conjecture that tax allocation funds only to a limited extent have been used for training purposes. Had the funds really been instrumental in alleviating the adverse effects generated by the accounting standards we would have expected to see more of a counter-cyclical training pattern.

Unfortunately, lack of data prevents us from examining whether a similar pro-cyclical pattern for training prevails also in other sectors than manufacturing, i.e. in the private and public service sectors. However, it will be shown below that the manufacturing sector does not differ very much from other sectors in the economy, as far as the volume of training is concerned. We can but conjecture that this is true with respect to the timing of training, too.

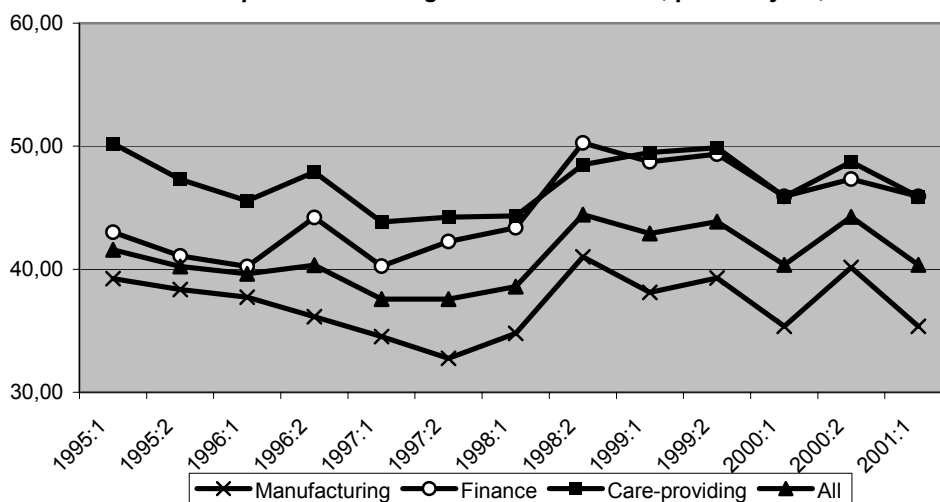
4. The volume of employer-sponsored training

Structural changes and rapid technological developments force training needs to increase over time. One manifestation of this is the by now general adaption of the concept of *life-long learning*, meaning that adults must continuously add to and update the basic knowledge they acquired in the regular education system. The economics literature also contains much evidence on the importance of workers' skills for successful implementation of new technologies; see, e.g., Piore (1968), Mincer (1991) and Gunnarsson et al. (2001).

The amount of training undertaken by a firm depends on the number of participants and on the length of the training sessions. *Figure 6a* and *Figure 6b* illustrate these two dimensions, which are based on statistics from Statistics Sweden. The data are reported for selected sectors and for the entire economy (all sectors).

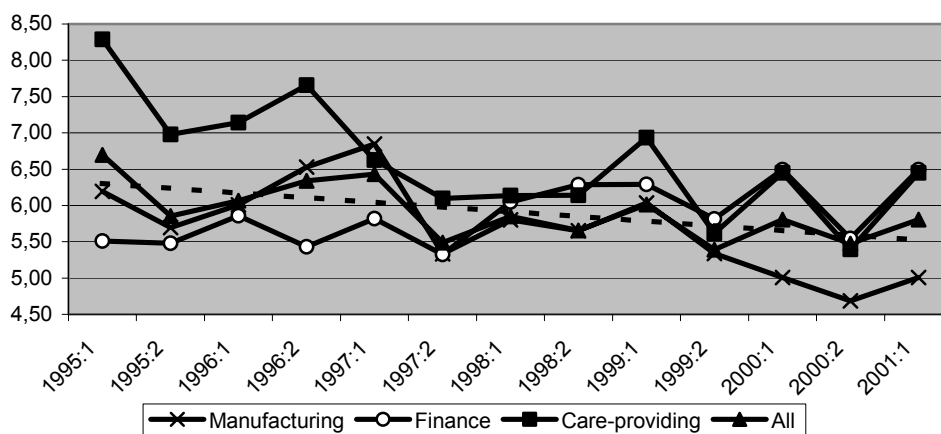
²⁵ The results are available on request.

Figure 6a. Proportion of employees who participated in employer-provided training in different sectors, per half year, %



Source: Statistics Sweden (SCB)

Figure 6b. Average number of training days for participants in training, per half year



Source: Statistics Sweden (SCB)

Figure 6a shows that for the entire economy, the number of participants has remained rather stable at about 40 percent since the mid-1990s. In the sectors studied, the proportion of employees who participated in some type of training has not exceeded 50 percent since the mid-1990s. In the care-providing sector (medical care, health care, child care, and care for the elderly) and the finance sector, participation reached 50 percent in the late 1990s but became somewhat lower in the early 2000s. The finance sector is the only sector showing an increase in participation during the period; it increased from about 40 percent in the mid-1990s to 45-50 percent in the second half of 1998.

Figure 6b shows that the average number of training days per training participant declined in all sectors except finance, which during the late 1990s experienced an upswing that was

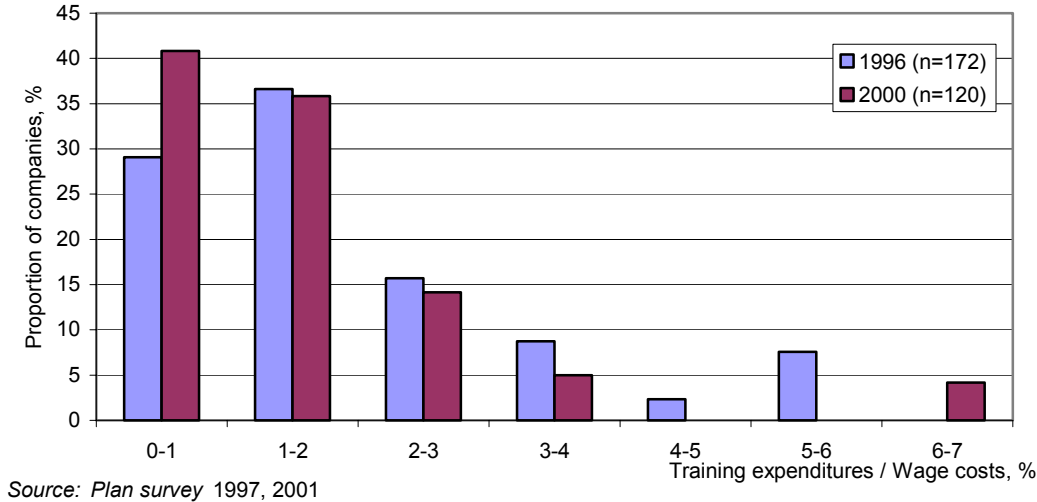
followed by a downswing to the mid-1990's level. The reductions in the care providing and manufacturing sectors are quite notable. For the entire economy, the number of training days was reduced by about one day during the period – from almost 6.5 days in the mid-1990s to about 5.5 days in the early 2000s (see the dashed line in the diagram).

In summary, participation remained rather constant, while the number of training days was somewhat lower. Constant or slightly reduced training is not in line with the increase in training needs that appears to have taken place during the 1990s.

It might be objected that data on participation levels and number of training days do not account for changes in quality of training. It is conceivable that, over time, employers could have increased training effectiveness by investing larger resources per training day. To analyse this possibility, we need data about training costs, by firm. Official statistics do not provide such data for the period 1995-2000. However, for large manufacturing firms, training costs are available in the aforementioned Plan survey.

Figure 7 shows how much the companies queried in the *Plan survey* spent on training in relation to their total wage costs. The figure covers 1996 and 2000, that is, the start and end of the period reported in *Figures 6a and 6b*. We see that during both years, the vast majority of the companies spent at most 2 percent of their total salary costs on training. Furthermore, the proportion of companies that spent that modestly, increased from about 65 percent in 1996 to more than 75 percent in 2000. Thus, also when we look at costs, we find that, if anything, the of amount training has gone down over time.

Figure 7. Distribution of (larger) companies over training expenditures relative to total wage costs, in %, 1996 and 2000



5. Proposed measures

In this section we outline two proposals that can change the time profile of employer-sponsored training, so as to make it more counter-cyclical, and, at the same time, increase the amount of training conducted. The proposals focus on the income and cash flow restrictions facing the firm, because these constraints can be affected by political decisions.

We believe that it is desirable to influence both cash flow and income restrictions. As mentioned earlier, training expenditures must be financed with internally generated cash. The cash-flow restriction is of central importance because if cash is unavailable to finance training, then training will not occur, even if the profit margin allows for it.

The two proposals do not impose any constraints on the existing possibilities to conduct employer-sponsored training. The intention is to make suggestions which allow the firms to do what they do today plus somewhat more. The additional possibilities are created by facilitating the undertaking of larger training programs during economic downturns. Thus

The proposals are thus explicitly aimed at affect the timing of employer-sponsored training. However, they will also affect the volume of training, for two reasons. First, the increased flexibility gained by the firm with respect to the timing decision will by itself have a positive affect on the amount of training. Secondly, the fact that this increased flexibility stems from increased opportunities to conduct training when the opportunity cost for doing so is lowest has an additional positive effect – a price effect – on the volume of training. Of course, alleviation of firms' cash-flow constraints strengthens these tendencies even further.

The following subsections discuss the two different proposals. The first addresses the discrepancy between the Annual Accounts Act and its application. The second proposal is inspired by the tax allocation funds. Both proposals contain a component that affects the cash-flow restriction. Our proposals being mere sketches, we do not take a stand on the technical realisation and the numerical values of the different policy parameters. It should also be added that the proposed measures to ease the income and cash flow restrictions need not be implemented together – they can also be carried out separately.

5.1 Proposal 1: Change the accounting standards for training expenditures

A simple way to ease the firm's income restriction is to change the accounting standards for training expenditures so that the standards are adapted to the Annual Accounts Act and its intentions. This measure creates extra spending opportunities by lowering costs during the

year in which the training expenditures are made. It does so by treating the training expenditures as an investment.

During the year in which the training is carried out only a portion of the expenditures, the depreciation, affects the firm's costs. This increases the possibilities for the firm to make larger training expenditures during recessions, when extra spending opportunities are otherwise reduced. In return, training expenditures will affect income over several years, through future depreciations.

The cash-flow restriction can be eased if payroll taxes are reduced in connection with the company's training investment. The simplest possible variant is to let the reduction in the payroll taxes be proportional to the training expenditures. This measure facilitates the financing of training expenditures, particularly during recessions when cash flow is often strained. Using payroll taxes for this purpose can be motivated in at least two ways.

First, the largest training-related cost is probably the cost for lost production. Total salary costs dominate these costs. To ease the expenditure burden, it is therefore natural to use instruments that affect salary costs.

Second, payroll tax reductions are used to stimulate employers to contribute to so called individual learning accounts (ILA), aimed at increasing training at the individual level. Such accounts have been tried in the UK and currently are being discussed in Sweden. A reduction in payroll taxes in connection with firm training expenditures can be justified on the ground that it would help avoid asymmetrical treatment of employers' expenditures on firm training and on ILAs.²⁶

In principle, this proposal is simple and straightforward. It is also has the advantage that it makes the Annual Accounts Act and the accounting standards more consistent with one another.

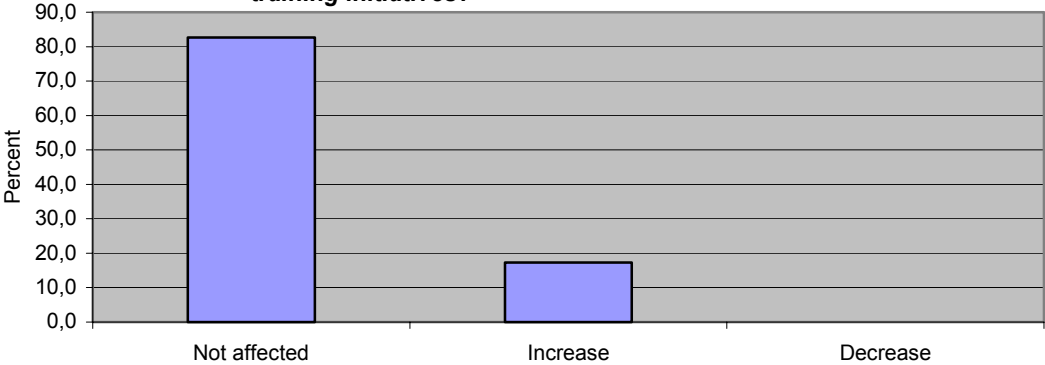
Implementation of the proposal could cause problems, however. It is not obvious that the standard-setting organisations can be forced to change their standards – especially not the private organisations (like the Financial Accounting Standards Council in Sweden). The proposed change also works against ongoing international harmonisation of accounting pursued by the International Accounting Standards Board (IASB). By so doing, it is bound to meet with protests from the domestic standard-setting organization which often perceive as one of their primary tasks to follow international guidelines. Finally, certain administrative

²⁶ Asymmetrical treatment of employers' expenditures on training expenditures and contributions to ILAs increases the risk for employers replacing part of their own training activities with training acquired through the ILAs. See Mellander and Savvidou (2001) and Ericsson (2002) for discussions of this displacement problem.

support is needed to deal with the suggested reduction in payroll taxes. Companies will have to prove to the tax authorities that the expenditures they use for calculating their tax reductions really are intended for training purposes.

To get an idea of what companies would think about this type of proposal, we asked a hypothetical question in the *Plan survey 2001*. *Figure 8* reports the response.²⁷

Figur 8: "If the possibilities to capitalize training expenditures were improved, how would this effect the scope of your firm's training initiatives?"



Source: *Plan survey 2001*

Responses to questions of this type must be interpreted with great care because the companies' responses put them under no obligations. However, with this in mind, a remarkably small proportion of companies said that their training expenditures would increase. Perhaps one explanation for the low proportion is that companies anticipate some of the problems that we have just noted.

5.2 Proposal 2: Implement personnel training funds (PTFs)

This proposal also mitigates the income restriction by increasing the spending opportunities during the year that the training is implemented. It does so without changing the current status of training expenditures, however. The entire training expenditure is still to be written off immediately.

The extra spending opportunities are created through the tax system, rather than through the accounting system, as is the case in Proposal 1. Companies can set aside a portion of their

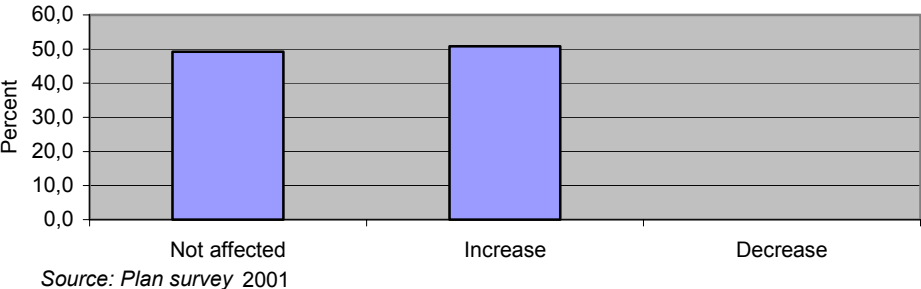
²⁷ In the question we indicated that we meant that it would be easier to take up training expenditures on the balance sheet and write them off over several years. We did not, however, consider the cash-flow restriction in our question, nor did we explicitly allow for the possibility that the proposed measure can affect the timing of training. Indirectly, however, we left open the possibility of a change in the time profile. As should be clear from the above discussion, if increased possibilities to capitalise training expenditure do increase the amount of training, then a large part of this increase will probably to come about through a change in the timing of training.

income in a personnel training fund (PTF) during years with good income. During years with less income (economic downturns), companies can draw on the PTF to create extra spending opportunities *if*, in the same year, the company implements training that costs at least as much as is being drawn from the fund. Training costs will thus be totally or partially neutralised (in terms of income) via the PTF. Like the first proposal, this proposal can be complemented by a reduction in pay-roll taxes, in order to ease the firm’s cash-flow constraint.

As has been indicated in both the theoretical and the empirical discussion, existing general-purpose tax allocation funds are probably not used for training purposes to a very large extent; other, less risky, uses are likely to be considered first. To set up a fund specifically for training purposes is a way to indirectly make training expenditures a higher priority.

Companies support the idea that there is a need for a special tax allocation fund for training; see *Figure 9* in which we report responses to another hypothetical question in the *Plan survey 2001*.²⁸

Figure 9 “Assume that it would be possible to annually set aside nontaxable income for special personnel training funds (compare tax allocation funds). How would this effect your training expenditures?”



Half of the companies said that their training expenditures would be affected positively if special training funds were established. This must be considered as a high proportion. Of course, we have to remember that, the companies did not commit to anything. However, had the companies’ responses been motivated by purely tactical reasons, we would have expected an even higher proportion indicating positive effects. This is because the way in which the question is formulated means that companies are offered an opportunity to move company tax payments forward, without having to refrain from something else in return.

Compared to the first proposal, this proposal is easier to implement – all that is needed is a change in the tax system. Because the tax allocation funds are used as a model, it is also easy to design the PTF. Implementation of this proposal is also simplified when it comes to the

²⁸ The qualifications made with respect to Figure 8 apply to Figure 9, as well; see footnote 27.

cash-flow restriction because no extra evidence (documentation) is needed for the tax authorities. The evidence required to prove that the reduction really applies to training must have been prepared earlier, in order to use the PTF.

6. Conclusions

Present accounting standards do not allow firm training expenditures to be treated like investments. And human capital formation, of which employer-sponsored training constitutes an example, does not create its own collateral, unlike investments in real capital. Our theoretical analysis of how these features might affect training generated two empirical implications. According to the first, training will tend vary pro-cyclically rather than counter-cyclically, despite the fact that the opportunity cost of employer-sponsored training is highest during boom periods and lowest during economic downturns. According to the second, more vague, implication the amount of training will be “too low”, relative to training needs.

Both of the empirical implications were supported by empirical data for Sweden. Training occurs more frequently during booms than during recessions, i.e., the pattern is the reverse of what is desirable from a stabilisation policy perspective. This result is not sensitive to the choice of business cycle indicators. And we did not see any signs indicating that the amount of training increased during the second half of the 1990s, despite increased need for continuing education and life-long learning. Whether we measured training in terms of time spent or in terms of outlays had no effect on this finding.

We formulated two general proposals that should make training more counter-cyclical and increase the amount of training conducted.

The first proposal is to adapt the accounting standards to the Annual Accounts Act (AAA). Unlike the accounting standards, the AAA gives companies opportunities to capitalise training expenditures and strongly recommends that these opportunities are used when the effects of the training extend over more than one year. This proposal reduces barriers associated with companies' income statements when it comes to training implementation during recessions. To also mitigate the limitation caused by strained cash flow during economic downturns, we propose that when the training investment is made the company receives a reduction in payroll taxes, proportional to the size of the investment.

The second proposal does not affect current accounting practices; the entire training expenditure will still be taken up as a cost during the year that expenditures are incurred. Instead, extra spending opportunities are created via the tax system, by implementation of a

special personnel training funds (PTF). The design of the PTF is analogous to the existing tax allocation fund, i.e. companies can set aside a proportion of their income in the fund during good years. The company can then draw upon its PTF during economic downturns, thereby creating extra spending opportunities, *provided* that the redrawal is used for training purposes. This proviso is what distinguishes PTFs from traditional tax allocation funds. Relative to the existing general-purpose tax allocation funds, establishment of the PTF supports training expenditures because these expenditures need not compete with other purposes when it comes to extra spending opportunities, which is the case with the current tax allocation funds. The PTF can also be combined with a complementary reduction in payroll taxes to ease the firms cash-flow constraint.

Comparing the two proposals, we conclude that the second is preferable over the first. The second proposal is easier to manage. It requires a change in tax legislation, and the change is simple because the PTF essentially builds on existing tax allocation funds. While the first proposal certainly is easy to implement in a technical sense it will be associated with considerable practical problems. The main reason is that the national and international organisation that are responsible for formulating the accounting standards are quite independent and cannot easily be forced to change their recommendations.

The second proposal might lead to a somewhat heavier administrative burden, as it requires monitoring to ensure that withdrawals from the PTF correspond to at least equally large training expenditures. However, if a system with payroll tax reductions is also enacted then the training expenditure have to be verified by the tax authorities anyhow.

The companies themselves seem to perceive the second proposal as more interesting. We should emphasise, however, that the questions used to uncover the companies' viewpoints on the two proposals are purely hypothetical and in no way put obligations on the companies. This of course limits the reliability of the responses. But because this applies to both questions, the information that reveals the companies' *relative* evaluation of the proposals will still be of value. From a purely economic viewpoint, it is not strange that the companies prefer the PTF proposal – rather than a change to the accounting standards – because the PTF would be advantageous from a tax perspective.

Finally, it is important to emphasise that the changes we propose are not just positive for companies. To reduce the volatility in employment over the business cycle and to increase the amount of training is particularly important for the employees.

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