Transferable training and the collective action problem for employers: An analysis of further education and training in four Norwegian industries

Lars-Henrik Johansen

A dissertation submitted for the degree of Ph.D. (Econ.)

Faculty of Economics
The London School of Economics and Political Science
University of London

1999

ProQuest LLC
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106-1346

To my parents and Thor Hallgeir

Abstract

The potential significance of employers' collective action for economic performance is widely acknowledged, but has not been complemented with corresponding theory-guided research on the probability of collective action and the conditions for effective action.

This thesis examines the nature of, the conditions for, and the consequences of employers' collective action on further training, a crucial component of a successful high-skill strategy for industries and nations. The study addresses three core issues of labour economics: transferability of training, skill shortages, and sharing of training costs between employer and employees.

The enquiry builds on and adds to previous contributions that analyse transferable training as a collective good. It scrutinises the theoretical foundation and compares its implications with those of human capital theory. Finally, the empirical study of further education and training in four Norwegian industries is offered as a strategic test of these two alternative theories.

The collective action perspective shares core assumptions of human capital theory, but integrates the possibility of collective action as a solution to some of the market failures associated with investment in transferable human capital. This alternative view also predicts in what labour market settings such action is likely to occur, building on Olson's work and theories of employers' collective action.

The collective action perspective differs crucially from human capital theory by predicting that transferability is endogenous i.e. significantly shaped by employers' individual and collective action, and not simply by technology. Thus, 'endogenous transferability' is a principal

link between the constitution of labour markets and employers' choice of training and skill supply strategies.

The results confirm the prediction that transferability is 'endogenous'. Moreover, they suggest that employers' collective action is more likely to succeed in ensuring transferability and encouraging employee investment than is using sanctions against employers to promote employer-financed transferable training.

Contents

List of tables and figures

Tables

Figures

Acknowledgements

Unfortunately, all I have to offer those who have given me tremendous support and ensured that I have had a terrific time during the course of this project, is this thesis and some humble thanks.

First, I am greatly indebted to David Marsden, and his invariable encouragement and excellent guidance. I am also grateful to the *'Fafoists'* for their first rate support during my fieldwork in Norway. And all the welcoming people I have interviewed deserve special thanks for sacrificing their precious time and giving forthright answers to my countless questions.

I also acknowledge the financial support from a number of sources, in particular The Norwegian Research Council through the 'Education and training, qualifications and economic activity' programme.

Finally, thanks to Elin, whose smile and warmth can make up for days of futile toil in front of the computer.

Abbreviations and translations

AF	Federation of Norwegian Professional Associations (*Akademikernes Fellesorganisasjon*)
BI	Norwegian School of Management (*Bedriftsøkonomisk institutt*)
EEA	European Economic Area (*Europeisk økonomisk samarbeidsområde*)
EU	The European Union (*Den europeiske union*)
FA	The Association of Employers within Insurance (*Forsikringsselskapenes arbeidsgiverforening*)
FL	Norwegian Insurance Employees Union (*Forsikringsfunksjonærenes Landsforbund*)
ILO	International Labour Organization (*Den internasjonale arbeidsorganisasjon*)
KS	Norwegian Association of Local Authorities (*Kommunenes sentralforbund*)
KUF	Ministry of Education, Research and Church Affairs (*Kirke-, utdannings- og forskningsdepartementet*)
LO	Norwegian Confederation of Trade Unions (*Landsorganisasjonen i Norge*)
NAF	*Norske assurandørers forbund* (*No English translation exists*)
NAI	Norwegian Academy of Insurance (*Forsikringsakademiet*)
NFF	Association of Norwegian Insurance Companies (*Norges Forsikringsforbund*)
NHO	Confederation of Norwegian Business and Industry (*Næringslivets hovedorganisasjon*)
NIF	Norwegian Society of Chartered Engineers (*Norske Sivilingeniørers Forening*)
NITO	Norwegian Society of Engineers (*Norges Ingeniørorganisasjon*)

NL	Norwegian Union of Teachers (*Norsk Lærerlag)*
NSF	Nurses Association (*Norsk Sykepleierforbund)*
NTNU	Norwegian University of Science and Technology (*Norges teknisk-naturvitenskapelige universitet)*
OECD	Organisation for Economic Co-operation and Development (*Organisasjonen for økonomisk samarbeid og utvikling)*
PDC	Professional Development Certificates (*No Norwegian translation exists)*
PIL	*Prosessindustriens Landsforening* (No English translation exists)
RHHS	National Council for Health and Social Work Education (*Rådet for utdanning i helse og sosialfag)*
SHD	Ministry of Health and Social Affairs (*Sosial- og helse-departementet)*
TBL	The Federation of Norwegian Manufacturing Industries (*Teknologibedriftenes Landsforbund)*
YS	Confederation of Vocational Unions (*Yrkesorganisasjonenes Sentralforbund)*

The Labour court *(Arbeidsretten)*

Finance Sector Union – Norway (*Finansforbundet)*

National Council for Engineering Education (*Ingeniør-utdanningsrådet)*

Teachers Association (*Lærerforbundet)*

Teacher Training Council (*Lærerutdanningsrådet)*

The Network Norway Council (*Norgesnettrådet)*

National Cancer Hospital (*Radiumhospitalet)*

National Hospital of Norway (*Rikshospitalet)*

Norwegian Board of Health (*Statens helsetilsyn)*

Section for Continued Training of Teachers (*Statens lærerkurs)*

State Educational Loan Fund (*Statens lånekasse for utdanning)*

1. Introduction

1.1 The research question

The purpose of this thesis is the study of the conditions for and the nature and consequences of employers' collective action on further education and training. It draws on collective action theory together with the basic principles of training as an investment, and the notion of transferable training as a collective good, to show how this approach diverges from human capital theory. This alternative view predicts that, depending on institutional and labour market structures, some market failure problems of transferable training might be overcome through collective action by employers, and predicts under what conditions such action is likely to occur. The empirical study is designed to test three pairs of hypotheses derived both from human capital theory and this alternative perspective, in order to assess the value of incorporating employers' collective action in economic theory of transferable training.

The structure of the argument is quite simple: the basic assumption is that for both employers and employees training is an investment; if strict conditions concerning information and competition are fulfilled, some optimal amount of training will be provided, but if parties other than those investing benefit from the transferable training, too little will be provided.[1] According to human capital theory this would reflect a market failure, and the only guarantee of the right amount of transferable training being provided is a 'perfect' labour market.

[1] Taking into account that training makes an employee more valuable for other firms, Hendry, Arthur and Jones (1994: 203) argue that 'any single firm faces a strategic dilemma between contributing to learning and retaining ownership of it.'

The alternative view states, on the other hand, that the problem of externalities might be solved if employers were to act collectively. If successful, such action can ensure that the outcomes are the optimal for the group of employers as a whole. One problem, however, is that since each individual employer has an incentive to free ride while other employers contribute, collective action may not occur although it would be the rational option for employers as a group. Therefore a powerful superordinate body might be needed to induce employers to collaborate. Both employers' organisations or the national government might constitute such a 'powerful body,' so there need be no dichotomy between state and non-state solutions. In addition to this institutional solution, collective action might also result from interaction between a small group of large employers. However even if there is collective action to address the collective action problem of transferable training, the action might be counterproductive or it might address only one of several related problems of training provision.

The three separate problems of sharing training costs, ensuring that training is transferable and providing sufficient training are all collective action problems that need to be addressed and adequately resolved. If these problems are solved through collective action by employers, it means that the 'market failure' problem of transferable training might also be solved, even if the labour market is not 'perfect' and that institutions and employer collaboration may be more important determinants of training outcomes than labour market competition alone. Moreover, since the alternative view predicts that collective action by employers is least likely if there is strong labour market competition and no superordinate powerful body, fiercer labour market competition does not necessarily mean that the market failure problem is less severe.

Hence many of the predictions of the collective action perspective contrast with those of human capital theory. Still, a salient feature of the alternative perspective is that is does not violate standard assumptions of economic theory. Training is seen as an investment that improves

productivity, agents are assumed to maximise utility or profit and, at the point of departure, markets are assumed to be efficient. Thus the alternative view is simply developed by integrating the economic theory of collective action with human capital theory. Therefore it may be seen both as an independent alternative to human capital theory and also as a possible development of the theory.[2]

1.2 Structure of the thesis

The thesis is divided into four parts each with a different aim. The purpose of this chapter and chapters 2 and 3 is to set out the research question, based on an analysis of background and core theory that results in the proposal of two sets of hypotheses to be tested in the empirical study. This first part also aims to show that while the thesis builds on established theories and examines core issues within education and training research, it also goes beyond established theories through their further development, and designs an empirical study to critically evaluate human capital theory versus the alternative perspective. After the introduction to the research question followed by a brief overview of the arguments introduced above, this chapter goes on to examine the significance of the research, and to show how previous research has treated the role of employers' organisations in training provision. The next part presents existing research on each of the three main topics: cost sharing, transferability and amount of training. The purpose of chapter 2 is to derive hypotheses from human capital theory on each of these topics. In order to do this Becker's human capital theory is complemented by more recent human capital contributions which have modified the original model. In chapter 3, a set of alternative hypotheses is developed in order to facilitate a test of the two theories. The bulk of the chapter

[2] However, chapter 8 will show the importance of collective action as an institutional basis for transferability and labour market competition, and discuss the possibility of integrating collective action theory and human capital theory.

explains how the notion of transferable training as a collective action problem can be developed to constitute an alternative to the theory presented in chapter 2.

The purpose of the second part of the thesis, chapter 4, is to provide a link between the hypotheses and the empirical study. The chapter explains how the empirical research is designed and how four industries are selected in order to test the three pairs of hypotheses. The chapter also provides the necessary information on the Norwegian labour market and presents the existing types of formal further training offers in the four cases.

Chapters 5, 6 and 7 present the results of the empirical study and explain where the empirical results support or conflict with the two theories. Each chapter treats one pair of hypotheses. Chapter 5 examines the way employers act or fail to act to ensure that further training is transferable; chapter 6 looks at how employers and employees share the costs of training; the topic of the last chapter in this section is the extent to which the two theories can or cannot explain the existence of skill shortages or deficiencies. The final part, chapter 8, summarises and evaluates the results and their implications for the two theories. The final section of the chapter provides some suggestions for further research.

1.3 Two important topics

The study of further education and training as a collective action problem contributes to two fields where research is needed, and where research results potentially are of great relevance to policy.

First, the topic of further training is one where significant political concern, at least on the rhetorical level, is coupled with still insufficient research on how measures should be designed to accomplish the political aims. One of the most important tasks is to find a balance between individual needs and company needs, between employers' need for relevant skills and the labour market's need for mobile employees. Reich's

(1992: 3) forecast concerning the near future is that 'each nation's primary assets will be its citizens' skills and insights.' Hence a crucial task for all states is to ensure not only that their citizens' initial training meets current needs but also that their skills are updated and upgraded throughout their working life. Current policies on further education and training are hardly up to this task, according to an OECD report, which claims that on the whole the present systems are 'expensive,' 'inefficient,' 'partial,' narrow' and 'locally constrained' (Clement et al. 1993: 81-82). Moreover 'the consequences of inadequate further education and training and skill formation generally are becoming more serious in an economic climate that promises to become increasingly competitive, with human resources becoming a more decisive determinant of competitive advantage' (Clement et al. 1993: 94).

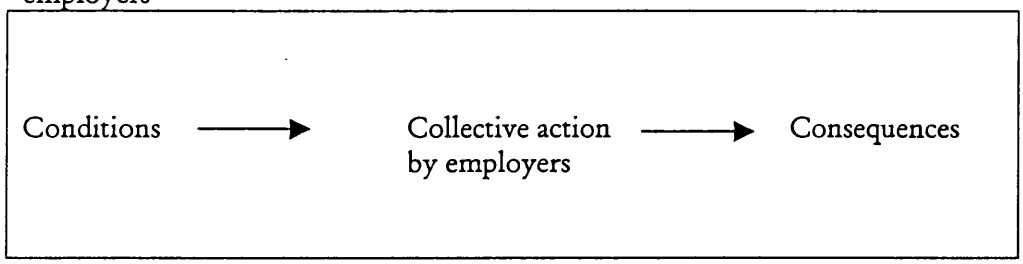
The second key topic is the potential significance of employers' collective action for economic success. According to Streeck (1992: 17-21), diversified quality production requires several production inputs that are collective goods. Broad and high-level skills, polyvalent organisational structures, decentralised competence and social peace are all factors that 'firms on their own find hard to produce or procure since their provision depends on some form of co-ordinated collective action' (Streeck 1992: 12). This view is echoed by Finegold (1991b: 105), who argues that collective action by employers is essential for economic success since 'a high skill strategy requires a number of investments that may be beyond the means of any one player to finance but to the mutual benefit of many if they share the costs and the risks involved.' Moreover co-operation between firms is also claimed to be an important factor in successful 'flexible specialisation' (Piore and Sabel 1984). Indeed, Bowman (1998: 304) holds that what Best's 'new competition,' Streeck's 'diversified quality production' and Piore and Sabel's 'flexible specialisation' have in common is collective action by business firms. The claims about the significance of collective action by employers have however not yet been complemented with extensive research concerning the conditions for and nature of such

collaboration. According to Bowman (1998: 304), 'how this co-ordination among employers is achieved is hardly addressed in the literature.'

1.4 Employers' collective action and training

An analysis of the nature and importance of employers' collective action for training provision requires a distinction between the consequences of, the conditions for and the nature of such action, as illustrated in figure 1.1. This section gives a broad overview of how these three topics have been treated in previous research.

Figure 1.1 Conditions for, nature of and consequences of collective action by employers



One of several formulations of the collective action problem involved in training provision is that 'the fundamental uncertainty for employers recovering their training expenses in an open, contractual labor market turns skills, from the viewpoint of individual employers, into a collective good' (Streeck 1992: 24). The problem is that there is limited available research on how collective action can solve the problem, what possible other consequences such actions have, and under what conditions employers' collective action occurs. Therefore, this review will also highlight some of the limitations of previous research.

1.4.1 The nature of collective action by employers

Collective action by employers has been seen as a key to the success of the German dual system of initial vocational training. The research on employers' collective action and training has therefore primarily been based on this example (Berg 1994: 294-295; Finegold and Crouch 1994;

Soskice 1994a; 1994b; Streeck 1987), even if there are other studies of employer associations and training (e.g. Rainbird and Grant 1985).

Streeck (1987: 84) distinguishes four ways in which employers' organisations may participate in the regulation, financing, administration and implementation of industrial training policy. Firstly, they can participate as interest representatives according to the classic model of pluralist interest politics. Moreover, they can participate through the formulation and aggregation of interests relevant to industrial training policy. A third mode of participation is in the exercise of public authority, for example through implementing vocational training policies. Finally, employers' associations may be suppliers in the market for training services.

But employers' organisations may also take different types of action that are not associated with government training policies. In the case of further training, where national government policies have had little impact, these actions are more important. They may take many different forms.

One type of action attempts to address the problem that individual employers or other training providers might lack the knowledge to deliver high-quality training, by advising employers on how to set up internal training, or human resource practices more generally. Through knowledge from a variety of member firms, and sometimes through independent research and development, the collective organisations may be well positioned as advisers on employers' training efforts. Moreover, if employers rely on external training providers, such as schools or universities, employers' associations may play a significant role through complementing employers' 'exit' with 'voice' in order to ensure that training offers are in line with its members' demands (Hirschman 1970). Thirdly, employers' organisations may choose to offer training themselves. Since the employer organisations seek neither profit nor the fulfilment of diverse government pledges (for example training for

unemployed), they might enjoy more legitimacy than government organisations and private companies.

However, training below agreed standards or insufficient amount of training requires different forms of action. Employers' organisations can use monitoring of employers and informal as well as formal sanctions to address these problems. An inherent problem of employer-based training is the informational asymmetry between the employer and other parties, such as the trainee, other employers and government agencies. This asymmetry can lead to training below agreed standards since individual employers might be tempted to undercut standards, provide too specific training or use trainees as cheap labour. The employer organisations can therefore act to ensure high quality of training by monitoring the employers' training standards. In Germany's apprenticeship system, this is done through assessing the suitability of firms to provide training and through the monitoring of training.

If the problem is too low a supply of training, employer organisations may use positive incentives to encourage employers to provide training or negative incentives to discourage under-provision. For example, the organisations can co-finance employers' training activities. A levy scheme, in which employers are obliged to invest a certain amount in training, is an even more formalised system of sanctions (Drake 1991; Snower and Booth 1996: 345). Still, informal sanctions may be equally important in the organisations' efforts to increase training quantity. In Germany, 'employer associations, including chambers, have significant informal sanctioning ability over companies' (Soskice 1994a: 34). For example, employer organisations can contribute to establishing norms on what 'adequate training efforts' are and publicise information on how much individual employers invest in training in order to facilitate peer pressure among employers.

1.4.2 Conditions for and consequences of employers' collective action

While the nature and purpose of employers' collective action regarding training has been given some attention, as shown above, the research has left largely untouched the questions of when and how such collective action occurs, and what the consequences of such action is.

If one accepts the conclusions from the German studies mentioned, it is clear that in some situations employers' collective action might successfully solve the collective action problem of transferable training. The question is, however, when employers' collective action is worthwhile, given the costs and possible unintended negative consequences. The possible negative side effects of state intervention to solve the collective action problem are most frequently cited, for example characterised as 'government failure' as opposed to 'market failure' (Finegold 1996; Hansen 1992). However, even in other cases it might be that employers as a group would be better off with the collective action problem unsolved than with attempts to solve the problem through employers' collective action. For example, collective training organisations have shown problems in adapting to employers' needs (Crouch, Finegold, and Sako 1999). Therefore, the overall outcome is not necessarily better than it would be without a solution to the problem. Thus, a study of employers' collective action and training should include not only what the purpose of the organisation's actions are, but also an analysis of how the targets are met.

The second question that few contributions have attempted to answer is under what conditions employers' collective action on training occurs. Chapter 3 describes the existing research in some detail, and shows that, with few exceptions, previous research lacks not only a critical evaluation of positive and negative consequences of employers' collective action, but also theoretical predictions about the occurrence of such action.

1.5 Three issues in training research

The previous section showed that there is limited available research on the link between employers' collective action and training. There is however no lack of research on training more generally. This section first presents some of the main alternative theoretical approaches to training, and then illuminates the contents of these contributions by discussing each of the three main aspects of training studied in the thesis:

- transferability of training;
- cost sharing;
- and the amount of training and skill shortages.

Training and skills are both important policy issues and keys to a variety of different theories explaining a multitude of different phenomena. Training is 'at the centre of almost all theories of labour markets' (Rubery and Grimshaw 1999: 4). Education and training are also seen as a more or less integrated part of business strategy, an investment opportunity for employers and individuals, a device for signalling ability or screening individuals, an important source of inequality between individuals, a source of self realisation, an important determinant of both companies' and nations' productivity and a factor that contributes to determining the business strategies companies choose. Moreover, a long-running theoretical debate has been concerned with whether training is determined primarily by technology, by the organisation of work, by characteristics of the educational system, by institutions and rules or by some combination of these factors. Thus, all attempts to provide an overview of theoretical approaches to education and training necessarily neglect a range of significant theories.

In an overview of the wide range of theories, Ashton and Green (1996) propose five crude categories of labour market theories on training: the human capital approach, the internal labour market approach, the corporatist approach, the business systems and societal approaches as well

as the political science approach. Rubery and Grimshaw (1999) add labour process theories and segmentation theories.[3] Even if categorisation can be valuable, the inherent risk in attempts to make clear distinctions is that the fine details and the significant similarities between the contributions are neglected. Therefore, in order to avoid 'pigeonholing', the review below is focused on the three main topics, and attempts to draw on research in all these categories to give a picture of existing research on each issue.

This thesis makes no claim that the three issues were selected purely on the basis of empirical significance. On the contrary, they are chosen to address three core issues in human capital theory, and thus reflect the dominant position of human capital theory. After its 'birth' in 1962 (Blaug 1992a: 3), human capital theory has developed into one of the most significant areas of economic research, and it is 'still the most influential strand of theory linking education and training behaviour of individuals and firms to economic performance and outcomes' (Buechtemann and Soloff 1994: 237). Thus, the advantage of selecting issues in line with human capital theory is that the thesis addresses some of the most important questions in economic research on education and training. On the other hand, the study must inevitably treat issues that might be of equally great empirical importance in less detail, for example how training is organised effectively, how skills are transferred from formal learning to daily practice, the effect of training and innovation as well as the link between training, work organisation and so-called organisational learning. However, since these issues are linked to assessments of optimal training levels, they cannot be totally ignored.

[3] One might also argue that Human Resource Management (HRM) research should be included, but the question is whether HRM can be seen as a theory or merely a field of study consisting of employee influence, human resource flow, reward systems and work systems (Beer 1984: 7; Blyton and Turnbull 1992; Noon 1992).

1.5.1 Transferability and labour market structures

Transferability of training, the topic of chapter 5, is important because it is a determinant of labour market structures, and is also partly formed by these structures. In addition, transferability is significant for cost sharing, as the next section shows. Later in the thesis, it is shown that the assumed significance of employers' actions as a determinant of transferability is a crucial difference between the two theories.

There are several benefits of training being transferable instead of non-transferable. One important advantage is that employers can draw on a pool of skilled labour, which is especially important for small firms.[4] The major advantage for employees is that they can more easily change jobs without loss of acquired skills and pay. From the employers' point of view, that may make it is easier to lay off people, because the employees can expect to get jobs elsewhere. Society as a whole can benefit through a better allocation of skilled resources (Marsden 1986: 235).

This section presents Doeringer and Piore's account and other explanations of how and why internal labour markets develop, with emphasis on the role of transferability of training. The five explanations are skill specificity, the inherent problems of the employment relation, employers' relatively free choice, 'societal' factors and finally that internal labour markets are the 'natural state' for most skilled jobs.

While internal labour markets and occupational labour markets are ideal types, actual labour markets consist of some combinations of each of the two types, and the degree of transferability of training is partly a result of this structure and partly a determinant of the actual labour market structure. Hence, transferability of training is crucial in the analysis of internal and occupational labour markets.

---

[4] For example, Streeck (1987: 81) argues that 'it cannot simply be assumed that in the long term only trade unions will have an interest in standardizing the increasingly important further training certificates. The associations of employers, if not necessarily their individual members, are interested in a functioning external labor market.'

The structure of internal labour markets can shape not only the provision of training; it can also be shaped by the training that is provided. Research on the relative importance of these two causal chains, and other explanations of labour market structures, have proceeded Doeringer and Piore's (1971: xvi) *Internal labor markets and manpower analysis.* This landmark work marked a departure from the neo-classical framework.[5] An internal labour market is defined as 'an administrative unit, such as a manufacturing plant, within which the pricing and allocation of labor is governed by a set of administrative rules and procedures' (Doeringer and Piore 1971: 1).[6]

Skill specificity, and hence transferability, is at the core of Doeringer and Piore's (1971) explanation for why employers develop company internal labour markets.[7] The two most important reasons why employers develop company internal labour markets, Doeringer and Piore claim, are skill specificity and on-the-job training.[8] These two factors are reinforcing, since on-the-job training tends to be firm specific (Doeringer and Piore 1971: 32). Internal labour markets facilitate on-the-job training, and especially informal training, through skill accumulation and incentives. Skill accumulation is enhanced through job ladders. When a worker has learnt one job, he has an advantage when he has to learn the job on the next level of the ladder. The second reason is that workers have an incentive to provide training when they are promised internal

[5] Yet, it still maintains the assumption that skill specificity is independent of employers' actions.

[6]Subsequent research has used operational definitions of internal labour markets that are narrower than Doeringer and Piore's definition (Althauser and Kalleberg 1981).

[7]Doeringer and Piore distinguish between enterprise internal labour markets, craft internal labour markets and competitive labour markets. The focus here is on enterprise internal markets and not craft internal labour markets.

[8] The third reason is that workers must be socialised, using the sociological term, or learn how to adhere to 'an unwritten set of rules based largely upon past practice or precedent' (Doeringer and Piore 1971: 23).

promotion opportunities. Seniority pay also enhances the incentives for experienced workers to teach (Piore 1968).

Employers have strong incentives to avoid turnover of these specifically trained employees.[9] While Becker (1962; 1993) suggests that this can be done with a wage premium, as will be shown in chapter 2, Doeringer and Piore put forward the idea that firms can use career ladders for the same purpose. Thus, employers solve the problem by placing the job in an internal labour market with employment security and advancement promises.

Employers might also choose to develop internal labour markets because they solve inherent problems in employment relations (Williamson 1975). The core of Williamson's argument with respect to internal labour markets is that since promotion is awarded for both high productivity and non-opportunistic behaviour, employees get incentives for such beneficial behaviour in a way that would be difficult to achieve in other ways.

Some contributions emphasise that employers' have considerable room for choice in deciding to rely on the internal or the external labour market for supply of skills. Despite many differences, this is a key element of both Osterman's (1984a; 1984b) analysis of internal labour markets for white-collar workers and Cappelli and Cocker-Hefter's (1993) analysis of core competencies.

Osterman stresses that several factors other than skill specificity can affect internal labour market organisation, and that employers have freedom of choice when they have to decide what kind of subsystem to implement. Firms are composed of industrial relations subsystems that 'vary considerably in their rules, procedures, and employment outcomes' (Osterman 1984b: 170). What differentiates Osterman's analysis from Doeringer and Piore's is that 'it does not seem likely that skill specificity

[9] Chapter 2 shows that Becker's distinction between general and specific training is based on usefulness in other firms and market conditions. Doeringer and Piore's definition is however based only on usefulness outside the firm.

can explain differences in subsystem structure' (Osterman 1984b: 176). The results 'undermine rather severely the human capital explanation,' which says that internal labour markets are designed to protect employers against turnover of specifically trained employees. Instead, Osterman (1984b) claims that product market, labour market and technology changes are the factors that can influence the conditions for change between different subsystems. He argues that 'company culture' is an important variable explaining different managerial choices of industrial subsystem. Fear of unionisation and government regulations can also affect the choice. Osterman uses a case of computer programmers to exemplify managerial choice of subsystem even when work tasks are given. In this case there was under-supply, employers chose to provide internal training, keep training narrow and select employees with long tenure to avoid turnover instead of hiring from the craft market. The craft market is based on employee-financed training outside the firm.

The scope for employer choice corresponds with Cappelli and Cocker-Hefter's (1993: 1) claim that 'the notion of a single set of 'best' practices [in managing people] may be overstated.' They show that success within a single sector or niche can be the result of contrasting employment practices, training strategies and ways of organising work. Some combinations of practices are considered successful. There is no single 'high skill route,' but employers can be successful with strong internal labour markets and focus on provision of internal training, or they can 'compete through flexibility, moving quickly to seize new opportunities, and do not develop employee competencies from within because it does not pay to do so' (Cappelli and Crocker-Hefter 1993: 17). Thus, numerical flexibility may be a feasible strategy even in a high skill sector, and it is thus 'an important empirical question as to whether firms with highly skilled, broadly trained employees can be more flexible in

their product markets than can firms that hire-and-fire to change their competencies' (Cappelli and Crocker-Hefter 1993: 17).[10]

A fourth group of contributions claim that the existence, prevalence and characteristics of internal labour markets cannot be explained by individual employers' choices or skill specificity in isolation, but must be seen as responses to a particular societal setting or a 'societal effect' (Maurice, Sellier, and Silvestre 1984; 1986). The Aix-en-Provence researchers argue that the educational, organisational (which binds individuals to a society through the division of labour)' and industrial relations (which bind individuals to society through systems that establish social identity and economic opposition, i.e., management, workers, and their organisations) 'domains' must be seen as interrelated (Maurice, Sellier, and Silvestre 1984: 233). Based on a comparison of carefully matched samples of manufacturing plants in France and Germany, the conclusion is that one cannot explain phenomena in one 'domain' without considering the other two.

In Germany, for example, the broad, vocational training for a large proportion of the youngsters fits work organisations with broad jobs and mobility based on formal skills in an occupational labour market. By contrast, Maurice, Sellier and Silvestre argue that in France workers have narrower jobs, and the labour market is characterised by internal mobility. The important difference is that mobility in France is more linked to the specific company, while German workers' mobility is linked to the formal qualifications they achieve. This is partly due to the educational domain, because the vocational track is stronger in Germany. However, it is also because of the organisational domain, since German

[10] This description of a choice between strategies seems more appropriate in the American than in the European labour market. Cappelli and Crocker-Hefter (1993: 18) agree that 'in European countries, the constraints on dismissing employees/using the external labour market encourage investments in existing employees and, it is argued, shift production towards the higher quality (and higher) cost markets that makes use of higher skills.'

employers to a greater extent take workers' qualification into account when organising jobs, so that they fit their capabilities and skills (Maurice, Sellier, and Silvestre 1984: 246).

By adding a dynamic element to the 'societal analysis' through including more recent developments, such as changes in further education and training, Gehin and Mehaut (1995: 75) argue that the two countries have become more similar. In Germany, 'individual employer initiative; strong orientation to production needs; and the principle of non-recognition in terms of job classification and salary' (Gehin and Mehaut 1995: 74-75) for further training may contribute to an internalisation of the occupational labour market. In France, on the other hand, further training is the basis for a development towards a more 'occupational model' (Gehin and Mehaut 1995: 79; Mehaut 1988).

Gehin and Mehaut's inclusion of a dynamic element helps to lessen the problems of societal analysis, namely that it uses many independent variables to explain a limited number of different outcomes, and it does not make clear which variables are necessary or sufficient. Consequently, it cannot be empirically tested on other cases (Rose 1985).

The fifth account of the existence and characteristics of internal labour markets argues that the existence of internal labour markets, at least for skilled labour, requires no explanation. According to Rubery (1994), there is a wide range of reasons, ranging from skill specificity to trust and commitment as production conditions, why employers would prefer long-term employment relationships. Marsden (1986: 231) argues that 'one might expect company internal labour markets to be the natural state of affairs, and that, if anything, one should have to explain how occupational labour markets sometimes emerge when employers have developed their own internal labour markets.' The reason is that there are substantial costs associated with the establishment and maintenance of occupational labour markets, which usually cannot be borne by individual employers, but require employer co-ordination. Thus, Marsden's view is

that the provision of transferable skills is a collective action problem, a notion that will be studied in detail in chapter 3.

1.5.2 Cost sharing

The second topic, analysed in chapter 6, is how employers, employees and others share the costs of transferable training. Education and training are very often a shared investment. If cost sharing is inadequate, too little, too much or the wrong type of training is provided. Thus, cost sharing is of great practical importance since it is a prerequisite for successful training initiatives.

Economic theory says that those who benefit from a good should contribute to its financing, funding the same fraction of the total costs as the share of the benefits they receive. But finding such solutions is problematic in the case of training. One problem is that the employers and employees have different time frames and markedly different capacities to finance training costs. Moreover, as chapter 2 shows, there are externalities present in training provision. An additional problem is that there is likely to be limited information about the cost of training, particularly for on-the-job training. Cost sharing for training is also difficult because there are risks involved. Not only is the effect of training uncertain but employers cannot know beforehand if and when employees quit, and employees cannot know if and when they are laid off. Matters are even more complicated by the fact that cost sharing is inevitably tightly linked to wage setting, where employers, employees and their organisations must accommodate a series of concerns other than how training costs are shared.

Broadly speaking, there are two different conclusions from research on cost sharing. The first is that employers usually finance the training that is needed for employees to do their jobs, while the alternative view is that employers are reluctant to invest in training that increases employees' value on the external labour market.

The first type of explanation takes work organisation as its point of departure. It says that job design and job tasks are the primary determinants of the training employees get, and that employers usually finance the training that is required to do the job. If training is less relevant for the job, the employer and the employee share the costs of training or the employee fully finances training costs. Thus, the most important factors for cost sharing are job design and relevance of training. Scoville (1969; 1972) presents a theoretical justification for this argument.

The basis of the argument is that 'given the work to be done and the basic technology, the recent literature on job design suggests that different constellations on tasks and duties incorporated in varying bundles of jobs are feasible' (Scoville 1969: 37). Therefore, the employers must choose how broad or narrow are the jobs they want. If jobs are narrow, employers will experience higher efficiency and lower training costs, but also lower quality control by workers, higher supervision costs and decreased work force stability. Employees will avoid narrow jobs because they will receive less training, the risk of unemployment is higher, and there is a psychological cost associated with narrow jobs. On the other hand, the workers will need to pay less for the training, since it is shorter than for broad jobs According to Scoville, employers will always finance training that is required for a job. In addition, employers have preferences for 'excess training' that are 'analogous to those for job breadth alone' (Scoville 1969: 48). Thus, if employers think 'excess training' will increase quality control, reduce supervision costs or increase work force stability, they will finance even more training than is required in the job.

The alternative claim is that employers are reluctant to invest in training that increases employees' value on the external labour market. The basis of this lies in human capital theory, which will be discussed in detail in chapter 2. The core of the argument is that in a competitive labour market, employers will not finance general training, which is as

useful outside as within the firm, because they must award wage increases that equal the productivity increase after training.

There is thus a clear contrast between the two views on how training costs are shared.[11] While both can account successfully for some forms of labour market behaviour, there are also intrinsic problems with each. It is likely that both types of logic are evident, but to a different extent in different settings and for different types of training. The reason is that the human capital view tends to over-estimate the impact of the external labour market, while the job design approach tends to under-estimate it.

The most important problem with the view that employers are reluctant to finance training that is useful outside the firm, is that it relies on the assumption that employees are easily disposable and replaceable, and that employees are highly mobile. Therefore, this view is most likely to hold for types of training that significantly changes employees' value on the labour market, and external recruitment of skilled employees is a viable option.[12] For types of training that, in practice, has limited impact on employers' opportunities in the external labour market, for example short up-dating training, the human capital view is likely to over-estimate the impact of the external labour market on cost sharing.

By contrast, the most important problem with the Scoville model is that it does not convincingly address the possibility of external recruitment. The model ignores the fact that firms can hire ready-trained workers, and also that workers might choose to find jobs somewhere else if they are not compensated for their general training. The three reasons are that the wage rate is assumed to be fixed and independent of the job design (Scoville 1969: 41), that broad training will reduce turnover

[11] Both views also embody implicit normative judgements about how costs should be shared. As chapter 2 shows, optimal provision of general training requires that employees bear the full cost of training.

[12] The empirical study is of long further training, which is assumed to potentially have a significant impact of employees' value in the labour market.

(Scoville 1969: 40), and that abundant availability of fully qualified employees is assumed to be no more than hypothetical over the long run. Scoville (1969: 39) does acknowledge, however, that if external recruitment is available, 'the training cost aspect of choice and job content would vanish.' Thus, while the model is 'less fettered by neo-classical preconceptions about labour markets' (Scoville 1969: 53), it underestimates the impact of the external labour market. Thus, the model seems relevant only if external recruitment is not a likely alternative and training does not significantly increase employees' value in the external labour market.

In practice, affecting cost sharing is one of the most important ways in which employer organisations influence training provision. In some cases, a levy system is used, but usually collective agreements are the most important vehicle for affecting the way costs are shared, through determining wages during and after training.

An organisation can have two different goals for its cost sharing policies. One purpose is to achieve cost sharing that gives employers and employees the incentives that in turn lead to the right quality and quantity of training. But the organisation can also simply seek to keep the degree of employer financing low so that employees or the government bear most of the costs.

In principle employers would prefer to pay as little as possible during training, but still sufficient to ensure that enough able individuals want to undertake the training. Employees, on the other hand, would prefer as high a wage as possible, as long as the quality of training remains good and the number of training places remains sufficiently high. Wages and employment prospects after training are important because they determine the individuals' incentives to invest in training. Young people need assurance that both employment security and higher earnings will compensate the low income they receive during training. On the other hand, employers might become less willing to invest in training if

employees are very well rewarded after training.[13] So cost sharing is an area where different interests must be taken into account to find a solution that serves the purpose of ensuring sufficient amounts of high quality training. But at the same time both the employee and the employer side might want to reduce costs at the expense of the other party.

The example of apprentice wages illustrates the problem. Employer organisations might argue that these wages should be reduced in order to make employers willing to supply more training places, and thus increase the supply of skills in the labour market.[14] However, at the same time, a reduction means reduced costs for employers, and potentially an increased chance that trainees replace normal employees. Therefore, it may be impossible to distinguish between the two purposes when evaluating employer organisation policies to affect cost sharing.

Thus, the way training employers and employees share training costs is not only a theme of great theoretical importance, but also a significant issue for employers' and employees' organisations that seek to promote their members' interests in both adequate skill provision and in benefiting from, but not financing, training.

1.5.3 Amount of training and skill shortages

To explain why some employers, industries and nations provide more training than others, and how this changes over time, one must distinguish between what factors cause skill needs, requirements or demand, and what determines whether or not these are met. This section shows that while skill needs are usually explained as consequences of technology and work organisation, it is assumed that 'market failures' explain why skill supply does not necessarily meet demand. While the

[13] In some instances, this is described as employees 'exploiting' their bargaining power.

[14] For example, in Norway, apprentice wages were reduced in connection with Reform 94 in order to make it easier for pupils in vocational education to get apprenticeships (Bosch 1997).

focus later in the thesis is on skill shortages, or whether or not training meets employers' demand, a brief discussion of the evolution of skill requirements is needed to understand the relationship between skill shortages and the amount of training provided.

In addition to the acknowledgement that education and training are important determinants of individuals' welfare and of inequality in society, the political concern about further education and training in the 1990s was driven by the two impressions that skill requirements were expected to rise rapidly as a result of the accelerating speed of technological change and that employees' skills were becoming increasingly important requirements for competitive business.

The research shows, however, that there is not necessarily a direct link between technological change and skill requirements. Moreover, other factors, such as organisation of work, may be as important determinants of skill requirements. The contributions involved in studying this question have attempted primarily to explain what constitute skill requirements or employers' skill demand. Most have implicitly assumed that these requirements are met, and consequently that the amount of training provided is a reflection of employers' demand.

One core discussion has been whether technological change leads to 'upskilling,' 'deskilling' or 'polarisation.' The debate is based on a simplified view of Braverman (1974), namely that technological change in a capitalist society inevitably leads to 'deskilling' of jobs (Armstrong 1988). The evidence suggests that the effect of technology on the content of jobs depends on a variety of other factors (Cappelli and Rogovsky 1994; Lewis 1992; Osterman 1995a). Evidence from Britain, the United States and Norway suggests that there is at least no trend towards deskilling, but rather 'polarisation' of skills (Gallie 1991; Gooderham, Kvitastein, and Nordhaug 1996; Osterman 1995a).

One reason why the evidence on the link between technology and skill requirements is not straightforward is that it depends on employers' choice of organisational structure. Employers have considerable freedom

in deciding how to meet technological change, and there are no automatic effects of technology on organisational design (Sorge and Streeck 1988; Training Agency 1990b: 21).[15] One argument has been that in sectors where there are rapid changes, either technological or organisational, the employees need broader training to tackle the changes. That is the core of 'functional flexibility' (Atkinson and Meager 1986), and also an aspect of the 'lean production' management strategy (Pfeffer 1994). However, it is also possible to achieve flexibility by breaking down complex tasks into simple components (Brown 1994; Cappelli and Crocker-Hefter 1993) or by 'numerical flexibility' (Atkinson and Meager 1986).

A second reason why the research gives mixed results on the link between technology and skill requirements is that there is a clear difference between the short-term and long-term effects of new technology. The introduction of new technology necessarily requires some induction training, but does not necessarily require a higher level of skills than previous equipment. For example, the introduction of information technology (IT) might necessitate frequent up-dating training when new versions of the software arrive but that has little impact on the long-term skill requirements of the jobs.

Acknowledging the problem of explaining skill needs directly through technology, a second group of contributions emphasise the impact of work organisation on skill needs, partly directly and partly as a factor that determines the effect of technology on skill needs. One simple argument is that the basis of all training provision is the jobs people are in. The broader these jobs are, the broader training employees will receive (Scoville 1969). More recently it has been shown that some 'bundles' of human resource practices (i.e. certain combinations of HR practices)

[15] Product market changes are not necessarily caused by technological changes, even if they often are. A recent Norwegian study argues that consumer demand for formal training as a 'quality indicator' is an important trigger of training initiatives in the private sector (Larsen et al. 1997), in line with neo-institutional theory(Meyer and Rowan 1991; Powell and DiMaggio 1991).

account for differences in training levels between employers (Kochan and Osterman 1994: 170; MacDuffie and Kochnan 1995; Osterman 1994). Still, these studies cannot show if this is a long-term effect or only a temporary effect, since the implementation of new work practices invariably requires new skills. Another version of the argument that work organisation determines skill needs is that there is, or will be, a gap between a group of highly qualified employees in safe, high-skill jobs and a group of employees in jobs where skill requirements remain low (Doeringer and Piore 1971).

A third way of explaining skill requirements is that they first and foremost are determined by employers' choice of high- or low-skill routes (Finegold 1991b: 97). Finegold argues that these choices are made in interaction with individuals and policy makers, and that these three parties' actions are mutually reinforcing. Thus, if employers choose to follow the 'low-skill route,' with modest skill requirements, individuals and policy-makers will adapt so that employers' are even more likely to continue on this path later. Hence, economies will tend to end up in either 'low skill' or 'high skill equilibria' (Finegold 1991a; 1991b; Finegold and Crouch 1994; Finegold and Soskice 1988). Given such mutually reinforcing factors, the problem with the theory is that it cannot explain how a wide range of 'middle skill' economies exist, and how even within a 'low skill equilibrium' there are often important high-skill industries.

While the contributions above concentrate on explaining what forms skill needs, others have focused on how and why these needs are or are not met. In the latter, it is assumed that skill needs develop into employers' skill demand, which also depends on the wage rate, so even if demand equals supply, all skill 'needs' or 'requirements' are not met. The research has concentrated on why skill supply may be lower or higher than demand, with the bulk of the theoretical argument focussing on why too little training may be provided. The screening, signalling or credentialism arguments are exceptions, suggesting that individuals take education and training to signalise their abilities or ambitions, and not

merely to improve their own productivity (Becker 1993; Milgrom and Roberts 1992; Spence 1973). Moreover, based primarily on the evidence of a growing number of graduates, there has been some concern about 'over-education' (Freeman 1976; Larsen 1999). Nevertheless, a more prominent question has been, 'Does the free market produce enough skills?' (Booth and Snower 1996).

There are several reasons to assume that the market for training is not a 'perfect' market, and thus there is a 'market failure' (Acemoglu 1996; Booth and Snower 1996; Finegold 1996; Layard 1994; Ritzen 1992; Snower 1996; Stevens 1996). Some of these problems will be discussed in more detail in chapters 2 and 3. One problem is that the capital market is not perfect, so the individual may find it difficult to finance education and training. This effect is strengthened by the assumption that many people are risk averse, and are therefore reluctant to make investments when the returns are uncertain. Yet another argument is that there is an interaction between supply and demand, which means that if there are few skilled workers, few firms will design jobs that use these qualifications, and that is a disincentive for individuals to take the training. One can also argue that the tax system and unemployment benefits will tend to reduce the benefits of training. All these reasons for a market failure in training have been widely discussed, and with a few exceptions (e.g., Shackleton 1992), the validity of the claims are accepted, even if the propositions are rarely rigidly tested.

In this thesis the focus is on market failures caused by externalities between employers associated with investment in transferable training. In contrast to a substantial share of previous research, the study includes both predictions of the severity of the 'failures' in different industries and empirical analyses of attempts to address the failures.

1.6 Delimitation and definitions

This study leaves out several interesting aspects, either because it is outside the research question as presented in these first three chapters or because there are limits to what range of evidence can be included within a single study. The study primarily covers economic theories on education and training, and the focus is on the industry and company level rather than the national level or on that of individuals. Moreover, since it is a study of four industries in one country, the results cannot directly be generalised outside these four cases. The study excludes special measures for the unemployed. Training is primarily seen as an investment that increases productivity, and not as a good in itself. It is assumed that training leads to improved skills and acquired and practised abilities to competently carry out a task or job (International Labour Office 1986: 64), and this leads to increased productivity. These links are not studied directly, and neither is the quality of training programs in terms of the effectiveness of training methods and the relevance of training for daily work.

The definitions of training and further training require some more explanation. The main point is that, primarily, formal further training is included. Training is defined as 'the process of acquiring the range of knowledge and skills that are related to current and future work requirements by formal or structured or guided means (i.e. excluding pure experience)' (Training Agency 1990c: 5). The definition excludes (the significant amount of) learning that is achieved thought doing one's job, if this is not done under special guidance, even if such learning also has a cost. Moreover, the definition excludes training that is not expected to relate to work requirements or work tasks.

Further training, which the study covers, is defined in contrast to initial training, which is 'the first complete course of training for an occupation' (Cedefop 1996: 61). Thus, further training is 'used for any training subsequent to initial training (Cedefop 1996: 72; International Labour Office 1986: 29). It is however not simple to distinguish between

initial and further training, because it differs between contexts to what extent training is done initially or later. Moreover, the categorisation of training is not dependent on any characterises of the training, but of the participants. While mid-wife training for experienced nurses is clearly further training, introductory training at a new employer is hard to categorise. Training given to youngsters directly after finishing school may be categorised as initial, whereas the case of experienced workers is more ambiguous. Since the empirical study in chapters 4 to 7 is of workers with several years of initial training, the problem will probably be less than it would have been with unskilled workers.

This chapter has briefly presented the most important aspects of the study, and presented previous research both on the three aspects of training that are studied and on the link between employers' collective action and training. The next chapter analyses how human capital theory treats these three aspects, while chapter 3 presents an alternative theoretical perspective.

2. Transferable training as a human capital investment

2.1 Introduction

The purpose of this chapter is to derive three hypotheses from human capital theory concerning the provision of transferable training. The hypotheses are that individual employers will not act spontaneously to make training transferable, that employers will pay for transferable training only under certain conditions, and finally that the optimal amount of transferable training will be provided only in a perfect labour market. In the next chapter, these hypotheses will be contrasted with hypotheses based on transferable training being a collective action problem, and subsequently the two alternative views will be put on to empirical test in the next part of the thesis.

2.2 The basic ideas and assumptions

This thesis will focus on human capital theory in relation to further education and training, which is only one part, or one particular application, of human capital theory. Human capital theory applies to a much wider range of issues. Becker's (1993) *Human Capital* analyses as diverse themes as childbirth, measures against economic inequality, as well as education and training.

Human capital theory is not a single theory, but rather a research programme. According to Blaug (1992b: 207) it 'cannot be reduced to one single theory, being simply an application of standard capital theory to

certain economic phenomena.' Blaug's argument is that there is a 'hard core' to this research programme, which is that people spend on themselves for the sake of future pecuniary and non-pecuniary returns. This cannot be empirically refuted (Blaug 1992b: 34). The 'hard core' has however generated a 'protective belt' of different theories that may be empirically tested. One of these is Becker's theory of job training. In this thesis 'human capital theory' connotes only theories involving the analysis of investment education and training investments. [1] The theory presented in chapter 3 also sees training as an investment in human capital, but diverges from the latter three of these postulates.

Figure 2.1 The relationship between training, skills, productivity and pay in human capital investment decisions

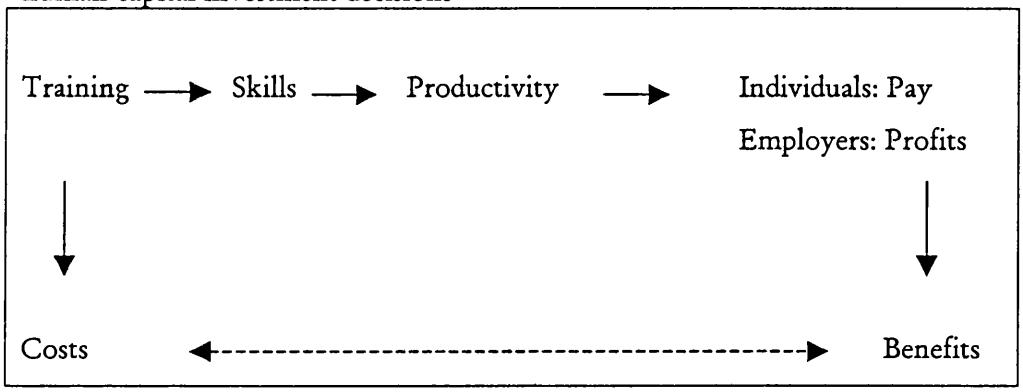


Figure 2.1 illustrates the basic logic of training investments according to human capital theory. The idea is that training improves employees' skills, which determine their productivity. Finally, their pay will depend on their productivity. For employees, the benefit of training is the wage rise they get as a result of it. Employers, on the other hand, will benefit to the extent that the pay increase does not fully offset the productivity increase. For each of the parties, the decision to train or not is determined by the

[1] Some important postulates of neo-classical economics is methodological individualism, the logical priority of perfect markets, the assumption that labour markets consist of a large number of similar jobs in different firms and the assumption that technology is a key determinant of the factor combinations firms use (Marsden 1995: 20).

size of the benefits compared with the costs of training and their distribution.

As in neo-classical economics in general, the point of departure for human capital analysis is 'perfect markets.' Not only the labour market, but also the product market and the capital markets must be perfect. These assumptions mean that there are a very large numbers of employers, there are a very large number of workers, there are a very large numbers of capital suppliers; there is perfect information, there are no barriers to entry to or exit from any of the markets and there are no transaction costs (e.g. in connection with switching jobs). In addition, one must assume that the employer and the employee are free to choose the level of investment in training and that both the employer and the employee know the effect of training on productivity.

In the earlier works, such as those by Becker (1962; 1993) and Mincer (1962) these assumptions are maintained. Broadly speaking, subsequent theoretical research has studied the effects on education and training if any of these assumptions are not met.[2] Later this chapter will show what it means if, for example, there are only few employers, or there is not perfect information.

2.3 Critique of human capital theory

As a scientific theory human capital theory has several attractive features (Blaug 1992b:24). It is applicable to a wide range of topics, it is simple, it is built on a set of well-defined principles, and it is fruitful measured by the number of hypotheses that one can derive from the theory. At least four types of criticism have however been raised against human capital theory.

[2] Already a year after Becker's work was published in the *Journal of Political Economy*, he was criticised because his conclusions were based on assumptions that were unlikely to be exist in practice (Eckaus 1963).

One criticism is that is takes a too narrow view of training, and fails to grasp important aspects of how training is part of work processes and management strategies. One could argue that 'human capital theory treats the education and training process as a 'black box,' in which the skills are produced' (Ashton and Green 1996: 18). Moreover, the effect of training on skills, and of skills on productivity is rarely questioned.[3] Gintis (1992: 266) is one of those who criticise human capital research because 'almost no attempt has been made... to determine the mechanism by which education affects earnings or productivity.' However, this criticism is mainly an effect of the level of abstraction of human capital theory. Therefore, it should not lead to a rejection of human capital theory, but rather the development of complementary theories, which, on a lower level of abstraction, treat the processes on the basis of which human capital theory abstracts from.

Another type of criticism is that the assumptions underlying human capital theory are often violated. For example, individuals may not act in accordance with the assumptions of human capital theory. Green (1994: 243) claims that 'there can be little pretence...that training decisions are taken solely, as human capital theory suggests, on the basis of a rational individualistic calculus.' Within sociology the analysis of what influences educational choice has provided alternative theories to human capital theory. To some extent this critique has been met by new versions of human capital theory, which relax some of the strict assumptions in the earliest versions of the theory.[4]

A third type of criticism is ideological, and argues that human

---

[3] The idea that education can be as signal of productivity rather than a generator of productivity, is one example from the general impression that human capital research rarely questions the effect of training on productivity (Spence 1973).

[4] Freeman (1971) stresses the fact that human capital theory can include other ways to explain educational choice. Rational choice and pecuniary awards need only be important at the margins for human capital theory to have predictive power. Moreover,

capital theory treats labour and skills as 'commodities' (Thurow 1970: 7), or more precisely that outcomes are analysed as if workers and firms were treating investment in training as a commodity. Given that the core of human capital theory is that training can be analysed as an investment decision, this is true almost by definition. Yet, one of the crucial points in human capital theory is that each individual is free to choose how much to invest in human capital and where to work. Thus, the individual freedom is emphasised more in human capital theory than in other theories on training in firms, which tend to view employees' skills as employers' property. Moreover, shifting from a viewing of education and training as investments rather than consumer goods, as they were seen earlier (Blaug 1992a: 5), was hardly a shift towards a viewing of skills more rather as 'commodities.'

One final type of criticism, and potentially the most damaging, is that the empirical findings are not in line with what one would expect from human capital theory. Faced by negative evidence one can either modify or reject the theory, and both these responses have been made in the case of human capital theory. As this chapter shows, several researchers have modified the human capital theory to explain common findings that apparently contradicted the original version of the theory. This has made it more difficult to find observations that would contradict human capital theory in all its modified versions.

Instead of devoting much space to theoretical and ideological criticism of human capital theory, this chapter will aim at deriving empirically refutable hypotheses. These hypotheses will then be tested in chapters 5, 6 and 7, and the theory will then be evaluated on the basis of its ability to predict empirical findings. According to Blaug (1992a: 8), 'it can hardly be said that the human capital approach to labor training has yet been put to a decisive empirical test.' This thesis cannot offer a decisive test, but it will attempt to give a strategic test of neo-classical human

---

Becker (1993) emphasises that human capital theory can also include non-pecuniary

capital theory versus a theory based on transferable training as a collective action problem.

2.4 General training and cost sharing

Becker's (1993) model of how training costs are shared between employers and employees is the point of departure for the deriving of the three hypotheses. He introduces the distinction between general and specific training, and comes to the crucial conclusion that employers will not finance any of the costs of training that is 'general.' Both these two points are fundamental building blocks for the argument in this chapter.

A simple two-period model shows the logic behind the cost-sharing conclusion. Employers must in some way finance both direct outlays and the opportunity cost of training. The opportunity cost is the difference between what could have been produced in the training period and what is actually produced. In the model employees can make an investment in training through accepting a lower wage than he or she would have received, because marginal productivity is reduced during training, in return for a higher marginal product, and therefore a higher wage in period 2.[5] Employers can finance training by paying employees more than their net marginal product (marginal productivity minus direct training costs) during 1. In making decisions on whether or not to finance training, employees consider the wage increases after training versus the reduction of wages during training. Employers consider how much to invest in training according to the net profit from training, which is the difference between increased productivity and wage increases.

How much employers and employees choose to invest in training depends on whether training is 'general' or 'specific.' For training to be 'perfectly general' it must 'be equally useful in many firms and marginal

---

benefits.

products would rise by the same amount in all of them' (Becker 1993:34). Perfectly specific training, on the other hand, is 'training that has no effect on the productivity of trainees that would be useful in other firms' (Becker 1993:40).

One of Becker's most important conclusions concerning employers' provision of training is that the trainee pays the full cost of perfectly general training, because she is awarded the full increase in marginal productivity through a wage increase in the subsequent period. The reason is that general training increases the marginal product by the same amount in all firms, and since there is perfect competition, the wage must equal marginal productivity after training is completed. Thus, any rise in marginal productivity must then be accompanied by an equally large increase in the wage rate, and the firm cannot retain any of the increased productivity from the training. Therefore, the trainee must pay the whole cost of general training.

Perfectly general training is the extreme case where the employee gains the whole advantage from the training. In all other instances a smaller or larger part of training is specific, either because the skills are useful at only to the training employer or because the employer is a monopsonist. In these cases the employees will pay part of their specific training by receiving a lower wage in the training period, while employers will finance their share by paying employees more than their marginal product in the training period. The employee will pay the same ratio of the costs as she receives from the gains.

It is not obvious that employees will receive any of the gains, and thus that they will be willing to finance any of the costs of specific training. The current employer could choose to pay employees no more than the wage they would receive elsewhere, and therefore give no wage increase after specific training, since such training is of no value for other

[5] The assumption is that a worker trying to complete a new task will produce less than she would with doing tasks she already performs well. It is assumed that all training is done in period 1, while the productivity increase does not occur before period 2.

employers. Becker introduces turnover as an explanation for why the gains will be shared between the two parties. He argues that after an employee has received specific training, there is a cost of turnover for both her and the employer. The firm profits from specific training since it can pay less than the workers' marginal product. If the worker quits, the firm loses its gains from the specific training. Becker argues that it is therefore rational for the firm to pay the employee a 'premium' after she has received specific training. The reason is that it is less likely that the employee will quit if she is paid more than she could receive elsewhere, since with such a premium turnover will incur a loss on the employee, too. The analysis provides little detail on how large this premium will be, and consequently how costs of specific training will be shared between employers and employees. Becker (1993:44) briefly mentions that 'the shares of each depend on the relations between quit rates and wages, layoff rates and profits, and on other factors not discussed here, such as the cost of funds, attitudes toward risk, and desires for liquidity.' Investments in specific human capital may furthermore give rise to a hold-up problem, which means that each side is vulnerable to the opposite side's potential post-contractual opportunism aimed at obtaining better terms than were initially agreed (Milgrom and Roberts 1992: 599).[6]

2.5 Definition of transferable training

In order to modify Becker's analysis to cover situations with neither perfectly general nor perfectly specific training, some researchers have broadened the definition of general training to 'all the training which can be used in more than one firm' (Ritzen 1992:185), that is training that leads to 'skills and knowledge that are broad enough to be applicable in other firms' (Feuer, Glick, and Desai 1992: 42) or 'those which are useful

[6] Hashimoto (1981) provides a more rigid analysis of what determines the sharing of costs and benefits from specific training.

with other employers' (Acemoglu and Pischke 1999: F113). If it is not made explicit that this diverges from Becker's definition, it leads to the conclusion that employers will not finance any training that is useful outside the firm. As this chapter will show, this is erroneous.

Instead of Becker's general training concept, the theoretical argument in this thesis is therefore based on the adjacent notion of 'transferable training.' There is one crucial difference between Becker's concept of general training and this concept of transferable training. What separates them is that the labour market does not have to be perfect for training to be transferable. The important point is that Becker's definition of specific and general training comprises two dimensions. Both usefulness and market conditions determine the categorisation of training. Becker (1993:41) explains that 'the effect of investment in employees on their productivity elsewhere depends on market conditions as well as on the nature of the employment.' This means that 'very strong monopsonists might be completely insulated from competition by other firms, and practically all investments in their labor force would be specific.' The fact that these concepts depend on two conditions has one important consequence for the general training term. It means that perfect labour market competition is a necessary condition for training to be perfectly general. Hence, even though, for example, mathematical training could be seen as perfectly general training in terms of usefulness, it is not general if there are not a large number of companies in the labour market.

There is an element of circularity in Becker's concept of general training since labour markets cannot be perfect if training is not perfectly general, and training cannot be perfectly general if the labour market is not perfect. To avoid the problems of circularity and to distinguish between the two reasons why training may not be general, the definition of transferable training in this thesis does not include any condition regarding the competition in the labour market. In other words, this means that the number of firms shall not per se have any bearing on the

transferability of certain types of training.[7]

Thus the following definition of transferable training will be used in the thesis: training is transferable insofar as the resulting skills are equally valuable in more than one firm, and the employers have all the necessary information about the training to evaluate the value of the skills in their own firms.[8]

A simple model of the relationship between jobs, requirements and skills explains this definition in more detail. This model enables us to show how completely general and specific skills, and even skills combining only purely general and specific competencies are likely to be exceptional cases. Generally, one must assume that skills usually include several competencies, that all vary in the number of firms they are transferable to. This model can also be used to present the hypotheses that will be derived from human capital theory.

The model will show that what determines transferability is the fit between sets of job requirements and sets of competencies. Thus, transferability is not determined only by the tasks employees do, but how these are combined into jobs. Moreover, transferability is a matter not only of which competencies employees possess, but how these competencies are combined into skills, and how this fits with how jobs are designed by different employers.[9]

---

[7] A similar analysis has been offered by Oatey (1970: 15), who distinguishes between the generality of a particular skill and the generality of the investment, which is affected by potential mobility.

[8] A well-grounded critique is that information could be seen as a necessary part of the usefulness condition. That is the core of Katz and Ziderman's (1990) argument. Nevertheless, the information condition is included to underline the fact that it is a crucial condition, and to avoid misunderstandings based on a narrower perception of usefulness.

[9] Marsden (1995: 70) argues that 'skill transferability is partly a matter of the technical characteristics of the skills involved, but even more important are the diversity with which the same tasks are combined and applied in different firms, and lack of recognition.'

Since transferability is not just a matter of competencies and tasks per se, but how these are organised and combined, the model justifies the assumption that there is scope for employer action to affect transferability, discussed in more detail in chapter 3 and 5. There are three ways in which employers can increase transferability. First, they can design jobs so that the requirements are the same among employers. Moreover, they can design training so that the combination of competencies is equally valuable among employers.[10]

These two first options both directly influence the necessary match between skills and requirements. The final option is to ensure that other employers have information about the skills that employees get, a factor which is not included in the simple model presented here, but is discussed in chapter 5.

The model takes as its point of departure that certain competencies are required for a specific job, and that a certain skill consists of different competencies. Thus, the job requirements can be represented as: $R = r_1 \ldots r_i \ldots .r_n$, and the skills as $S = c_1 \ldots c_i \ldots .c_n$.

These job requirements are not requirements in the strict sense of the word. Rather, this model assumes that each employer values a skill according to how many of the job requirements it meets, and the value of the skill is the same as the number of requirements it fills. For example, if the skill meets two requirements, the value is 2.

An obvious critique of the simple model is that skill requirements for a job are seldom a matter of a set of strict, dichotomous requirements. At the same time, a person's skills are unlikely to be represented by a set of competencies that he or she has or has not got. In the real world, a skill will consist of degrees of certain competencies, and jobs will vary by the extent to which these competencies will be utilised. This point corresponds closely to Blaug's (1972: chapter 5) critique of the manpower-requirements approach to educational planning. The simple requirements-

[10] In chapter 5 it is shown that this may either be resolved through organising training

skills model presented here must assume that there is a minimum qualification that is needed, 'below which the task in question cannot be carried out at all but above which additional qualifications have no value' (Blaug 1972: 141).[11] Still, the important point remains the same even in a model that does not assume that it is a question only of having or not having a particular competence. Since different jobs utilise the different competencies a skill consists of, the value of a skill is likely to vary according to the job it is used in, and the transferability of a skill will be defined by the extent to which the skill is valued by different employers.

Table 2.1 Jobs as bundles of job requirements and skills as bundles of different competencies

	Employers				Skills			
	A	B	C		S_1	S_2	S_3	S_4
Job requirements	r_1	r_1	r_1	Competencies	c_1		c_1	
	r_2	r_2				c_2		c_2
	r_3		r_3					c_3
	r_4						c_4	
		r_5						
			r_6					

Table 2.1 illustrates a situation where employer A's job requirements are r_1, r_2, r_3 and r_4, employer B's job requirements are r_1, r_2 and r_5, and employer C's job requirements are r_1, r_3 and r_6. These are the only employers in the labour market, and they offer only this one type of job each. For each requirement (r_i) there is a competency (c_i) that fills this

for employees in different firms or harmonising internal training.

[11] Blaug argues that the manpower requirements approach to education planning can also give provide valid predictions if 'the output of workers in particular occupations increases with their educational qualifications, very gradually at first, then at a sharply increasing rate beyond a certain threshold level, after which it levels off again' (Blaug 1972: 141). The important theoretical point is however only the distinction between a dichotomous and a continuous relationship between skills and output.

requirement. This means for example that c_2 is a requirement for employer A and B, but not for C. There are several different training options available, which can lead to one of the four different skills shown in table 2.1.

In this case, S_1 and S_2 are perfectly transferable skills according to the definition, since they are both equally useful in more than one firm. The value of S_1 is 1 for all three employers, and the value of S_2 is 1 for both employer A and employer B. Even S_1 is however not a general skill, as Becker defined it, since the number of employers is so low that the employers are likely to enjoy some degree of monopsony power. It should be added that with this definition of transferability, S_1 is not more transferable than S_2, even if it (S_1) is transferable to more employers. In other words, theoretically transferability is independent of the number of firms the skill is equally useful in. That is a consequence of distinguishing between usefulness and competition.[12]

In most cases a skill consists of combinations of competencies, each of which are transferable to a given number of firms. As will be shown later, an important possibility is that a skill can consist of one part that is transferable to all employers and one part that is firm specific. In table 2.1, S_3 is such a skill. This skill is worth 2 to one employer and 1 to the two other employers. This chapter will show how human capital theorists have used the existences of such skills to explain that employers may finance transferable training.

The last skill, S_4, can be used to explain how training in itself tends to limit labour market competition. The skill consists of two competencies that are both perfectly transferable, but the combination of

[12] This distinction is more complex than it might seen, since usefulness in other firms is a necessary condition for competition. If we exclude other factors such as geography for a moment, the degree of labour market competition is a direct consequence of how the different employers value certain skills.

these two is not. The value of the skill is 2 to employer A, but only 1 to employers B and C.[13]

The purpose of the next section is to derive the hypotheses, which say that according to human capital theory employers:

- will finance only skills consisting of competencies such as c_1, that are transferable to all employers, if there are few employers in the labour market or the skill also includes a component of specific human capital (such as S_3);
- will have incentives to prefer skills S_3 with a specific component to S_1, which is more transferable;
- will not provide the optimal amount of transferable training unless there is perfect labour market competition.[14]

2.6 Modifications of Becker's theory

Too little transferable training is provided, and employers seem to pay even for general training. These two observations have caught many researchers' attention because they apparently contradict Becker's predictions.

To explain this, researchers within the human capital tradition have modified Becker's original theory, and introduced 'imperfections' in the labour markets, and also in the capital market. This part of the chapter focuses on modifications of Becker's theory that can contribute to

[13] In this model, a skill can however be more transferable by adding another competency, since it can make the value of the skill more similar among employers. S_5, consisting of c_2, c_3 and c_5, would for example be perfectly transferable between employer A and B. Skill S_4, that only consists of c_2 and c_3, is less transferable.

[14] Chapter 7 will discuss in detail what is meant by the 'optimal amount' of training, and how it may be measured.

deriving the three hypotheses that will be presented.[15] There are three types of modifications. Theories involving limited labour market competition are one type of modification. The second type of modifications are those which imply that training is not perfectly transferable, but includes elements of firm-specific human capital. The third type of modification is based on the assumption that investments in specific training may be more profitable if general training is provided at the same time.

In Becker's theory, there are two reasons why training may be neither perfectly specific nor perfectly general. One possibility is that the training raises marginal productivity in other firms, but the rise is smaller than in the training firm. It is also an intermediate case if there is imperfect competition in the labour market. Becker analyses the first case by assuming that the training consists of a general and a specific part (Becker 1993:44). Then it follows that the trainee pays for the general part and the two parties share the costs of the specific training. Regarding the latter, Becker (1993:50) says that all training provided by a monopsonist is perfectly specific, whereas 'the effect on training in less extreme monopsony positions is more difficult to assess.' Moreover, 'monopsony power as a whole, including the more extreme manifestations, would appear to increase the importance of specific training and the incentives for firms to invest in general capital.' He does not discuss imperfect labour markets any further. According to Eckaus (1963: 504) and Ziderman (1978: 23), Becker was well aware of what it would mean for his conclusions to allow for imperfect labour markets, but he saw them as only minor qualifications.

[15] This means that this chapter will not discuss all the reasons why there might be an under-investment in training, for example taxation, risk and unemployment benefits (Layard 1994).

2.6.1 Limited labour market competition

In practice, labour markets for particular skills may consist of few employers. Specialisation in education and training, high moving costs and barriers to entry make monopsony power likely. This section presents some explanations of why employers according to the theory might co-finance perfectly transferable training if there are few employers in the labour market. These theories can also explain why too little transferable training may be provided. This section will also show how several other modifications of Becker's original theory implicitly assume that there is limited labour market competition.

One explanation for why employers might be willing to finance perfectly transferable training has been put forward by Stevens (1993; 1994c; 1996). She analyses situations with imperfect labour market competition, in which employers can pay employees less than their marginal productivity even for transferable training since they have monopsony power in the labour market (Stevens 1996: 27).[16] Usually this difference is smaller the more employers there are (Stevens 1994c: 550). However, even labour markets with few employers can be effectively competitive, and in some cases employers may still be able to pay employees less than their marginal product even if there are many employers.[17] The important point for Stevens, however, is not so much the origin of imperfect competition as the consequences imperfect competition has for provision of training.

The fact that employees are paid less than their marginal product means that employers will be able to profit directly from transferable training, because the gains from employees' increased productivity will not be totally offset by higher wages. This has two important

[16] Becker (1962: 24) points out that the observation that employers pay their employees less than their marginal productivity cannot be a valid indicator of monopoly power when employees have specific skills.

[17] That is the case if the supply of labour is 'sticky,' so not all workers will quit even if they are paid somewhat less than they could have done elsewhere (Stevens 1996: 31-32).

consequences, according to Stevens. As long as the number of firms is not very high employers might be willing contribute to financing transferable training, because they will reap some of the benefits from transferable training. Moreover, because of positive externalities between employers too little transferable training will be provided.[18] The externality exists because employers will benefit from training they do not finance themselves.

The externality effect here is the product of the probability of separation and the difference between wages and marginal productivity, which is the employer's gains from transferable training (Stevens 1996:29). The probability of separation is an increasing function of the number of firms. The employer's gains, on the other hand, are a decreasing function of labour market competition. Stevens (1994c:541) claims that 'any source of imperfect competition leading to wages below marginal product, combined with any source of uncertainty about labour turnover, gives rise to this externality.' What is clear, is that there are no externalities present in the cases of general or specific training, the two extreme cases. Neither is there any externality effect when training consists of one general and one specific part.

This theory can explain not only why employers pay for transferable training but also why too little transferable training may be provided. Another implication is the hypothesis that employers will act to make training non-transferable or at least not act to make training transferable. This is however a conclusion that cannot be drawn if one keeps to the assumptions of Stevens' theory. One limitation of Stevens' theory is, namely, that the number of firms to which training is transferable, is exogenous (Stevens 1994c: 544). This means that firms can choose only between training that is either firm specific or that is transferable to the given number of firms in the relevant labour market.

[18] Positive externalities are defined as 'situations where consumption benefits are shared and cannot be limited to particular consumers' (Musgrave and Musgrave 1989: 42).

Stevens (1994c: 550) finds that if the number of firms between which training is transferable decreases the following occur:

(1) the total return to the training programme falls;

(2) the return to any individual firm increases;

(3) the probability of the worker moving to another firm falls;

(4) and the return to the worker falls.

Hence, one implication is that, according to (2), any individual employer has an incentive to make training less transferable.[19] Since Stevens' analysis does not include the possibility that employers can affect the transferability of training, she concludes that employers will have incentives to provide more than the optimal amount of specific training, because specific training reduces the probability of turnover. Therefore, if workers get a lot of specific training, employers are more likely to recoup their investment in the transferable training. One more direct way for employers to ensure that they benefit from the training would, however, be to restrict the number of firms who would value the training. The way Stevens treats the size of the external market for skills as 'exogenous' reflects the way neo-classical economists tend to treat the characteristics of labour markets as given by the technical nature of the skills involved. She mentions that 'training may be regarded as a process which itself reduces competition,' but she applies this argument only to how specific training might reduce turnover (Stevens 1996: 26). The theoretical perspective presented in the next chapter focuses more on the institutional setting of labour markets than human capital theory does, and argues that transferability may be endogenous.

Not only Stevens has argued that the number of firms in the labour market might affect the willingness of employers to pay for

[19] While Stevens argues that transferability increases with the number of firms to which training is transferable, the definition of transferability in this thesis is independent of labour market competition. Still, in practice, attempts to increase transferability by Stevens' definition will increase transferability as it is defined in this thesis.

transferable training. The point that firms may finance transferable training in labour markets characterised by some degree of immobility was put forward soon after the publication of Becker's work (Eckaus 1963: 503; Thurow 1970: 99; Ziderman 1978: 22). Ritzen (1992:189) argues that 'the specificity of one and the same type of training increases with the size of the firm' because it has a larger internal labour market. A more general point is made by Ryan (1984: 209) about the situation where not all skilled workers leave even if they are paid less than elsewhere. Then firms 'will find it not only feasible but also profitable to meet its labor requirements by paying lower wages to its experienced workers and spending some of the saving on training new labor.' The conclusion is the same as Stevens': if the labour market is not perfectly competitive, employers might be able to pay their workers less than their marginal productivity, and then employers have an incentive to finance transferable training.

Even the association between tenure and training is more or less implicitly based on the assumption that there is limited labour market competition. Tenure may have an impact on the level of training, but that the argument has to be based on a variant of Stevens' theory above. Average tenure in most countries and in most situations seems to be so long that employers are likely to reap much of the benefits general training generates, goes the argument. OECD (1993) has also shown that in countries and sectors with long tenure, training levels tend to be high. The link between tenure and training is mentioned by Becker (1962:23). He says that 'with an effective long-term contract...firms would be more willing to pay for all kinds of training...since a contract, in effect converts all training into completely specific training.' Subsequent research has studied average tenure rather than formal long-term contracts. In other words, if the labour contract is *de facto* long term, one would expect the firm to pay for some general training. Some writers have also argued that employers are likely to provide general training to employees they expect to stay with the firm (Bosworth, Wilson, and Assefa 1994; Feuer, Glick,

and Desai 1987; Ryan 1984). Yet, as long as the employee is free to leave after the training period, long average tenure does not provide a sufficient answer to why employers finance transferable training. This conclusion is based on an important implicit assumption in Becker's model. In a perfect labour market, it is always possible to hire employees with the general skills on the external labour market at the going market wage instead of training them oneself.[20] Bosworth, Wilson and Assefa (1994:86) claim that 'the individual may stay in the firm for a sufficient period for the employer to reap some of the benefits from general training.' However, there is nothing in Becker's work that suggests that employees with general training are not going to stay with the employer. Bosworth, Wilson and Assefa therefore have to assume that all employees will not leave the firm even if they are paid below their marginal productivity. They argue that 'if duration is, in part, socially or institutionally determined, the crucial role of market forces which underpins the role of specific versus general training as the allocative mechanism to some degree breaks down' (Bosworth, Wilson, and Assefa 1994:86). But their findings should be seen as just one example of how employers might be willing to finance transferable training if there is limited labour market competition, as Stevens argues.

Yet another argument that proves to be another version of the limited competition argument is presented by Bishop (1992: 91), who claims that seemingly general training does not have the expected effect on earnings and cost sharing since different firms need different mixes of skills. He argues that 'the package of general skills that workers develop are always more valuable at the training firm than at other firms even when each individual skill is correctly perceived to be useful elsewhere.' Thus, acquisition of non-specific skills in itself tends to limit labour market competition. In those situations Bishop describes, training is no longer general according to Becker's definition, because there is limited

[20] Not only is it assumed that new workers can hired, the current employees can also be

competition in the labour market.[21] It may however be transferable, so his argument should be interpreted as one variant of the argument that employers may pay for transferable training if there are few employers in the labour market.

2.6.2 Transferable training with elements of specific human capital

This section examines the explanation that employers might pay if training is not perfectly transferable, for example, because they have more information about the training than other employers do. These modifications of the original theory all present factors which mean that the training is not equally valuable in all firms. This is where they depart from both Becker's concept of general training and this thesis' definition of transferable training. The reason is that employers can benefit from training if it is not perfectly transferable, because they can give a wage increase that is smaller than the productivity increase brought about by the training. An important implication is that if employers have the choice between providing perfectly transferable training and less transferable training, they would prefer the less transferable training. The type of explanation presented here implies that training which is apparently general includes an element of specific human capital. Becker (1993:41) argues that hiring costs represent a form of specific human capital. He also says that 'expenditure on acquiring knowledge of employee talents would be a specific knowledge if the knowledge could be kept from other firms, for then the productivity would be raised more in the firms making the expenditures than elsewhere.' The conclusion about

---

fired at no cost to the employer.

[21] Bishop's point is illustrated by the skill S_4 in the skill-requirements model shown earlier in the chapter. This skill is less transferable than each of the competencies it consists of is.

skills consisting of only perfectly specific and perfectly human capital is a simple one. Other employers in the labour market will offer an alternative wage that equals the value of the general component, and employers may therefore be willing to share the costs of only the specific component (Stevens 1996: 24).

Asymmetric information is one reason why otherwise general training can include an element of specific human capital. Katz and Ziderman (1990) argue that employers may share the cost of general training, and even finance it fully, if they have more information about the training than other employers have. Bishop (1992) gives Katz and Ziderman empirical support, since 'even though employers claim that the skills they are teaching are general, the labor market is not treating these skills as if they were general' because of informational asymmetry.

The paper by Katz and Ziderman takes as its point of departure that the training employer possesses more information about the nature of the training than other employers do. The larger this informational asymmetry is, the more the employer is willing to pay and the less the employee is willing to contribute. In the extreme case where other employers are not willing to pay for the training because of informational asymmetry, the current employer will pay the whole cost for the otherwise general training, leaving it free for the employee. The premise of the argument is that information costs make an employee with otherwise perfectly transferable skills less valuable to other employers. Katz and Ziderman's main point is that there will be some costs incurred by the firm if they place a worker in a job he is not trained for. And since they cannot know for sure what skills he has, it will be a risk to place him in such a position. Moreover, it is costly to monitor the employee to find out what skill he possesses.

The conclusions from this theory are strikingly different from Becker's. Katz and Ziderman (1990:1154) find that in some cases 'the training firm will be prepared to finance [general training] fully.' Becker,

on the contrary, found that firms would not pay for any general training, and would only partly finance specific training.[22]

Even if Katz and Ziderman claim to provide an explanation for why employers would pay for general training, strictly speaking they do not. According to Becker (1993:34) 'perfectly general training' would be equally useful in many firms and marginal products would rise by the same exactly the same amount in all of them.' In Katz and Ziderman's (1990:1148) theory, by contrast, 'a recruiting firm will place a lower value on a recruited worker with general training than will the firm that trained him.' More important for the purpose of this thesis is the fact that training is not perfectly transferable if not all employers have the same information about the value of the training. Therefore, by definition, asymmetrical information cannot provide an explanation for why employers would pay for perfectly transferable training. It is however a relevant example of how the transferability of training is a matter of not only the technical content of the training, but also the information about the training, and more broadly institutional matters. Among other things, the theory presents a potential problem with certification of on-the-job training, which means that information is more equally divided between the training employer and other employers.

An argument similar to Katz and Ziderman's is used by Bishop (1992: 94), who says that 'because other employers are unaware of [the training's] exact character and unable to assess its quality prior to making hiring decisions, training that is technically general often becomes effectively specific.' The point that seemingly transferable training can include a specific element is also used by Stevens (1994a) to explain the patterns in the numbers of apprenticeships in the British engineering

[22] The reason for the different conclusions is not just that Katz and Ziderman introduce asymmetric information. Another difference is that Becker includes turnover costs in his model, which means employers will pay a 'premium' to employees with specific skills. Since Katz and Ziderman do not include this factor, they can conclude that the employer may pay the full cost of general training.

industry. She argues that it is cheaper for the employer to recruit a worker who has undertaken the apprenticeship within the firm than it is to recruit a worker who has been trained elsewhere. In times when there are skill shortages recruitment costs for skilled workers are high, and that makes supplying apprenticeships a good alternative, since the cost of recruiting an apprentice does not vary that much, according to Stevens.[23] Another version of the asymmetric information argument is that employers who provide training might have more information about the abilities of young workers than other potential employers have. Thus, if an employee cannot signal her ability to other employers, employers can pay the employee less than the full value of her skills (Acemoglu and Pischke 1998; 1999: F122).

2.6.3 Complementarities between specific and general training

The third modification of Becker's theory is the introduction of interaction effects between investments in specific and general training. In other words: one can argue that learning general skills increases the positive effect of specific training, or reduces the costs of specific training. If that is the case, employers may have an incentive to finance for transferable training. This argument is potentially of great theoretical value, since it is one of very few arguments that can challenge Becker's conclusion about cost sharing without relaxing his assumptions

[23] There are alternative explanations of the association Stevens finds between skill shortages and apprentices. A simpler explanation of Stevens' findings is that it reflects firms' simple decision between 'buy skills' and 'make skills.' When it is difficult to 'buy' them (recruit externally), firms will rather 'make them' (train apprentices) (Senker 1996). If she had not maintained the assumption that all workers are necessarily paid their marginal productivity, she could have found that skill shortages make apprentices actual work effort more valuable tow the firm, and that they therefore would take on more apprentices. Thurow (1970: 100-101) discusses the impact unemployment, output expectations and the interest rate is expected to have on firm's training decisions.

concerning perfect competition. The problem is, however, that in practice it is difficult to see that the argument both theoretically and empirically adds much to the argument that employers might finance seemingly general training if it includes an investment in specific human capital

One of the most common findings in research on education and training is that those with a long education get more further training than those with a short education (Ashton and Green 1996: 50; Nordhaug and Gooderham 1996: 83). One explanation is that either the costs of training are smaller or the benefits of training are larger for the group that already has education (Green 1994: 261-262). This means that education and training are complementary, i.e., that the benefits from both education and training will be larger than the sum of the net benefits from education and training separately (Thurow 1970: 54). It is also reasonable to assume that there are complementarities between general and specific training.

According to Thurow (1970: 93) employers may be willing to pay for general training if there are such complementarities between general and specific training. These complementarities in themselves are however not a sufficient explanation for why firms might finance general training. The reason is that employers would rather choose to recruit employees with general training and give them specific training than finance general training themselves. The analogy with the relationship between education and training is illuminating. Even if they are complementary, this is no reason for employers to finance education. Instead of financing education, they recruit graduates.

Employers may however be willing to finance general training if there are complementarities between general and specific training *in the training process.* If specific training becomes more valuable, or specific training becomes less costly, when provided together with general training, employers may want to contribute to financing general training. Not only must general and specific training be complementary; the complementarities must exist only if the two types of training are provided at the same time.

The complementarity argument has been presented in different ways. Most of them are more complex than the version presented above. One example is the 'insurance hypothesis,' presented by Feuer, Glick and Desai. According to this hypothesis, 'firm-sponsored training in general skills is not necessarily vulnerable to poaching' (Feuer, Glick, and Desai 1987: 122). They argue that as long as an employee acquires both general and specific skills at the same time, firms might want to finance some of the general training. The reason is that the worker will not leave the firm as long as his return to his specific and general skills is higher than he would receive elsewhere for his general skills. It is true that the worker might not leave, but this is still not an explanation for why employers would finance general training. There is no reason why employers should not just provide the specific training. The fact that they provide specific training at the same time gives no reason for them to finance general training, if there is no interaction effect between the two. Feuer, Glick and Desai's (1987: 123) argument about 'hazards associated with firm-specific human capital investments' is one such interaction. They argue that employees are reluctant to invest in specific training because they are the weaker part in the bargaining with the employer once the training is finished. Therefore firms will provide both general training and specific training, since then the worker knows that she will at least get a wage increase that equals the increase she can get from the general skills in another firm.[24] Feuer, Glick and Desai argue that firms will pay for general training to encourage specific training. By contrast, Stevens argues that investments in specific training are used to reduce turnover so that employers are more likely to reap the benefits of transferable training. Feuer, Glick and Desai (1992: 53) expect that employees will prefer general training to wage 'premiums.' The reason is that general training is valuable outside the firm, and the benefits are therefore less vulnerable to

[24] This argument is similar to Stevens' (1994c), since they both imply that investments in general and specific training are correlated. The difference is the rationale employers have to finance general training.

the present employer's possible exploitation or layoff. But still, the insurance hypothesis fails to explain why the firm cannot just pay a larger share of the investment in specific training if there are such hazards associated with it.[25] The argument advocated above, about complementarities in the training process, is simpler than the insurance hypothesis presented by Feuer, Glick and Desai's, without having to rely on a hypothesis concerning the vulnerability of employees.

Without making assumptions about employees' vulnerability, Franz and Soskice (1995) use a version of the complementarity argument to explain why German employers finance apprenticeships, which apparently constitute perfectly general training. They argue that if specific training is cheaper during general training than after, and specific skills are necessary for using general skills, employers may be willing to finance general training.[26] Franz and Soskice (1995: 224) argue that in German organisations, general skills themselves are not of much value until extensive specific skills are acquired. In the case of German apprenticeships, this may be a reasonable assumption to make. Even if the condition that much specific training is needed, it is not a necessary condition for the complementarity argument more generally to be true, but it makes it more likely that this logic will affect training decisions.

The problem with the complementarity argument is that it could be seen as little more than a sophisticated version of the argument that the apparently transferable training also includes aspects of specific human capital investments, even if they could be seen as two theoretically distinct explanations. The extreme example that specific training has no costs

---

[25] Feuer, Glick and Desai (1992) claim to test the insurance hypothesis, but the research design does not permit a proper test of the hypothesis. They show that turnover is lower for employees who undertake employer-paid education compared with those who pay for the further education themselves. This is hardly surprising if we believe that employees often pay for further education to get a new job. A test of the insurance hypothesis would have to compare those with firm-sponsored education with a comparable group of employees who do not undertake any further education at all.

during general training elucidates this point. There is a negligible difference in practice between saying employers pay for apparently transferable training if it includes specific human capital aspects and saying they pay because provision of general training makes specific training free. The case of apprenticeships may be an illuminating example. Franz and Soskice's argument can hardly be distinguished from explanations presented in the previous section; that seemingly general training includes aspects of specific human capital.

Later in this thesis the distinction will therefore not always be made between the 'complementarities argument' and the argument presented earlier, that employers might pay for apparently fully transferable training if it includes elements of specific human capital.

An additional rationale for not emphasising possible complementarities effects in this particular empirical study, is that the effects are likely to be small for further training, which is usually short compared with for example apprenticeships. The importance of the 'complementarities argument' is likely to be limited by the fact that the effect depends on the difference between giving already generally trained employees specific training and providing the two at the same time.

2.7 Human capital hypotheses

This section will present three hypotheses that apply to central problems in research on education and training. Each of these three hypotheses will then be tested in chapter 5,6 and 7, respectively, and compared with alternative hypotheses, which treat transferable training as a collective action problem. These are all H_0-hypotheses, which will be contrasted with alternative hypotheses in chapter 3.

[26] Franz and Soskice use 'marketable skills' as a synonym for 'general skills.'

The first hypothesis, $H_0$1, states: *since each individual employer has no incentive to ensure that training is transferable, each employer will act to reduce transferability.*

Becker's cost sharing conclusion is the best starting point to explain why this might be true according to human capital theory. He argues that the employer will not pay any of the costs of general training because the employer will not benefit from it afterwards. The employer will however benefit from specific training, and will therefore contribute to financing it. As shown earlier, Stevens makes the more general point that the fewer firms the training is transferable to, the more will the individual employer who finances training benefit from it. The result is that human capital theory on this point predicts that each individual employer will prefer the less transferable training if he can choose between two otherwise equal types of training, even if this, according to Stevens, means that the total return to the training programme falls. One example is Katz and Ziderman's model, where each employer would prefer to have more information about the training than other firms do, even if they then have to pay some of the training costs. So each employer will have an incentive to reject certification or other measures to share information about training to other employers.

However, the implicit assumption in human capital research is that the design of different training options is given, and that employers are not in a position to affect the transferability of these options. In other words, transferability has been treated as exogenous, while the theory presented in chapter 3 assumes that it is endogenous. Exogenous transferability is an assumption not only in human capital theory. For example, Doeringer and Piore's (1971) account of internal labour markets is also based on the assumption that skill specificity is determined by the technology employees use. While the issue of how transferability is determined has remained largely untouched in human capital theory, the next hypothesis addresses a core theme of human capital research since the theory was presented in the early 1960s.

The second hypothesis, $H_0 2$, states: *employers will not pay for any of the costs of perfectly transferable training in a perfect labour market, but they will pay some of the costs to the extent that transferable skills includes firm-specific human capital, or employees can be paid less than their marginal productivity due to limited labour market competition.*

The original hypothesis, presented by Becker, is that employers will not pay any of the costs of general training.[27] Since transferable training and general training are equivalents if there are many employers in the labour market, his hypothesis can also be said to cover the case of transferable training. His hypothesis can then be reformulated thus: given fierce competition in the labour market, employers will not contribute to pay for transferable training.

As long as Becker does not discuss the case of imperfect competition in the labour market (except for the extreme case of monopsony), other contributions must be used to make predictions about the case with few employers. Stevens is the one who most clearly presents the argument for that employers will share part of the costs for fully transferable training if there are few employers in the labour market, and an oligopoly solution develops where employees can be paid less than their marginal product. Thus, there is theoretical support for the hypothesis that employers will not individually pay for transferable training, except if there are few employers in the labour market, or the training includes specific human capital components.

It is worth emphasising that according to human capital theory employers will not finance general training just because employees cannot afford to pay for it (Acemoglu and Pischke 1999: F119). The fact that employees are unable or unwilling to pay for general training has however, according to Becker's theory, no impact on employers' willingness to pay for general training, since employees would still reap all the benefits from such training. What is the case, however, is that the level

of training will be too low if employees are liquidity constrained. In practice, what some researchers seem to suggest, is that in those cases where employees cannot pay for general skills, employers offer less transferable training. Then the employer may finance some of the training. That will tend to reduce the under-investment in skills (Bishop 1992; Ryan 1984).

The last hypothesis ($H_0 3$) states: *the optimal amount of transferable training will, and can only, be provided in a perfect labour market with a perfect capital market.*

Given Becker's assumptions, standard economic theory will show that the training decisions taken in a perfect labour market are the optimal ones for the society (Varian 1993). The core idea in human capital theory is that 'the standard tools of economic analysis can be applied to the analyses of the determinants and consequences of investments in human capital' (Mincer 1992: 186). Applying these 'standard economic tools' shows that Becker's theory predicts that the market itself will provide the socially optimal amount of training if the capital market is perfect, as long as a perfect labour market is part of the *definition* of general training. Once again this must be reformulated to cover transferable training. Then Becker's conclusion is that the optimal amount of transferable training will be provided if there are many employers in the labour market and no barriers to mobility. If, on the other hand, there is limited competition in the labour market, Stevens' conclusion is that the optimal amount of transferable training may not be provided, since in that case transferable training has 'poaching externalities.' More generally, 'even when workers have access to perfect loan markets and there are no contractual problems, the amount of training in imperfect labour markets will be suboptimally low' (Acemoglu and Pischke 1999: F127).

So the optimal situation, according to human capital theory, can arise only in a situation with perfect competition in the labour market when

---

[27] A perfect labour market is not a condition here; for it is part of the *definition* of

employees bear all training costs. If employers pay for transferable training, there must be 'imperfections' in the labour market. And when there are 'imperfections' in the labour market, the amount of training cannot be optimal. So from the point of view of human capital theory, the fact that employers pay for training that is not specific, does not contradict the observation that too little training is provided. On the contrary, in the optimal situation employers should *not* pay for transferable training. In other words, the observation that employers do in fact pay for transferable training should, according to this theory, be a matter of concern, rather than an indication of higher-than-expected provision of training. This shows how the optimal situation depends heavily on the capital market being perfect, and the employees therefore able and willing to finance general training fully.

The question is then how likely it is that the optimal situation will arise. For example, Booth and Snower (1996: 7) argue that

> Once we accept that wages are usually set under imperfectly competitive conditions (with firms exerting some market power) and that most skills are imperfectly transferable (so that poaching is usually a possibility), it becomes obvious that the free market generally does not provide sufficient incentives for training.

To the extent that individual employers can affect the transferability of training, they will prefer training not to be transferable. Even if they cannot, situations with few employers or not perfectly transferable training can arise. In these situations employers will pay some of the training costs, but the amount will be sub-optimal. But human capital theory says nothing about the likelihood of the 'imperfections' arising since the existence of labour markets for particular skills and the value of these skills in other firms are treated as exogenous.

The theory presented in the next chapter, to a greater extent than human capital theory, tries to explain the existence and constitution of labour markets. Based on this theory a set of alternative hypotheses about

---

general training.

transferability, cost sharing and training provision are developed. After chapter 4, which provides the link between the theoretical predictions and the empirical test, these two sets of predictions are tested in chapter 5, 6 and 7.

3. The collective action problem of transferable training

3.1 Introduction

Chapter 2 presented human capital theory and its predictions about the provision of transferable training. The defining characteristic of human capital theory is that it sees education and training as investments. The theory that will be presented in this chapter still considers education and training as investments, but it deviates from the theory in chapter 2 in one important respect. The difference is that this alternative theory regards provision of transferable training as a collective action problem for employers. This small addition proves to be significant. It leads not only to other predictions; it also requires a changed empirical focus.

An example from the German apprenticeship system illuminates the difference between the two approaches. It has been a puzzle why German employers finance training of so many apprentices when the resulting skills are highly valued by other employers, since this appears to contradict Becker's conclusion on cost sharing (Acemoglu and Pischke 1998). Franz and Soskice (1995) present an explanation in line with human capital theory by arguing that the main reason is complementarities between specific and general training. Crouch (1993) holds an alternative view which emphasises the importance of collective action. He claims that German employers finance apprenticeship to such a large extent because the chambers of commerce, *Kammern*, provide the means for collective

action. It is an alternative view similar to Crouch's that will be the topic of this chapter.[1]

The purpose of the chapter is to present the basis and the implications of the alternative view. It first shows how transferable training theoretically is a collective action problem for employers. Then it presents the predicted impact employers' collective action has on the provision of transferable training, cost sharing and transferability, and compares this to the hypotheses developed in chapter 2. The collective action theory does however predict not only what consequences such action may have, but also the probability of employers' collective action in different types of industries, and this is the topic of the last part of the chapter.

3.2 Transferable training as a collective good

To make clear what transferable training being a collective good means, it can be compared to the more widely used notion of 'public goods.' A standard definition of a public good is that it is 'non-rival' and 'non-excludable' (Musgrave and Musgrave 1989). If a good is non-rival it means that 'A's partaking of the consumption benefits does not reduce the benefits derived by all others' (Musgrave and Musgrave 1989: 43). Exclusion means that 'A's consumption is made contingent on A's paying the price, while B, who does not pay, is excluded' (Musgrave and Musgrave 1989: 42). If such exclusion is not feasible, a good is non-excludable. Pure public goods are both non-rival and non-excludable, in contrast to pure private goods, which are rival and excludable. Goods that are either rival and non-excludable or non-rival and excludable are called impure public goods.[2] Collective goods are not necessarily non-rival, but

[1] As this thesis will show, Tessaring (1998 : 15) is inaccurate when claiming that while the neo-classical economists favour market steering of education and training, proponents of the collective action perspective favour steering by the state.

[2] Musgrave and Musgrave (1989: 44) apply the term 'social goods' to all goods that are not purely private goods.

they are non-excludable, according to Olson (1971: 14). In his seminal work on collective action he defines a collective good as 'any such good that, if person X_i in a group $X_1....X_i.....X_n$ consumes, it cannot feasibly be withheld from the others in the group.'

Transferable training is akin to a collective good since an employee is free to leave the firm at any time if no special agreement exists (Crouch 1995; Crouch, Finegold, and Sako 1999: 26). This means that transferable skills 'cannot feasibly be withheld from others in the groups,' i.e. other employers. Hence, the skills are non-excludable, and therefore covered by Olson's definition. As a reflection of the fact that labour markets differ from markets for goods, skills differ from consumer goods in one important way: those who buy labour never own the labour as they would own other goods. Therefore, skills can never be a collective good by a strict definition of such goods. For example, Becker (1962: 17) argues that since property rights in skills are automatically vested – they cannot be used without the permission of the owner – 'an analogy with unowned innovations is misleading.' Still, in the rest of the thesis 'training is a collective good' will be used instead of 'training is akin to collective goods.'

One may argue that transferable training is not only non-excludable, but also non-rival. Marsden (1986) claims that it all depends upon the elasticity in labour supply, or to what extent higher wages will increase the supply of labour. If supply is perfectly elastic, all employers can have their skill needs covered at the going wage rate. Then transferable training is not rival. The less elastic labour supply is, the less is transferable training a public good, is Marsden's argument. Transferable training is more like a pure public good in the long than in the short run, since in the long run the supply of skills is more elastic. Crouch, Finegold and Sako (1999: 26), on the other hand, generally see transferable skills as rival since they are 'not in infinite supply, and if one firm is employing no one else can' and hence they are not pure public goods. Thus, at least in the short run, transferable skills are rival, and non-excludable, and

therefore impure public goods. In the longer run, however, the number of schools and training places may be increased, so skills are more similar to a pure public good.

Skill transferability is however a pure public good irrespective of time frame. The benefits stemming from increased transferability are, for example, lower information costs about employees' skills and lower recruitment costs. In contrast to the skill itself, these benefits are both non-rival and non-excludable, and hence pure public goods.

Table 3.1 Public good characteristics of training

		Excludable	
		Yes	No (i.e. collective good)
Rival	Yes	Specific training	Transferable training
	No	Employers' information about own training	Transferability of training

The categorisation is summarised in table 3.1. Specific training is excludable, as no other employers can benefit from the training. Since only the current employer can profit from these skills, they can be seen as pure private goods even if the employer can never be confident that the employee will not leave. Information about training within the firm might be non-rival, yet excludable, because the employer may choose not to provide information about the training to other employers.[3]

The most important point to establish here, however, is that according to this theory transferable training is non-excludable and therefore a collective good. Consequently, a collective action problem exists. There is such a problem 'where rational individual action can lead to a strictly Pareto-inferior outcome, that is, an outcome which is strictly less preferred by every individual than at least one other outcome' (Taylor 1987: 19). Table 3.1 shows that the provision of transferable training generates two collective action problems for employers:

[3] The information the employee can give about the training is ignored here. As shown in chapter 2, employers have incentives not to pass on information to other employers.

- actions to make training transferable, or to organise the supply of transferable training, involves a collective action problem for employers;
- financing of transferable training is a collective action problem for employers

From Taylor's definition of a collective action problem two important consequences evolve, which will be in focus in the remaining part of this thesis. Firstly, since transferable training is a collective good, we expect that the outcome of investment decisions by individual employers will be too little training.. Secondly, this problem can be overcome by co-ordinated action. Of these two consequences, previous research has given most attention to the former. Therefore, this chapter includes a framework for the analysis of *solutions* to the collective action problem. However, first it analyses the impact of employers' collective action.

3.3 Impact of collective action

This part of the chapter (3.3) discusses the impact of employers' collective action on transferability, cost sharing and amount of training, and generates the set of alternative hypotheses presented in table 3.2. The next part (3.4) answers the separate question of what determines the probability of such action. These two parts are both required in order to derive the predictions about each industry, which are discussed in detail in chapters 5, 6 and 7.

Table 3.2 H_0- and H_{alt}-hypotheses

Human capital theory	Collective action theory	Ch.
$H_0$1: Since each individual employer has no incentive to ensure that training is transferable, each employer will act to reduce transferability	H_{alt}1: Individual employers will usually have no incentive to make training transferable, but through collective action they may do so because it is best for the employers as a group.	5
$H_0$2: Employers will not pay for any of the costs of perfectly transferable training in a perfect labour market, but they will pay some of the costs to the extent that transferable skills includes firm-specific human capital, or employees can be paid less than their marginal productivity due to limited labour market competition.	H_{alt}2: If the increased productivity from transferable training is not fully offset by higher wages, employers may be willing to finance a share of the costs of transferable training, and they are likely to finance the highest share if there is collective action among employers.	6
$H_0$3: The optimal amount of transferable training will, and can only, be provided in a perfect labour market with a perfect capital market.	H_{alt}3: Even though the optimal amount of training may be provided in perfect labour markets with perfect capital markets, it is more likely to be a result of employers' collective action, which may be achieved if there are few employers, or through a powerful body.	7

3.3.1 Transferability of training and 'endogenisation'

Collective action theory does not dispute the prediction of human capital theory that employers individually are unlikely to try to ensure that training is transferable. Collective action theory says, however, that this

problem can be overcome either because there is voluntary co-operation between a few, large employers or there is a powerful body that can use selective incentives to make employers contribute to making training transferable, as this chapter will show. Still, the possibility of defection is always there, since individual employers have an incentive to free ride. Hence, co-operation is inherently unstable, and dependent on the continuing co-operation of the employers.

A significant difference between human capital theory and collective action theory is the importance of employers' action in determining transferability. While human capital theory predicts that individual employers' actions to reduce transferability have limited impact, collective action theory emphasises that employers' actions are crucial in determining transferability of training.

Collective action theory states that transferability is only partly a result of the technology applied or the product produced. What eventually determines transferability is how work is organised and skills applied in different firms, and the information employers have about the training, and whether action is taken to ensure employees in different firms get similar training. Thus the alternative hypothesis ($H_{alt}1$), which will be treated in more detail in chapter 5, is: *individual employers will usually have no incentive to make training transferable, but through collective action they may do so because it is best for the employers as a group.*

This 'endogenisation' of transferability, implying that transferability of training is not set independently of employers' choices, has had wide-ranging implications for the study of training and labour markets more generally. 'Endogenisation' would imply not only that employers' individual and collective actions significantly affect transferability, but consequently labour market competition as well, since transferability of skills is a necessary condition for labour market competition. Therefore, collective action theory predicts that without collective action by employers, action by individual employers to reduce transferability contribute to reducing labour market competition. In other

words, labour market competition will, according to collective action theory, affect not only employers' training decisions; but these decisions will in turn also affect labour market competition. Human capital theory, on the other hand, assumes that labour market competition is given, and is a factor that employers must only take into consideration. The relationship between endogenous transferability, cost sharing and skill shortages are discussed in chapters 6 and 7, and the more general conclusions treated in chapter 8.

3.3.2 Cost sharing

Instead of maintaining that employer financing can be due only to specific human capital elements in the training, or limited competition in the labour market, collective action theory predicts that the existence or lack of co-operative solutions between employers is an important determinant of how much employers contribute to financing transferable training.

Figure 3.1 Supply and demand for training places given share of training costs borne by employers

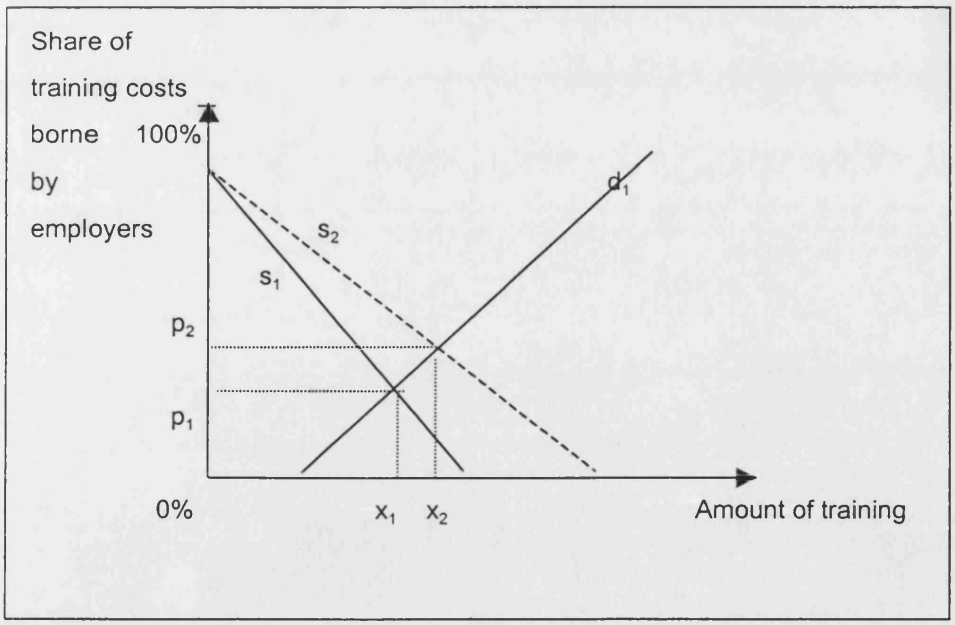


Figure 3.1 gives a simple presentation of the argument for why collective action leads to a higher share of training costs borne by the employer. The supply of training places by employers (s_1, s_2) depends on the

transferability of training and competition in the labour market. If training is perfectly transferable and there is perfect competition in the labour market, the supply curve is horizontal at 0 per cent, since employers would not be willing to finance any training places. In this figure, however, the curve is downward sloping, illustrating that employers may be willing to supply training places, but the higher the share of training costs they have to bear, the smaller the number of places offered. The demand for training places from individuals reflects transferability of training, wage increases from training, ability to finance training and their willingness to bear risks.

Collective action theory predicts that collective action through formal and informal sanctions will lead to a shift from s_1 to s_2, so that employers will provide more training places for any given cost sharing. Hence, even if the goal of employers' collective action is not to increase the share of training costs borne by employers, but to increase the amount of training (from x_1 to x_2 in figure 3.1), in the new equilibrium the share of training costs borne by employers will increase (from p_1 to p_2). Hence, the second alternative hypothesis ($H_{alt}2$), is: *if the increased productivity from transferable training is not fully offset by higher wages, employers may be willing to finance a share of the costs of transferable training, and they are likely to finance the highest share if there is collective action among employers.*

The rationale for employers' collective action to shift the supply curve, could be not only the collective action problem among employers, but also that individuals' demand for training places, for some reason, is lower than what is perceived to be optimal. That may happen, for example, if individuals find it more difficult to finance training, or they get more uncertain about the future pay-off, which could lead to a breakdown of a solution with high trainee contributions.

It may however be the case that a trainee-financed solution breaks down or is not possible, because the share of training costs borne by employers for some reason, for example trade union power or government regulations, is set so high that supply is lower than demand.

In that case, a shift in the supply curve leads only to a higher amount of training being provided, and not a higher share of training costs borne by employers. Thus, collective action theory predicts that collective action leads to a higher share of training costs borne by employers, except in the case where employers' collective cannot influence this share.

3.3.3 Amount of training and skill shortages

Human capital theory states that the optimal amount of training is provided only if there are perfect labour and capital markets, and departures from this ideal situation will always mean sub-optimal provision of transferable training. Collective action theory does not conflict with the human capital theory conclusion, that if the labour market and the capital market are perfect, the provision of transferable training will be optimal. But the collective action hypothesis is distinctively different since it does not use the perfect labour market as the only ideal or point of departure. Instead, collective action theory predicts that the optimal amount of transferable training may be achieved in several different situations, and that a large number of employers in a labour market does not necessarily mean that the provision of transferable training is more likely to be optimal. This is because, as this chapter will show, employers' collective action is most likely in a situation with few employers and a powerful superordinate body. This situation stands in contrast to a situation with a high number of employers without monopsony power, which according to human capital theory is most likely to generate the optimal amount of training.

Moreover, this alternative theory predicts that since transferability is endogenous, labour market competition is unlikely to be 'perfect' in skilled labour markets if there is no collective action, since employers' collective action is likely to be a requirement for transferability of training. Hence the ideal situation of human capital theory is unlikely to develop without an institutional underpinning.

Thus, the third alternative hypothesis (H_{alt} *3*), is: *even though the optimal amount of training may be provided in perfect labour markets with perfect capital markets, it is more likely to be a result of employers' collective action, which may be achieved if there are few employers, or through a powerful body.*

The hypothesis is closely linked to the considerable difference between the theories regarding the theoretical position of perfect labour markets. In human capital theory the perfect labour market is the one point of reference, which other competitive situations are judged against, and the degree of labour market competition determines cost sharing and the provision of transferable training. In collective action theory a situation with many employers, without market power, is one of several possible patterns rather than a standard that the other types are compared with. These different patterns and the different probability of employers' collective action in different labour market settings are the topic of the next part of the chapter.

3.4 Probability of collective action by employers

While the first step in presenting a collective action theory of training has been to discuss the impact of employers' collective action, the next step necessary to develop predictions about training outcomes, is to derive the probability of collective action under different conditions.

Several other authors have argued that transferable training is a collective action problem. Crouch (1998: 370) acknowledges that training is a collective good, which implies that there is 'no reason why company decisions and market forces should maximise the level of vocational ability for society as a whole.' Marsden (1986: chapter 8) bases his 'alternative approach to labour markets' on transferable training being a public good, and finally Finegold (1991b: 104) argues that the provision of transferable skills is a classic free-rider problem. Yet few attempts have been made to investigate how the conditions for solving the collective

action problem may vary between different labour markets and different parts of the labour market.[4] That will be done here, by linking the acknowledgement of training as a collective good with theories of employers' collective action. Thus, an aim for this thesis is to contribute to the research that can explain differences in employers' collective action between different categories of employers. What this section shows, however, is that most theories of employers' collective action so far have done more to explain differences between employees' and employers' collective action than to explain differences between different groups of employers. First the theoretical status of employers' collective action in general is presented, before it is shown how this can be applied to cases of transferable training. The next part of the chapter will present Olson's theory of collective action, and then describe how other authors later have treated employers' collective action more specifically.

3.4.1 Olson's two solutions

Since its publication in 1971, few books in economics have achieved such wide-ranging, lasting and profound impact as Olson's watershed work on collective action (Sandler 1992: 1). The essence of Olson's (1971; 1982) thesis is that it is an exception when groups of self-interested individuals act to achieve their common interest. The reason is that in large groups each individual's contribution is unlikely to significantly affect the total output of the collective good, and individuals are therefore unlikely to contribute. That is the case even if each individual would be better off if all contributed so that the collective good was provided. This is the collective action problem.

The problem could be solved however. Olson argues that there are basically two solutions to this collective action problem. In short his

---

[4] Bowman (1989) develops predictions of employers' collective action in the product market only. The factors that determine the probability of such product market collaboration, for example cartels, are necessarily very different from the ones that influence collective action in the labour market.

argument is that 'those groups that have access to selective incentives will be more likely to act collectively to obtain collective goods than those that do not, and that small groups will have a greater likelihood of engaging in collective action than larger ones' (Olson 1982: 34).

Selective incentives are excludable goods provided only to those who contribute to the provision of the collective good. A necessary condition for this solution to be effective is that another organisation cannot provide the same goods without supplying the collective goods (Sandler 1992). The selective incentives can be either negative or positive (Olson 1982: 21). In other words, if an organisation can use selective incentives to encourage collective action, it means that it can either reward those who contribute to the collective good or punish those who do not. These incentives are not necessarily pecuniary or formal; censure of those who do not contribute can also be an important selective incentive (Olson 1982: 23). Olson does not limit his discussion of selective incentives to trade unions or business associations. He also argues that government taxes are contributions obtained with the help of negative selective incentives (through the legal system).

The collective action problem may also be solved because the group that will benefit from the collective good is small. The probability that the collective goods will be provided, increases the smaller, and the more asymmetric, the group is.[5] Asymmetry means that interest in the collective good varies between agents. This asymmetry can reflect differences in size, for example between firms, but the asymmetry can also exist because agents have different preferences. Hence size does not necessarily reflect the agents' interest in the good (Sandler 1992). Olson (1971) argues that differences in size between the agents make it more likely that the largest agents contribute to the provision of the collective goods. Nevertheless, preference differences can alter Olson's (1971: 28)

[5] In line with Sandler (1992),the terms 'asymmetry' and 'symmetry' are used instead of Olson's (1971) 'heterogeneous' and 'homogeneous'. The purpose is to avoid confusion with 'social heterogeneity', which Olson (1982) argues is an obstacle for collective action.

observation that there is a tendency for 'exploitation of the great by the small.' That may happen if the interest in the collective good increases less than proportionally with size.

What Olson means with 'group size' is not the number of agents (n), but rather k, defined as the size of the smallest subgroup that could benefit more than the total cost of the whole group's good' (Hardin 1982: 46-48). As Schelling (1978: 221) shows, it depends on the situation whether k, k/n or n-k is most interesting. Generally k is lower the more asymmetric the agents are. The implication of focusing on k instead of n is that one can hardly find any general rule defining how few agents are 'few' and how many are 'many' without studying the situation in more detail. In other words, it is hard to have a priori expectations about where the exact borderline between small- and large number cases should be drawn. It depends not only on the agents themselves, but also on the collective good in question.[6]

The argument that collective action is most likely when there are few agents is strengthened if one includes strategic interaction. One type of strategic interaction is conditional co-operation, which is to co-operate, but only if others do. Dynamic analyses show that conditional co-operation makes it more likely that the collective action problem is solved (Dixit and Nalebuff 1991; Hardin 1982: 13; Olson 1971: 43; Taylor 1987: 12). One simple possibility deriving from game theory is to see it as a multi-period prisoner's dilemma, where it may be rational for interacting agents to 'co-operate,' i.e., provide transferable training. In a series of two-agent games it can be rational to co-operate in the first round and then co-operate as long as the counterpart does so (Axelrod 1984). This means that the conditions for solving the collective action problem in smaller groups are better than Olson predicts in his static model. However, as the number of agents becomes very large, dynamic analyses will not result in

[6] Later, 'small group' is used instead of 'small and/or asymmetric group' and 'large group' instead of 'large and symmetric group.'

outcomes significantly different from static ones (Hardin 1982; Olson 1971: 45). Thus, adding the possibility of repeated games strengthens the argument that small groups and large groups have substantially different prospects of providing collective goods.

Theoretically, each of these conditions (small group and selective incentives) can make it more likely that the collective good is provided. Even if Olson discusses these two solutions separately, one does not preclude the other. There may very well be 'selective incentives' in cases where there are few agents.

Table 3.3 Groups by conditions for collective action according to Olson

		Group size	
		Large	Small
Organisation with selective incentives	N	(1)	(2)
	Ye	(3)	(4)

A simple version of the argument is presented in table 3.3. In large groups without an organisation with selective incentives (1), a solution to the collective goods problem is least likely, according to Olson. In cases where there is either an organisation which can use selective incentives, or few agents, but not both (2 and 3), there could also be a solution to the collective goods problems. The theory does not provide a priori expectations about in which of these two groups collective action is most likely. The probability of collective action is highest where there are few agents and an organisation that can use selective incentives (4).

Olson's theory fostered a great amount of research, as well as critique. The theory was vulnerable to criticism partly because the book did not present any rigid test of his theory (Traxler 1991: 34). One common objection was that the theory was too simplistic. Taylor (1987: 12), for example, argues that 'Olson's model...is rather unrealistic.

Accordingly, not too much weight should be attached to conclusions derived from it.'

Many of the critics argue that Olson underestimates the probability that the collective action problem will be overcome. One important reason to believe so is that collective action is more likely when we take into account that the decision to contribute or not depends on whether others do. These possibilities, and several others, have been analysed in game theory. Yet, even if they qualify Olson's conclusions, they hardly provide any reason to reject Olson's theory.[7]

One important such qualification is the acknowledgement that the provision of collective goods always involves cost sharing that is more complicated than Olson assumes (Udehn 1996: 212). Another is that there is often a choice between different levels of collective goods, and it is not simply a question of providing it or not (Sandler 1992: 49). Traxler (1991; 1993) also argues that Olson confuses different aspects of collective action. He therefore suggests a distinction between associability (the organisation's ability to attract a large proportion of the relevant target group), generalisability (its ability to attract members with different interests) and governability (its ability to influence its members actions).

A potentially more fatal criticism is that contributions towards collective action are in fact not based on rational calculation of pure self interest (Marwell and Ames 1981). More precisely, Olson's theory is criticised for not including the importance of identification, socialisation, norms and mutual expectations for individual choice (Traxler 1991: 33).[8] These factors could themselves represent alternatives to Olson's theory in explaining collective action. A pragmatic view would be that depending on the type of situation, the impact of identification and norms (as

---

[7] Sandler (1992: 12) says that 'the failure of Olson's propositions to have universal validity does not significantly detract from his great achievement in elucidating some of the principles of collective action.'

[8] This critique reflects the major debate within sociology of rational versus norm-based action.

opposed to rational self-interest) on action, would vary. And even if Olson's theory cannot be deterministic, since not everyone acts out of pure self-interest, his theory can still be valuable in predicting variation in the provision of collective goods.

Later in this thesis his theory is used to predict which groups of employers are likely to solve the collective action problem of transferable training. But first the next part analyses alternative theories that have been used to explain employers' collective action.

3.4.2 Alternative theories of employers' collective action

The question of why collective action varies between different groups of employers has remained largely unanswered. Instead, one must infer what can be learnt about comparisons between different groups of employers from employer – employee comparisons. This section shows how these contributions build on and complement Olson' theory of collective action.

A decisive contribution, and the point of departure for subsequent employer – employee comparisons, is Offe and Wiesenthal's (1980) paper on 'two logics of collective action', which concludes that the problem of collective action is smaller for employers than for employees. One reason is that employers depend less on collective action to achieve their goals than employees do.[9] Moreover, employers find it easier to act collectively because their needs are better defined and vary less between different employers than the case for employees. This controversial conclusion, based on class theory, triggered empirical research. The results to a large extent contradict the predictions Offe and Wiesenthal make (Waarden

[9] According to Offe and Wiesenthal (1980: 84), 'most of the 'central life interests' of capital are either resolved *beneath* the level of association, namely within the individual firm, or *above* the level of association, namely within the state apparatus.'

1991: 56). Therefore, new attempts have been made to explain the differences between employees' and employers' collective action.

One of the important contributions in the debate that followed Offe and Wiesenthal's work argues that the most important difference between employees' and employers' collective action is not their class position in itself; the crucial difference is that employers' associations and business organisations are 'organisations of organisations,' and hence they differ from trade unions, which are organisations of individuals (Waarden 1991).[10] This argument does not conflict strongly with Olson's theory, but is valuable particularly through the way it discusses resources and heterogeneity as a basis for Olson's more abstract concept of 'different preferences' for a collective good.

According to van Waarden, 'organisations of organisations' encounter five types of problems that distinguish them from organisations of individuals. First, organisations tend to have more resources than individuals. Traxler (1993: 684-685) argues that the most essential difference between business and labour, aside from interests, are available resources. One important consequence is that employers are in a better position to further their interests individually than employees are (Traxler 1991: 43; Waarden 1991: 58). According to Traxler available resources reduce the 'need for organisation,' or need for collective action. Applied to differences between employers, one would expect that large firms need collective action less than small employers do. But having considerable resources also means that membership fees may be a minor expense (Traxler 1991). Hence the effect of available resources, or 'size', is theoretically indeterminate; the need for collective action may be reduced, but the ability to contribute towards the collective good is enhanced. This is in line with the previous discussion of the effect of size and preferences in Olson's theory. The fact that employers in many cases are able to

[10] One may however argue that this is only partially true, since trade union confederations by definition are 'organisations of organisations.'

further their interests without collective action is also important because it affects the collective organisation's possible power over the members. Traxler (1991) argues that employers are less 'governable' than employees are because it is 'relatively easy for employers to bypass their associations' goals through autonomous mobilisation of power resources.' Applying this to comparisons between employers, one would expect that large employers are especially hard to govern because they can most easily do without the collective organisation. Offe and Wiesenthal (1980: 80) argue that whereas employers' associations depend only on the companies' willingness to pay, trade unions also depend on their ability to mobilise their members to act. But employers' as well as employees' organisations face two different problems: one of joining the organisation and one of making members comply (Bowman 1998: 326).

A second problem for 'organisations of organisations' is that 'organisations may differ on many more characteristics than individuals' (Waarden 1991: 59). Streeck (1992) suggests that this is the most important reason why firms tend to establish less comprehensive organisations than employees do. Using Traxler's terminology, it means that business organisations have less 'generalisability.' In other words, it is particularly difficult to include a wide range of different firms with a wide scope of different interests in one organisation. All these contributions contradict Offe and Wiesenthal's (1980: 75) position, namely that interest differences are greater among employees 'since the worker is at the same time the subject and the object of the exchange of labor power.' Streeck (1991) argues that heterogeneity among employers is high because they are represented both in the labour market and the product market, and their interests are more diverse in the product market. This means that it is easier to organise comprehensive organisations for labour market issues than for product market issues. Therefore, if training is regarded as a labour market issue, the possibility for co-operative solutions is higher

than if it is regarded as a product market issue.[11] Olson (1982) mentions that interest heterogeneity poses a problem for collective action, but he does not discuss how that could effect collective action among employers.

The last three problems van Waarden mentions are all clearly in line with Olson's theory. One problem for collective action is that employers are more likely than individuals to act in accordance with Olson's behavioural assumptions. According to van Waarden (1991: 60) 'if there is one group which fits the behavioural assumptions underlying the theory, namely rational action and rational choice, perfect information and economic self-interest, it should be business.' Hence, the free-rider problem is expected to be especially important for employers' collective action.

The fourth and the fifth problem are 'asymmetry in size and resources' as well as 'small group size.' Together these two problems constitute one of Olson's two solutions to the collective action problem: small, asymmetric groups. Therefore, one would expect that the conditions for collective action among employers are good compared to employees, according to Olson's theory. Both Traxler (1991: 45) and van Waarden (1991: 69) specifically mention the possibility that contributions from a few large firms may suffice to set up an association. The implications of Olson's theory for employer's collective action are discussed in more detail later. Yet, two important points can already be made. First, Olson's theory clearly influences the theories of employers' collective action that were presented. Moreover, some empirical findings seem to confirm that collective action is more likely in small groups. Traxler (1991: 73) finds that the larger the share of employees in an industry that are employed in the four largest firms, the larger the share of organised employers tends to be.

---

[11] Based on this line of reasoning, one prediction is that the emphasis within HRM on skills as a potential basis for competitive advantage in the labour market may discourage employers' collective action.

One final question remains about Olson's theory and the way it is applied by van Waarden, namely the link between interest heterogeneity and group size. The paradox is illustrated by van Waarden (1991: 61), who on the one hand argues that 'high interest heterogeneity will make it difficult for business to find a general group interest on which to organise, and hence be a hindrance to collective interest organisation.' At the same time, this high degree of 'fragmentation' is an advantage because groups are small. That is, according to Olson, an advantage for collective action, and van Waarden (1991: 64) adds that small groups have less interest heterogeneity within the association than larger ones would have. This theoretical argument can explain why business associations tend to be smaller than trade unions (Waarden 1991: 62).

The literature on this point is confusing, mainly because the assumptions are not made clear, and there is no definition of what it means to solve the collective action problem. None of the authors disagree that interest heterogeneity reduces generalisability. Olson (1982: 24-25) mentions the effect only on governability. He argues that it will be more difficult for associations to unify its member's diverging interests. The question is then how heterogeneity affects associability, 'an association's capacity to recruit members within its domain' (Traxler 1993: 677).

The problem is that interest heterogeneity affects what is the 'domain.' Interest heterogeneity can have two different effects on the domain. It may reduce the number of agents who benefit from the collective good. But it can also reduce the number who are willing to co-operate without reducing the number who are actually benefiting from the collective good. In the first case, it will make collective action more likely. In the latter, however, interest heterogeneity will only hinder collective action. In real cases both effects will occur, depending on the

nature of the collective good involved, and the effect of interest heterogeneity on collective action is therefore ambiguous.[12]

3.5 Collective action theory and transferable training

So far this chapter has shown how transferable training is a collective action problem for employers, and presented theories about employers' collective action. Here these two are combined by applying Olson's theory to predict under what conditions the collective action problem is likely to be solved, and when it is not.

Olson makes it clear that there are two conditions that can foster collective action: small group size as well as organisations that can use selective incentives. Both can be applied to the case of employers' collective action. The first condition, the number of agents, could readily be interpreted as the number of employers. The hypothesis is then that the fewer employers that benefit from the transferable training, the more likely is it that the collective action problem of transferable training is solved (if there are no fixed start-up costs). The fewer the firms in the relevant industry, the more likely it is for these firms to provide the collective goods, if skills are valuable within one industry, and not outside.[13] In addition, the more the firms vary with regard to how much they would benefit from transferable training, the more likely is it that they provide the transferable further education and training. It is

---

[12] This problem is related to another problem of collective action theory; It does not discuss how group identification is formed.

[13] In practice, the boundaries for where a skill is valuable are not necessarily the same as industry boundaries. Skills may be more useful in only one part of the industry than in other parts, or skills may be valuable outside the industry. Then, characteristics of the group of employers benefiting from a certain type of skill, which may not be the same as those of the industry, is the correct basis for considerations of the probability of collective action.

reasonable that firms should benefit more, the more employees they have. Firms' size, measured by the number of employees, can therefore be a valid indicator of firms' interest in the collective good. Thus, size may have a positive effect on the probability of collective action. Yet, since large employers are more able to organise training themselves, and less dependent on the external labour market for recruitment of skilled employees, one would expect that their benefit from transferable training increases less than proportionally with the number of employees. Hence, in some ways size may be a hinder for collective action. Still, the prediction is that sectors dominated by a few, large employers are most likely to solve the collective action problem, ensure that transferable training options exist, and contribute to financing such transferable training. On the contrary, industries with many firms of equal size are least likely to solve the problem. 'Concentration' is used to denote the degree to which a few employers employ a large share of the employees in an industry.

The second condition that may promote collective action, organisations with selective incentives, is not so straightforward to apply to the employers' collective action problem of transferable training. In this study, 'powerful bodies' denotes organisations that can use negative or positive sanctions to encourage employers to contribute to the collective good. The higher the opportunity cost of non-compliance for the employers, the more powerful is the organisation, and the more likely is it that the collective action problem will be solved.

This definition requires some further explanation. It is based on Olson's definition of selective incentives, but is adjusted to the topic of transferable training. Another advantage of this definition is that it is neither biased towards the analysis of joining voluntary organisation nor specific countries or contexts. The 'cost of non-compliance' means how costly it would be not to comply with the organisation's decisions. Cost here means opportunity cost. For example: the more valuable the membership of the organisation is to the employer, the more powerful is

the organisation, if the organisation can exclude employers that do not comply, and excluding members is its main power tool. In some cases, employers would rather stay outside an organisation than be a member and contribute towards the collective good. That would mean that the 'cost of non-compliance' was negative, and that the organisation did not have the power to ensure contributions towards the collective good.

One of few other attempts to apply Olson's theory to the case of transferable training is made by Crouch (1995). He argues that 'associations' can solve the collective action problem of training. The concept of 'associations' is clearly influenced by the German example it is derived from, and is therefore a less general application of Olson's point about selective incentives than the concept of 'powerful bodies' above.

An association is defined as 'a monopolistic, possibly compulsory, multi-purpose organization' that 'might use control over excludable benefits in order to elicit contributions to collective goods.' Moreover, the association must have a 'virtual monopoly' over supplies of the excludable benefits. This 'virtual monopoly' is most likely to exist if the organisation offers a range of excludable goods, or the organisation has a monopoly position that is secured through laws or through a set of ties to a particular community (Crouch 1995: 291).

Crouch diverges from Olson's theory in at least two ways. First, he does not distinguish between primary and secondary goods in the way Olson does. Primary goods are the collective goods, while the secondary goods are private goods provided to encourage the contribution to the provision of collective goods. Instead, Crouch argues that in practice an organisation can provide several different collective and private benefits for members, which cannot easily be categorised as 'primary' or 'secondary.' Even if this goes beyond Olson's theory, it is not in any way in conflict with his 'logic of collective action.'

Second, whereas Crouch maintains that associations might be compulsory, Olson (1971: 16) says that only large organisations that 'are not able to make membership compulsory' must also provide non-

collective goods. This difference is however superficial. While Olson describes joining the organisation as the collective action problem, Crouch describes a problem that includes making members contribute towards the collective good.[14] Crouch's main example of associations is the German chambers of commerce (*Kammern*). Since they are monopolistic, and provide a variety of excludable goods, they can use resources for the provision of collective goods, such as transferable training. Moreover, they may use pressure to make employers provide the training, even if such pressure is seldom necessary (Soskice 1994a).

3.6 A typology of employers' provision of transferable training

The section above showed that according to collective action theory, the collective action problem of transferable training is most likely to be solved either if the industry is concentrated or if there is a powerful body that can make it advantageous for employers to contribute towards the collective good. These two conditions can be seen as two variables which are both continuous. While concentration may enable small group interaction and informal control, a powerful body can enforce collective decisions. Yet, in order to grasp the impact of these two variables on the provision of transferable training, it may help to define a typology based on combinations of extreme values on the two variables. The basis for the typology is illustrated in table 3.4. The interpretation is similar to that of table 3.3.

[14] This is Offe and Wiesenthal's (1980) and Bowman's (1998) distinction between 'joining' and 'acting.'

Table 3.4 Typology of industries by conditions for collective action

		Employer concentration	
		Low	High
Superordinate body	Weak	(1)	(2)
	Powerful	(3)	(4)

Employers are least likely to finance transferable training in industries where there is low concentration and weak/no organisation (1). The collective action problem is most likely to be solved if there is high concentration, and at the same time a powerful body (4). The two intermediate cases are high concentration with no/weak organisation (2), and low concentration with a powerful superordinate body (3). The presentation below of the predictions in each case concentrates on the probability of collective action, while the detailed predictions of the probability and impact of collective action on transferability, cost sharing and amount of training are presented in chapters 5, 6 and 7, respectively.

(1) Low concentration, no powerful body

Collective action theory predicts that the situation with many employers and no powerful body is least likely to experience an adequate supply of transferable training, since these industries are least likely to solve the collective action problem of transferable training. The main problem is that employers have few or no incentives to ensure that transferable training options exist, for example by working for the establishment of a common training organisation or standards for training in the industry.

(2) High concentration, no powerful body

If there are few employers, the collective action problem of transferable training may be solved (Olson 1971). But the solution is fragile, since no powerful body can oversee it. The solution depends on the large employers contributing towards the collective good. On the one hand, large employers can benefit most from co-operation on training, simply

because they have most employees. But since large firms on the other hand are those who most easily can run training internally without co-operation, the cost of pulling out can also be low if the co-operation does not benefit them sufficiently, according to resource explanations of employers collective action (Traxler 1991; Waarden 1991).[15] This means that collective action for transferable training must aim to a large extent at satisfying the large employers. If the changing needs and demands of the large employers are not met, collective action is likely to fail, which would be a disadvantage not only for large but also for small firms. Small employers' contributions are less vital to the existence of the co-operative solution, and they are also least likely to replace external with internal training. The fact that the benefits from transferable training are likely to increase less than proportionally with size may also cause conflicts between firms regarding the contribution towards the collective good. Large firms can argue that their contributions should not be proportional to their number of employees (Waarden 1991).

The 'dynamic interaction' between the major employers is likely to be important for the collective action solution to be maintained. A likely scenario is that if one large employer chooses to defect, other large employers will follow. The reason is that contributing when no one else contributes of course is the worst possible situation for the employers. The employers will therefore keep an eye on the other employers' actions when they decide whether to co-operate or not. As the analysis of the 'tit-for-tat' strategy would suggest, this scenario is nevertheless a force for the co-operative solution. The reason is that each of the large employers will know that it is hard to be a free rider, since if they pull out, the others will as well. Therefore, they are more likely to choose to contribute.[16]

---

[15] It is assumed here that the largest employers in industries with high concentration are larger than those in low-concentration industries.

[16] If there can be misunderstandings, the tit-for-tat theory does not however secure co-operation, since some may defect because they thought others pulled out, even if they did not (Dixit and Nalebuff 1991). In the case of training, that may be a problem if some

In other ways, dynamic interaction can be a problem. If the few, large companies are each other's main competitors in the product market, the position in the product market vis-à-vis the other firms may affect their willingness to contribute towards the collective good (Streeck 1991). Since contributing more than one's 'fair share' then would mean not only a cost for the firm, but a benefit for its main competitors; oligopoly in the product market may be an obstacle for collective action. This is not only a question of how much to contribute financially. It may also mean that each employer has an interest in knowing what sort of training the competitors' employees get, and not revealing the contents of their own training. In other words, the more training is seen as a product market issue, and not only a labour market issue, the more reluctant are employers to co-operate. These possible disadvantages of oligopoly in the product market mean that the collective action problem is most likely to be solved if employers are competing mainly with international companies, the employers do not compete in the product market, or training is not regarded as of strategic importance in the product market. Still, the major problem is that any solution is inherently fragile, and dependent on the continuous co-operation of the large employers.

(3) Low concentration, powerful body

The case with low concentration but a powerful body is the one most similar to the example of the German chambers. The powerful body can contribute to solving the collective action problem, but it will face a more difficult task than if there were only a small number of employers. The reason is that the employers themselves are unlikely to establish or uphold a solution without the intervention of the organisation. Therefore, positive or negative sanctions have to be used continually to keep the co-operation intact.

---

employers suspect that other employers do not deliver training of the amount or of the standard they claim.

A crucial strategic choice for the organisation is finding the right balance between positive and negative sanctions. On the one hand, punishing those who do not contribute may not only be unpopular among employers, it will also imply a substantial task of controlling all employers and sanctioning those who do not act in accordance with the organisation's instructions. On the other hand, the German experience suggests that the organisations may use negative sanctions successfully. Perhaps equally important, is that the use of positive sanctions, if they are to be consequential, may be too costly for the organisation.

To the extent that the organisation can ensure that training is transferable and adequate amounts are provided, it will be a great benefit for small employers. Not only is it difficult for them to rely solely on internal training, they are also most dependent on using the external labour market when they recruit. Yet, individual employers will not consider that a sufficient reason to contribute towards the collective good, since their actions will not affect the other employers' decision on whether or not to co-operate (Olson 1971). Therefore, the organisation plays a critical role, not only in establishing co-operation, but also in ensuring that individual employers do not undermine the solution, for example, by delivering training of a lower standard than agreed. Thus, even if the problem of provision of transferable training can be solved in the case of many employers and a powerful body, it depends very much on the organisation's ability to encourage and monitor employers.

(4) High concentration, powerful body

The collective action problem is most likely to be solved, and any solution likely to be most stable, if it is based on both peer pressure and institutional support. The powerful body is likely to be important for the provision of the collective good even if it seldom needs to use its power to keep employers in line. The reason is that the employers' knowledge of the positive and negative incentives is a sufficient reason for them to contribute towards the collective good.

However, there are probably limits to the extent to which the organisation can or should use positive and negative sanctions actively to make employers provide sufficient transferable training. The reason is that the sanctions that are necessary reflect the private opportunity cost for employers of co-operating. If this cost is very high, it is likely to reflect not only externalities, but also other problems, such as outdated training. Still, the powerful body might choose to rely purely on negative sanctions to ensure that employers co-operate. One could also expect the powerful body to use its power to ensure that the transferable training meets the small employers' needs more than it otherwise would do. But that will inevitably make it more difficult to maintain large employers' support.

So far, the powerful body has been described as independent of the employers, but that is unlikely to be the case in practice. In many situations the employers will have some power to influence the organisation's decisions. Then the relationship between the organisation and the employers is more complex, because the organisation's actions will more or less reflect the will of the employers who will benefit from the transferable training. The main point to emphasise here is that this will make it even more unlikely that the organisation will rely heavily on the use of negative sanctions to ensure that employers co-operate.

3.7 Towards a test of H_0 and H_{alt}

Chapters 2 and 3 have presented two alternative set of predictions of what affects transferability of training, provision of training and how costs of transferable training are shared. These will be put to empirical test in chapters 5, 6 and 7. First, however, chapter 4 provides the link between the two theoretical chapters and the empirical study.

4. Research design and case study background

4.1 Introduction

Chapters 2 and 3 presented two different theoretical views of the provision of transferable training, and their similarities and differences. Chapters 5, 6 and 7 will test which of these two theories does better judged by how their predictions are confirmed or rejected in the empirical study. The purpose of this chapter is to provide the link between the theoretical prepositions and the empirical study undertaken to test these prepositions. The first part of the chapter explains how the empirical research was designed and how four industries were selected on the basis of theoretical considerations. The careful selection of these four cases, based on the predicted probability of employers' collective action in different labour market settings, provides the necessary basis for a strong test of the collective action theory against human capital theory. The next part of the chapter briefly presents some important characteristics of the Norwegian economy, in which these cases are set, and then the existing further education and training offers in each of the industries.

4.2 Research design and data collection

The first part of this chapter describes how the research was designed and data were collected to ensure that the empirical study could answer the theoretical research questions set up in chapters 2 and 3.

4.2.1 Data collection and multiple case study design

There are three reasons why an answer to the research questions required both qualitative and quantitative data. The first is that neither qualitative nor quantitative data separately would be sufficient to give reliable and valid measures of the variables under study. For example, employers' individual and collective action to affect transferability, described in chapter 5, could not be adequately represented by only quantitative data. The second was that in some cases, qualitative measures were necessary to estimate the values of quantitative variables. For example, to make quantitative estimates of how training costs are shared between employers and employees, qualitative data on each individual case are in practice necessary to ensure that the estimate reflects actual cost sharing (OECD 1997a). The final rationale for choosing both qualitative and quantitative data was that it would facilitate data triangulation (Yin 1994: 91). Thus, conclusions based on qualitative data could be tested against quantitative data and vice versa.

Since both qualitative and quantitative must be collected, statistical analysis could not be used to analyse the relationship between industry characteristics and the provision of transferable training. Therefore, a large sample of industries and statistical generalisation could not provide answers to the research questions. Instead, a multiple case study design was used, which requires a different logic of case selection. In a multiple case study 'every case should serve a specific purpose within the overall scope of inquiry' (Yin 1994: 45).

To analyse the variation of the independent variables it was necessary to select cases that had contrasting values on the two independent variables: 1) high concentration without a powerful body, 2) high concentration and a powerful body, 3) low concentration and no powerful body and 4) low concentration and a powerful body.

In order to counteract the lack of statistical control in a case study, it was it was necessary to study not only the outcomes, but also to trace the processes that caused these outcomes, to evaluate the predicative

power of the two different theories (King, Keohane, and Verba 1994). Thus, in chapters 5, 6 and 7 the correspondence between predictions, processes and outcomes determines the conclusions.

Choosing to study further education and training instead of initial education and training ensured that there was possible variation on the dependent variables, since further education and training has been much less influenced by national policies, as the last part of this chapter shows.

4.2.2 Operationalisation

The next task was to find measures of both concentration and powerful bodies. The nature of the two variables implies that it is difficult to find accurate operational measures. For example, chapter 3 illustrated the problems associated with finding a precise definition of what constitutes a 'small group'. The research design will however to a large extent avoid the problems this may cause. By selecting cases with contrasting values on both variables, the conclusions are no longer so vulnerable to measurement errors.

The share of employees in an industry that work for the five largest employers is used as the indicator of concentration. The purpose of the measure, in line with collective action theory, is to measure the interest of a group that is small enough for small group collaboration compared with the industry as a whole. Since the limit for what is a small group is impossible to determine a priori, as described in chapter 3, other limits may have been chosen.[1] However, since cases with extreme values are selected, this would make little difference. Since employers' interest in training is likely to increase with the number of employees, employment is assumed to reflect interest in the collective good. Measurement of 'powerful body' is not so straightforward. Excellent literature has been published on this topic (e.g., Lukes 1974), but there is not, and cannot be

[1] Traxler's (1991) operational definition of concentration is the four largest employers' share of total employment in the industry.

any 'gold standard' for power in the social sciences. Moreover, the measuring of power is inherently inaccurate.

In Norway, the clearest examples of 'powerful bodies' exist in the relationship between different public sector organisations, and not in relations between private employers and employers' associations. It might seem paradoxical that there can be collective action problems in the public sector. Nevertheless, it is *not* an inherent condition for the 'logic of collective action' that the agents belong to the private sector.

A necessary condition is though that the powerful body is not so strong that the organisation and the employers should be regarded as one agent. This means that there must be broad opportunities for independent decision-making for each agent in the relevant area. The problem of defining 'one agent' is however not limited to the public sector. For private employers, the equivalent question is if subsidiaries can be treated as separate agents, or if they should be treated as part of the whole company. The answer is that it depends on the issue one investigates, and the way the parent company governs the subsidiary. In this case, the room for independent personnel practices by subsidiaries would determine whether or not a subsidiary and the parent company should be seen as one agent. The same logic applies to the public sector cases. One should not analyse 'public sector' as *one* agent, and hence refuse it in a study of collective action when public sector in Norway consists of at least three levels, or three formally independent groups of agents. These are the 435 municipalities, the 19 counties as well as the state.

There are separate elections for local government (counties and municipalities) and the national parliament, and all municipalities and counties are autonomous entities. While county councils previously consisted of envoys from the municipalities in the county, there are now separate elections of county representatives. Yet, even if municipalities and counties are legally autonomous with their own budgets, have their own elections as well as set the local tax rate, the state is still a powerful body that can influence local government decisions greatly. In the post-

war period growth in the public sector has been most notable in the municipalities, which are responsible for many of the basic welfare services. Coinciding with this growth in local government, which has been partly due to a delegation of tasks from the state, there has been a corresponding growth in financial transfers from the state to local government. Even if municipalities in principle are free to set their tax rate to finance their services, there is a legal maximum limit to this rate. In practice, all municipalities use the same maximum rate since it anyway covers only a small part of their expenditure and a reduction of the rate would do little to attract tax-payers. The most important source of additional funds is financial transfers from the state. In addition to a yearly lump sum transfer to the municipalities, based on objective measures such as population and proportion of old people, the state also provides earmarked funds. Thus, the state has considerable power through the system of financial transfers. Moreover, the state can regulate local government by law, which is a substantial power base. The national parliament is the law-making body, but the growing use of framework laws has given the ministries more discretion regarding the implementation of laws. Consequently the relationship between the state and local government can be used as a prime example of 'powerful body.' Even if local government is autonomous, and has considerable freedom in deciding their course of action, the state also has substantial power over local government through economic and legal instruments (Christensen and Egeberg 1994).

Private employers' associations, on the other hand, have much less power over their members than the state has over local government. Even if a larger proportion of employers in Norway are organised than in most other countries, this does not mean that the employers' associations are very powerful vis-à-vis their members.[2] In one of the few works on Norwegian employers' associations, Bowman (1998) concludes that even if

[2] This is the distinction Traxler draws between 'associability' and 'governability.'

employers' associations enjoy a high degree of associability, their problems are considerably more severe when it comes to making their members comply with the associations' policy.[3] It also means that Norwegian employers' associations are unlikely to be as powerful as the German *Kammern* that Crouch (1995) uses as examples of strong associations. Thus, even if employers' associations have some power over their members, their position contrasts with the strong position of the state vis-à-vis the municipalities and counties.

4.2.3 Selection of industries

As in all real-life research, the finite number of cases inevitably imposes a limit on the selection of cases that fit perfectly the theoretical criteria applied. However, as this section shows, the four industries ensured the necessary variation on the two independent variables. This study focuses on one specific group of employees in each of the industries. In order to control for the effect of education, their educational level must be comparable. Moreover, the groups of employees should all be one of the principal groups in their industries, so that their competence is unquestionably important for the employers. A final, more practical, concern was they had to be so large within the industry that it was likely that there were available sufficient data on their training. Table 4.1 presents the cases that were selected. Appendix 1 gives the tables that provided the basis for the concentration figures.

Table 4.1 Selected cases, by conditions for collective action and employer concentration (per cent)

		Employer concentration	
		Low	High
Superordinate body	Weak	Metal industry (8.8%)	Insurance industry (84.1%)
	Powerful	Municipal schools (19.2%)	County hospitals (47.6%)

[3] This is in line with Traxler's (1991) and van Waarden's (1991) predictions presented earlier

The private sector case with low concentration is the metal industry.[4] Within the metal industry, the study is more specifically about engineers. Most engineers have two or three years of college education after secondary school.

The selection of the metal industry as a case with low concentration is not straightforward as table 4.1 suggests, however, since the metal industry is a diverse one compared with the three other cases in the study.[5] Thus, if the industry were broken into narrower categories, the concentration measure would inevitably increase. As explained in chapter 3, the basis for an evaluation of the relevant boundaries is the usefulness of employees' skills. As shown in the skill requirement – transferability model in chapter 2, any such evaluation is made difficult by the fact that an employee's skills consist of a bundle of different competencies that are useful in different subsets of firms. Therefore, any decision on the relevant group boundaries must necessarily be based on some degree of discretion. Still, the main point for the selection of cases here is that unless the metal industry is divided into very small groups of employers, it is considerably less concentrated than the insurance industry is.[6]

---

[4] More generally, Norwegian manufacturing is characterised by a large number of small and medium sized employers (Bosch 1997).

[5] An additional problem of demarcating sectors, industries and branches is that the boundaries can be based on either statistical or social/socio-political categories (Warmerdam and Tillaart 1998: 15-19).

[6] The fact that collective action theory may influence transferability, which in turn affects the characteristics of the group of employers that a skill is valued in, makes this issue even more complex. However, given the already defined industry boundaries and the fact that collective action is not assumed to be the only, or indeed the most important, determinant of transferability, this problem of feedback between the independent and the dependent variables does not undermine the use of industry boundaries as a basis for case selection.

The insurance industry illustrates a private sector industry with a few, large employers that account for most of the employees. Within the industry the focus is on employees with insurance specific tasks, and hence are excluded IT personnel, secretaries, etc. Previously insurance companies primarily recruited employees with higher secondary education, *gymnas*, whereas now the majority of recruits have a college education, usually in business administration.

The municipalities and more specifically the municipalities' primary and secondary schools constitute the low concentration case in public sector. The municipalities are responsible for the compulsory parts of the Norwegian education system, the comprehensive schools, which are both primary schools and lower secondary schools.[7] However, the municipalities' discretion in running the schools is restricted by national regulation and supervision (OECD 1997b: 109). The focus is on the teachers who are general teachers (*allmennlærere*). Most of them have three years of college education, though previously the education lasted only two years, and was extended to four years in the 1990s.

Nurses in general hospitals are the public sector, high concentration case.[8] Concentration here is not as high as for the insurance industry, but still considerably higher than the two low concentration cases. Both psychiatric and non-psychiatric (somatic) hospitals are the responsibilities of the 19 counties. Still, the Ministry of Health and Social Affairs has considerable power, for example through the Norwegian Board of Health, the central supervisory authority (OECD 1998: 75). Private hospitals play only a very limited role (OECD 1998: 78). The state, however, runs two large specialist hospitals with national overage: the National Hospital of Norway and the National Cancer Hospital. So in addition to its regulatory and supervisory role, the state is also directly

---

[7] Since very few pupils go to private comprehensive schools, private schools will be ignored in the analysis. The counties are responsible for upper secondary schools.

[8] The term 'general hospitals' is used instead of 'somatic' (non-psychiatric) hospitals, since the difference between these two is insignificant for the topic of this thesis.

an employer. The state in itself is however no dominant employer, with less than 9.5 per cent of the total number of nurses employed by them.

4.2.4 Reliability and validity

Construct validity, internal validity, external validity and reliability are the four problems high quality case study research must tackle. This study was designed to ensure that all of these were addressed appropriately (Maxwell 1996: 92; Yin 1994).

Construct validity means using correct operational measures for the concepts being studied. In this thesis, such validity is enhanced through the various sources of evidence, both qualitative and quantitative. Using several indicators and checking the correspondence between them is the best, and possibly the only, way to ensure construct validity. Moreover, in the coming chapters, an important goal has been to establish a 'chain of evidence': explicit links between research questions, data and conclusions. Finally, since some of the results and many of the empirical data were published in a separate report after the fieldwork was completed, key informants were able to read the report (Johansen 1999).[9]

The second test, internal validity, demands that causal links are separated from spurious ones. As Hume has shown in his classic example, such causal links can never be definitely proven. The challenge is rather therefore to gain support for one hypothesis at the expense of others by comparing 'plausible rival hypotheses' (Campbell 1994). Such comparison, and pattern-matching, is achieved since the empirical chapters compare the data with the two sets of hypotheses that were derived in chapter 2 and 3. In the coming chapters, triangulation is a major tactic to enhance validity. For each topic the link between the theories and the outcomes are probed by assessing the processes that have led to these outcomes.

---

[9] Moreover, a separate working paper on further training for engineers in the metal industry was sent to all informants in this case (Johansen 1998).

External validity addresses the problem of knowing if the case study can be generalised to other cases. The difference between case studies and surveys based on sampling is that 'case studies, like experiments, are generalizable to theoretical propositions and not to populations or universes' (Yin 1994: 10). Thus, the criteria for evaluating external validity cannot be the same. The important factor is that the cases have been carefully selected on the basis of clear, explicit considerations. Anyway, the four cases cannot be used to draw direct conclusions about, for example, other Norwegian industries. If, however, one agrees that this study of four cases represents a plausible test of the two theories, the results can be used to corroborate or refute the theories that are examined.

The final test, reliability, is concerned first and foremost with precision during data collection. One way to define reliability, is that another researcher should be able to repeat the study and come to the same results. In order to achieve this, copies of all available data were kept, and all interviews (with one exception) were taped, and are hence available for repeated analysis by other researchers.

4.3 The background of the case study

While the purpose of the first part of this chapter has been to explain how the empirical study provides a good test of the two theories, the purpose of this second part is to present the background information that is needed to understand the case study in the following three chapters. First it briefly presents the national setting, with a description of Norway's economic position, industrial relations and training system, while the second part of this section describes the existing types of further training in each of the industries.

4.3.1 Economic development, industrial relations and training in Norway

This section gives a short presentation of significant parts of this national setting, with the emphasis on issues that are likely to affect the topic of the case study: further education and training. First, the economic status of Norway is described in brief, and it shows that Norway at the time of the study was in a more favourable economic position than was the vast majority of other countries. Next, the section on industrial relations among other things covers the important roles of the Confederation of Norwegian Business and Industry (NHO) and the Norwegian Confederation of Trade Unions (LO). Then the system of basic education and training is presented, before a larger section treats the further education and training system, and it is shown that further training is a particularly good case for the purpose of this thesis, since national government policies have played a minor role.

Economic development

In 1998, OECD summed up Norway's financial situation as follows: 'The Norwegian economy has performed extraordinarily well in recent years, based on soaring petroleum exports, a stable exchange regime, a prudent fiscal policy stance, and a consensus based incomes policy.'[10]

There is little doubt that Norway in the late 1990s is in a favourable economic position compared with most other countries in the world. This small kingdom with no more than 4.4 million people (in 1997) enjoys a higher gross domestic product (GDP) per capita than all but a very few countries in the world, unemployment is relatively low,

[10] The situation changed somewhat in 1998, when the price of oil fell, the Norwegian *krona* depreciated, wages rose more than previous years and interest rates rose considerably.

and the recession in the early 1990s affected Norway less damagingly than many other western European countries. The exceptional financial position of Norway is reflected in various indicators. In 1995 the government had a budget surplus of 3.1 per cent of GDP, while the average European OECD country had a deficit of 3.6 per cent (Freeman 1997: 23). Moreover, the general government in Norway had net financial assets relative to GDP of 26 per cent. The comparable measure for OECD countries in Europe as a whole, was a net financial liability of 46 per cent. Finally, the unemployment rate in Norway has persistently been lower than the OECD average (OECD 1997b: 59).

One explanation for Norway's exceptional financial position is the natural resources from the North Sea. About one-eighth of GDP comes from petroleum and natural gas production (Freeman 1997: 23). Generating more than 30 per cent of total export income (in 1991) (Freeman 1997), oil and gas are undoubtedly major wealth generators. This income facilitates the combination of an extensive welfare state and good state finances.[11]

In many other respects Norway is, however, broadly similar to many other western European countries. During the last decades, the welfare state has expanded, and the public sector now spends roughly half the GDP (Freeman 1997), and one third of the labour force work in the public sector (Dølvik et al. 1997: 54). The expanding welfare state has accommodated women's entry in the labour market, and almost three out of four women are now in the labour force (Dølvik and Steen 1997: 366). In 1997 employment reached almost 80 per cent of the working age-population, which was the highest ratio in the OECD area (OECD 1998: 1).

As is typical for small, industrialised countries, Norway also

[11] However, in a recent study Freeman (1997) rejects the oil income as a sufficient explanation for such favourable economic outcomes. Instead, he argues that Norway has faced less dramatic problems than Sweden, for example, because it developed a less comprehensive welfare state.

depends heavily on foreign trade. Roughly 40 per cent of goods and services produced in Norway are exported (Freeman 1997: 30). Even if Norway is not a member of the EU, its membership in the European Economic Area (EEA) secures Norway a place within the Single European Market. Joining EEA required Norway to harmonise its laws with the EU, and accordingly 'foreign competitive pressures have increased significantly in product and financial markets' (OECD 1998: 55).

Norway is also close to the OECD average on a measure of tax wedges, the sum of employees' and employers' social security contributions and personal income tax as a percentage of gross labour costs (OECD 1997b). Still, in only Denmark, Sweden and the Netherlands does government spend a larger proportion of GDP (OECD 1997b: 77).

Finally, among European OECD members, employment protection legislation in Norway was ranked as the eighth strictest of the 16 countries (OECD 1997b: 75). Thus, the Norwegian labour market is not particularly strictly regulated (Dølvik et al. 1997: 64). Moreover, compared with other countries, the labour market seems to be more flexible than one would expect with the existing regulation. Numbers on job reallocation, internal migration between regions and monthly flows in and out of employment are higher than in countries with protected internal labour markets (e.g. France and Japan). One explanation is the dominance of small and medium-sized enterprises (SMEs), which cannot establish strong internal labour markets. Another is that the universal pension system imposes fewer barriers than more occupational or firm-internal systems (Bosch 1997; Dølvik et al. 1997).

Industrial relations

The advantageous economic situation in Norway inevitably affects the labour market. But co-operative partnership has also been used to *explain* the situation (Dølvik and Stokke 1998; Freeman 1997; OECD 1998).

Faced with unprecedented high levels of unemployment in the early 1990s, the Labour government appointed an Employment Commission with representatives from all political parties as well as the largest employer and trade union confederations, in addition to professional economists and ministerial experts. The five-year social pact implemented in 1992 on the basis of this Commission aimed at reducing the unemployment to 3 per cent. By the end of the five years, the unemployment target was met, and unemployment had been reduced in parallel with real wage increases and enhanced competitiveness (Dølvik and Stokke 1998). According to OECD (1998), it is 'noteworthy' how the policy secured recovery, employment growth and low inflation.

The two dominant partners in the social pact, and more generally in Norwegian industrial relations, are LO and NHO. Generally private sector collective bargaining in the post-war period has been at the peak inter-sector level or at the industry level. In addition local bargaining is widespread, especially in manufacturing, and for most private sector white-collar workers pay is set individually (Dølvik and Stokke 1998: 127). The state plays a more dominant role in Norway than in e.g. Sweden, especially in conflict resolution (Dølvik et al. 1997: 81).

Since 1980 trade union density has been stable at around 56 per cent.[12] This is considerably less than in neighbouring Denmark, Sweden and Finland (Dølvik and Stokke 1998: 124). Nevertheless, survey studies have suggested that the coverage rates for collective agreements are similar in Denmark and Norway (Dølvik et al. 1997: 85). The majority of unionised employees were members of LO-affiliated unions in 1994. The three other confederations are the Confederation of Vocational Unions (YS), the Federation of Norwegian Professional Associations (AF) and *Akademikerne*.

[12] Trade union density has been fairly stable during the whole post-war period fluctuating between 50 and 57 per cent (Dølvik and Stokke 1998: 125).

On the employer side, NHO is the only employers' confederation in the private sector. After a merger in 1989 between the Norwegian Employers Confederation (NAF) and two industry and crafts associations, NHO became not only the dominant employers' associations in the private sector, covering more than 400,000 employees (Dølvik et al. 1997: 81), but also the most important industrial interest organisation (Dølvik and Stokke 1998: 122). It re-negotiates the Basic Agreement with LO every fourth year, and the outcome of the negotiations is the benchmark for the other bargaining rounds. The second largest employers' association is the Norwegian Association of Local Authorities (KS). KS's pay negotiations covers approx. 400,000 employees in the counties and municipalities (Statistisk sentralbyrå 1998e: table 209). In the state sector, the Ministry of Planning and Co-ordination negotiates on behalf of the government. Current employer organisation 'is marked by a high degree of centralized power and fairly high density' (Dølvik and Stokke 1998: 123).

Basic education and training

Three main characteristics of the system of basic education and training are the insignificance of private education, the high participation rates and the reform of vocational training in 1994.

Private schools play a minor role in the provision of primary and secondary education. The vast majority of primary and secondary schools are publicly funded. Municipalities and counties run the schools, but they are comprehensively regulated by the national government. National legislation ensures that all children have the right and duty to complete primary and lower secondary education, totalling 10 years of education. In 1994, the government also established a statutory right to three years of upper secondary education, either general or vocational.

Compared to most countries, except its Nordic neighbours, Norway's expenditure on education and training is high, and so are participation rates. In 1992, 6.6 per cent of Norway's GDP was spent on

education, compared to 8.0 per cent for the other Nordic countries and 5.7 for the OECD as a whole (OECD 1997b: 115). More than 80 per cent of Norwegians between 25 and 64 years of age have at least upper secondary school, and around 30 per cent have a higher education. This is among the highest rates in the OECD (OECD 1997b: 11).

A reform of upper secondary education in 1994, and the accompanying right to such education, further increased the number of pupils, and in 1997 no less than 96 per cent of the age group participated in upper secondary education. One of the reform's main ambitions was to ensure that more of those who started on a vocational education completed it. Until then the system for vocational education and training was held to be inadequate, characterised by inefficiency in the number of students completing, and a severe lack of apprenticeship places.

Further education and training

To understand how employers in the four industries' act within the further education and training area, it is necessary to know their national setting. Therefore, this section gives a brief introduction to the role of the government as well as the social partners at the national level in further education and training. One important aim is to show that national regulation of further education in Norway has been limited. Hence it stands in stark contrast to the system of initial training, where national regulation and provision are crucial. In the case of Norway, further education and training are therefore particularly suitable for the study of employer's collective action, since training decisions are very much left to individual employers and collectivities of employers. This might be true even for other countries; Crouch, Finegold and Sako (1999: 21) argue that, in the case of further training compared to initial training, 'public policy becomes increasingly dependent on the decisions of firms, and whole areas of [vocational education and training] begin to 'disappear' into the corporation, while remaining no less an object of public concern.'

In describing the role of the national government in further

education and training in Norway, it is useful to distinguish its role in regulating, supplying and financing education and training, respectively. Employers' and employees' training decisions are in most cases not likely to be much influenced by national government financing or regulation, but the national colleges and universities represent significant suppliers of further education and training.

The most important point about national regulation of further education and training is that it has been weak both compared to basic education and training, and compared to further education and training in other countries (Torp 1995: 47). Larsen et al. (1997: 15) argue that 'whereas countries such as Sweden and Denmark have laws which shall ensure that firms invest in competence development, this area has been almost unregulated in Norway.' Employees have few legal rights to further education and training, and there is no obligatory financial contribution towards training by companies (EIRO Online 1998a). The Work Environment Act says that the employers shall give employees introduction and supervision in job tasks, but it is not clear to what extent this duty includes education and training (NOU 1997:25 : 147). Moreover, section 3 of the Adult Education Act states that adults should be allowed to document their knowledge and skills at all levels and in all areas, independently of how they acquired this knowledge in the first place (National Institute of Technology 1996). Yet, in practice, people have had few opportunities to document their non-formal learning. The notable exception is section 20 in the Act relating to Apprenticeship Training in Working Life, which states that experienced workers can get a skilled worker's certificate without going through an apprenticeship. The requirements are that the worker documents relevant, all-round experience that is 25 per cent longer than the apprenticeship period, passes a theoretical test and finally passes a practical test (Reichborn, Pape, and Kleven 1998: 97). This opportunity has been widely used, and has remained popular among both employers and employees (Bosch 1997; Reichborn, Pape, and Kleven 1998).

There has been widespread concern that the Norwegian government lacked a coherent strategy on further education and training. According to Dølvik et al. (1997: 72), 'Norwegian public authorities have had no articulated policy on employer-sponsored skill formation,' and the Employment Commission in 1992 said that 'Norway has no unified policy of adult education' (NOU 1992:26 : 67).

The lack of an adequate national policy on further education and training triggered the Government to appoint a committee to present suggestions for new policy measures in this area. Based on the committee's report, a 1998 Government white paper, among other things, proposed a legal right to educational leave (Kirke- utdannings- og forskningsdepartementet 1999).[13] In January 1999, the Parliament decided not only that employees shall have the right to unpaid educational leave, but also that all adults shall have the right to comprehensive education.[14] Still, since the fieldwork was completed by the time Parliament made these decisions, the conclusion is that national laws had little impact, neither on the employees' right to further education and training nor on employers' duty to provide it.

The government has played a more influential role as a supplier of further education and training than it has as a regulator, but it has been criticised for not responding adequately to business needs. In 1997, more than 80 000 participated in further education and training at public colleges and universities (Statistisk sentralbyrå 1998b: table 1.1).

Still, the government's ability to offer adequate high-quality further education and training has been criticised. The public schools, colleges and universities have generally failed to make further education and training an integrated part of their programs, was the conclusion of

---

[13] A previous government appointed committee already in 1988 recommended (but Parliament did not follow its advice) that Norway ratify the ILO convention no. 140 (NOU 1988:28 : 78).

[14] However, the Parliament did not allow adults the same right to upper secondary education that had been given to all youth a few years earlier (NTB 1999).

the government appointed committee that evaluated further education and training policy (NOU 1997:25 : 15). Seven of the 20 members of the committee, including the leader and the NHO and LO representatives, therefore suggested establishing an Open University in co-operation with business and the labour market parties (NOU 1997:25 : 33). Moreover, even if the proposal was voted down in the committee, NHO continued to argue that an Open University is necessary (Brækken 1997). However, the government's policy remained that of reforming the existing institutions than to create a new one (Kirke- utdannings- og forskningsdepartementet 1999).

The state mainly contributes to financing further education in two ways. First, it finances the colleges and universities. Moreover, students who take further education and training can apply for grants and loans for from the State Educational Loan fund. The rules for providing these grants and loans have however suited young full-time students rather than adult further education students. Therefore a public committee in 1998 suggested that students should be allowed to earn more without any deduction of allowance from the Loan Fund, something which would especially favour part-time students and employees on paid educational leave (EIRO Online 1998c). With a few exceptions, such as initiatives by the Norwegian Industrial and Regional Development Fund (SND) and the Research Council of Norway (NFR) (National Institute of Technology 1996: 14-15), the state does little to subsidise employers' provision of further education and training. On the contrary, employers and employees may be taxed if employers finance education for their employees. Until 1999, and thus until the fieldwork was completed, financial support from the employer for a higher formal level of education or a new degree was taxed as income for the employee (NOU 1997:25). Due to the problems of implementing these tax rules, and the potential disincentives for employers who wanted to invest in employer training, the government announced that it wanted new tax rules that were 'clear,

predictable and easy to apply' (Kirke- utdannings- og forskningsdepartementet 1999).

4.3.2 Existing types of further training programs for the four groups

In order to understand the case studies in subsequent chapters, it is important to know not only the national setting of the cases, but also the most important types of extensive formal further training that the four groups of employees can provide.[15] It shows that even if the four groups are comparable with respect to educational background, there are significant differences in what sort of further training they can take, and who organises it. For all four groups, the colleges, public or private, offer formal further training. Nurses are the only group who can choose to take extensive formal internal training. The employers in the insurance industry are running formal further training through the industry's training organisation. In neither the teachers' nor the engineers' case are the employers providers of extensive formal further training. The next chapter studies how employers' actions have contributed to these different outcomes.

Nurses at general hospitals can take formal further education and training, either internally at the hospital or at nursing training colleges. As table 4.2 shows, nurses have a wide variety of opportunities to take further education and training.[16]

---

[15] For all groups the focus is on education and training that is more than one week long.

[16] In addition some types of further education and training at colleges are open for more groups of health personnel. For example, colleges offer different types further education in management and administration in the health sector and from 1998 all types of health personnel could undertake specialist training in psychiatric care. However, the thesis will concentrate on the further training that is exclusively for nurses. Moreover, it will focus on training that is especially relevant for general hospitals.

Table 4.2 Further education and training offers for nurses

	Duration	No. of colleges/hospitals that offered training in 1997/98
College-based further training		
Specialist training to be psychiatric nurse (until 1998)	1 academic year	16
Specialist training in nursing for elderly and chronically ill	1 academic year	9
Health visitor training	1 academic year	5
Mid-wife training	1 academic year	3
Specialist training in nursing for dementia patients	½ academic year	3
Cand san	2 academic years	
Internal specialist training		
Specialist training to be anaesthesia nurse	18 months	22
Specialist training to be operation nurse	18 months	22
Specialist training to be intensive care nurse	18 months	22
Specialist training in paediatric nursing (nursing of children)	18 months	7
Specialist training in onkological nursing (nursing of cancer patients)	10 months	3

Note: The duration of specialist internal training to be anaesthesia, operation or intensive nurse varies between 16 and 24 months, but is 18 months in most hospitals. *Source:* Kirke- utdannings- og forskningsdepartementet (1998) and Norsk sykepleierforbund (1996).

Even if internal and college-based further training are similar in many ways, there are also important differences in the way they are organised. Nurses who take further training at colleges are legally defined as students, and are covered by the Act on Universities and Colleges. Nurses who do internal further education and training are however not legally students, but employees. This has several implications for the way

training is organised, and the rights nurses have during further training (Kirke- utdannings- og forskningsdepartementet 1998). The Ministry of Education and Research is responsible for the college-based education, and the Act on Universities and Colleges regulates how plans are made for the training, how exams are organised, as well as teacher requirements. Moreover, when nurses follow college-based further training, they have the right to loans and grants from the State Educational Loan Fund, which is the principal source of funding for Norwegian students (Kirke- utdannings- og forskningsdepartementet 1998: 28-29). By contrast, no law regulates internal further education and training, and since nurses are regarded as employees and not students, they cannot get support from the Loan Fund. This means that each hospital can organise their internal further education as they want to meet their own needs, within the laws that generally regulate the relationship between employers and employees.

The distinction between up-dating training (*etterutdanning*) and up-grading training (*videreutdanning*) is crucial in order to understand further education and training for teachers. Up-dating training is defined in section 4 of the Act concerning Teacher Training (of 8 June 1973) as 'various forms of training intended to refresh and expand academic and educational knowledge to keep teachers informed of and abreast of the development in school and society, but without having effect on their formal qualifications' (Statens lærerkurs 1993: 1). Up-grading training, on the other hand, is training that can lead to formal competence (NOU 1996:22 : 31).

Table 4.3 Educational requirements for teachers' formal competence levels

Level	Education	Translation
Grade 1	Three-year teacher training	*Lærer*
Grade 2	(1) + one year of further education	*Adjunkt*
Grade 3	(2) + one year of further education	*Adjunkt med opprykk*
Grade 4	(2) + Master's degree (2 years of further edu.)	*Lektor*

Note: Based on teachers with a three-year general teacher *(allmennlærer)* education. Teachers with a four-year basic education are grade 2 teachers.

Table 4.3 shows how teachers can increase their formal competence through further education. A general teacher, with three years of basic education, who takes one year of further education can become a grade 2 teachers, after an additional year, a grade 3 teacher. A grade 2 teacher can also choose to become a grade 4 teacher by taking a Master's degree (*hovedfag*).[17]

In practice teachers can use most of the education that gives credits at universities and colleges to get higher formal competence, as long as they combine equal one year of full-time education (20 credits) (Kirke-utdannings- og forskningsdepartementet 1992).[18] Still, the most important suppliers of up-grading training are the teacher training colleges, which are obliged by the Act concerning the Training of Teachers to offer such training (NOU 1988:32 : 20). A government-appointed committee in 1988 recommended that colleges should offer further training in modules that were shorter than the quarter-year units they offered earlier (NOU 1988:32). Teachers can now use courses as small as 30 hours of teaching (1 unit) as parts of up-grading training (Statens lærerkurs 1997b: 7).

Since up-dating training is negatively defined, as training that does not lead to higher formal competence, the variation of training suppliers and types of training is larger. Generally up-dating courses are short, from one to five days.[19] They are usually organised by the schools themselves, by teacher colleges, by the ministerial Section for Continuing Training of Teachers or by the school directors. The single most important type of suppliers are the regional colleges who, with the financial support of the

---

[17] The teacher training was extended from two to three years in 1973 (Lærerutdanningsrådet 1985: 25). A more detailed presentation of the competence levels for teachers is given in Act on teacher training, sections 6, 7 and 8, and by Koch (1983).

[18] There are however some restrictions to avoid overlap with a teacher's basic education.

[19] The average course updating organised by the colleges in co-operation with Section for Continuing Training of Teachers was approximately four days in 1996 (Statens lærerkurs 1997a: 11).

Section for Continuing Training of Teachers, in 1996 organised 282 updating courses (Statens lærerkurs 1997a: 11).

The main difference between insurance and the other groups is that the employers are members of a trust that offers training to all its members. Virtually all insurance companies in Norway are members of The Norwegian Academy of Insurance (NAI). Table 4.4 shows the education offered by NAI.

Table 4.4 Further education and training offers at the Norwegian Academy of Insurance

Course	Duration (full-time equivalents	Contents
Preparatory course: Basic insurance	*(Short, no credits)*	Introduction to insurance
Step I: Insurance examination	½ year	50 % insurance subjects, 50 % points statistics, maths, business administration and law
Step II: Higher Insurance Examination	½ year	40 % insurance subjects, 60 % business administration
Step III: Insurance Graduate	½ year	40 % insurance subjects, 40 % business administration, 20 % project paper
Total	2 years (5 five years of part time education)	

Note: Duration is in full-time study equivalents according to NAI. Completed insurance graduate exam counts as 1½ years of full-time education in the national college system, i.e. ½ year less than the 2 years NAI estimates.
Source: Forsikringsakademiet (1995).

As table 4.4 shows, the education is a combination of insurance subjects and business administration subjects. NAI does not itself organise the business administration courses, so students have to take these courses at other colleges. To be allowed to take courses at the NAI, students are required to have completed upper secondary education. Each step consists of several courses at NAI. All the courses are distance education courses,

with one or more voluntary seminars. These courses can be taken separately, and most participants choose to take courses, but not to combine them into a full education. In 1996 about the 58 courses offered by NAI had about 2,400 participants, but only 38 candidates completed the Insurance Examination, and even fewer finished the higher steps (Forsikringsakademiet 1997: 2).

Table 4.5 Courses for insurance adviser authorisation

	Duration (full-time study equivalents)
Obligatory courses	¼ year
And either non-life insurance; or	¼ year
Life insurance	¼ year
Total	½ year

Source: Forsikringsakademiet (1995; 1996b).

Authorisation for insurance advisers and claims officers, respectively, is the other main type of education NAI offers. The Association of Norwegian Insurance Companies grants the authorisation, but the courses are run by NAI. Employees who complete the courses and have three years of relevant experience, and 'systematic on-the job training' can be authorised (Forsikringsakademiet 1995; 1996b). Table 4.5 shows the courses one must take to become an authorised insurance adviser in life or non-life insurance. There is a similar structure for authorisation as claims officer.

In addition to further training offered by NAI, insurance employees can also take further training in business and administration at public or private colleges. This training ranges from short seminars to the one-year *bedriftsøkonom,* including many credit-awarding evening courses.

Table 4.6 Further education and training offers for engineers

	Technical	Administrative
Long	Graduate engineer 2 – 3 years of full time study. For engineers with two years college education: 1 year of training to be 'college engineers' (*høyskoleingeniør*)	Long courses (equivalent of 1 year full time) : *bedriftsøkonom*
Medium	Specialist education EEU	Courses at private and public colleges
Short	Offers from a wide variety of providers	

Most further training in technical skills consists of short courses organised by a variety of different providers. Among others, the professional associations for engineers and graduate engineers, suppliers, industry organisations, universities, consulting firms, as well as profit-seeking course providers, offer such short training. This type of training is usually aimed at introducing engineers to a new area, or up-dating their knowledge within a specific field.

Some engineers also choose to take the somewhat longer EEU (*eksamensrettet etterutdanning*) courses at the Norwegian Institute of Technology (NTNU), which is the major educator of graduate engineers. Most of these courses last two working weeks, and participants can choose to take an exam at the end of the course.[20] Since 1991 these courses could be combined into one of 11 different types specialist education, which are equivalent of a little more than a half year of full time education (12 credits) (NTNU 1997).

A more extensive type of further training is the up-grading training for engineers with a two-year basic engineering training. In the 1980s the basic engineering training was extended from two to three years,

[20] According to Brandt (1991: 76) between 45 and 60 per cent of the participants chose annually to take the exams in the 1980s.

and a three year education is now required to be a 'college engineer' (*høgskoleingeniør*) or a 'Euro-engineer' (*eur. ing.*) (Brandt 1991: 86; Eldring and Falkum 1995).[21] One example of such up-grading training is the College of Stord/Haugesund, which offers up-grading training over 1.5 years part-time to become a Euro-engineer (Høgskolen Stord/Haugesund 1997).[22]

Engineers may also choose to build on the engineer training to become a graduate engineer. But this option is used primarily as an alternative track for young people onto the graduate engineer degree rather than as further training for engineers with more than a minimum of work experience (Johansen 1999: 51). At NTNU, engineers must do 2½ years of further education to become graduate engineers.[23] At other colleges, it takes from 2 to 3 years of full time education (Ingeniørutdanningsrådet 1997: 28).

These are the most important types of technical further education and training. But engineers often choose to take administrative further education and training instead of, or in addition to, technical training. Such training in business administration and similar subjects are available at many private and public colleges. These courses do not target engineers in particular, but are the same as those relevant for insurance employees and others.

4.4 The next chapters

So far this thesis has presented two alternative views on transferable training, derived hypotheses from these two, and shown how these hypotheses will be tested. Chapters 5, 6 and 7 present the results of this

---

[21] The *eur.ing* title also requires relevant experience (Ingeniørutdanningsrådet 1997: 27)

[22] A *eur. ing.* education has to satisfy the criteria set by Fédération Européenne d'Associations Nationales d'Ingénieurs (FEANI).

[2323] If an engineer wants to become a graduate engineer in an area other than her basic engineering training, the further education takes longer.

empirical study, before the conclusions and implications of the research are drawn in chapter 8. Chapter 5 will test $H_0 1$ and $H_{alt} 1$ about transferability of training. The hypotheses $H_0 2$ and $H_{alt} 2$ concerning financing of training will then be the topic of chapter 6, before chapter 7 presents evidence concerning the amount of training and skill deficits, which tests $H_0 3$ and $H_{alt} 3$.

5.Transferability of training

5.1 Introduction

This and the two subsequent chapters give the results of the empirical study, and show how the results both confirm or weaken the two theories presented in chapters 2 and 3. The problems of establishing transferable training, sharing costs, and providing the optimal amount are treated in three different chapters. Yet, even if these themes are discussed in separate chapters, the chapters will also show how these three aspects of transferable training are inherently interrelated.

After the presentation of the two hypotheses that will be tested in this chapter, $H_0 2$ and $H_{alt} 2$, it is argued that two types of measures must be used to carry out the test. In addition to studying the outcomes, the transferability of training, the processes that influence the transferability must also be taken into account to provide a test of the theories. The first part of this chapter analyses action by employers to enhance and avoid transferability of training, while the outcomes, the transferability of training, are presented in the second part. The correspondence or lack of it between these two shows whether or not transferability is 'endogenous,' as explained in chapter 3.

5.2 Hypotheses and predictions

Table 5.1 shows the two rival hypotheses that were derived in chapters 2 and 3, and will be tested in this chapter.

Table 5.1 H_0- and H_{alt}-hypotheses: employers' actions to increase transferability of training

Human capital theory	Collective action theory
$H_0$1: Since each individual employer has no incentive to ensure that training is transferable, each employer will act to reduce transferability.	H_{alt}1: Individual employers will usually have no incentive to make training transferable, but through collective action they may do so because it is best for the employers as a group.

Thus, the two topics of the chapter are if, and under what conditions, employers act to improve transferability, and how these actions affect transferability of training.

Figure 5.1 H_0 and H_{alt} explanations of factors determining transferability

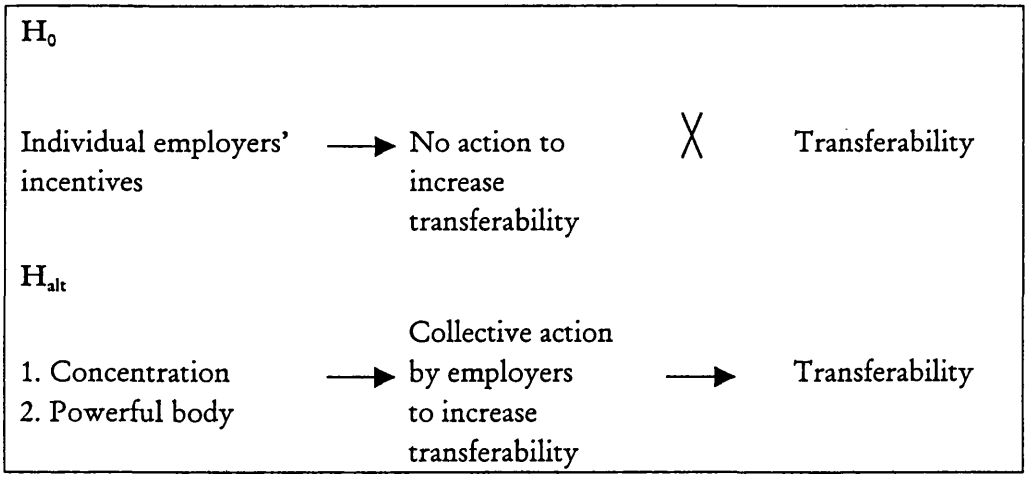


Figure 5.1 illustrates the two alternative predictions. H_0 predicts that since individual employers have incentives to ensure that training is not transferable, there will be no employer action to increase transferability. However, such actions would anyway have little impact, since transferability is exogenous, as explained in chapter 2. Collective action theory, by contrast, states that employers' collective action has a significant impact on transferability, since transferability is 'endogenous'

in this model, as chapter 3 showed. The theory also includes predictions of the probability of such action occurring, which implies that an analysis of the four different cases provides a strong test of this alternative view. Collective action by employers is assumed to be most likely if there is concentration or if there is a powerful superordinate body.

The predictions for each case are presented in table 5.2. While H_0 says that employer action to increase transferability is unlikely in all four cases, H_{alt} says it is very likely in the nurses' case, likely in the insurance and teacher cases, and unlikely in only the engineers' case. The basis for these predictions is described in detail in chapter 3.

Table 5.2 Summary of predictions: employers' actions to increase transferability of further training

	Nurses	Teachers	Insurance	Engineers
Concentration	High	Low	High	Low
Powerful body	Yes	Yes	No	No
H_{alt} prediction	Very likely	Likely	Likely	Unlikely
H_0 prediction	Unlikely	Unlikely	Unlikely	Unlikely

The predictions in the table are only relative to the other cases in the study. Thus, they are not attempts to make predictions compared to any absolute level, other industries or other countries. This goes for the predictions in the next two chapters, too.

5.3 Processes: employers' actions to influence transferability

There are three main ways in which employers can act to enhance transferability of skills, as shown in figure 5.2. Each of these may be, but are not always, sufficient to ensure that skills are transferable. After explaining how these three actions can increase transferability, the chapter will show how employers in the four cases act or do not act to ensure that employees' skills are transferable.

Figure 5.2 Actions to increase transferability

Actions to increase transferability		
a. Choosing common training instead of individual firm training b. Harmonising training, making training more equal among employers c. Improving information among other employers	→	Increased transferability of skills

Since few researchers have tried to explain in detail how employers may influence transferability, this is one of the first attempts to find operational measures of actions employers can take to enhance transferability.[1] Osterman (1984b) and Ryan (1984) give examples of how employers may act to reduce transferability of training, but neither tries to give a more comprehensive account of how employers may influence transferability.

5.3.1 Common training

One way employers can increase transferability is by organising 'common training', for employees in more than one company, or giving employees such training instead of 'individual training' for employees in only one firm. Common training tends be more transferable than training that is done by firms individually. If the same training is given to employees from different firms, it must be transferable to be of value to more than one employer. Yet, training being common may be a sufficient but not a necessary condition for training to be transferable.

The choice between internal and external training has been given some attention in previous research (for example Osterman 1995a, Rolfe 1994 and Nordhaug 1993).[2] Since concerns about transferability are only

[1] One exception is that several employers have argued that certification can increase transferability (Katz and Ziderman 1990; Marsden 1995; Prais 1995: 105).

[2] 'Internal training' and 'external training' are not always clearly defined. In this thesis, internal training is defined as all training that the employer has the overall responsibility

one of many factors that can influence the choice between common and individual training, it is important to trace the processes and study employers' rationales to address the hypotheses in this chapter.

There are many reasons why employers may choose to organise training internally instead of externally. Internal training is likely to be preferred if equipment within the firm is needed to do the training, or there are no external training providers that can offer this type of training. It can also be easier to adapt to the employees' job, for example by organising training in slack periods, and it may be easier to direct to company needs. Moreover, it may be easier to combine internal training with on-the-job training or work practice. Employers may also prefer internal training because they can then retain the full control of the contents of the training, and there is no risk of revealing information to competitors. Finally, internal training may be preferable for employers because it strengthens employees' commitment to the company (Green 1996; Heyes 1996) and enhances communication between employees in different departments (Nordhaug 1993). There are however strong reasons to choose external training too. One reason is, as this study will show in more detail, that such training is more likely to be transferable, and *ceteris paribus* that increases the total return from training (as Stevens shows in chapter 2). But external training may also be preferred because the training simply cannot be done internally, due to lack of competence or lack of equipment. Moreover, external training providers can have economies of scale that individual employers do not have. It can also be advantageous that external training is often quality controlled in a way internal training more seldom is, for example through legislation. Finally, external training can have positive side effects through providing employees with contacts and networks outside the company.

---

for. This will include training that is organised by hired consultants and training that is done off the employer's premises. The concepts of 'common' and 'individual' training, on the other hand, only refer to who is participating in the training – whether or not the training is for employees in only one firm.

In many cases these factors will mean that employers have a simple choice in selecting one or the other, for example because there are no external alternatives, or because it would be virtually impossible for the employer to acquire the equipment or competence necessary to organise the training. Yet for some types of training, some middle ground, employers have a real choice, and these choices will be studied in this section of the chapter. There is evidence both from Norway and internationally which shows that employers who say they plan to increase training for their employees primarily plan to increase internal training and not external training (Brandt 1989; MMI 1997; Nordhaug and Gooderham 1996; Rolfe 1994). These findings accentuate the importance of analysing how employers make these choices, and what consequences these actions have for transferability of skills.

5.3.2 Harmonising internal training

A second way of acting to make training transferable is to harmonise internal training, so that the content of the training is more equal among employers. Harmonising training means that internal training is organised to meet certain standards. This is what is done for example in the German apprenticeship system, which combines harmonised internal training and common training in vocational schools (Berg 1994). Another example of harmonising internal training is through the requirements of health and safety regulations. Such harmonising will have similar effects as common training in enhancing transferability. Yet, as the rules and standards are unlikely to ensure that training is completely equal among firms, and that may not even be a goal, harmonised training will usually include aspects of specific training. Nevertheless, even if harmonised training may not lead to perfectly transferable skills, harmonisation still tends to make individual company training more transferable than it would otherwise be.

Harmonisation can be achieved in many different ways. The German apprenticeship system includes detailed national training

standards and occupational curricula. Since each employer may have an incentive to undercut these standards (Marsden 1986), institutions at the national, regional and workplace levels monitor training within companies (Berg 1994; Soskice 1994a). Still, the detailed standards and extensive monitoring have not ensured harmonised training of high quality in all firms and all sectors (Berg 1994: 301-302; Marsden and Ryan 1990: 358).

Even if similar types of standard setting and monitoring are the norm in the apprenticeship systems, harmonisation can also be achieved in other ways. For example, in Norway the section 20 of the Act on Vocational Training, as mentioned earlier, will tend to harmonise training within companies since the resulting skills are tested, even if the contents of the training are not monitored directly.[3]

A third way of achieving harmonisation is by national regulation of training requirements, for example in relation to health and safety standards.

Finally, rules and regulation that make the contents of jobs more similar within an industry will also indirectly tend to harmonise the training employees get. This is 'indirect harmonisation.' While the existence of any of the first three types of harmonisation are clear examples of actions to increase transferability of training, it is debatable how indirect harmonisation can be used to support the collective action hypothesis, and not the human capital hypothesis. As explained in chapters 2 and 3, it is more in line with human capital theory to assume that training options are direct consequences of the tasks employees must do, and that employers have little or no choice in the design of these training options to influence transferability.

[3] National skill testing is also an important part of the Japanese training system (Dore and Sako 1989).

5.3.3 Improving information among other employers

Information is a necessary, but not sufficient, condition for transferability. Skills are transferable only if employers have sufficient information to evaluate the value of the skills in their own firms. Therefore, if employers act to increase the information other employers get about the training they offer, it will tend to improve the transferability of skills from this training. In the extreme case skills may be of no value to other employers if they have not and cannot get information about the skills. If the skill is potentially useful in the firm, information about the skill will always increase the value of the skill to the employer, as Katz and Ziderman (1990) show.

To some extent improving information other employers get about the training may be independent of other actions to increase transferability. For example, an employer may choose to establish an internal training programme with diplomas and formal courses, which makes it easier for other employers to assess the contents of the training. However, improved information will often be a by-product of other action to increase transferability. If employers choose to give employees common or harmonised training, training will not only be more similar among employers, but employers will also have more adequate information about the training employees in other firms receive. Therefore, action to specifically improve information about training is necessary, and most likely, in cases where training is neither common nor harmonised.

To increase the value of employees' skills through improved information was an important rationale behind the introduction of the British National Vocational Qualifications (NVQ) system (Marsden 1995). The most common way of improving information about skills is some form of documentation. One type of documentation is that of formal training. This means that if employees go through formal internal or external training, they get some written proof, which describes the contents of the training. However, the debate about documentation has

been more concerned with how other types of training, informal on-the-job training and learning through job experience, can be documented. Several reports have found that a substantial share of employees' learning takes place outside formal training situations (e.g., Larsen et al. 1997 and Training Agency 1990a), and it is therefore important that other employers can get reliable information about the nature of such training and learning. Hence, the second type of skill documentation is of experience and on-the-job training.[4] The final type of documentation is directly that relating to skills, typically through an exam. Documentation of skills has an advantage in that it measures the outcomes of training, rather than the processes. Skill testing in Japan or in the national 'section 20 system' thus tends not only to harmonise training, as argued above, but is also important as a measure of documenting skills. In practice, many documentation measures include more than one of these three types. For example, a CV, a simple form of documentation, includes information about formal training, experience and also skill testing (exams).

5.3.4 Results

The results will show that in the insurance, teachers' and the nurses' cases there are examples of how collective action has made training common instead of individual and harmonised internal training. The engineers' case is the only one where there has been no significant attempts to make training transferable in any of the three possible ways.

---

[4] This type of documentation was at the heart of the policy discussions in Norway while the fieldwork was undertaken. The government-appointed committee on further training recommended efforts to improve documentation of non-formal learning (NOU 1997:25), which had also been the recommendation of similar committee a decade earlier (NOU 1985:26). This was seen as important for both employers and employees, and NHO initiated research into how documentation schemes could be organised (Reichborn, Pape, and Kleven 1998). New measures for documentation of competence were later proposed by the government and finally approved by the Parliament (Kirke-utdannings- og forskningsdepartementet 1999; NTB 1999).

Common training

An important conclusion in this section is that the choice between internal training and external training is not one that individual employers take independently of other employers or institutions. By contrast, at least in the nurses' and the insurance employees' case, the choice between training for employees from only one firm, 'individual training', and training that is undertaken by employees from many companies, 'common training', has been a matter of great importance for employers and employees and a target of collective action.

For nurses, the choice between internal and college-based specialist training has accentuated the issue, while in the insurance industry the large employers have had a clear choice between organising training internally or contributing to a common training organisation. In the engineers' case common extensive training is much less important, and attempts by the public colleges to play an important further training provider role have failed. Finally, for teachers the most important point in this section is the way the state, through collective bargaining, has influenced the type of further training that teachers take.

The process that led to the Parliament decision in 1996 to transfer internal specialist training of nurses to the public regional colleges highlights the importance of how training is organised. The Nurses Association (NSF) had long argued that the training should not remain internal, but become college-based. Both SHD and KUF were, however, against such a move. The hospitals have also, overall, been sceptical about leaving the responsibility for all specialist training to the colleges. By analysing the parties' respective arguments one can better understand the employers' action to influence the types of further training that are offered.

For NSF the dual purposes of establishing nursing as a profession and of ensuring high quality training have led its struggle to make further training college-based (Melby 1990: 308). The most important argument

from NSF has been that further training should be college-based because that would lead to higher and more equal standards of training.

By contrast, the two ministries involved emphasised potential disadvantages of making all specialist training college-based. Even if they have not opposed the goal of equal training standards, what was then the Ministry of Culture and Science in 1985 rejected national plans for internal specialist training. The reason was that it saw such training as the employers', the hospitals', responsibility (Rådet for høgskoleutdanning i helse- og sosialfag 1992: 3). The two ministries have opposed a transfer because it could give hospitals more severe recruitment problems and that the training could be too 'academic,' and less directed towards solving the practical tasks of a specialist nurse (Kirke- utdannings- og forskningsdepartementet 1998: 59; St prp nr 1 (1997-98): 174).[5] The argument is that the purpose of the internal specialist training is to meet the needs of hospitals for technical skills in highly specialised jobs, and that the employers' needs would have less priority in college-based studies.[6]

While the two relevant Ministries have been opposed and the nurses have been clearly in favour of making all specialist training college-based, the employers themselves have been more ambivalent. A committee of the directors of the five regional hospitals in 1996 made no clear recommendation, but said that 'the college system is good in itself...but one may loose some of the link to practice by a transfer [of internal specialist training] to the colleges' (Holter et al. 1996: 21).

Many hospitals did in fact reorganise their training, and out-sourced part of the training to colleges before the 1996 Parliament decision on transfer. So it is somewhat misleading to call specialist training either internal or college-based. In practice the distinction was not so clear, and the case is a good example of how the distinction between

[5] Interviews with NSF representative, KUF representative, Representative of the Norwegian Board of Health and RHHS representative.

[6] Interview with KUF representative.

internal and external training is often blurred. Even if the Ministries were opposed to transferring further training to the colleges, almost half of the hospitals had still, on their own initiative, decided to let colleges run the whole or parts of the training. Of the 22 hospitals, nine had already given colleges some or full responsibility for so-called internal training, and bought training services from the local college. In 1998, only one hospital, the National Hospital, organised its internal specialist training without any co-operation with other institutions. The most common form of organising internal specialist training was that in a region one hospital had the main responsibility for the training and organised theoretical training, while nurses did their practice at their respective employers. (Kirke- utdannings- og forskningsdepartementet 1998). The committee that was appointed to evaluate how internal specialist training recommended a training-on-demand system, similar to how four counties had already done it, by hospitals buying places for the number of students they wanted from the local college. The reason was that, according to the committee, this model would solve the problems of varying standards in internal training, and at the same time give employers the possibility of regulating the number of students (Kirke- utdannings- og forskningsdepartementet 1998).

The insurance case is the other example where the choice between internal and common training has been of great importance. The existence of NAI confirms that employers have co-operated to establish and maintain an institution for transferable training. It is a also a clear and outspoken opinion among NAI, employers, employees and their organisations, that there is a collective action problem involved in upholding NAI. More specifically, the challenge for those who want NAI to continue to exist is to ensure that the largest employers still use the common training organisation. As a NAI representative said, 'We are quite vulnerable. The use of NAI is not obligatory, and the companies can at any time say: 'We don't want this any more."[7] In 1996, more than half

[7] Interview with NAI representative.

of the participants came from one of the three largest companies (Forsikringsakademiet 1997), so a pulling out of one or more of these could be critical for the organisation.[8] At the same time, in line with the resource explanation for employers' collective action presented in chapter 3, the large employers are those who can most easily replace common training with internal training. As one informant said: 'Storebrand [the largest insurance company] could have made their own academy.'[9] So, according to a trade union representative, 'NAI is most important for the small companies. The large companies can do fine on their own.'[10] This impression was confirmed by a personnel manager in one of the small firms who said: 'At present we have no alternative [to NAI].'[11]

Even if, or maybe because, of the manifest awareness of the collective action problem, there has been no known attempt by any of the large companies to pull out of NAI. Nevertheless, the informants indicated that there had been discussions within the large companies about their role in NAI. All informants described the opposition to common training rather vaguely. A personnel manager in one of the large companies said there had been 'forces which wanted to do more internally,'[12] and a representative for the employers' association said that 'there have been hints *(ymting)* [about leaving the organisation], but it seems safe at the moment.'[13]

NAI has used several different strategies to ensure that co-operation has continued for 40 years without any of the large employers pulling out. One important strategy the NAI has used is the broad

---

[8] Several informants used the history of the Norwegian Banking Academy and the Swedish Insurance Academy (IFU) as examples of the sort of crisis a withdrawal of large employers could lead to. Olberg (1995) argues the crisis of the Norwegian Banking Academy in the 1980s illuminates the collective action problem of industry training.

[9] Interview with NAF representative.

[10] Interview with Group of FL representatives.

[11] Interview with Personnel manager of small insurance company (B).

[12] Interview with Organisational development manager, large insurance company (B).

[13] Interview with FA representative.

participation by the member firms in the running of the organisation. This has contributed not only to making the training offers relevant for the firms, but also that the organisation has had supporters within the companies.[14] According to one member of the board, the policy has been successful: 'We on the NAI board have all been clear on this point [the continuing existence of NAI], and we think we have had positions in our companies that meant we could influence this. So we have not been close to any breakdown.'[15] First, one representative for each of the two largest companies is always on the board. These representatives have usually not been training managers, but more senior managers. The reason is that representation on the board has had the purpose of not only giving NAI input on how to run the organisation but has also been a way of ensuring that the organisation had a voice when important company decisions were made, and these were often made above the level of training managers.[16] All training managers have been included, though, through an annual meeting where the main object has been to get feedback from the companies (Forsikringsakademiet 1998a). Many more members of the firm have been included through teaching. Employees from the member firms teach all courses at NAI, and they constitute the committees that define the contents of teaching and employ teachers.

Another important factor behind the NAI's continuing existence may be the way NAI has developed its training programmes and limited its scope. NAI's strategy has for many years been to offer training in insurance skills only. As shown in chapter 4, students have to take the business administration parts of the insurance education at other colleges. In the school's first years, management training was an important part of NAI's program.[17] But already in the early 1970s the management training

[14] Interview with NAI representative.

[15] Interview with Organisational development manager, large insurance company (B).

[16] Interview with NAI representative.

[17] NAI was then called the Norwegian School of Insurance (*Forsikringsskolen*). It changed names to NAI in 1986 (Lefdal 1993: 24)

was criticised for being outside what should be the main task of the school, namely to educate insurance employees in insurance skills (Lefdal 1993: 19). This critique reflects the view that is prevalent today, namely that NAI should stick to strictly insurance-related training (Johansen 1999: 36).

The way NAI has developed its programs as alternatives to internal training is frequently called a 'balance' or 'task sharing' by the informants.[18] In the 1989 annual report, the school states that:

> The interdependence between the companies and NAI requires that the courses can be made up-to-date in line with the development in the industry. With good collaboration with the training departments a suitable sharing of tasks has been developed between internal training and NAI's courses (Forsikringsakademiet 1990: 8).[19]

This 'task sharing' is greatly influenced by two factors, except for the quality and relevance of training, namely comparative costs and competition sensitivity. A substantial challenge or threat to the organisation is that large employers may choose to do training internally if the costs are lower than at NAI. Small and large employers have reacted differently in order to save costs. While large employers have chosen to do some training internally, some small employers have tried to co-operate to achieve the same economies of scale that the large employers can. This contributes to explain why, as 4 shows, a smaller proportion of employees at large employers do NAI courses than employees at small employers.[20]

---

[18] Interviews with FA representative, FL representative, NAF representative, and NAI representative.

[19] This view was not only the official view, but also a view generally supported by the employers.

[20] A personnel manager in one of the largest companies said that 'You may...say that it is easier for the large companies to benefit from economies of scale, and thus do things [internal training] more cheaply than the small companies. And that is an explanation [why large companies do more internal training], not competition sensitivity.' Interview with Organisational development manager, large insurance company (B).

However, small employers have also tried to establish their own training to save cost. To attempt to achieve economies of scale in training, a group of training managers from five small insurance companies in the so-called INFO group in 1997 discussed the possibility of co-operation on training, but the plans never materialised.[21]

The other challenge to a task sharing where NAI does a substantial amount of training of insurance employees is 'competition sensitivity.' All parties (employers, employees and the training organisation) recognise that companies want some training to be organised internally because the skills are especially important for their competitive strength in the product market.[22] The result is that sales training and training about new insurance products are usually done internally because they are 'competition sensitive.' The personnel manager of one of the large companies explained how the company chooses between NAI and internal training based on comparative costs and competition sensitivity:

> We have, let's call it a borderline (*grensesnitt*) to NAI which [means that if training] is not competition sensitive...and if they at the same time are competitive on price, they can do it. But if we can do it cheaper internally, there may be basis for doing that, but we especially organise competition sensitive training internally. It turns out that not so much is. It is more about price.[23]

---

[21] The aims of co-operation were not well defined at the meeting. One participant said that the group planned to provide training as an alternative to NAI, with 'greater freedom and lower costs.' Another training manager, who attended the same meeting, said, on the other hand, that the co-operation was mainly meant to cover areas that NAI did not cover, for example IT training. Nevertheless, they both shared the view that saving training costs would be the main purpose of such co-operation. Interviews with Personnel manager of small insurance company (A) and Personnel manager of small insurance company (B).

[22] A similar observation was made in the case of further training in German banks. Here, large banks preferred internal training, the Association for Further training offered small banks further training that did not 'affect their relative competitive positions' (Streeck 1987: 80).

[23] Interview with Organisational development manager, large insurance company (B).

The inconsistency in the excerpt reflects that there is not an absolutely clear policy that determines the choice between internal training and training at NAI. No companies said that they wanted to carry out competition-sensitive training at NAI, but except for sales training and information about their own products that were not yet released, employers were not clear on which training was competition-sensitive. Thus, this challenge to employer co-operation through NAI is not so much one of organising competition-sensitive training, but rather to ensure that employers do not define too much training as 'competition-sensitive.'

The problem of competition sensitivity has been more significant in the 1990s than earlier. When NAI was established in 1958, and in the subsequent two decades, product market competition in the insurance industry was limited, even if the members of the industry, already in the early 1960s, were experiencing considerably increased competition.[24] Still, competition in the product market remained 'competition within a system characterised by extensive co-operation and regulation' until the 1980s (Lange 1996: 7).[25] But in the 1980s and 1990s competition increased markedly, after the most important price cartel broke down in 1982, a new Insurance Act (*Forsikringsloven*) was introduced in 1988, and Norway became part of EU's internal market through the European Economic Area (EEA) (Espeli 1995; Kjær 1992; Lange 1996: 7).

What is characteristic for engineers compared with the three other cases, is how little common extensive further training there is, at least in technical skills. There have not been very noticeable efforts to change this situation by the employees, the employers or the state, even if some

[24] The background was a liberalisation of the national regulations and that consequently a previously very specialised company broadened their scope, for example from only fire insurance to all sorts of non-life insurance.

[25] According to Espeli (1995: 80) 'the price cartels within non life insurance, especially fire [insurance], were some of the most lasting and powerful cartels in the history of modern Norwegian business.'

attempts have been made to strengthen the position of engineer colleges as providers of further training.

The state's role is most important in this case as a provider of training through the universities (NTNU in particular) and the public colleges. The engineer colleges have a marginal position as providers of further training for engineers.[26] As one engineer informant said: 'We have never heard anything from the engineer colleges, to be honest.'[27]

Table 5.3 reveals the minimal importance of engineer colleges in further training among the 33 per cent of NITO members who planned or had started further education. Of these, only 9 per cent said they did or would do their training at the engineer colleges. Thus, not more than three per cent of NITO members overall had started or planned to do further training at the engineer colleges.

Table 5.3 Engineers who have commenced on or are planning further education, by further education provider

Education provider	%	N
Economic college	23	121
University	14	76
Regional college	10	53
Graduate engineer training	10	52
Engineer college	9	48
Maritime college	1	3
Other type of further education	48	254
Sum	100	530

Source: Norges ingeniørorganisasjon (1997b).

The National Council for Engineering Education did a four-year project in the early 1990s to strengthen the role of the engineer colleges in

[26] Brandt (1991: 86) argues that the engineer colleges could not play an important role as providers in the 1980s because they had to use their resources for extending the basic training from two to three years. Nevertheless, the engineer colleges do not seem to have been significantly more important during the 1990s.

[27] Interview with NITO representative, offshore contractor.

provision of further training for engineers (Havn and Huitfeldt 1994; Ingeniørutdanningsrådet 1995; Ingeniørutdanningsrådet 1996). The most important conclusion from their project was that there was a lack of communication between the colleges and employers:

> What we saw, was that if you are to succeed within that area [further education and training]...users/buyers and providers/sellers...have to initiate a dialogue, they have to understand each others' distinctive features, demands, mind set and approach.[28]

According to Havn and Huitfeldt (1994: xx) another major obstacle is that 'it seems as if engineer colleges and the industry have conflicting priorities: individual, academic careers versus experience-based competence (practical use of theoretical knowledge).'

The employers' association, TBL, has spent considerable resources on encouraging further education and training and strategic competence development in their member firms. In contrast to the employers' association in the process industry, PIL, it has not established its own training, but has rather tried to influence the training offered by public schools and colleges in order to bring it more into line with its members' demands (Econ 1997: 10; Prosessindustriens Landsforening 1997; Teknologibedriftenes Landsforening 1996).[29]

The Norwegian Society of Engineers (NITO) is an important provider of further training. But all its courses are short, and can hence hardly be interpreted as any attempt to ensure that engineers get extensive common further training. In 1996 NITO held 88 courses and seminars with about 3000 participants in total (Norges ingeniørorganisasjon 1997a).[30] This training usually lasts from one to three days, and aims at up-dating engineers about new developments, as well as serving as a meeting

[28] Interview with National Council for Engineering Education representative.

[29] Interview with National Council for Engineering Education representative.

[30] NIF, which runs similar courses, had about the same number of participants in 1996 (Norske Sivilingeniørers Forening 1997)

place for engineers interested in related issues. Even if NITO organises the courses, they are not restricted to its members, but are open to all that are interested. In 1990 not more than 30 per cent of the participants at NITO courses were NITO members (Eldring and Falkum 1995). Members do get a small discount, about 10 per cent, but as long as the employer always pays the course fees, that is hardly an important member benefit.[31] At the same time, membership fees are not used to subsidise training, so NITO's course department has to be self-financing. Even if it is clear that NITO organises training to encourage their members' competence development, the organisation has a very clear view that it is only one of a large number of training providers in a competitive market.

In the teachers' case the state has, by two different means, increased transferability of training, and also made it very difficult for individual employers to influence transferability in any significant way. Neither of these actions has been directed primarily at increasing transferability, but rather at ensuring equal national standards of education for all pupils in the compulsory comprehensive school. This section shows how collective bargaining has ensured that training is common, while the next section shows how detailed national curricula in comprehensive schools in effect have harmonised further training.

The state can use collective bargaining as a means because even if the municipalities employ teachers, NL and Teachers Association still negotiate their collective agreement with the state. In effect this has implications for the transferability of further training teachers take. The main point here is that as long as the collective agreement is negotiated between the state and the teachers' organisations, it remains an important vehicle for state power and limits the employers' possibility for influencing transferability of training.

The collective agreements negotiated by the state leave little or no scope for individual schools to remunerate teachers by performance, amount of school-specific skills or which courses they teach. Formal

[31] The details of cost sharing are presented in chapter 6 and appendix 3.

competence level (described in chapter 4) and seniority (not necessarily at the current employer) have determined teachers' wages. Chapters 6 and 7 will show in detail how this agreement determines cost sharing of further education and training, as well as how the training meets the employers' needs. What is most important here is that since teachers get automatic wage increases if they reach a higher competence level, the agreement gives strong incentives for teachers to take further education and training at colleges and universities, which can lead to higher formal competence. By contrast, the collective agreement gives no incentives to train in school-specific skills or other skills that do not lead to wage increases. Consequently through this wage agreement the state encourages teachers to take training that is likely to be transferable. The individual employers, on the other hand, are left with few possibilities to influence the transferability of teachers' further education. Thus, one might argue that because of the national collective agreement the teachers' case is similar to the case of a single monopoly employer.

Table 5.4 provides a summary of the findings on this indicator compared to the initial predictions. The conclusions will be discussed after the results on all three types of action to increase transferability of training.

Table 5.4 Summary of predictions and processes: employers' choice of common training instead of individual firm training

	Nurses	Teachers	Insurance	Engineers
H_{alt} prediction	Very likely	Likely	Likely	Unlikely
H_0 prediction	Unlikely	Unlikely	Unlikely	Unlikely
Results	Yes, after pressure from employees' organisation	Yes, through collective agreement	Yes, through common training organisation	No significant attempts

Harmonising internal training

Training does not have to be organised with employees from many firms or arranged outside the firm to be transferable. Internal training may be transferable, but it will be transferable to varying degrees, and employers can influence the transferability. This section presents results showing how employers have tried to increase transferability of internal (individual) training by making the content of the training more similar among employers, or resisted such harmonisation. Direct harmonisation of internal training has been most prevalent in the nurses' and the insurance cases. In the teachers' case, the state has more indirectly harmonised training, as a side effect of the national curricula. In the engineers' case, there have hardly been any attempts to harmonise training, and neither have skills been harmonised as a consequence of other decisions.

NSF worked long for more harmonised specialist training among hospitals before its struggle for transferring the training to the colleges succeeded in 1996. In 1989, the organisation published curricula for specialist training of anaesthesia, intensive and operation nurses. Even if there was no legal obligation to organise further training according to the plan, a study in 1992 showed that all but one of the hospitals used NSF's plan, either as it was, or in a modified version (Rådet for høgskoleutdanning i helse- og sosialfag 1992: 11). A representative of NSF argued that 'it is NSF which has ensured that there is a reasonably equal level and equal quality of [internal] further training.'[32] But even if most hospitals used the curricula, NSF was still not satisfied with the degree of harmonisation of training. The organisation therefore argued that curricula made by the KUF would 'contribute to quality control of the training and ensure unitary training nationally.' (Kirke- utdannings- og forskningsdepartementet 1998: 86). Thus, individual employers, based on

[32] Interview with NSF representative.

an employee organisation initiative, have acted to increase transferability of training through harmonisation.

There is also more evidence that hospitals have acted to harmonise internal training. The directors of the regional hospitals, five of the largest hospitals, in 1995 appointed a committee to compare specialist training for nurses in the hospitals. Among other things the committee discovered clear differences in the contents and organisation of training at the five hospitals, and therefore suggested further collaboration between the hospitals to achieve more similar standards of training (Holter et al. 1996: 3).

In the insurance industry, two factors have tended to harmonise internal training. First, national rules and regulations of the industry indirectly harmonise training. Moreover, NAI has tended to harmonise internal training because companies now integrate the NAI offers in their internal training.

In Norway, public regulation and control of the insurance industry have been weaker than in comparable industries such as banking, and have mainly been concerned with life insurance (Espeli 1995). Still, relevant laws and regulation have been important parts of insurance training, and have therefore tended to harmonise training. Moreover, cartels in the insurance industry regulated not only prices, but also conditions. Hence, the conditions tended to be similar, or the same, between companies (Espeli 1995).

Internal training has been directly harmonised through the existence of NAI. In many cases, the NAI courses have replaced internal training, or are integrated into the internal training of employees. So, as in the nurses' case, the distinction between internal and external training is not a clear one. For example, a large company has designed internal computer-assisted training with NAI courses as a basis, but adjusted the training to its own products and routines. Hence, by following this

internal training, employees can also qualify for the exams at the NAI.[33] In the future NAI wants it to be 'easier to find flexible solutions so that NAI's training offers can be fitted into the individual companies' own training' (Forsikringsakademiet 1997: 13). But even before the introduction of computer-assisted training, NAI offers have been included in companies' internal training catalogues, with little or no mention of these being organised by an external organisation.[34]

In schools, the curriculum has an important bearing on the transferability of skills through indirect harmonisation. The more freedom individual schools or municipalities have to set their own curricula and use that freedom, and thus the more the contents or structure of education varies between schools, the less transferable one would expect skills to be. Therefore, the way in which the state laid down tight rules, concerning the contents of education in comprehensive schools, has tended to increase transferability of skills, even if that was not the main purpose of the national curricula.

Guided by ideas of universalism and equal rights to education, the Norwegian state in the two decades after the second world war implemented detailed national curricula and elaborate national rules and regulation. In the late 1960s the ideological climate changed, and decentralised and local governance become more important, but there were few changes to the strong national regulation of education (Lauvdal, Rymoen, and Grooss 1998: xii). The national regulation of curricula is still strong, and recent educational reforms do not seem to have decreased the influence of the state.[35] Lauvdal, Rymoen and Groos (1998: 187) claim that 'after the latest reform in Norway the control of the content [of teaching] at the national level through curricula is still strong, and there is

[33] Interviews with Personnel manager, large insurance company (A) and NAI representative.

[34] Interview with NAI representative.

[35] By contrast, in Sweden and Finland there has been a far-reaching decentralisation of curriculum definition in the 1980s and 1990s (Green, Leney, and Wolf 1999: 22).

little room for municipal curricula.' Management through relatively detailed national rules has characterised comprehensive education (St meld nr 37 (1990-91): 18), and the rules have been formed to achieve national equality.[36] Another intention has been that schools should still adjust their teaching to local conditions, but in practice 'the opportunities for an individual school to organise its work, based on local conditions, to reach national goals are very limited' (St meld nr 37 (1990-91): 19). Compared to other countries, the local level in the Norwegian education system is relatively weak (OECD 1999). The fact that 97 per cent of municipalities reported that their teachers had received up-dating training related to the 1997 reform of comprehensive education shows the significance of the national curriculum for teachers' further training. (Jordfald and Nergaard 1999; Kirke- utdannings- og forskningsdepartementet 1997; Lærerforbundet 1995). So even if 'the municipalities have the main responsibility for further education and training of employees in primary schools' (Kirke- utdannings- og forskningsdepartementet 1996: 11), national regulation has tended to ensure transferability of skills since teaching tasks are, to a large extent, the same in all comprehensive schools.

For engineers in the metal industry there have been no direct attempts to harmonise internal training. Moreover, there has been little indirect harmonisation of tasks through harmonisation of job design among companies.

Table 5.5 summarises the results and compares the processes to the predications of H_0 and H_{alt}.

[36] The Ministry of Education and Research mentions one problem of management by detailed rules: 'To keep track of the different sector-related laws and the administrative apparatus connected to each of the laws can be problematic enough for those who work within the educational system and virtually impossible for those outside' (St meld nr 37 (1990-91): 21).

Table 5.5 Summary of predictions and processes: employers' actions to harmonise internal training

	Nurses	Teachers	Insurance	Engineers
H_{alt} prediction	Very likely	Likely	Likely	Unlikely
H_0 prediction	Unlikely	Unlikely	Unlikely	Unlikely
Results	Yes, but not result of state action	Indirectly through national curricula	Some	No

Improving information among other employers

A third type of action that employers can take to increase transferability of training is to improve the quality of the information other employers get, or can easily obtain, about the training. As shown above, in all but the engineers' case there has been action (common training and harmonisation) that tends to increase transferability, which also improves information about the training. Therefore, this section will focus on the engineers, in order to see whether or not the employers, in this case, have acted to increase transferability through improved information, since they have used, to only a slight extent, the two other options to ensure that training is transferable.

In the engineers' case, there is a substantial lack of information even about common training. In the market for short training NITO competes with NIF, consultants, professional training organisers, suppliers, NTNU, other colleges as well as industry interest organisations, in addition to internal training (Mofossbakke and Herrebrøden 1995).[37] For the buyers of training, this situation means that there is a wide selection of short courses and seminars to choose from. An engineer commented, 'there is no lack of opportunities to choose from [the training offers] that we get by post.'[38] On the other hand, it is hardly possible for

[37] Interview with NITO representative.

[38] Interview with NITO representative, offshore contractor.

the engineers and their employers to assess the contents and quality of the training programs with which they are presented. Havn and Huitfeldt (1994: 126) therefore argue that even if the engineers can choose from an 'enormous' amount of up-dating training, the 'opportunities for choice are very limited,' since they have no overview of what is offered. This lack of information among employers as well as employees is therefore likely to limit transferability of training so long as employers cannot assess the value of the skills.

There have been however some other attempts to improve information about further training. Some individual employers have made attempts, due to demand from buyers or employees, in ways that even if they are of limited importance for the overall transferability of skills, are interesting because they highlight alternative processes that may lead to increased transferability.[39] Some employers were *planning* to take action to increase transferability of training when they were interviewed. Not least in the area of further education and training there may be discrepancies between what employers say and plan and what they will implement, so these cases are mainly of interest because of the employers' rationale when considering policy change. One employer was in co-operation with NTNU and about to start further training that would give the participants credits in the college system.[40] Another employer said they would change their project management training in order to make it more attractive outside the company.[41] In both cases, the employers wanted to implement changes, partly because they wanted higher quality training, but stressed that the demands of current employees and potential

[39] In addition, in 1999, NITO and NHO (*Samarbeidsutvalget NITO-NHO)* financed research that assessed the possibilities for improved documentation of engineers' non-formal learning (Eldring and Skule 1999). More generally, in connection with the planning and implementation of new national further training policies in the late 1990s, NHO emphasised the importance of informal learning and documentation as alternatives to formal education and training.

[40] Interview with Leader of administrative section, telecom equipment manufacturer.

[41] Interview with Personnel manager, turbine producer (B).

employees were important when deciding to offer more transferable training. There had partly been pressure from NITO within the firm to get training that would be more valuable outside the firm.[42] But employers also said they wanted to make training transferable because that would make it more likely that good engineers would want to join the firm and remain there. One personnel manager said that to attract and retain competent engineers they 'had to offer' training that would be valuable outside the firm.[43] This is a rationale that Larsen et al. (1997) also found was prevalent in their study of further training in Norwegian manufacturing.

Another rationale behind action to improve information about training, is demand from the buyers of their products or services (Larsen et al. 1997; Meyer and Rowan 1991). A survey done for TBL showed that of those employers who said that they had made a written training plan for their employees, 18 per cent said the most important reason was demand from buyers of their products (MMI 1997). Two examples from the informants were a car part manufacturer who said a major buyer wanted to see a training plan for employees, and the same was the case when a shipyard was in contract negotiations.[44] But in most cases the information given does not exceed what employees would write in their CVs if they wanted to change employers, so there may be little net effect of this sort of documentation on the transferability of skills in the labour market.

In 1991, Brandt (1991: 91) concluded that 'certification [of further training] becomes more important,' but that seems hardly to have been the case. Documentation of engineers' skills has mostly proved difficult.

An attempt by the Norwegian Society of Chartered Engineers (NIF) illustrates the problems of establishing routines for documentation

---

[42] Interview with Leader of administrative section, telecom equipment manufacturer.

[43] Interview with Personnel manager, turbine producer (B).

[44] Interviews with Factory manager, car part manufacturer and Personnel manager, ship yard.

and certification of non-formal learning for engineers in general. In 1989, NIF established the Professional Development Certificates (PDC) for graduate engineers. The aim was for this certificate to provide a documentation of the 'good professional,' and at the same time inspire graduate engineers to further training.[45] The certificate was established within several different fields, for example 'Steel Construction' or 'Project Work.' To get the certificate, graduate engineers needed five years work experience, three of which had to be within the field relevant to the certificate. An important specification was also that the graduate engineer should take five course modules, which could be taken for example at NTNU, at the engineer colleges or at BI. Finally, the graduate engineer had to complete a study project in addition to the courses. NIF estimated the normal duration for completion of the certification at two and a half years (part-time), and the maximum period was five years. For each type of PDC certificate there was a professional council responsible for it, consisting of graduate engineers working in the field, as well as a representative of NTNU in each council (Brandt 1991). Even if NIF devoted considerable resources to the certification, very few graduate engineers chose to undertake the certification, however, and in 1998 NIF finally decided to terminate its involvement in the project.[46] So at a time when researchers, politicians, employers' associations and trade unions were working to establish systems for documentation of non-formal learning, NIF, an organisation that had established such certification many years previously, gave up their attempt. Chapter 6 will show that a probable explanation for the lack of interest in documentation was the lack of incentives for engineers to invest their spare time in training and certification.

In the three other cases, employers are, to a much larger extent than in the engineers' case, likely to have adequate information about training since it is common or harmonised. Thus, a real information

[45] Interview with NIF representative.

[46] Interview with NIF representative.

problem is likely to exist only in the engineers' case, while there has been less need for independent efforts to improve information in the three other cases.

An important point in the insurance case is, however, that such measures would contradict an important reason why companies choose to undertake training individually: competition sensitivity. When companies choose to do internal training, because the contents of the training would give other companies a competitive advantage, it would hardly be logical for individual employers to try to improve information other employers get about the training. So in the insurance case, competition sensitivity has restricted not only the degree to which training is common, but also the information employers have about other companies' training.

Table 5.6 summarises the findings on the last of the three indicators.

Table 5.6 Summary of predictions and processes: employers' actions to improve information about training

	Nurses	Teachers	Insurance	Engineers
H_{alt} prediction	Very likely	Likely	Likely	Unlikely
H_0 prediction	Unlikely	Unlikely	Unlikely	Unlikely
Results	No	No	No	Some attempts by individual employers

5.3.5 Conclusion processes

Table 5.7 presents a summary of the results in this chapter. It clearly shows that overall the results strongly support H_{alt} and not H_0, since employers, to a much larger extent than predicted by human capital theory, act to make training transferable, and the pattern of such actions are in line with collective action theory.

Table 5.7 Summary of predictions and processes: employers' actions to increase transferability of further training

	Nurses	Teachers	Insurance	Engineers
Concentration	High	Low	High	Low
Powerful body	Yes	Yes	No	No
H_{alt} prediction	Very likely	Likely	Likely	Unlikely
H_0 prediction	Unlikely	Unlikely	Unlikely	Unlikely
a. Choosing common training instead of individual firm training	Yes, after pressure from employees' organisation	Yes, through collective agreement	Yes, through common training organisation	No significant attempts
b. Harmonising training, making training more equal among employers	Yes, but not result of state action	Indirectly through national curricula	Some	No
c. Improving information among other employers	No	No	No	A few attempts by individual employers
Results support	Support H_{alt}, but role of employees' organisations not integrated in theory	Support H_{alt}, but role of collective agreements not integrated in theory	Support H_{alt}	Support both H_0 and H_{alt}

However, one must locate not only where employers have done most or least to ensure transferability, but also consider to what extent the results are brought about by small group interaction among employers or action by a powerful superordinate body. This reveals that the support for H_{alt} is somewhat more mixed than table 5.7 indicates, mainly because factors other than those predicted seem to have contributed to the collective action. The nurses' case illustrates the potential importance of employees' organisations, ignored in H_{alt}, while examples from the engineers' case

show that employees indirectly affect transferability if employers' offer transferable training to attract able workers. The insurance case shows the importance of tracing the origin of the collaboration.

In the nurses' case, collaboration as a result of the small number of employers is not very important, even if there is one example of how the regional hospitals co-operated to ensure similar standards of training. The assumption in collective action theory that a powerful body can ensure transferability gets more support. The Parliament decision in 1996 to transfer training shows the impact a 'powerful body' can have on the transferability of training. On the other hand, the fact that the two relevant Ministries were more opposed to college-based training than the employers themselves were, shows that a powerful body does not guarantee action to increase transferability of skills. What has ensured transferability in the case of internal specialist training for nurses is not so much co-operation among employers nor actions made by the state (except the 1996 Parliament decision), but influence from NSF. In the two most important actions to enhance transferability, harmonisation of internal specialist training and the transfer of specialist training to the colleges, NSF played a pivotal role.[47]

In the teachers' case, the importance of the state in increasing transferability of skills is much clearer than the in the nurses' case. Through the national curricula and the national collective agreement the state has effectively given individual employers scope for influencing the transferability of the further training teachers take. Even if the teachers' organisations have supported national curricula and state bargaining, they have not played the same leading role as NSF has in ensuring transferability of skills.

[47] According to the informants, NSF played a crucial role in convincing the MPs that the internal specialist training should be transferred to the colleges. (Interviews with NSF representative, KUF representative and Representative of the Norwegian Board of Health).

In the insurance industry, collective action theory predicted that employers might act to increase transferability if there were co-operation between the small number of large employers. This seemed to be the case. The NAI was maintained through the continuing support of the large employers, and the organisation had developed strategies to ensure that these employers remained members of the trust. Nevertheless, the case is less straightforward if one distinguishes between the two problems, on the one hand of establishing the organisation and on the other the upholding of the organisation (Marsden 1986: chapter 8; Olson 1971: 22). In the case of the insurance industry, this problem of establishing the institution was solved in the 1950s when the insurance industry was much less concentrated (Kjær 1992; Lange 1996; Lefdal 1993).[48] The Norwegian School of Insurance, which established as a separate trust in 1958, was a continuation of the training that had previously been organised as part of the Association of Norwegian Insurance Companies (Lefdal 1993: 18).[49] So the establishment of what is now NAI can hardly be explained as a result of co-operation between a few, large employers, but is rather the result of efforts by the industry's business association. As long as the training organisation was already in place, the situation in the insurance industry has been in 'institutional equilibrium' where 'the relative costs and benefits of altering the game among the contracting parties does not make it worthwhile to do so' (North 1990: 86). Hence, even if the insurance case shows that co-operation between large employers can ensure that that they act to enhance transferability, it does not show that the co-operation can come into place without the support of a superordinate institution.

In the engineers' case, both theories predict that employers would not make a significant effort to ensure that skills from further education and training are transferable. These expectations are confirmed. Neither

[48] While the five largest companies had 50 per cent of the non-life insurance market in 1958, the same ratio in 1991 was 94 per cent (Kjær 1992: 79).

[49] Interview with NAI representative.

the state, nor the employers' association nor NITO, has taken significant action to ensure that skills from further training are transferable.

Table 5.8 Summary of predictions: transferability of further training

	Nurses	Teachers	Insurance	Engineers
H_0 prediction	Medium	Medium	Medium	Medium
H_{alt} prediction	Very high	High	High	Medium

The next part of the chapter shows how the processes analysed so far have influenced the transferability of further training for the four groups. Since the results in this first part of the chapter were in line with H_{alt} predictions, and H_0 does not predict a link between employers' action and transferability, the predictions do not have to be revised in order to test the second part of the explanation: the link between employers' action and transferability. The predictions are summarised in table 5.8.

5.4 Outcomes: transferability

This part of the chapter analyses how transferable skills are from further training, how this can be explained as resulting from employers' action, and finally how the results strengthen or weaken the two rival views as to what extent employers act to avoid or enhance transferability. Thus, this second part is a test of whether or not transferability of training is endogenous. If it is, transferability of training will be highest in cases where there has been collective action to improve transferability.

5.4.1 Measuring outcomes: transferability of skills

A spectrum of different indicators of transferability must be evaluated to draw a valid conclusion as to what extent skills are transferable. This section will use these five indicators to measure differences between the four cases: wages, perceptions of transferability, introductory training, importance in recruitment, and bonds. Due to the complex nature of the

indicators, and the even more complex combination of indicators, the overall measure of transferability cannot be an interval level measure. Any attempt to measure transferability so precisely fails to acknowledge the inherent measurement problems. Still, the indicators can be used to compare degrees of transferability between different types of training for one group and also between different groups.

This measurement strategy differs from that carried out so far in human capital research (e.g. Lynch 1993 and Schøne 1996) where the generality of skills has been induced from wage developments. The logic is that while perfectly general skills raise wages by the same amount in all firms, completely specific skills increase wages only in the current firm. So it is argued that the larger the difference in wage increases, between staying in a company and starting in another, the more specific the skills are.

The problem with this approach is that it is based on the assumption of a perfectly competitive labour market. If the labour market is not perfect, and, moreover, the level of 'imperfections' varies between sectors and occupational groups, such studies may not give valid results. As explained in chapter 2, Becker's (1993) definition of specific and general skills relies on competition in the labour market as well as usefulness in other firms. So differences in wage developments can in principle be due to differences in the usefulness in other firms, but they may also simply reflect that competition in the labour market varies between different parts of the labour market, and that wages do not always equal marginal productivity. The problem of deducing from wage developments to transferability of skills is evident in studies which find that training followed at a previous employer leads to larger wage increases than such training does at the current employer (Lowenstein and Spletzer 1998; Schøne 1996).[50] Such results are logically impossible in the

[50] Lowenstein and Spletzer (1998: 167) say that 'for outside seminars and business school training – training that is almost certainly general – the estimated return to training at a previous employer far exceeds the estimated return to previous training at the current

standard version of human capital theory, and thus suggest that other indicators of transferability must supplement those of wage increases.

The concept of transferable training, defined in chapter 2, differs from Becker's concepts in that labour market competition is not a part of the definition of the concept. Moreover it is not, by definition, assumed that wages equal marginal productivity. Therefore wage increases alone are not even in theory expected to give valid measures of the extent to which skills are transferable. The concept of 'transferable training' is instead based on organisational features of the firms in a labour market. These features are impossible to catch with a single measure, such as wages. They can, however, describe the mechanisms that cause the statistical associations one finds between training, mobility and wages. For example, one consequence of measuring transferability by measures other than wages is that the wage effect of transferability may by tested empirically.

Wages

The question here is not to what extent employees get wage increases from further training, or how large they are – that will be treated in chapter 6 – but whether or not the employees can get equally large wage increases at employers other than where they were trained. If wage increases as a result of training are equally large at other employers, it indicates that skills are transferable.

One important point is, however, that the nature of wage determination for the particular groups must be taken into consideration. If there are significant differences between groups in the way pay reflect productivity, wage increases may be more suitable as an indicator of transferability in comparisons between different types of training within one group than for cross-group comparisons. When wages are set by collective bargaining, for example, wage increases may be an inadequate

---

employer. It is difficult for the conventional human capital model to explain this differential.'

indicator of transferability. Still, there may be wage competition even with collective bargaining and national pay scales, for example, if employers can put employees on different levels of pay scale. Therefore, the impact of collective bargaining must be assessed in each individual case.

The four cases in this study can be used as examples of the problem of using wage increases as an indicator of transferability of skills, if one does take not industry-specific factors into account. For nurses and teachers, and to some extent for insurance employees, collective agreements determine the extent to which employers give wage increases after further training in order to remunerate increased productivity. Moreover, the impact of collective agreements varies from to case to case.

The clearest example of the inadequacy of wages as an indicator of transferability is the teachers' case, since a national collective agreement ensures that all employers must give equally large wage increases for up-grading training. When teachers get wage increases from further education if it leads to higher formal competence, even if they do not teach the subject they took the further education in, the assumption of wages reflecting marginal productivity is clearly violated. Moreover, if the assumption of wages reflecting productivity were true, it would mean that up-dating training did not affect productivity at all.

In the nurses' case there is more room for wage competition since the collective agreements set the lower and upper limits for the specific type of job, in this case the specialist nurse positions, and the hospital then decides where, within these limits, to set the individual nurse's wage.[51] Yet, a statistical analysis would have been likely to show that the wage increases were higher at other employers than at the one who trained. The reason is that different hospitals are covered by different agreements. Most hospitals are covered by an agreement between KS and NSF, but Oslo is outside this agreement, and the state hospitals have yet another agreement.

[51] Interview with NSF representative.

In practice, this has meant that the hospitals outside the KS area have been able to offer higher wages than hospitals within the KS area.

Thus, nurses trained at a hospital in the KS area will receive lower wage increases after internal specialist training at their current employer than they would at another employer not covered by the KS agreement. Hence wage increases are unsatisfactory as the only indicator of transferability.

In the insurance case, the collective agreement is of minor importance in examining whether or not training gives similar wage increases in all companies, even if employees in some instances have the right to wage increases after NAI training.[52] In the engineers' case, wages are set individually, so collective agreements have little impact on wage increases. Unfortunately, neither the annual Statistics Norway analysis of wages and wage differences in the insurance industry (Statistisk sentralbyrå 1998d) nor available wage statistics on engineers contain information on training and tenure at a current employer. So one must use other indicators to assess to what extent training is transferable.

Perceptions of transferability

Several attempts have been made to measure skill specificity by asking employees or employers whether skills are easy or difficult to transfer to other firms (Bishop 1992; Kalleberg and Reve 1993: 1118; Osterman 1984b: 175; 1995b: 137; Torp and Mastekaasa 1990: 36).

There are generally two problems with this approach. One problem is whether or not they measure perceptions of transferability as it is defined in this thesis. The problem with Bishop's definition, for example, is that such questions cannot measure different degrees of usefulness outside the current firm. An even more important problem, however, is that perceptions of transferability may be a dubious measure of actual transferability. A major problem is that employers and employees in most instances can give only hypothetical answers to

[52] The details of this are laid out in chapter 6.

whether or not training in their firm is transferable. Employees are unlikely to know how transferable their skills are before they have actually changed employers, and their perception of transferability of skills can therefore not be a reliable measure of transferability. Thus, a better test would be to ask those who have changed jobs recently. An additional problem is the way researchers have tried to quantify these perceptions of transferability (Bishop 1992; Kalleberg and Reve 1993; Osterman 1984b; 1995a).[53] As long as perceptions of transferability are likely to be imprecise and hypothetical, by quantifying these perceptions one constructs a pseudo-accurate measure. Still, if these problems are taken into consideration, perception of transferability may still be used as one of several indicators of transferability.

The results show that except for the engineers in the metal industry, employees and employers perceive training to be highly transferable. What makes transferability particularly important in the insurance industry is that it contributes to determining how much training is done internally and how much training is done at NAI. While FL and NAI emphasise how much of the skills are the same among firms, the employers more often add that there are important firm-specific skills, too, even if the employers maintain too that most of the insurance skills are equally valuable in all firms. When a small company's personnel manager was asked how similar or different jobs were in different companies, she said that 'the difference is the system [the IT system and the routines]. The tasks are the same and the customers are the same.'[54] Training at NAI is generally seen as transferable, and transferability is a condition for training to be organised by NAI. One reason is that

[53] For example, Bishop's (1991: appendix) asked employers, 'What share of the skills learned by new employees in this job are useful outside of your firm?' The response categories were 'All' (90-100 per cent), 'Most,' 61-89 per cent, 'Half' (40-60 per cent), 'Some' (11-39 per cent) and 'Minimal' (0-10 per cent). They were then asked, 'How many other firms in the local labor market have similar jobs to this one?' with the response categories 'Less than 10,' 10-24,' '25-100' and 'Over 100.'

[54] Interview with Personnel manager of small insurance company (B).

information about the training is more widely available. There is some statistical evidence to support the opinions of the informants. Torp and Mastekaasa (1990: 37) show that employees within banking and finance (including insurance) were most likely to say that the training they had received would be useful at other employers.

Specialist internal training for nurses is perceived as being, to a large extent, the same between hospitals, but not equal in all respects. On the one hand, nurses' 'function is the same wherever they are,' as a NSF representative said.[55] A personnel manager agreed that the different hospitals 'wanted exactly the same' from their specialist nurses.[56] Hospitals are organised in much the same way, and within that organisation, specialist nurses have particular tasks, which the specialist training must qualify them for. But at the same time, the informants raised three reasons why the internal training was not exactly the same at all hospitals. First, there has been no state regulation of quality and contents.[57] Moreover, during their practice the nurses have different experiences. Nurses at large hospitals are, for example, likely to experience a wider variety of particularly challenging patients and tasks than nurses at small hospitals are.[58] A final reason for differences in training is that some hospitals have a special, national responsibility for certain types of patients, and that will affect the specialist training.[59] Nevertheless, the overall perception among the informants was that training was highly transferable

In a national survey Torp and Mastekaasa (1990: 37) find that 60 per cent of employees in the education sector (including upper secondary schools and universities) think the training they have received is useful in other firms. This is 6 per cent more than the national average. The clear

[55] Interview with NSF representative.

[56] Interview with Personnel manager of hospital outside Oslo.

[57] Interviews with RHHS representative, Representative of the Norwegian Board of Health and NSF representative.

[58] Interviews with RHHS representative and Representative of the Norwegian Board of Health.

[59] Interview with RHHS representative.

view of the informants was that skills are transferable. The reason is that the contents of teaching, and partly how teaching is organised, is so strictly regulated by the state, as the first part of this chapter showed.

Employees in manufacturing in general seem to perceive their training as much less transferable than the three other groups. Less than 50 per cent of employees in manufacturing said that the training they had received would be useful at other employers (Torp and Mastekaasa 1990: 37). This is confirmed by the informants, who said that a large part of the skills they have developed after basic training are valuable only inside the firm, or in a small number of other firms.[60] But even if the engineers regard their skills as clearly less transferable than the three other groups do, the lack of transferability should nevertheless not be exaggerated. Some skills, such as computer assisted design (CAD) skills, are valuable at virtually every potential employer. Moreover, the industrial structure with specialised products may make engineers' skills transferable to a smaller set of employers, but they may still be transferable to the other employers within their niche of the industry.[61]

Introductory training

The rationale for using introductory training as an indicator of transferability is as follows: if skills are transferable, it means that employees need little time and little introductory training to do a job in another firm. If, on the other hand, skills are not transferable, workers need extensive introductory training, or a long time with learning by doing, before they can do a job in another firm.

Using the amount of introductory training as an indicator is advantageous because it depends less on subjective evaluation than do perceptions of transferability. However, instead of providing formal

---

[60] A similar point has been made about engineers in Sweden, even if Swedish manufacturing is much larger than the Norwegian (Ingenjörsvetenskapsakademien 1994: 61).

[61] Interview with Organisational development manager, offshore contractor. The problem of defining industry boundaries is discussed in chapters 3 and 4.

introductory training employers may let new employees learn by doing their job, and not expecting the output of an experienced worker for the first period in employment. Therefore, the length of time it takes for an average newcomer to become as productive as an average experienced worker may be an indicator of transferability. The problem with the latter indicator is however that it depends on employers' evaluation of productivity, which in many, maybe most, cases is difficult and imprecise.[62] Moreover, what should be measured is not only the time it takes, but also the gap between what a newcomer produces and what an experienced worker produces.[63] Nevertheless, even introductory training and the time it takes to master a job are not incontestable measures of transferability of skills, they should be included in the range of indicators used to evaluate transferability.

Table 5.9 shows that in a national survey, employees on average reported that new recruits needed to work for 12 months in their position before they fully tackled the tasks. Employees in health and social care report the shortest training periods, while employees in manufacturing say that they need the longest introductory training, controlled for number of employees, centrality and the educational level of the employees. For example the table shows that, controlled for size, centre-periphery and education, employees in health and social care need almost ten months less of introductory training than employees in manufacturing without international competition.

[62] Bishop (1992) attempts to measure productivity, and the cost of training due to new employees' producing less than experienced employees, but his results rely heavily on employers' ability to evaluate the productivity of individual employees.

[63] The most correct indicator would be the total gap between an experienced employee's output and a newcomer's output in the period it takes for the newcomer to be as productive as an experienced employee.

Table 5.9 Number of months of introduction training necessary, by industry, size, centrality and education

	No. of months of training required in new job
National average	12.1*
Industry	
Health care and social care	6.5*
Teaching	11.6
Banking and finance	14.4*
Manufacturing with international competition	14.4*
Manufacturing without international competition	16.4*
Retail trade	10.6*
Public administration	13.6
Other services	9.4*
Size	
Less than 20 employees	12.6
20 - 49 employees	11.2
50 - 199 employees	12.8
200 or more employees	12.4
Centre/periphery	
Central area	10.0*
Peripheral area	13.2*
Education	
The controlled effect of an additional year of education after completed comprehensive education	1.13*
N: 4,326 employees in 825 firms	

Note: * denotes coefficients significance on. 05 level. The results are based on an ANOVA analysis with length of required training as the dependent variable. No interaction factors are included. The average figures in the table are not actual averages, but theoretical average figures, controlled for the other variables in the model. *Source:* Torp and Mastekaasa (1990: 32).

Table 5.10 Percentage of vacancies with more than 2 months necessary introductory training period, by sector and type of higher education preferred in the position. January/February 1993

	Private sector	Public sector	Total
Culture and education (incl. teachers)	–	45	47
Health care (incl. nurses)	–	30	29
Administrative	64	63	63
Technical or science (incl. engineers)	63	68	65
Average	67	47	50

Note: The source does not give information on the number of vacancies where higher education was preferred, except that only cells with at least 40 observations are shown. – denotes cells with less than 10 observations. The average also includes 'no subject specified' and 'subject of no importance.'
Source: Larsen (1996: 36).

Table 5.10 more specifically treats three of the four groups in this study. The results are from the annual Recruitment Survey *(Rekrutteringsundersøkelsen)*, which asks employers who advertise a vacant position how much training is needed to handle the job fully if the new recruit already has the required education. The table shows that in 50 per cent of the jobs that required higher education more than 2 months of introductory training was needed.

The evidence in tables 5.10 and 5.11 suggests that the skills of engineers in the metal industry are significantly less transferable than those of the other three groups, which is in line with the previous indicators. Employees in manufacturing are not only least likely to say that their skills are transferable, on average they also report the longest introductory training period as being necessary, as table 5.9 shows. Moreover, table 5.10 shows that 63 per cent of private sector employers who recruited employees with higher education in science and technical subjects, where engineers are a major group, said they would need more than two months of introductory training. That is a larger proportion than for the nurses or the teachers. Finally, using industry groups Larsen (1996: 34) finds that 75 per cent of employers in the metal industry said

their vacant positions required more than two months of introductory training. The average proportion was 53 per cent in the private sector and 42 in the public sector. In no other industry did so large a proportion of employers report that a period of more than two months was needed. So even if none of the surveys separately had a large enough sample to look at the introductory training needed for engineers in the metal industry specifically, the results clearly indicate that this group needs longer introductory training than most other groups, and considerably more than the three other groups.

The evidence suggests equally clearly that nurses' skills are highly transferable. Table 5.9 shows that, within the health sector, employees on average needed much shorter introductory training than other groups. The result is similar in table 5.10. It shows that only 29 per cent of public sector employers who want employees with higher health care education, a category where nurses is the largest group, report that new employees need more than two months of introductory training. Even if there are no survey data on the specific case of internally trained specialist training, the informants' unequivocal view was that the specialist nurses needed little introductory training if they started at a new employer.

Further training for teachers does not seem to be equally transferable by this indicator. According to table 5.10, 45 per cent of public sector employers who recruited people with higher education within 'culture and education,' most of them teachers, said that new employees needed more than two months of introductory training. This was about the national average and a somewhat bigger proportion than for nurses. Table 5.9 shows that the period of introductory training in the education sector was close to the national average. The informants, however, argued that introductory training for teachers does not have to be long. A Teachers Association representative said that 'in principle there is no problem in stepping in' without any introductory training at the new employer.[64]

[64] Interview with Teachers Association representative.

Table 5.9 shows that employees in the banking and finance industry report longer than average introductory training periods. Unfortunately there are no better statistical data on the amount of training needed in the insurance industry. It was clear that employers who recruited people from other insurance companies expected them to be quickly able to do the new job, but the introductory period is considerably longer than for nurses.

Importance in recruitment

If an employee experiences that if a skill, valued by his current employer, is given no weight when she applies for a job at another employer, the skill is specific. If, by contrast, other employers deem the skill as important for recruitment, the skill is transferable. This is the logic that implies recruitment and selection can give valuable evidence on the transferability of skills. What matters is not how much weight other employers put on these skills in recruitment, but rather how this compares to how the current employer values them. If both the current and other employers think one particular skill is of equally little value, it does not mean that the skill is not transferable, it is just that the skill has little effect on productivity in all firms. The extreme case of importance in recruitment decisions is occupational licensing, which means that a particular skill is obligatory for carrying out one type of job (Shapiro 1986).

Also by this fourth indicator specialist training for nurses is clearly transferable. Even if some specialist nurse positions are filled with nurses without specialist education, this is done because there are not enough specialist nurses available. Hence, the specialist internal training is a crucial qualification in all hospitals for getting a position as specialist nurse.

In the case of teachers, skills from further training are undoubtedly important in recruitment decisions, but it has also been the subject of a lengthy political process which criteria should guide the selection and

recruitment of teachers, and consequently what importance further education should have. One issue has been that, according to the Act concerning Comprehensive Education (*Grunnskoleloven*), employers have been allowed to consider only applicants' education and experience, and not other personal qualifications. Earlier the norm was that schools did not interview job applicants, but the municipalities have defied teacher organisations' opposition and they now use interviews in the recruitment process (Lauvdal, Rymoen, and Grooss 1998: 45). Still, formal education, including further education, remains the most important criterion in recruitment processes.

In the insurance case, authorisation training is a major advantage for insurance salespersons (*assurandører*) that want a job in another company. The collective agreement for insurance salespersons states that employees are obliged to undertake the authorisation training during their first three years of employment, but they do not have the *right* to undergo the training (Forsikringsselskapenes Arbeidsgiverforening (FA) and Forsikringsfunksjonærenes Landsforbund (FL) 1996). Even in a small company, where 'formal competence has not been highly valued,' the personnel manager held that authorisation was important in recruitment decisions.[65] A representative of the insurance salespersons' trade union said that 'being authorised is of great importance for getting a job in other companies,' but he added that the employers 'are even more worried about finding the right man.'[66] Other types of further training for insurance employees seem to be taken into account when employers make recruitment decisions. But except for authorisation training, training at NAI seems seldom to be a decisive factor in these decisions. A survey of all who had completed the Higher Insurance Exam showed that, except in one company, the majority said that their company did not mention the exam in their job advertisements (Gunhildsbu 1994: 333).

[65] Interview with Personnel manager of small insurance company (A).

[66] Interview with NAF representative.

In the engineers' case, the limited importance of formal further training for recruitment reflects the little weight that is more generally put on formal skills in remuneration and recruitment decisions. Even for two groups that differ with more than two years of basic education, engineers and graduate engineers, Eldring and Falkum (1995: 25) argue that 'it seems as if in the engineering occupations non-formal learning (*realkompetanse*) more than formal skills have been the decisive criterion in recruitment.' Even if graduate engineers are often preferred to engineers because of their formal skills, it is clear that formal further training, at least in technical skills, seldom has any great importance in recruitment decisions. One employer said that in recruitment decisions 'what counts, is first and foremost what they worked on before.'[67]

Bonds

A final indication of transferable skills is that employers use bonds to ensure that trained employees stay with the company after they have completed their training. Such arrangements indicate that the employer and the employee share the cost of training, so that by agreeing to let the employer profit from the training, the employee does not have to pay all the costs of the transferable training. Bonds are less likely for specific training partly because training will tend to increase wages in the firm, but give no wage increase in other firms, and specific training will itself tend to reduce the probability of turnover (Stevens 1994a). Moreover, employees need to pay less of the costs of specific training. They are therefore less likely to need to agree to a bond because they cannot finance training themselves.

The widespread existence of bonds for nurses who take internal training indicates that training is transferable. At all hospitals nurses have to agree to work for the hospital that trains them for a given period after the training is completed. In most cases the obligatory period is the same as the duration of the specialist training - 18 months. Usually the nurse is

[67] Interview with Leader of administrative section, telecom equipment manufacturer.

obliged by the agreement to work in a position the hospital chooses, but preferably in the position the nurse is trained for. It is then usual that if the nurse leaves straight after completed training, he has to pay back the wages received during the training. If he works for some time at the employer, but leaves before the end of the obligatory period, the amount the nurse has to pay back depends on how much time is remaining (Kirke-utdannings- og forskningsdepartementet 1998: appendix 2a).

The majority of insurance employees, working in the largest companies, must pay back part of the training costs if they choose to leave the employer shortly after completed training.[68] As of 1994, the bonds are usually two or three years if the training costs exceed limits of NOK 5,000 or 10,000. If the employee quits before this period ends, she must pay back a sum that is proportional to the remaining time. For example, in Vesta, where the bond is two years, an employee must pay back half of the training costs if she quits one year after the training is completed (Gunhildsbu 1994: 20-21).

Employers in the metal industry very seldom use bonds when engineers take further technical training, except if they finance extensive further education, for example up-grading from engineer to graduate engineer. But these are all infrequent cases, and the agreements seem to be made on an individual basis, and not based on clear, written guidelines, as in the case of insurance employees or nurses. In the teachers' case bonds are not needed, since employees bear the cost of extensive further training, as chapter 6 will show.

5.4.2 Conclusion outcomes

Table 5.11 summarises the results on the five indicators in the different cases.

[68] Not all small companies seem to use bonds, however. Interview with Personnel manager of small insurance company (B).

Table 5.11 Summary of outcomes: transferability of further training

Indicators	Nurses	Teachers	Insurance	Engineers
a. Wage increases at other employers	Problem with indicator: different collective agreements	Problem with indicator: automatic wage increases	Collective agreement includes small wage increases. Lack of data	Individual wage setting. Lack of data
b. Perception of transfer-ability	High, but quality differences	High	High	Lower
c.Introductory training	Very short	Short	Medium	Long
d. Importance in recruitment	Very important	Important. Different views on how much it should count	Authorisation important Other: not crucial, but may be a factor	Of little importance
e. Bonds	In all cases	Not relevant	In all large companies	Bonds in special cases
Transferability	Very high	High/very high	High	Medium

The table shows that the results are not consistent across the five indicators. The results clearly show that further training is most transferable in the nurses' case, and least in the engineers.' The somewhat shorter introductory training period, and the stronger overall importance of skills from further training in the teachers' case than in the insurance case, suggest that skills are more transferable in the former.

Table 5.12. Summary of predictions and outcomes: transferability of further training

	Nurses	Teachers	Insurance	Engineers
H_0 prediction	Medium	Medium	Medium	Medium
H_{alt} prediction	Very high	High	High	Medium
Outcome	Very high	High/very high	High	Medium
Collective action to increase transferability	Yes	Yes	Yes	No

Table 5.12 shows that the results are in line with H_{alt} and not H_0 since further training for nurses is the most transferable and further training for engineers is the least transferable.

These outcomes lend strong support to the H_{alt} prediction that transferability of training is endogenous i.e. shaped by employers' action. The pattern for transferability of skills is almost the same as the one for employers' action in the first part of this chapter. The last row in table 5.12 also shows that there is strong coherence between the collective action processes and outcomes described in this chapter. In the cases where there has been collective action, skills are more transferable than in the one case where there has not been. Moreover, in the case with the best conditions for collective action further training is most transferable. Hence, the results in this chapter clearly indicate support for the collective action hypothesis at the expense of human capital theory.

This strong link between employers' action and transferability proves to be significant in the remaining part of the thesis. Chapter 6 will show that employers' action to affect transferability may have significant cost sharing implications, and chapter 7 shows the impact on skill shortages and skill deficiencies. Finally, chapter 8 discusses some wider possible implications of endogenisation.

5.5 Conclusion

This chapter has shown support for the collective action hypothesis, and not just in the fact that the outcomes, the transferability of skills, are broadly in line with the collective action theory and not human capital theory. The different outcomes also broadly reflect the differences with respect to employers' action to enhance transferability of skills. Hence, the results, with the possible exception of teachers, support the assumption that employers' action is an important determinant of the transferability of skills. In other words, the chapter supports the collective action prediction that transferability is 'endogenous.'

However, it has also revealed reasons other than employers' collective action that have lead to initiatives to increase transferability of training in the four cases. These have been the different explanations for why employers have acted to make further training transferable:

- Direct employer co-operation (upholding insurance training organisation, partly nurses)
- Powerful body (teachers, nurses, establishing insurance organisation)
- Pressure from employees' organisations (nurses, partly teachers, partly engineers, partly insurance)
- To attract and retain good employees, willing to learn (engineers, nurses)
- Demand from buyers (engineers)

The conclusion is that employers act to make training transferable more than one would expect from the human capital hypothesis. But the support for the collective action hypothesis is not definitive either. The results give most support to the assumption that a powerful body can make employers act to enhance transferability. In the cases with few employers, there is also evidence that employers co-operate without the intervention of a powerful body. But in the nurses' case such co-operation is clearly secondary. In the insurance industry, such co-operation is crucial

in upholding the common training organisation, but cannot explain the establishment of the organisation.

What both theories lack is a treatment of how employees' organisations can influence transferability of training. Employees have a clear interest in training being transferable, and in all four cases, most notably in the nurses' case, the employees' organisations have worked to make training transferable. By not including the impact of these organisations, both theories fail to explain thoroughly the processes described in the four cases. Finally, the chapter has also shown that employers may choose to make further training transferable to attract and retain good employees, or to satisfy demand from consumers, but these have had only limited impact in this study.

6. Sharing training costs between employer and employee

6.1 Introduction

Chapter 3 showed that the provision of transferable training generates two problems: one of making training transferable and one of financing such training. The previous chapter studied the problem of organising transferable training. The topic of this chapter is how employers and employees share the costs of training. Cost sharing for transferable training is of interest not only because it has been a persistent issue in the conflict between labour and capital on how to share costs and profits. The way employers and employees share training costs is also of particular importance because in two ways it is linked inherently with the amount of training provided. As this chapter will show, cost sharing can reflect the incentive employees and employers have to invest in training. Moreover, reducing the share of training costs they bear may be one of two ways employers can reduce their investment in training. The second option, a reduction in the amount of training provided, will be the topic of chapter 7.

The first part of the chapter develops the predictions of the two theories of cost sharing in each of the four cases, and shows how both theories consist of predictions concerning both processes and outcomes. These two are in turn the subjects of the second and the third parts of the chapter. In the final part of the chapter an alternative to the two hypotheses is developed, based on a synthesis of the two coupled with the assumption that employers' collective action is an important determinant of individuals' incentives to invest in training.

6.2 Hypotheses and predictions

The two hypotheses that will be tested this chapter are shown in table 6.1. Both theories predict that employers pay the costs of transferable training to the extent that the training includes firm specific aspects, or there is limited competition in the labour market, so that employers can pay employees below their marginal product. The difference is that H_{alt} predicts that employers' collective action can induce employers to pay a larger share.[1]

Table 6.1 H_0- and H_{alt}-hypotheses: cost sharing for transferable training

Human capital theory	Collective action theory
$H_0$2: Employers will not pay for any of the costs of perfectly transferable training in a perfect labour market, but they will pay some of the costs to the extent that transferable skills includes firm-specific human capital, or employees can be paid less than their marginal productivity due to limited labour market competition.	H_{alt}2: If the increased productivity from transferable training is not fully offset by higher wages, employers may be willing to finance a share of the costs of transferable training, and they are likely to finance the highest share if there is collective action among employers.

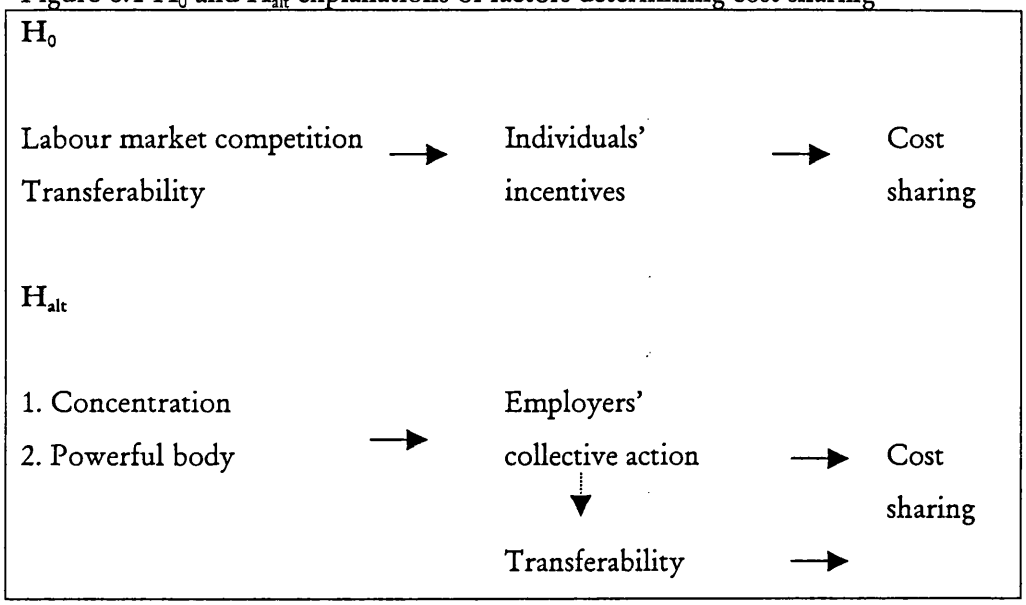
Chapter 3 showed how the two hypotheses were derived. In order to test these two empirically, they must however be coupled with what the theories predict about the processes that determine incentives and the probability of collective action.

Figure 6.1 illustrates the logic of the two arguments, and this logic is also reflected in this chapter's outline. The testing of the theories will be performed not only by comparing the outcomes with the predictions, but also by assessing the processes that lead to these outcomes, similar to the procedure in chapter 5. H_0, based on human capital theory, states that cost sharing reflects the incentives individuals have to spend resources on improving their skills. The second explanation, leading to H_{alt}, states that

[1] This was illustrated as a positive shift in the supply of training places in figure 3.1.

employers' collective action can account for different patterns of cost sharing between industries.

Figure 6.1 H_0 and H_{alt} explanations of factors determining cost sharing



Chapter 2 presented human capital theory and its predictions about how employers and employees share training costs. The theory predicts that employers will share the costs of transferable training only to the extent that the training included specific human capital, or limited competition in the labour market meant employers could pay their employees less than their marginal product. So as shown in figure 6.1; if transferability is low or labour market competition is weak, individuals' incentives to invest in training are weak, and the share of training costs borne by employers high.

The core of the argument is that incentives shape the way costs are shared. Employers have an incentive to invest in transferable training only if subsequently they can pay their trained employees less than their marginal product. So the more general point about limited competition and specific aspects, discussed in chapter 2, is that they give employers incentives to invest in transferable training.

The difference between previous contributions and the explanation developed here is that the latter takes the individual employees' perspective, albeit it seeks primarily to explain employer financing. Even

if the employers' perspective has been the dominant one in the human capital literature on job training, the explanation depends equally on individuals' incentives to invest in training.[2]

The argument is that wage increases after completed training are incentives for individuals to invest in transferable training, and the larger the increases are, the more resources individuals will devote to training. Previously, the incentives individuals face, and the investments they make, have been discussed and addressed for the most part by government policies in the area of initial education and training, and not further training.[3] So the issue of individuals' investments in training is not a new one. But the argument in this chapter is one of the first to combine employees' and employers' incentives in an explanation of an empirical pattern of cost sharing of further training.

The shift of focus from employer to employee investments in training alters the logic of the explanation of cost sharing. Previous human capital explanations of employers' investments in transferable training have taken as their point of departure that employers will not

---

[2] This shift of focus from employer to employee contributions could for example imply that an examination of the German apprenticeship system would not only reveal why employers contributed to financing transferable training (Crouch 1995; Soskice 1994a), but also why young German make large investments in this type of training.

[3] According to economic theory, there are several reasons why individuals may invest less in training than the economic optimal amount, and governments have implemented different policies to tackle these problems. For example, governments have established loan and grant schemes to support education. One reason has been that individuals may under-invest in training because it can be difficult to finance such investments. Moreover, individuals may invest less in training than the social optimum if there are positive externalities associated with investment in education and training. For example, if training reduces the probability of unemployment, and the state finances unemployment benefits, the government may find it profitable to partly finance individuals' training. Risk aversion may be another reason individuals do not themselves finance the optimal amount of education and training. This problem has been addressed by government loan schemes, which make payback dependent on individuals' income after training.

finance transferable training. Instead, the explanation here will start out with the assumption that individuals will invest in transferable training only if they have sufficient incentives to do so. If they do not, employers must fully finance transferable training if there is to be any training. Employers might finance some training, but the amount is likely to be sub-optimal.

The argument shows clearly that a high share of employer financing does not secure an optimal amount of training. On the contrary, according to human capital theory, the optimal amount of transferable training will be provided in a perfect labour market, where it is assumed that individuals finance the full cost of transferable training, because the increase in marginal productivity will be fully reflected in higher wages.[4] So this incentive explanation, based on human capital theory, predicts that if employees have strong incentives to invest in transferable training, there will much employee investment, much training, and a small share of training costs will be borne by employers, and much transferable training provided. If, on the other hand, there are weak incentives for individuals to spend resources on transferable further training, there will be little employee investment, employers will bear most of the training costs, and little transferable training will be provided. The issue of cost sharing will be treated in this chapter, while the amount of training provided is the topic of chapter 7.

The core of the H_{alt} explanation is that employers' collective action in order to increase the amount of training provided will increase the share of training costs borne by employers, as shown in chapter 3. According to the collective action theory, there are two possible solutions to the collective action problem: either there is a powerful body that can induce employers to finance training, or there is co-operation in a small group of employers. In both cases, both formal and informal pressure can

[4] In this case, where employees bear the full cost of training, the optimal amount of transferable training will be provided, as explained in chapter 2.

be used to restrict employers from financing a too small share of training costs.

However, just as in human capital theory, collective action theory also predicts that transferability of training has a significant impact on how training costs are shared by employers and employees. The more transferable skills are, the less likely are employers to bear a large share of training costs. Thus, since there is no difference between the two theories in the predicted impact of transferability, this chapter will focus on the other factors in figure 6.1, namely labour market competition, individuals' incentives, the probability of collective action and the impact of collective action. Still, as the dotted line in figure 6.1 indicates, one difference between the two explanations is that H_{alt}, as shown in chapter 5, states that employers' collective action is an important determinant of transferability. The possible indirect effect of such actions on cost sharing is not integrated into the H_{alt} prediction, but is discussed in the last part of this chapter.

Table 6.2 Summary of predictions: cost sharing for transferable training

	Nurses	Teachers	Insurance	Engineers
H_0				
Transferability (ch. 5)	Very high	Very high	High	Medium
Concentration (ch. 4)	High	Low	High	Low
H_0 prediction of individuals' incentives	Strong	Very strong	Medium	Medium
H_0 prediction of employer contribution	Low	Very low	Medium	Medium
H_{alt}				
Transferability (ch. 5)	Very high	Very high	High	Medium
Probability of collective action (ch.3)	High	Medium	Medium	Low
H_{alt} prediction of employer contribution	Medium	Medium	Medium	Medium

Table 6.2 shows the predictions of the two theories concerning each of the cases. Within the limits of the table format all nuances cannot be taken into account, but the table shows the broad differences between the two theories. As in chapter 5, all predictions must be interpreted as rankings.

To derive the H_0 prediction information on transferability of training and labour market competition was needed. The data on transferability from chapter 5 are used, while the measures of concentration from chapter 4 are used to measure labour market competition. The fact that the selection of the cases was guided by the need to get industries with extreme values on the concentration variable, warrants its use as an indicator of labour market competition. In order to make *ad hoc* assumptions about the relative importance of transferability versus labour market competition, these two are assumed to have the same impact in table 6.2.

Based on the combination of transferability and the probability of collective action the H_{alt} prediction is that employers will bear the same share of training costs in all four cases. The reason is that in the cases with the highest probability of collective action, transferability is also highest, while, for example, in the engineers' case the probability of collective action is low, but this is outweighed by the fact that transferability is lower than in the other cases. Hence, the prediction is simply that the effect collective action was shown to have had on transferability in chapter 5, and therefore indirectly on cost sharing, is outweighed by the predicted direct effect of collective action.

6.3 Processes

The first task in testing the two theories is that of testing the predictions of individuals' incentives and employers' collective action, respectively. Later in the chapter the cost sharing outcomes are assessed. Eventually, any conclusion will be based on both the extent to which individuals' incentives to invest in training or employers' collective action, are more

important determinants of cost sharing, but also the two theories' ability to predict the variation within these two. This section will show first what incentives employees in each of the cases have to invest in further education and training. Then a shorter section analyses whether or not employers' collective action has increased the share of training cost borne by employers.

6.3.1 Employees' incentives

In order to study employees' incentives to invest in training, it is necessary to study the effects of further training and assume that these are the reasons for employees to undertake training.[5] In addition, one may ask employees who have undertaken further training what were their motives for doing so, and this data is also used.[6]

The use of both effects of training and individuals' motives for doing further training, in order to assess incentives, aims to solve the problems of each of the measures separately. Showing that further training has a positive effect on wages does not necessarily confirm that this is why employees choose to finance such training. On the other hand, higher wages and better promotion possibilities may be significant incentives, and may explain variation between groups of employees, even if neither is the most important motive for investing in further training. If individuals' incentives are to be used as an explanation of cost sharing of further training, it should be shown that the incentives mentioned, wages and promotion, are in fact significant factors when employees choose whether or not to finance further training. Still, the importance or lack of importance of wage increases as an incentive to take further training

[5] These potential benefits can of course only be incentives if potential trainees have information about the effects of training. It is assumed that employees have a reasonably good idea of the effect further training will have on their career.

[6] One may also ask employees who have not undertaken training why they have not, but such data were not available for this study.

cannot simply be evaluated only by what employees report as motives for undertaking the training. The reason is that wage increases after training may be a necessary, but not sufficient, condition for some to finance further training. If employees do not get wage increases after further training they may find it too costly to finance, but a wage increase that can cover their training costs may not be sufficient reason for them to undertake the training. This explanation, in line with human capital theory, may explain situations where employees finance the highest share of training costs if they get wage increases as a result of the training, even if they do not report that wage increases were the most important motive for taking it. However, this is the case for all groups, so variations between the motives employees report can still be used as indicators of how incentives vary between groups.

Effects of further training

There are three different ways to measure effects of further training. One way is perform a regression analysis, which can show the effect of training on wages or promotion, statistically controlled for the other independent variables in the analysis. One theoretical problem with this approach is that it is vulnerable to unobserved heterogeneity bias, or differences created because those who choose to commence on further training differ from those who do not, for example because they are more able or more ambitious (McNabb and Whitfield 1994: 14-16). Moreover, the comparison of different groups might fail to take into account the institutional differences between groups that contribute to the effects of further education and training. This is not an argument against regression analysis *per se*, but it suggests that other indicators must be used as well.

A second way of measuring effects of further training is self-reporting from employees. The potential advantage of such self-reporting is that employees may know whether or not the further training actually was the reason why they received wage increases or promotion, or if

other factors could account for the effect. The problem, however, is that it be difficult for individual employees to assess the employers' rationales for giving or not giving them new jobs, new tasks or higher wages. This problem is especially severe if further training alone does not have a clear independent effect, but is one of several attributes employers consider when they make salary or promotion decisions.

The final way of measuring the effect is to use collective agreements or details of occupational licensing if such exist. These are less vulnerable to the selection problem and the self-reporting problems, and can therefore be valuable supplements to the two other measures.

The human capital prediction is that the effect on wages and job opportunities of taking further training is largest for nurses and teachers, and the results here will confirm this prediction. However, contrary to the H_0 prediction the results will show that the effect of further training is considerably stronger in the insurance case than in the engineers' case. Still, an even more important shortcoming, which will be discussed later in the chapter, is that a more detailed analysis shows that factors other than the ones included in the H_0 explanation are important in explaining individuals' incentives.

There is a distinction between 'direct' and 'indirect' wage effects of training. Direct wage effects are wage increases employees get even if they remain in the same position, while indirect wage effects exist when employees get higher wages only because they change position as a results of training, and thus get higher wages.[7] This means that the results will cover further training's effect both directly on wages and on the probability of getting a job with higher wages.[8] The data in this section

---

[7] Another way of stating the same point is to say that if the wage effect is only indirect, there is no wage effect of training controlled for position. If the wage effect is purely direct, further training has an effect on wages controlled for position, but there is no effect of further training on the probability of being promoted.

[8] In addition, promotion may be an independent incentive for employees, and thus an incentive for individuals to finance further training.

are mostly from similar questions asked in separate surveys within each of the four industries. These single industry survey data are supplemented with qualitative data and data from collective agreements, as well as a survey that covers more than one of the four cases.

Nurses have strong incentives to take both internal specialist training and college-based further training. Further training increases the probability of getting higher positions or specialist positions, and as a consequence of job changes nurses get higher wages. Thus, nurses are a strong example of 'indirect wage increases.'

Table 6.3 Self-reported effects of further education and training equivalent of 6 months or more of full-time study for nurses. Per cent

Changes as results of further education and training	%
New tasks or responsibilities	75
New position	77
Wage increase	91
N: 851	

Source: Havn (1996: chapter 9).

Table 6.3 shows that 75 per cent of nurses with completed extensive further education and training said they had new tasks or responsibilities as a result of the training. While 91 per cent reported wage increases, 77 per cent said they had a new job as a result of the training. The survey substantiates the claim that these changes are effects of the training, by showing that most of these effects occur within six months after the training is completed (Havn 1996: chapter 9).

According to Havn (1996: 119-121) the changes in wages and tasks are to a large extent associated with the new positions nurses get after they have completed the training. In other words, the effect of further training on obtaining new jobs is an important factor in understanding the effect of training on wages and tasks. This survey shows that 62 per cent of nurses who had completed training started in a new job, as a result of the training, within one year after completed training. A further 15 per cent

started in a new job as a result of the training more than one year after completion, while the remaining 23 per cent did not get new jobs that resulted from the further training they had completed (Havn 1996: 118). The evidence on which groups of nurses have completed further training supports the conclusion that further training is important for promotion.[9] While only 17 per cent of ordinary nurses (*offentlig godkjente sykepleiere)* have completed a further training of more than six months, as many as 55 per cent of charge nurses have done so. Of nurses in higher management positions (unit nursing officers, senior nursing officers, etc), 79 per cent have completed such extensive further training (Havn 1996: 50-51).[10] If there is occupational licensing, further training may be not only important, but also absolutely necessary for employees to get a certain type of position. For nurses, this is the case only for mid-wife training (Kirke- utdannings- og forskningsdepartementet 1998). But even if there is not, strictly speaking, occupational licensing for the other types of further training for nurses, they are also, in practice, very important in specialist positions, even if they are not legal requirements.

Improved chances of getting a new position may be an independent rationale for employees to take further training, but it can also be a vehicle for earning higher wages. In the case of further training

---

[9] A previous survey, based on a cohort of nurses who completed training in 1979, shows a weaker link between further training and leading positions. Among women, the majority of nurses, 24 per cent of those with further training were in leading positions, compared to 18 per cent of those without further training. The corresponding figures for men were 59 per cent and 50 per cent, respectively (Hoel 1991: 41).

[10] The survey also shows that not only do more nurses in the higher positions have further training, but they have on average also completed longer further training than 'ordinary nurses' (*offentlig godkjente sykepleiere)* who have done such training (Havn 1996: 64). There are alternative explanations for this pattern, for example that with age, more nurses take further training, and more nurses get leading positions, but these two processes are not related. Nevertheless, combined with the self-reported data, this gives a weighty evidence for the conclusion that further education and training for nurses to a very large degree improves employees' chances of getting new positions.

for nurses, it is clear that the vast majority of those who take training get higher wages. A large survey shows that 51 per cent of nurses who have completed extensive further training report that their wages increased shortly afterwards. Only 9 per cent said they had not experienced any wage effect, while 23 percent reported that the wage effect came at least one year after they had finished their further training (Havn 1996: 121). Thus, it is clear that in the vast majority of cases, nurses get wage increases if they complete further training.[11]

Table 6.4 shows that the wage premium for doing specialist training is between 5 and 10 per cent.[12] This is based on minimum wages for nurses with and without specialist training according to three different collective agreements described in chapter 5.[13] Since employers may put nurses higher on the wage scale, the actual wage premium might differ from those in the table. Nevertheless, since that goes for nurses both with and without specialist training, table 6.4 gives a good estimate of the wage increases nurses can expect if they undertake specialist training.[14] Therefore, the clear conclusion is that for nurses, the effect of further training on wages and job opportunities is strong.

---

[11] Among the different groups of nurses, nurses at general hospitals who do specialist training are most likely to report that they had wage increases directly after they completed training. In this group 68 per cent say their wages increased directly after they finished their further training.

[12] A 1989 survey found that the controlled wage effect of further training for a cohort of nurses graduated in 1979 was 1.2 per cent per semester, or 3.6 per cent for 18 month training (Hoel, Mastekaasa, and Arnesen 1990: 33).

[13] Wages for midwives and health visitors are the same as for specialist nurses.

[14] Given the severe shortages of nurses with specialist skills to be described in chapter 7, the employers are more likely to pay nurses with further training more than the minimum rate. Thus, the estimates in table 6.4 may underestimate the wage increases.

Table 6.4 Minimum wages for nurses (*offentlig godkjente sykepleiere*) and specialist nurses, by collective agreement. NOK. 1999

	KS		Oslo		State	
Experience (years)	5	10	5	10	5	10
Nurse	201,300	220,100	208,700	220,100	216,500	234,500
Specialist nurse	212,600	241,700	227,300	234,500	230,900	249,000
Wage increase	11,300	21,600	18,600	14,400	14,400	14,500
Per cent increase	5.6	9.8	8.9	6.5	6.7	6.2

Note: The stabilisation supplement in Oslo, mentioned in chapter 5, is not included in this table.
Source: Norsk sykepleierforbund (1999).

The strong effect of further training for teachers is in line with H_0 predictions. However, the analysis will later show that the support for the H_0 prediction is only superficial. While the nurses' case is a good example of the indirect wage effects of further training, the teachers' case is an equally clear example of 'direct' wage increases. Teachers have a strong incentive to take up-grading training because of the automatic wage increases they get according to the collective agreement. In a system with 'indirect' wage effects, as in the nurses' case, the increased possibility of getting a new position if one takes further training is an important incentive for taking further training. But in the teachers' case, where fewer are promoted to leading positions; and there is no similar differentiation between specialists and non-specialists, indirect wage-effects can hardly form sufficient incentives for teachers to take further training.[15] Therefore, it is necessary for employers to differentiate between teachers with and without further training, even if they are doing the same job, if there is to be an incentive for teachers to invest in further training. A representative of Norwegian Union of Teachers put it this way: 'The flat

[15] Hoel (1991: 19) shows that ten years after graduation from college, less than 10 per cent of teachers were in leading positions, compared with approx. 30 per cent of nurses and 50 per cent of engineers.

structure of our labour market...means we have to have some incentives like that [wage increases from formal further training]."[16]

Table 6.5 Teachers' wages and wage increase from up-grading training, by formal competence and experience. NOK. 1998

	5 years' experience		10 years' experience	
	Wages	Increase	Wages	Increase
1. Grade 1	205,000	-	223,700	-
2. Grade 2	220,100	15,100 (2 - 1)	234,500	10,800 (2 - 1)
3. Grade 3	227,300	7,200 (3 - 2)	241,700	7,200 (3 - 2)
4. Grade 4	234,500	14,400 (4 - 2)	249,000	14,500 (4 - 2)

Note: Both grade 3 and grade 4 build on grade 2, as explained in chapter 4
Source: Norsk lærerlag (1998).

Table 6.5 shows that the collective agreement ensures that teachers who take up-grading training get considerable wage increases. A grade 1 teacher who takes one year of further training to become a grade 2, gets a wage increase of between NOK 10,000 and NOK 15,000, depending on how experienced she is. The increase from taking one more year of training to become grade 3 is smaller, NOK 7,200 or roughly 3 per cent in both examples, but still considerable. If the grade 2 teacher took instead two years of further training to become a grade 4, the wage increase would be twice as big; NOK 14,400 or NOK 14,500. The effect of one year of up-grading training for teachers with five years' experience is roughly the same as the effect of five more years of experience. Grade 2 teachers with five years' experience need to take two years of up-grading training to become grade 4 to get the wage increase equivalent of the increase from five more years of experience.

H_0 predicts that the effect of further training is smaller for insurance employees than for the two other groups, and the data confirm that this is the case. In the insurance industry the most important incentive employees have to take further education is neither that some

[16] Interview with NL representative.

positions necessarily require a special type of further training, as in the nurses' case, or that employees get automatic wage increases from training, as in the teachers' case. The most important incentive is that further training may make it more likely that they get a better job, but the link between training and certain jobs is not as clear and inflexible as it is for nurses. There are also some direct wage increases from training. More important, however, are the increased opportunities for promotion, which are substantial in the large insurance companies' well developed internal labour markets with rich promotion opportunities.[17]

Table 6.6 Insurance employees' responses to the statement 'If I took further education and training at NAI, it would have a large impact on my career,' and age. Per cent

	Age				
Attitude	Under 30	30–39	40–49	50 +	Total
Totally/partly disagree	33	38	40	67	42
Totally/partly agree	47	46	37	17	388
Don't know	19	17	22	17	19
Sum	100	101	99	101	99
N	86	105	87	53	331

Note: Missing excluded from original table.
Source: MMI (1989).

A survey of insurance employees found that 83 per cent of those under 50 years of age disagreed with the statement 'I would gain little from further education and training' (MMI 1989).[18] But table 6.6 shows that employees are less convinced that taking further training at NAI would have a large impact on their career. While 38 per cent think it will, 42 per cent do not.

[17] In 1988, a survey in Gjensidige showed that 67 per cent of employees said the company gave them 'good development possibilities in line with...personal goals and ambitions' (Gran and Tofte 1989: 129).

[18] Of those over 50 years of age, only 36 per cent disagreed.

Young employees are more likely than older employees to think they would benefit from further training.[19]

The self-reported effect of further training at NAI is clearly lower than in the nurses' case, and not very high compared to the working population as a whole either. Table 6.7 shows that 42 per cent of those who have taken the Higher Insurance Exam report that it has given them a higher position, or new job tasks in their current job, while 46 say that it has not had any significant impact on their position or the tasks they do.[20] By comparison, 75 per cent of nurses said they were in new positions as a result of training, and 77 per cent said they had new tasks (table 6.3). A representative survey of the Norwegian working population shows that, of those who had taken further training equivalent to 12 weeks full time study or more in the last five years, 45 per cent said it had contributed to a job change, and 33 per cent said it had contributed to their having new job tasks (Johansen 1999: 74).[21] So in the insurance case the effect of further training, at least at NAI, is not particularly large.[22]

---

[19] There may have been changes since the survey was conducted in 1989. However, in the interviews there were no suggestions that further education and training had become less important between 1989 and 1999, rather the contrary. Moreover, the increased importance of higher education in recruitment in this period may also indicate that at least there has not been any significant decrease in the significance of formal training in recruitment and promotion decisions.

[20] The report does not distinguish between different groups according to the length of time since they completed the training.

[21] The data in table 6.7 are not directly comparable to the results from the survey of the working population as a whole, since table 6.7 does not adequately cover the effect the training may have in combination with other factors. In the national survey, the question was whether or not the training had *contributed*.

[22] Unfortunately, there are no data that shows the impact of other types of further training for insurance employees, but wage statistics show that formal education is a very strong determinant of insurance employees' wages (Statistisk sentralbyrå 1998d). Still, a strong effect of basic education on wages does not necessarily imply that further training is a strong determinant of wages.

Table 6.7 Employees with completed Higher Insurance Exam, by self-reported career impact of training

Perceived impact	%
Yes, I have a job with more responsibilities	24
Yes, I have more interesting job tasks [but not a higher position]	18
No, I am working with almost the same as I did before I took the exam	46
Other impact	13
Sum	101
N	443

Source: Gunhildsbu (1994: 184).

For insurance employees enhanced possibilities of promotion to other positions are the most important career benefits. Since salary class is the most important determinant of wages in the insurance industry (Statistisk sentralbyrå 1998d: 17), the impact of further training on promotion is indirectly but strongly associated with the impact of training on wages. Still, there are some direct wage benefits from training. In the collective agreement between FL and FA, insurance employees in the lower salary classes (*stillingsklasser*) are entitled to an increase of about NOK 6,500, or about 3 per cent of annual salary, when they complete the Insurance Examination or the Higher Insurance Examination (Forsikringsselskapenes Arbeidsgiverforening (FA) and Forsikringsfunksjonærenes Landsforbund (FL) 1996). Neither employers nor employees consider this as an important incentive, however, mostly because those who complete these exams are often in higher positions already, where this clause does not apply.[23] A representative of NAI said that 'in practice these rights mean nothing.'[24] Both the employers and NAI have been opposed to including other wage increases for formal training in the collective agreement,[25] and such clauses are not an

[23] Interviews with NAI representative, Organisational development manager, large insurance company (B), FA representative and Group of FL representatives

[24] Interview with NAI representative.

[25] Interviews with FA representative and NAI representative.

important issue for Norwegian Insurance Employees Union (FL) either (Forsikringsfunksjonærenes Landsforbund 1997). So insurance employees enjoy weaker effects from further training than nurses and teachers do, but increased promotion possibilities still seem to be a notable effect.

The weak effect of further technical training for engineers is contrary to H_0 predictions. For the short further training that engineers usually take, the unequivocal opinion among all informants in the industry is that such training has virtually no impact on wages or promotion possibilities. The training is not given much weight in individual wage setting, is not important for internal promotion, and it is not important in recruitment of engineers from other companies.[26]

However, even for more extensive technical training, there seems to be few clear incentives for engineers to invest in training. An NIF representative said that employers 'are very reluctant to pay for further training [through higher wages]. They do not even pay more for a doctorate.'[27] This has been used as an explanation for why the PDC programme, the system for documentation of skills described in chapter 5, failed. Since Norwegian engineers' and graduate engineers' labour markets to some extent overlap, and moreover share many of the same characteristics in terms of wage-setting, as well as in terms of the importance of formal skills in recruitment and selection (Eldring and Falkum 1995; Havn and Huitfeldt 1994; Holter 1961; Sørensen 1988), the example of graduate engineers can illuminate the case of engineers as well. A NIF representative said that 'in hindsight it is not hard to see that [in PDC] there had been a little too much idealism,' since 'there is nothing to

[26] Interviews with NITO representative, NIF representative, Leader of administrative section, telecom equipment manufacturer, NITO representative, telecom equipment manufacturer, NITO representative, turbine producer (A), Personnel manager, turbine producer (A), NITO representative, car part manufacturer, NITO representative, turbine producer (B), Managing director, traffic system supplier, NITO representative, offshore contractor and Personnel manager, ship yard.

[27] Interview with NIF representative.

collect [through higher wages] from that sort of thing.'[28] A representative of NITO had a very similar explanation for the failure of PDC:

> My belief is that as long as you do not have a good 'receiver' at the other end, that is an employer who signals that it is of importance for [the engineer's] position in the organisation, wage development and so on, the program is quite laborious to go through. And there is no doubt that is costs a few *kroner* and takes a lot of time.[29]

Wages for engineers in the private sector are set individually, and unlike the three other cases there are no collective agreements that ensure wage increases. Moreover, formal competence is not an important consideration for employers when establishing a basis for wage setting. Employers have generally been reluctant to award formal skills in their wage setting (Eldring and Falkum 1995).[30] Instead, there is a clear and explicit emphasis on non-formal learning *(realkompetanse).* This way of rewarding performance rather than formal skills may give sufficient incentives for employees to finance further training if the employers perceive that the training enhances productivity. Thus, in the case of engineers in the metal industry, the lack of incentives for individuals to finance further training may have different explanations. It may mean that further training does not improve job performance significantly, and employers therefore will not give higher wages or increased possibilities of promotion for those who take the training. But it may also mean that employers do not fully recognise the positive impact of further training on productivity or fail to utilise the new skills.[31]

---

[28] Interview with NIF representative.

[29] Interview with NITO representative.

[30] Interviews with NIF representative and NITO representative.

[31] The policy implications of the three explanations differ. If the problem is that training only yields a small productivity increase, the solution is to find ways to improve the training. If the problem rather is that employers do not recognise the impact of training, changes should be made to the way wages are set. Finally, if the problem is one of utilisation of skills, the organisation of work should be assessed.

One exception to this pattern is that administrative training according to the informants may be rewarded through higher wages or increased probability of promotion to senior positions. As one expects from the incentive explanation, if engineers spend their spare time on further training, it is usually on administrative training.[32]

Several metal industry companies said that they were planning, or considering, introducing professional job ladders *(tekniske stiger)* for engineers.[33] These may contribute to improving engineers' incentives to invest in technical further education and training as well. A professional ladder 'involves the design of explicit career ladders for professionals or technical employees in which advancement along the technical track parallels advancement along a managerial track' (Kanter 1984: 123). Such parallel ladders have been introduced by a number of large American companies in order to provide incentives for competence development and to provide an alternative for employees who are more valuable to the firm in technical than in management positions (Kanter 1990; Milgrom and Roberts 1992: 366). If such technical ladders mean that engineers can improve their status and get higher wages without going into administrative positions, they can give engineers stronger incentives to invest in training.

Motives for investing in further training

So far the results have shown that nurses have very strong incentives to finance specialist training, and so have teachers for up-grading training. Insurance employees have significant incentives to invest their spare time

[32] Interviews with NITO representative, telecom equipment manufacturer, NITO representative, turbine producer (A), Factory manager, car part manufacturer, Personnel manager, turbine producer (B) and Managing director, traffic system supplier.

[33] Interviews with Organisational development manager, offshore contractor, NITO representative, turbine producer (B), Personnel manager, turbine producer (A) and Factory manager, car part manufacturer.

in further training, while engineers have weak incentives to invest in technical further training.

The results in this section confirm the results above by showing that the differences between the groups in motivation broadly reflect the differences in effects shown above. This correspondence between the two indicators of individuals' incentives is important, not only as a methodological confirmation of indicator validity, but it also confirms an important link between the effects of training and individuals' subjective rationales when deciding whether or not to invest in training.

The results above show that nurses have strong incentives to take further training since such training gives them new positions and higher wages. Nevertheless, for a majority of nurses these incentives do not seem to be the most important reason why they undertake further training.

Table 6.8 Nurses with completed further training, by most important motive for training

Motive	%
Wanted more knowledge about existing or new tasks within current position	37
Wanted to learn more	32
Wanted knowledge for new position at current or other employer	26
Wanted higher wages	3
Request by employer	3
Other	6
Sum	107
N: 888	

Note: Assumedly, the sum is higher than 100 because some respondents have chosen more than one alternative as 'most important'.
Source: Havn (1996: 70).

Table 6.8 shows that two out of three nurses said they had taken further training primarily because they wanted to learn more (*lærelyst*), or because they wanted more knowledge in their current position. Only 3 per cent

said their primary motive was a wage increase, while 26 per cent said they first and foremost took further training to qualify for a new position at their current employer or a new one.[34] Table 6.8 shows similar results, with 25 per cent of nurses saying their most import motive for taking further training was 'better opportunities to choose between jobs' or the possibility of promotion. In this survey, only 2 per cent reported that higher wages was the primary motive (NAVFs utredningsinstitutt 1989: 102).[35] So to the extent that nurses take further training as a result of the incentives described above, it is mainly because they can gain access to new positions. However, since nurses' wages are closely linked to the positions they are in, there is a possible under-reporting of the importance of wages if one considers only their most important motives. Considerably more, 20 per cent of the respondents, say that wage increase was one of the three most important motives for taking further training (Havn 1996: 73). So the strong effects of further training are reflected in nurses' motives.

In line with what one would expect from the incentive explanation, the wage increases from further training are an important reason why teachers have taken on such training. As one would expect, teachers who get 'direct' wage increases more often report this as a primary motive than nurses, who get 'indirect' wage increases, and more often report that they take further training to get a new job. The Ministry of Education and Research argues that 'the main force [behind the extensive further training teachers take] is a wage system that has given

[34] A 1988 report found that 17 per cent of specialist nurses had taken the specialist training to improve their opportunities to choose between jobs, to get higher wages or increase their chances of getting a place in a kindergarten for their children (Skaar 1988: 53).

[35] Based on the same material, Hoel (1991: 41) reports that more men than women say access to new positions or higher wages are most important, this gender difference is marginal in Havn's (1996: 74) survey.

automatic advantage to formal further training of a given magnitude' (Kirke- utdannings- og forskningsdepartementet 1992: 6).

Table 6.9 Teachers and nurses with further training ten years after graduation, by most important motive for training. Per cent

Motive	Teachers	Nurses
Interest in the subject	61	65
Higher wages	17	2
Better opportunities to choose between jobs	17	19
Tired of current job situation	3	8
Better promotion possibilities	2	6
Sum	100	100
N:	298	316

Note: N for this particular table is not reported in the source. N is therefore estimated on the basis of information about the sample size of each group and the proportion in each group who had taken further training (NAVFs utredningsinstitutt 1989:18: 96).
Source: NAVFs utredningsinstitutt (1989: 102).

Table 6.9 shows that 17 per cent of teachers say that their most important motive for taking further training is that they can get higher wages. By comparison, only 2 per cent of nurses say the same.[36] Thus, wage increases from further training are a significant incentive in the teachers' case, not least because a much larger group would probably say wage increases were the second or third most important motive, as showed above in the nurses' case.

The incentive explanation is further supported by Jordfald and Nergaard (1999: 66), who find that a much larger proportion of grade 1 teachers than of grade 4 teachers take extensive formal further training.

[36] This study is based on a cohort of college graduates (from 1979) at a particular moment in time (1989), and the results cannot therefore be generalised directly to all members of the three groups. Still, on this particular question the differences are so large that they

While 11 per cent of grade 1 teachers said they took up-grading training in 1998, 10 per cent of grade 2 and 3 teachers,[37] but only 6 per cent of grade 4 teachers did. Thus, the groups that get pecuniary rewards from up-grading training, take such training much more often. The results form strong support for the incentive explanation because the groups with least education take most further education and training. That is contrary to the 'iron law of training', which says that those with most education also get most further training (Nordhaug and Gooderham 1996: 83).

Table 6.7 showed that only a minority of insurance employees who had taken the Higher Insurance Exam reported that they had a new position, or new tasks in their old position, as a result of the training. Still, improved promotion possibilities were an important rationale for those who have undertaken the training.[38] This supports the incentive explanation, since increased probability of promotion may be an important incentive even if the majority who take the training do not get promoted as a direct result of it.

---

are assumed to reflect a difference even for other cohorts, and at other stages of their career.

[37] There is made no distinction between grade 2 and grade 3 teachers in the report.

[38] Since the majority of participants had more than seven years' experience in the insurance industry before they commenced the Higher Insurance Exam study, it is assumed that those who chose to take the training had reasonably correct impressions of the impact the training could have on their career, even if the first thorough evaluation of the effects of the training was completed only in 1994 (Gunhildsbu 1994).

Table 6.10 Employees with completed higher insurance exam, by most and second most important motive for training. Per cent

Motive	Most important motive	Second most important motive	Most or second most important motive
Wanted to learn more	75	17	92
Wanted a middle manager position in the insurance industry	12	21	33
Wage increases	1	16	17
Not to be 'overtaken' by newly recruited with better education than I have	1	9	10
Get more out of my spare time	0	6	6
Employer's order	2	3	4
Wanted a middle manager position outside the insurance industry	0	2	3
Keep the job	0	2	2
Other	7	15	22
Sum	98	91	189
N: 455			

Note: The sum of second most important reason is less than 100 per cent since not all respondents have given more than more reason. *Source:* Gunhildsbu (1994: 67).

The most important motive is 'to learn more.' Apart from this, three career-related motives are the most important. One third, 33 per cent, say they have taken the Higher Insurance Exam because they wanted a middle manager position in the insurance industry, and 17 per cent say they wanted higher wages. The motive to not be 'overtaken' by new employees with better education can also be interpreted as a career motive.[39] Thus, the data are important supplements to the data on the effect of training, and therefore contribute to the support of the H_0 explanation.

[39] The question was asked because young employees in the insurance industry on average have higher education than more experienced employees.

Earlier the results showed that further training for engineers has little impact on wages and promotion, with the possible exception of business administration training, but in the engineers' case, there is no representative survey that shows the motives of those who take further training. Overall the data on employees' motives for taking further training are clearly in line with the effects described earlier, and are therefore broadly in line with the H_0 prediction.

The H_0 prediction of incentives

As indicated in the teachers' case, the fit between H_0 predictions and outcomes is superficial. Even if the incentives above are shown to be roughly in line with H_0 prediction, the simple human capital prediction is inadequate for two important reasons. The first is that it does not include collective agreements, which in the teachers' case is the most important reason why employees have strong incentives to invest in further training. While the outcome is in line with H_0 predictions, the reason is not high transferability and strong labour market competition, as assumed by H_0. On the contrary, the key to the strong incentives teachers have to invest in training is a collective agreement that in practice virtually abolishes labour market competition. More generally collective agreements can, to a greater or lesser extent contribute to weakening the link between marginal productivity and wages, that is the link at the heart of the human capital account of the link between labour market competition, incentives and cost sharing.

The second objection to the H_0 prediction of individuals' incentives is based on the considerable difference between incentives in the engineers' and the insurance cases. This suggests that transferability is considerably more important than labour market competition as measured by concentration in the labour market (even if this cannot be verified by using one simple comparison). Still, the strong link between transferability and individuals' incentives in all cases suggests that actions to affect transferability are crucial determinants of cost sharing, and that

these actions should be integrated into the cost sharing analysis. One such integrated analysis is tested in the last part of this chapter, and is developed further in chapter 8.

6.3.2 Employers' collective action

According to the theory presented in chapter 3, collective action by employers may be achieved either if there is a powerful body or if there is interaction between a small group of employers.[40] While the results support the prediction that these two factors increase the probability of collective action, there is no evidence that such action has increased the share of training costs borne by the employers. In fact, the results rather suggest that collective action may reduce the share of training costs borne by employers. An explanation of why this may be the case, based on the link between collective action and incentives, is presented in the last part of this chapter.

The insurance case not only weakens the collective action hypothesis, but also shows that employers' collective action can also be used to reduce, and not increase, the share of training costs borne by employers. When NAI replaced classroom education and seminars at hotels with distance education in 1989 (Brandt 1989: 97), it meant that the employees, instead of the employers, had to bear the time costs.[41] As the results in the next part of this chapter will show, these costs are the most substantial part of total training costs. Thus, through collective action employers were able to substantially reduce the share of training costs they bore. This means that today employers finance a smaller share of

[40] However, as chapter 4 showed, employees' organisations may also play a significant role in establishing collective solutions among employers.

[41] NAI argues that in addition to saving costs for employers, the change also meant the training was more easily available to employees outside Oslo, the exam results improved, and it allowed a 'more optimal use of personnel resources' (Forsikringsakademiet 1995: 6).

training costs for NAI training than for internal training, which indicates the problem for the collective action prediction that collective action is likely to directly increase the share of training costs borne by employers. The insurance case at least shows that just the opposite is also possible.

Similarly, in the nurses' case, the collective action that lead to a transfer of internal specialist training to the colleges, consequently also reduced the share of training costs borne by employers, as the results later in the chapter show.

The key to the incentive explanation of why collective action may reduce employers' share, the explanation suggested later in the chapter, shows most clearly in the teachers' case. Here, the collective agreement, by definition a result of collective action, gives employees' strong incentives to fully finance up-grading training.

Finally, as predicted by H_{alt}, in the engineers' case, collective action to restrict employers from financing a too small share of training costs has been insignificant. TBL has encouraged further training through giving financial support to companies that implement competence mapping, which has also been encouraged by NITO and NHO. However, this action has not aimed at making employers finance a larger share of costs of further training for engineers, and is unlikely to have affected these investments much.

6.3.3 Conclusion processes

The results of this first part of the chapter are summed up in table 6.11. It shows that both theories faired poorly. Human capital theory did so because it could not account for the variation in individuals' incentives between the four cases. Collective action theory was correct in predicting the occurrence of employers' collective action, but the consequences of this type of action were quite the opposite of the prediction.

Table 6.11 Summary of predictions and processes: cost sharing for transferable training

	Nurses	Teachers	Insurance	Engineers
H_0				
H_0 prediction of individuals' incentives	Strong	Very strong	Medium	Medium
Results: Wage increases	Wage increases	Guaranteed wage increases	Contributes	Limited
Increased chances of better positions	New positions	Of little importance	Contributes	More for admin. than for technical training
Conclusion	Very strong incentives	Up-grading training: very strong. Up-dating training: very weak	Strong	Technical training: weak. Business admin. training: stronger
Fit	Even if rough correspondence between predictions and outcomes, H_0 weakened because processes that shaped the incentives are not in line with H_0 explanation.			
H_{alt}				
H_{alt} prediction of probability of collective action	High	Medium	Medium	Low
Actions to increase share of training costs borne by employers	Collective action, but rather to reduce than to increase	Collective action, but rather to reduce than to increase	Collective action, but rather to reduce than to increase	Insignificant
Fit	Prediction of collective action right, but consequence of collective action the opposite of prediction			

6.4 Outcomes

The purpose of this second part of the chapter is to study the cost sharing outcomes and compare these with the initial predictions and the processes above in order to facilitate a full test of the two alternative theories. First, however, some of the problems associated with defining and measuring training costs are discussed. This is the background to the selection of direct costs and the use of spare time as the two crucial determinants of formal further training costs in the four cases. The advantage of being able to use spare time training as the indicator of time costs is that it solves the otherwise intricate problem of measuring the gap between what is produced during training and what could otherwise have been produced.

6.4.1 Definition and measurement of training costs

Two initial problems with studying cost sharing are to define what training costs are and how they can be measured (Ryan 1991). This thesis uses what Ryan calls an economic definition of training costs: 'the [opportunity] cost to the employer of the resources used in the enhancement of employee knowledge and skills' (Ryan 1991: 59). By contrast, according to Ryan, an 'accounting definition' of training costs instead of opportunity costs only includes recorded pecuniary costs. The difference is clearest in the case of on-the-job training. While such training is without costs, by an accounting definition, users of the economic definition will assess the difference between actual output in the training period and what could have been produced if there had been no training. Ryan is right in distinguishing between the definitional and operational problems involved in cost sharing, but his distinction between an 'economic definition' and an 'accounting definition' transcends his distinction between definition and operationalisation. When economists and others have used accounting data to measure training costs, it has not necessarily been because they prefer the accounting definition theoretically to the economic definition. It has rather been because

accounting data have been used as operational measures of the economic definition.

There are at least three problems with measuring employers' training costs. The first, and primarily practical problem, is that few employers have detailed data on training costs available. A more important problem is that even if employers have accounting data on training costs, these are unlikely to be valid measures of the economic costs of training, since the accounting data do not measure the opportunity costs of training. This relates to the third, and potentially most serious problem, namely that of measuring informal on-the-job training. Such training constitutes a major part of the training employees receive, but does not usually show as a cost in the employer accounts Mincer (1962: 52). OECD (1997a: 221) says that 'the complex empirical issues posed by the measurement of the costs of on-the-job training... are *not* capable of resolution in a survey context.'

Two different approaches have been applied to measuring the costs of on-the-job training. One approach has been to estimate the costs of on-the-job training indirectly through analysing age-earnings profiles. The premise of this approach is that since wages reflect marginal productivity, wage growth reflects human capital investments, and after basic education is completed such investment is effected through on-the-job training. Using this approach, Mincer (1962) in his influential paper argues that investment in on-the-job training for the US male labour force was as large as investment in formal education. One important problem with this approach is, however, that age-earnings profiles may not directly reflect the range and quantity of skills obtained through on-the-job training. Mincer uses investment in on-the-job training as a residual variable to explain those wage developments that cannot be explained by differences in formal education. This indirect approach is most likely to give valid results for analyses of individuals' investment in and returns from initial training, in for example apprenticeships, since returns then can be estimated similarly to those for individuals' investments in formal

education. The approach is less likely to measure adequately the investments employers make in on-the-job training later, since such investments cannot be measured as easily as the difference between what an employee earns and what she could have earned in another job.

Acknowledging the problems of the indirect measure of training costs, an alternative approach has been to measure the costs of on-the-job training more directly by trying to measure the opportunity cost of training. These contributions are designed to measure the gap between productivity of trainees and of experienced workers, and the costs of informal supervision. The problem with this approach is the inherent complexity involved in measuring these variables, as Ryan (1980) shows in a case study of welding training in a large US shipyard. In an attempt to use the direct approach to cost measurement in a larger sample, Bishop (1992) uses a questionnaire to find out about training period, wage developments and productivity increases for new hires. In the UK, the measurement of employers' training investments in the 'Training in Britain' study has highlighted the problems of directly measuring the costs of on-the-job training. The study quantifies the importance of on-the-job training, estimating that the costs of on-the-job training were higher than the costs of off-the-job training (Training Agency 1990a: 29). But the subsequent critique of the methods used also makes clear the severe methodological problems involved in measuring costs of informal training in a high number of firms. For example, the study excluded learning by experience and induction training (Finegold 1991a; Ryan 1991).

This study will make no attempt to estimate the precise costs of on-the-job training in the four cases. The purpose is rather to elicit results on the cost sharing of transferable further training that are accurate enough to facilitate a comparison of the four industries. Moreover, the focus is on extensive, transferable further training, which to a large extent is off-the-job training, and hence less difficult to measure.

For the purpose of this thesis, a simple distinction is made between time costs and pay during training, which is similar to cost categories used

for cases with mainly on-the-job training (Becker 1993; Ryan 1980; 1991; Training Agency 1990a). The most important difference is that the key to understanding cost sharing in the four cases is employees' use of spare time for further training. By comparison, the key to understanding cost sharing in the case of on-the-job training has been the difference between trainee productivity and trainee wages (Becker 1962; Bishop 1992; Bosch 1997; Jones 1986; Mincer 1962; Training Agency 1990a). The difference is that during off-the-job training the trainee usually has no output, so that the entire trainee's wages are net costs. In other words, the principle for cost measurement is the same as for off-the-job training, but employers' contributions towards training costs differ. In the case of on-the-job training employers may contribute by paying trainees more than their marginal productivity, while in the case of off-the-job training employers contribute if employees get paid at all.

If one applies a strict definition of opportunity costs, time costs are the costs of spending time on training instead of on production if it is done within working hours, or the costs of training instead of having time off if it is done in the employee's spare time.[42] But in this study, employers' time costs are operationalised as the wages they pay employees during off-the-job further training. Direct costs include course fees, material expenses, transport and hotels, and will in this case also include the cost of time spent by instructors and co-workers.[43]

6.4.2 Results

This section presents how training costs are shared in the four cases. The results are then compared both with the initial predictions of both theories and then with predictions revised after taking into account the results described earlier in this chapter, which were not in line with

[42] It is assumed that individuals will adjust their supply of labour so that the wage rate equals the individual's marginal cost of working instead of having time off.

[43] In effect, 'direct costs' in this case cover all but the trainee's time costs.

predictions. Appendix 3 presents the assumptions made in the estimates and the details of how cost sharing is calculated.

Table 6.12 gives a summary of the results presented here, distinguishing between direct costs and time costs. Since both must be combined in each case to estimate the share of the cost employers and employees bear, respectively, cost sharing will be presented case by case. While nurses' internal specialist training and engineers' technical further training are those cases where employers bear the largest share of training costs, they finance the smallest share of costs of teachers' up-grading training and nurses' college-based training.

Table 6.12 Summary of outcomes: cost sharing

	Nurses	Teachers	Insurance	Engineers
a. Direct costs	Internal: Employers pay all. College-based: small employer contribution	No employer contribution	Employer pays	Employer pays
b. Time cost (pay during training)	Internal: employers' time. College-based: employees'	Upgrading: All in spare time	Mostly in spare time	Mostly in working time
Share of employee and employer costs borne by employer	Internal: 75 – 85 %.	Upgrading : 0 – 10 %	NAI : 25 – 35 %	Technical : 90 – 100 %
	College-based: 0 – 10 %.	Updating: 90 – 100 %	Business admin.: 30 – 40 %	Business admin.: 30 – 40 %
	College-based 'on demand': 10 – 20 % *(predicted)*			

Internal specialist training for nurses is the clearest example in this study of employers financing the larger part of highly transferable, extensive

further training. The estimates in Appendix 3 show that employers bear 75-85 per cent of the total costs of this training, while employees finance the remaining share. The college-based further training stands in stark contrast to the internal specialist training. For college-based training employers in most cases do not pay anything, since the costs are shared between the individual nurses and the state through the national educational system. A 1995 survey shows that no students undertaking college-based mid-wife or health visitor training received pay from their employers, but a few of those who trained to be psychiatric nurses received full or reduced wages (Norsk sykepleierforbund 1996).[44]

Cost sharing for the two types of further training is likely to be much more similar after the proposed transfer of internal specialist training to colleges, and the introduction of a 'training on demand' (*oppdragsutdanning)* system. In this new model, hospitals must finance the colleges' costs of specialist training, but can therefore also decide how many training places they will finance and 'to a large extent' decide who will be admitted for the training. But most importantly, they do not have to finance nurses' wages. An estimate is therefore that employers will then finance only 10-20 per cent of the total training costs, compared to 75-85 per cent for internal training (Appendix 3). Instead, the employees will bear the bulk of the costs. This will be the case if employers do not, for some reason, choose to use their opportunity to give some or all of the students financial support during the training (Kirke- utdannings- og forskningsdepartementet 1998: 71). However, until the internal specialist training was transferred to the colleges, the most noticeable result in the nurses' case was the striking difference between cost sharing for the two

[44] The survey does not give details of how large a proportion of the nurses received pay during training (Norsk sykepleierforbund 1996). Additional evidence shows that nurses at psychiatric institutions are more likely to agree that their employers were willing to give paid educational leave than nurses at other types of institutions are (Havn 1996: 101).

types of specialist training, when there were so many other characteristics in common.

Cost sharing in the nurses' case is characterised by very different cost sharing for two similar types of further training. By contrast, different cost sharing for the two types of teachers' further training reflects a profound difference in the types of training, and even more the different wage effects of such training.

The key to understanding further training for teachers is once again the distinction between up-grading training and up-dating training. In most cases the cost sharing follows a simple pattern: employers pay the full cost of up-dating training, but no up-grading training costs. In the case of up-grading training, employers usually bear neither the direct costs nor the time costs. The training is done in the teachers' spare time, teachers must themselves pay for fees and books, and they normally do not receive any wages if they take educational leave to do the training.[45]

Nevertheless, as in the nurses' case, recent changes have altered the hitherto clear difference between the two types of further training. The introduction of modularised up-grading training, described in chapter 4, has to some extent altered this clear distinction between up-grading and up-dating training and the cost sharing implications of this distinction. Modularised up-grading training in science is one example. Instead of a few large half-year or one-year courses, teachers can choose between 27 modules, each of which gives one, two or three credits. For these to count as up-grading training, they must be combined into 10 or 20 credit units (Statens lærerkurs 1997b). The reason why employers may pay for such modularised up-grading training is that teachers can take one or more of the modules as *up-dating* training. Thus, module courses blur the otherwise clear-cut distinction between up-dating and up-grading training. This means that the employers have had to find new solutions to the problem of sharing training costs. In one case the Ministry of Education

and Research has recommended that employers should finance all modules except the final one; the one that gives the teacher the possibility to combine the modules into a unit that gives the teacher higher wages according to the collective agreement. This solution has been used in some cases, but it is still not clear whether or not this will be the solution most employers opt for if or when more up-grading training is organised in modules. A recent survey shows that 28 per cent of teachers say up-grading training was done within working hours, and 24 per cent say employers paid all direct costs of up-grading training, which may be because they took modularised up-grading training (Jordfald and Nergaard 1999: 68-70). The conclusion is that if modularised courses are introduced in more subjects and partly replace up-grading training in larger units, employers are likely to pay a larger share of the costs of transferable further training.

As for teachers' up-grading training, insurance employees invest considerable amounts in further training through using their own spare time. However, the employer pays a considerably larger share of total training costs in the insurance case through financing the direct costs of training. Since fees are much higher in this case than for teachers' and nurses' training in public colleges, they constitute a significant share of total training costs. Still, trainees bear the bulk of the costs.

Training at NAI is, as described in chapter 4, organised as distance education with one or more voluntary seminars. When insurance employees take business administration training at other colleges, the study is usually organised similarly to that at NAI, and training costs are shared in the same way if the training is relevant for the employee's work tasks (see Appendix 3).[46] According to this estimate, employers finance

---

[45] The fees at public universities and colleges, where virtually all up-grading training is carried out are low: less than NOK 1,000 per year.

[46] One exception to this pattern, where employers finance direct costs and employees most time costs is the so-called 'The Gjensidige School,' established by the second largest insurance company in 1997. This special program included 25 carefully selected

around one third of the costs of NAI training.[47] Even if most NAI training is done in employees' spare time, employers do pay employees for some of the time they spend in training. In some cases NAI training is integrated into internal training, which is done within working hours. Between 10 - 15 per cent of the students at NAI carry out their training as internal training (Forsikringsakademiet 1995: 7). More often, employers allow employees to take the exams within working hours, and some employers also allow employees some time to prepare for the exam. In addition to giving some time off, the employers pay all course fees (Gunhildsbu 1994: 20).

Together with internal specialist training for nurses, the engineers' case is the one where employers bear the largest share of training costs. In most cases when engineers do further education and training, training is short, within working hours and fully paid for by the employer. Compared to teachers and insurance employees, engineers do, to a lesser extent, use their spare time for up-grading training. Nevertheless, for some types of training, most importantly extensive, external management and business administration training, engineers must use their spare time for the training. Both public and private colleges offer this sort of training. If engineers use their spare time, the employer tends to pay all, or the bulk of, the course fees. For example, an employer in the car industry, known for providing good further training, said that 'We have told all [engineers] that they can take management training at [the private college] BI if they want to, but that will require something from them...It requires time... A management course will not lead us to reducing their workload

---

employees, who during a 10-month period could take a 10-credit training at BI within working hours. Even if the intention was to continue the program, it was cancelled after one year because the company found it too costly. Interview with Personnel manager, large insurance company (A).

[47] Because of social costs and taxes, the share born by employers is higher from the employee's perspective, as shown in appendix 3.

significantly."[48] In those cases where half or more of the training is done in the spare time, 80 per cent of managing directors and representatives of salaried employees' organisations say that the employer pays all the (direct) costs of training (MMI 1997).[49] Thus, the situation is clearly similar to the insurance case. The difference is that while employees in the insurance industry use spare time for training in both technical and administrative skills, engineers usually do so only for administrative skills. In Appendix 3 it is estimated that through financing the direct costs of spare time business administration and management training employers finance 30 – 40 per cent of the total costs of such training.

6.4.3 Conclusion outcomes

Given that both theories have a two-step explanation of cost sharing, including both outcomes and processes, and their predictions for the first steps in the first part of this chapter were not confirmed, a conclusion can be drawn in two different ways. Table 6.13 shows the correspondence between the initial predictions and the outcomes. However, a better way to assess the second step of both theories is to compare the conclusions with revised predictions based on the results of the 'first step' described in the first part of this chapter, and the analysis is therefore based on this comparison.

[48] Interview with Factory manager, car part manufacturer.

[49] On this question, there were small differences between the views of employers and employees. In fact, slightly more employees than employers said employers paid all costs.

Table 6.13 Summary of predictions and outcomes: cost sharing for transferable training

	Nurses	Teachers	Insurance	Engineers
H_0 prediction of employer contribution	Low	Very low	Medium	Medium
H_{alt} prediction of employer contribution	Medium	Medium	Medium	Medium
Results	Internal: very high College-based: low	Upgrading: No, or very low	Medium	Technical: high

Table 6.13 shows that there is little correspondence between the initial predictions and the cost sharing outcomes. Contrary to H_{alt} predictions there is significant variation between the cases. Moreover, the H_0 is of limited help in explaining this variation. Yet, this does not warrant a complete rejection of either of the two theories. A sounder way to assess the theories is to take the incentives and the unpredicted nature of collective action from the first part of this chapter as given, and revise the predictions accordingly in order to test the second step of both theories. However, the results in the first section mean that it makes little sense to revise H_{alt} as has been done for H_0. The reason is that the problem with H_{alt} in the first section of the chapter was not its ability to predict the occurrence of employers' collective action, but rather the nature and purpose of these actions. Instead, the next section will present a theoretically founded explanation of the effect of employers' collective action that rivals $H_{alt}2$.

Table 6.14 shows how the results fit with the revised predictions of H_0, based on the logic that if employees have strong incentives to invest in training, primarily through using their spare time, a small share of the costs are borne by employers.

Table 6.14 Summary of revised predictions given processes: cost sharing for transferable training

	Nurses	Teachers	Insurance	Engineers
Employer contribution	Internal specialist training: very high. College-based training: low	Up-grading training: no, or very low	Medium	Technical training: High
Incentives	Very strong incentives	Up-grading training: very strong. Up-dating training: very weak	Strong	Technical training: weak. Business admin. training: stronger
H_0 prediction of employer contribution	Internal: very high. College-based: low	Upgrading: no, or very low	Medium	High
Fit	Good fit, except for internal specialist training of nurses			

The conclusion is that the explanation provides a plausible prediction of the pattern for insurance employees, teachers and engineers. However, the incentive explanation cannot account for the difference between cost sharing for internal and college-based training for nurses. Nurses have similar incentives to take both types of training, but they have to pay most of the costs of college-based training themselves, while employers pay the bulk of the costs of internal specialist training.

The explanation of the deviant case, why hospitals finance the bulk of costs for internal specialist training, requires more detailed analysis. The inability of nurses in practice to finance the training could be one reason why employers have financed such a large share of costs of highly transferable, further training. Since nurses who undertake internal

training do not have the right to loans and grants from the State Educational Loan fund (Kirke- utdannings- og forskningsdepartementet 1998), it has been difficult for employers to let nurses pay a larger share of training costs. Combined with the employers' wanting to control the number of trainees in skills of vital importance to the hospitals, this may explain why hospitals have continued to finance the very costly, highly specialist training for nurses.[50] The consequence, however, is that this has generated a significant collective action problem of ensuring that enough specialist nurses are trained, as chapter 7 will show.

The introduction of employees' inability to finance training as a reason why employers might finance a large share of training costs is, at best, an element introduced *deux ex machina*. As chapter 2 showed, human capital theory states that employees' inability to finance general training is not a reason for employers to do so. In collective action theory, the possibility of a set share of employer financing was discussed in chapter 3 as a reason why the amount of training provided is likely to be sub-optimal. But the theory itself does not include an explanation of how and why employers' share of costs may be set, or at least very difficult to reduce. Therefore, neither H_0 nor H_{alt} can adequately explain cost sharing in the case of internal specialist training compared with college-based training.

The overall conclusion is still that H_0 is confirmed in this second part of the prediction since the link between individuals' incentives and cost sharing is so strong. Nevertheless, the inadequacy of H_0 in explaining how these incentives were shaped, shown in the first part of this chapter, means that altogether the support of H_0 is mixed. An alternative explanation of how incentives are formed is presented next, based on the assumption that the main way in which employers' collective action affects cost sharing is through affecting individuals' incentives to invest in further training.

---

[50] This is an example of what in the discussion of figure 3.1 is described as the problem of

6.5 A collective action explanation of incentives

The explanation presented here accounts for the problems with both H_0 and H_{alt} earlier in the chapter. It explains both why H_0 failed to predict the variation between individuals' incentives in the four groups and why the effect of employers' collective action was not a higher share of training costs borne by employers.

The core of the explanation is that employers' collective action is important as a determinant of individuals' incentives, which subsequently determine cost sharing. The explanation includes the H_{alt} prediction of the probability of collective action as well as the H_0 prediction of the link between individuals' incentives and cost sharing. What is added is the assumption that the most important effect of employers' collective action is not to increase the share of training costs borne by employers, but rather to enable employers to bear a smaller share of costs by improving individuals' incentives to invest in training.

The difference between this new version of collective action theory and the one reflected in H_{alt} can be illustrated in figure 3.1, which showed the supply and demand of training places given the share of training costs borne by employers. Here, the amount of training can increase either through shifts in the supply or the demand curve. The original H_{alt} hypothesis was based on the assumption that in order to ensure that sufficient transferable training is provided, employers' collective action will induce employers to offer more training for any given cost sharing arrangement, represented as a shift in the supply of training places. The explanation presented here, however, is that the main impact of employers' collective action is that it increases individuals' demand, so that employees are willing to do more training for any given share of employer contributions. If employers' collective action can

---

employers' share being set too high.

induce such a shift, the outcome will be both more training and that trainees will bear a greater share of the costs.

There are several ways in which employers' collective action can improve individuals' incentives to finance further training, and consequently tend to reduce the share of training costs employers bear. Chapter 5 showed that collective action was important in improving transferability of training. These actions will indirectly improve individuals' incentives to take further training, and reduce the share of costs borne by employers. Collective action by employers may also directly improve training, and increase the productivity increase from training, especially if close employer involvement is necessary to establish high quality training. But collective action can also improve individuals' incentives more indirectly. Collective agreements can contain important incentives for individuals to take training, which do not always directly reflect productivity increases. Moreover, employers' collective action can affect the way training increases the probability of promotion or the way skills are utilised if collective action influences the way employers organise work or promotion criteria, for example by the introduction of common job ladders at different employers. Finally, employer collaboration may give employees the necessary trust in employers' claims that skills from training are transferable and will strengthen their position in the external labour market. Thus, there is a wide range of options for employers' collective action that give theoretical support to the claim that employers' collective action can increase the share of training costs borne by employees and increase the total amount of transferable training provided by improving individuals' incentives.

There are however two reasons why employers' collective action does not necessarily lead to a higher amount of training and a lower share of training costs borne by employers. First, employers' collective action may reduce individuals' incentives to invest in training. If, for example, a collective agreement restricts wage increases after training, this form of employers' collective action increases the share of cost borne by

employers. Another possibility is that employer collaboration on training reduces the quality or relevance of training, for example by adapting too slowly to new technology.

A second possible problem is that increased transferability, or other improvements of individuals' incentives, may worsen the problem through reducing employers' willingness to finance the training if there is, for some reason, no accompanying increase in employee contributions. As Stevens (1994c) showed in chapter 2, increased employee demand for training will more than outweigh employers' reduced willingness to finance training transferability if employees are willing to bear a larger a share of training costs. However, if employees' problems of financing training were the reason why employers paid a considerable share in the first place, a reduction of amount of training may be a likely outcome. In this case, employers' collective action to reduce individuals' incentives to invest in training could lead to increased employers' willingness to finance training. For example, if a collective agreement held down wage increases after training, employers would be more willing to finance training.

6.5.1 Results

A test of the explanation based on collective action forming individuals' incentives requires a test of three steps, compared with two steps for H_0 and H_{alt}. First, the explanation predicts that if there is high concentration or a powerful superordinate body, collective action is most likely. Second, the explanation predicts that employers' collective action improves individuals' incentives to invest in furthers training. Finally, it predicts that these incentives determine the cost sharing.

Table 6.15 Summary of collective action predictions of incentives and outcomes

	Nurses	Teachers	Insurance	Engineers
Probability of collective action	High	Medium	Medium	Low
Actions to shape individuals' incentives to invest in training	Significant	Significant	Significant	Insignificant
Individuals ' incentives to invest in training	Very strong incentives	Upgrading : very strong. Updating: very weak	Strong	Technical: weak. Business admin.: stronger
Fit	Good	Good	Good	Good

Table 6.15 shows the good fit between predictions and outcomes on both collective action and incentives, while the link between incentives and cost sharing was clearly confirmed in table 6.14.

In all but the engineers' case, employers' collective action has had a significant impact on employees' incentives to finance further training. Since such action was not expected in the engineers' case, this is in line with the collective action explanation.

In the nurses' case, collective action to increase individuals' incentives to take further training has primarily been the same action as those which improved transferability, described in chapter 5, which have directly improved individuals' incentives to take the training.[51] One may also argue that collective agreements have held down the wage increases nurses get as a result of specialist training but, as shown in chapter 5, individuals still have considerable incentives to finance this training. Moreover, there is no significant difference between college-based and internal training on this point.

[51] As explained in chapter 5, the employees' organisations played a more significant role in the nurses' case than predicted by collective action theory.

The introduction of 'professional ladders' in hospitals is an example of how collective action has shaped incentives in the nurses' case, through a process similar to the way most hospitals applied NSF's curricula for specialist training. NSF has introduced a plan for a 'clinical ladder' (*klinisk stige*), which share several important features with Kanter's professional ladder, even if Kanter sees such ladders as implemented by individual companies and not initiated by employees' organisations. The plan defines what experience and theoretical training is needed to advance on the ladder for nurses who work in clinical departments (*kliniske avdelinger*) (Diakonhjemmets sykehus 1996). Nurses who have the required practice, including practice with supervision, and have done some additional theoretical training, can be recognised as 'clinical nurses' by NSF. As was the case with the specialist training curricula, hospitals are not obliged to recognise these ladders and titles awarded by NSF. But the hospitals still use NSF's plan as a basis for their own professional ladder for nurses.[52] One important reason why the hospitals seem to use the employees' organisation's plan, modified or unmodified, is that it can help recruit and retain nurses. A senior nursing officer at a large hospital said that they initially wanted a professional ladder that differed from NSF's plan, but feared that introducing a completely different plan could effectively 'place the hospital on the sidelines' in the struggle to recruit qualified nurses.[53] The NSF ladder is not directly linked to wage increases, but according to a NSF official, they 'are working on it.'[54]

In the case of teachers, the incentives individuals have to invest in further training gives a plausible explanation of how costs are shared in this case. However, these are incentives not generated by individual employers, but through a collective agreement, a result of collective action. This collective agreement has ensured that teachers have strong

[52] Diakonhjemmets sykehus (1996) and interviews with Personnel manager of hospital outside Oslo and Senior nursing officer at an Oslo hospital.

[53] Interview with Senior nursing officer at an Oslo hospital.

[54] Interview with NSF representative.

incentives to take up-grading training and that the schools do not have to pay any of the costs, so there is no need for collective action to restrict employers' under-investment in up-grading training. The teachers have not negotiated with their employers, the municipalities, on wages and employment conditions since 1949. From 1949 to 1960, the Parliament set their wages, and then from 1960 the teachers' organisations have negotiated with the state, in the same way as national government employees do. The question of whether teachers should continue collective bargaining with the state rather than the municipalities has been raised since the mid 1980s (Lauvdal, Rymoen, and Grooss 1998: 23). The teachers' organisations have always been against transferring the responsibility for collective bargaining back to the municipalities (Lauvdal, Rymoen, and Grooss 1998: 25). Within the Teachers Association, there has been some discontent with the official position, because it may have restricted wage increases. The other main employees' organisation, Norwegian Union of Teachers (NL), on the other hand, has been unequivocal in its support for state negotiations (Hustadnes 1997). The municipalities' employer organisation, KS, has attempted to get the responsibility for the wage negotiations. In 1995 KS tried to establish whether legally the state had the right to oblige municipalities through collective bargaining (Lauvdal, Rymoen, and Grooss 1998: 27). Even though KS lost the legal case, the organisation has continued to maintain that they should negotiate collective agreement on behalf of the municipalities. For example, it has tried to convince the teachers that their working conditions may be improved if they choose to negotiate with KS instead of the state (Hustadnes 1997).[55]

[55] For the municipalities a transfer of negotiations from the state to KS would mean not only more power to influence wages and working conditions for their own employees, but it would also reduce the municipalities' current problems of administrating two sets of basic agreements, one for teachers and one for the rest of their employees (Lauvdal, Rymoen, and Grooss 1998).

The most important way insurance companies have improved individuals' incentives to invest in further training has been to make sure that NAI training has been valuable, and valued, in the companies. In the process, NAI itself has played an important role, partly independently of its members. All action described in chapter 5, which have secured NAI's position in the industry, has also contributed to ensuring that employees have incentives to spend their spare time on the organisation's training. But FL has expressed worries that employers may value NAI training less than other types of further training, for example at BI.[56] If this is the case, it may mean that employees have weaker incentives to take NAI training, and consequently employers must expect to pay a larger part of the training costs if the level of training is to remain the same. Based on interviews in 1988, Brandt (1989: 99) says that insurance employees wanted training that could be rewarded outside the industry. This view is confirmed by the trade union representative who said that 'NAI is no longer so attractive, since it does not confer the universal competence that can be used in the market,' and explained that 'the market' in this case meant a market beyond the insurance industry.[57] The employers have not opposed an insurance education that could give credits in the public college system. On the contrary, the employers' first choice has been for the public colleges to provide insurance education, mostly since that would be cheaper for the employers.[58] In 1998 a public college, in co-operation with NAI, presented the first one-year study in insurance (Forsikringsakademiet 1998b). So both the employers and the employees prefer education that gives credits and can be used as part of a degree in other colleges, but the rationales differ. While employees emphasise the recognition such education can give outside the industry, employers are primarily interested in reducing costs.

[56] Interview with Group of FL representatives.

[57] Interview with Group of FL representatives.

[58] Interview with NAI representative.

Collective action by employers has had little impact on the incentives engineers have to take transferable further training or the investments employers make in such training. Still, there have been some attempts to do both. Both TBL and the National Council for Engineering Education have worked to make training at engineer colleges and other public education institutions more valuable to employers (Econ 1997; Ingeniørutdanningsrådet 1995; 1996; Teknologibedriftenes Landsforening 1996).[59] Nevertheless, as chapter 3 showed, these types of further training play a very limited role in the further training of engineers.

A comparison of professional job ladders for nurses and engineers reveals some important differences. In contrast to the case of nurses, but more in line with what Kanter (1984; 1990) found, the characteristics of the engineers' ladders were to be determined by the individual employer and the local trade union representatives, based on local competence needs. So while the nurses' 'clinical ladder' is a clear example of how collective action has improved individuals' incentives to invest in training, the engineers' case is one of individual employers' initiatives.[60]

6.6 Conclusion

The chapter has shown that in the four cases, variation in individuals' incentives to invest in training could explain the pattern of cost sharing for these four groups. This is in line with the human capital prediction developed in chapter 2. The problem, however, was that this prediction could not adequately account for how and why the variation of incentives developed. The collective action hypothesis developed in the same chapter gained little support, primarily because employers' collective action rather

[59] Interview with National Council for Engineering Education representative.

[60] Moreover, the engineers' ladders will have a weaker harmonising effect on internal training, because the ladders are not linked to any system of recognition outside the firm.

tended to reduce than to increase the share of training costs borne by employers.

An alternative collective action based on the assumption that employers' collective action could improve individuals' incentives to invest in training, and therefore reduce the share of training costs borne by employers, gained more support than any of the two initial theories.

The implication of this alternative view, a synthesis H_0 and H_{alt}, is that on the one hand, cost sharing could be seen as a result of a market solution, where individuals' incentives to invest in training determine the share of training costs they are willing to bear. Employers' collective action, on the other hand, does not primarily intervene directly in how this market solution of cost sharing is set. Instead, the results in the chapter suggest that employers' collective action is crucial in determining the incentives individuals need to be willing to invest in training. Thus, the conclusion in this chapter supplements the conclusion of chapter 5 through emphasising the importance of employers' collective action as a requirement for market solutions. The importance of endogenisation and employers' collective action to shape individual incentives is discussed further in chapter 8. First, however, chapter 7 analyses how the supply of transferable training does or does not meet employers' demand.

7. Sufficient training or skill shortages?

7.1 Introduction

The ultimate indicator of adequate further education and training in an industry is neither transferability nor cost sharing, but whether or not the right amount of the right training is provided. However, as this chapter will show, this topic is inherently tightly linked with the themes of chapters 5 and 6.

If there is a collective action problem associated with the provision of transferable training, individual employers will tend to provide too little transferable training. The main purpose of this chapter is to test this prediction. Like the two previous chapters, the predictions consist of processes and outcomes, which will be considered in terms of whether or not the results are in line with predictions. The last part of the chapter explains how collective solutions may be amenable to solving some skill provision problems, but not others.

7.2 Hypotheses and predictions

The two hypotheses that will be tested in this chapter are presented in table 7.1.

Table 7.1 H_0- and H_{alt}-hypotheses: skill shortage and deficiencies

Human capital theory	Collective action theory
$H_0$3: The optimal amount of transferable training will, and can only, be provided in a perfect labour market with a perfect capital market.	H_{alt}3: Even though the optimal amount of training may be provided in perfect labour markets with perfect capital markets, it is more likely to be a result of employers' collective action, which may be achieved if there are few employers, or through a powerful body.

As this chapter will describe later, the notion of 'optimal amount' is in practice difficult both to define and to measure. Therefore, this chapter will rather study different indicators of sub-optimal amount of training than attempt to measure some 'optimal level' of training provision. As for the hypotheses tested in chapters 5 and 6, a comprehensive test cannot be performed without studying the processes that can explain the outcomes.

Figure 7.1 H_0 and H_{alt} explanations of factors leading to sub-optimal amount of transferable training

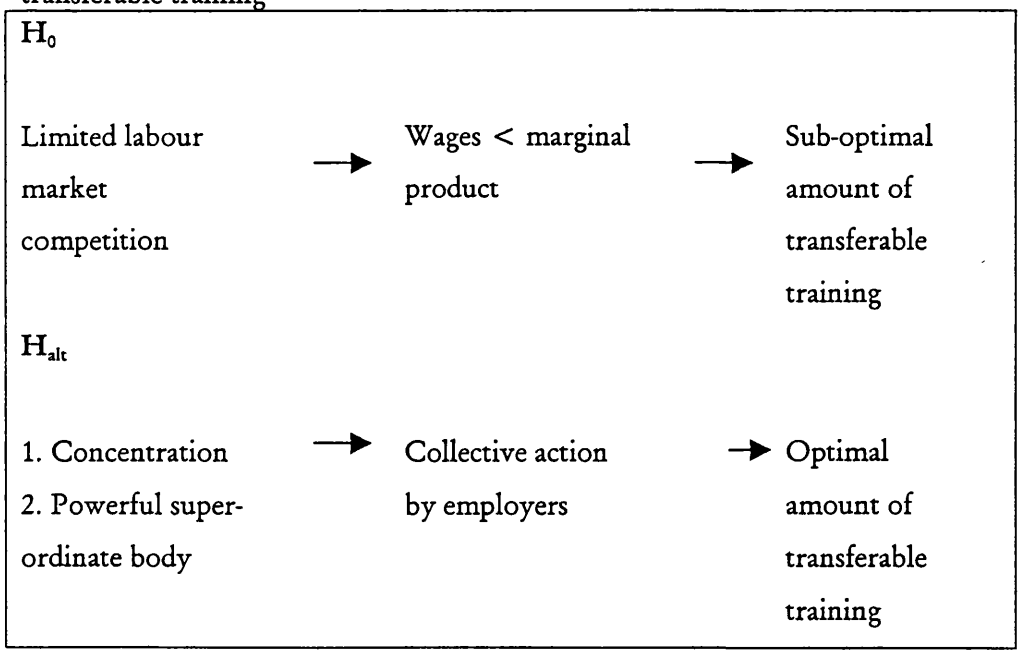


Figure 7.1 shows the logic of the two explanations.

The core of the H_0 argument is that if imperfect competition means wage increases are smaller than the increase in marginal

productivity after training, employees will finance less than the optimal amount of transferable training.[1] In this initial version of the H_0 explanation it is assumed, as it was in chapter 6, that concentration in the labour market (defined in chapter 4) is a valid indicator of imperfect competition. Therefore, the initial prediction is that wages are less likely to reflect marginal productivity in the insurance and nurses' cases than in the two others, and therefore skill shortages are most likely in the two former than in the two latter cases. It is beyond the limits of this study to assess precisely whether or not wages equal marginal productivity, but it is still possible to contemplate factors that affect the probability that productivity increases from training will be reflected in higher wages, and this will be done in the next section. The results will show that the clear examples of wages not reflecting marginal productivity are results of collective agreements, not oligopolistic competition between a few, large employers in the labour market.

According to H_{alt}, employers' collective action is what reduces the likelihood of skill shortages. Such action may in two different ways ensure that enough training is provided. First, as chapter 6 showed, employers' collective action may increase individuals' demand for training, and consequently increase the amount of training provided. However, if the share of training costs borne by employers is set too high, as discussed in chapters 3 and 6, collective action is necessary to ensure a positive shift in the number of training places employers supply for the given cost sharing arrangement. This latter explanation of how collective action can solve a potential skill shortage problem is most in line with the versions of collective action theory that argue that the collective action problem exists because employers must bear a large share of the costs of transferable training, for example because the solution of trainee financing has broken

[1] The essence of this explanation is summarised by Booth and Snower (1996: 4): 'The trick for finding market failures in the acquisition of skills is to identify the circumstances under which workers and firms do not get fully rewarded for the training costs they bear.'

down (Marsden 1986). In order to test the collective action theory by deriving predictions about each case, the predicted effects of collective action must be coupled with predictions of the probability of collective actions. Given the theoretical predictions of this probability in chapter 3, H_{alt} predicts that skill shortages are least likely in the nurses' case, more likely in the insurance and teacher cases, but most likely in the engineers' case.[2]

Table 7.2 Summary of predictions: skill shortage and deficiencies

	Nurses	Teachers	Insurance	Engineers
Concentration	High	Low	High	Low
H_0 prediction of skill shortages	Many	Few	Many	Few
Probability of collective action	High	Medium	Medium	Low
H_{alt} prediction of skill shortages	No	Few	Few	Many

Table 7.2 shows the predictions of the two theories for each of the four cases.

7.3 Processes

In a case study, correlation between skill shortages and concentration or probability of collective action would not suffice to confirm any of the hypotheses. Therefore, this section examines whether or not concentration leads to the predicted gap between wages and marginal productivity, and if employers' collective action occurs where predicted.

As indicated above, the clearest examples of marginal productivity increases from further training not being reflected in wage increases are not consequences of concentration in the labour market, but of collective

[2] It is assumed that collective action theory predicts not only the probability of employers' collective action, but also differences in the effect of such actions, and consequently can predict different degrees of skill provision problems.

agreements. The two public sector cases are the ones where collective agreements, more than in the other cases, have restricted employers' ability to reward productivity increases with higher wages. Thus, national pay scales have compressed wage differentials and so discouraged employee investments. In the nurses' case, the collective agreement between KS and the counties (except Oslo) has restricted the majority of hospitals' opportunities to increase wages for specialist nurses, even if there is some scope for wage competition, since employers can decide where on the wage scale to put their specialist nurses.

More than in the nurses' case there is, in the teachers' case, a weak link between increased productivity and increased wages. The most notable reason is that teachers get wage increases from further training even if they do not teach the subject they specialise in, but on the other hand do not get wage increases for types of training other than formal up-grading training. Given that the collective agreements do little to link teachers' up-grading training with employers' demand, H_0 predicts that, at least in some subjects, too few teachers undertake up-grading training, even if it is virtually impossible to *a priori* determine in which cases productivity increases are higher or lower than wage increases. However, unless the wage increases are higher than the productivity increases for all subjects, H_0 predicts shortages.

In the insurance and engineers' cases, there is considerably more scope for employers to set wages that they deem to reflect productivity. There may be a monopsony effect in the insurance case, but this is very unlikely to restrict wage growth as clearly as the collective agreements in the teachers' and nurses' cases. Insurance employees are covered by a collective agreement but, compared with the two public sector cases, employers have more opportunities to reward productivity increases from further training, especially through promotion, which in chapter 6 was shown to be the most important motive for insurance employees to undertake further training. In the engineers' case there is individual wage-setting, so collective agreements have little impact on employers' ability to

remunerate employees according to their marginal productivity, or at least employers' evaluation of productivity. Thus, the results show that, rather than concentration, collective agreements are the most important reasons why productivity increases from further training are not reflected in wage increases, which weakens the H_0 prediction. However, this hardly constitutes a critical weakening of human capital theory, since collective agreements may be adequately included in this line of reasoning without altering the more basic aspect of the explanation (see e.g. Acemoglu and Pischke (1999), namely the link between skill shortages and these productivity – wage gaps. This link will be the topic of the next section.

The H_{alt} prediction is that collective action to increase the amount of training is likely in the nurses', insurance employees' and teachers' cases, and that this will lead to increased employee demand for training and increased employer willingness to provide it. Since collective action by employers to improve individual employees' incentives has been treated in chapters 5 and 6, this chapter will focus on collective action to increase employers' willingness to finance training. The results show that the predictions are supported in all but the nurses' case. Moreover, the solution to the collective action problem in the teachers' case differs from the type of solution suggested by H_{alt}.

As predicted from H_{alt}, collective action to increase the amount of transferable further training provided has been very limited in the engineers' case compared with the others. Despite some attempts by NHO, NITO and TBL to encourage further training, there has been no marked collective action to ensure high levels of transferable training.

In the insurance case there is clear support for H_{alt}. While chapters 5 and 6 have shown how collective action by employers has improved individuals' incentives to undertake further training, the employers, through NAI, have also clearly acted to ensure that each employer contributes to the collective good by giving their employees transferable training. So in line with the predictions of H_{alt} there has been collective action to solve a perceived collective action problem. For example, each

annual report of the NAI gives details of the number of participants from each of the large and medium-sized companies.[3] Moreover, direct pressure has been applied to a company that trained less than others did. When the insurance company Vesta used insurance salespersons that were less trained than salespersons in other companies, 'officially the whole industry condemned it.'[4] Such direct pressure is a clear example of how collective action can discourage what is seen as under-investment in training.[5] However, in the insurance case, action aimed directly at keeping training levels high has been interwoven with collective action to uphold the common training organisation. These two are clearly interrelated since upholding the organisation is very difficult without sufficient participation, and the existence of the organisation probably increases the amount of training provided.

As chapter 6 showed, the national collective agreement for teachers ensures that employees have clear and strong wage incentives to invest in further training. The collective agreement also forms one sort of solution of the collective action problem of employers' contributions. The collective agreement binds all employers to give the same wage increases from transferable training, and at the same time it prevents poaching, since it makes it virtually impossible for employers to use wages to attract already trained teachers. However, this type of solution to the collective action problem differs from $H_{alt,}$ as it has been presented, since instead of ensuring that schools provide enough employer-financed further training, the collective agreement rather forces employers to give wage increases after fully trainee financed training. Thus, the teachers' case suggests that collective agreements may effectively constitute solutions to the collective

---

[3] A similar practice is used in the German vocational training system (Marsden 1999: 225).

[4] Interview with NAF representative.

[5] One may argue that the specific characteristics of the insurance industry makes employers especially concerned that their competitors under-investing in training, since they sell complex products, the consumer's trust is especially important, and the reputation of one company may affect the reputation of the whole industry.

action problem in a way that breaks down the distinction between improving individuals' incentives and increasing employer supply. The fact that up-grading training is trainee-financed, has meant that national government initiatives and action by teachers' organisations have aimed at encouraging up-dating training, which is mainly financed by employers (Kirke- utdannings- og forskningsdepartementet 1997; Lærerforbundet 1995).

The H_{alt} explanation is in line with H_0 regarding the inherent problems of the collective action solution in the teachers' case. The problem is that the agreement does not include any mechanism to adjust the supply of training to employers' needs. An employer, interviewed in a 1994 survey, said that 'when it comes to up-grading training, each individual school can do little but encourage teachers to take further training in those subjects where the school has a demand' (Statens lærerkurs 1994: 5). In 1991, the Ministry of Education and Research promised it would 'establish a system of further education and training which is based on each individual school's need for competence development, in which one creates a system that directs teachers' choice of subject and specialisation, based on the needs in a teacher collegium' (St meld nr 40 (1990-91): 132). But this type of collective action has not been introduced, so the potential problem of linking demand and supply has persisted. Even if some schools have used seniority increments to induce teachers to take up-grading training, as explained in appendix 3, its limited diffusion has restricted its impact as a vehicle for directing up-grading training towards employers' needs. Neither has the opportunity employers have to give educational leave only if the training is needed by the school (St meld nr 40 (1990-91): 124) had much impact. This is partly because this is primarily an option in those few cases where the teachers get financial support from the school, and also because most up-grading training is carried out without teachers taking educational leave.

Previous chapters have shown how employers, to some extent prompted by the Nurses Association, have acted to improve individuals'

incentives to invest in formal further training, for example by ensuring transferability. However, contrary to H_{alt} predictions, there been have no powerful attempts, either through hospital co-operation or state intervention, to ensure that employers provided enough of the very costly, highly transferable internal specialist training. Even if there has been some co-operation between the regional hospitals regarding internal specialist training, this co-operation has mainly focused on standards of training, and not directly on the number of specialist nurses each of the hospitals trained (Holter et al. 1996). Chapter 5 showed that the Nurses Association (NSF) has been important in fostering collective solutions, but the organisation has been less influential in reducing under-investment in training. However, from 1992 onwards, NSF has published yearly statistics on the numbers being trained by each hospital within each field, which, to some extent, may discourage hospitals from training too few (Norsk sykepleierforbund 1996). A government-appointed committee in 1997 recommended national subsidies to encourage specialist training (NOU 1997:2 : chapter 9), but such subsidises were not introduced before the transfer of specialist training to the colleges.

Consequently, it has been up to employers, the hospitals, to choose independently how many specialist nurses they wanted to train. In fact, according to KUF, one of the advantages of internal specialist training was that employers individually could regulate the number of nurses on internal training according to their needs. Therefore, KUF argued, supply was likely to meet demand (Kirke- utdannings- og forskningsdepartementet 1998).

However, cost sharing for this type of training, described in chapter 6, suggests that collective action was needed to avoid under-investment. The reason is that employers bear a very large share, 75-85 per cent, of the costs of the highly transferable and costly training. Hence, this situation is an example of the theoretical case where the employers' share of training costs is set so high that collective action is needed to ensure a sufficient amount of transferable training. In the nurses' case, there is

hardly an absolute barrier to individual investment, the situation is rather that, in practice, nurses have had few opportunities to finance the internal specialist training.[6] So the nurses' case is one example of a situation with a significant collective action problem, because employers must bear a very large share of training costs for a highly transferable skill; however, contrary to H_{alt} predictions there was no significant collective action to address the problem.

Table 7.3 Summary of predictions and outcomes: skill shortages and deficiencies

	Nurses	Teachers	Insurance	Engineers
H_0				
Concentration (ch. 3)	High	Low	High	Low
H_0 prediction gap between productivity increase and wage increase	Larger	Smaller	Larger	Smaller
Gap between productivity increase and wage increase	Larger	Larger	Smaller	Smaller
Fit	Weak fit, because of strict interpretation of H_0			
H_{alt}				
Probability of collective action (ch. 3)	High	Medium	Medium	Low
H_{alt} prediction skill shortages	No	Few	Few	Many
Collective action to increase employee demand for training (ch. 5, 6)	Yes	Yes	Yes	No
Collective action to increase employer supply of training	No	Yes, but only through collective agreement	Yes	No
Fit	Contrary to prediction lack of collective action to increase supply in nurses' case			

[6] A solution in line with cost sharing in the other cases, as described in chapter 6, would be to make specialist training a part time training, which was done both in spare time and within working hours

Table 7.3 summarises the processes. The H_0 fit is weak since collective agreements were not included, but this is mostly due to the strict interpretation of H_0 in the deriving of the predictions. There is a good fit between H_{alt} predictions and outcomes in three cases, but in the case where employers' collective action seems most needed to increase employer supply, there has been no significant such action, contrary to H_{alt} predictions.

In order to facilitate a test in the second part of the chapter, table 7.4 shows the revised predictions based on the results in this first part.

Table 7.4 Summary of revised predictions given processes: skill shortages and deficiencies

	Nurses	Teachers	Insurance	Engineers
H_0				
Gap between productivity increase and wage increase	Larger	Larger	Smaller	Smaller
H_0 prediction of skill shortages	Many	Many	Few	Few
H_{alt}				
Collective action to increase employee demand for training (ch. 5, 6)	Yes	Yes	Yes	No
Collective action to increase employer supply of training	No	Yes	Yes	No
H_{alt} prediction of skill shortages	Many	Many, because of nature of collective agreement	Few	Many

7.4 Definition and measurement of sub-optimal training levels

7.4.1 Introduction

The two tasks of assessing what constitutes an optimal level of training and whether or not enough training is supplied, are inherently complex. Bosworth and Pearson (1992: 92) say that 'the concept of skill shortage (or surplus) is difficult to define and even harder to measure with any degree of rigour.'

This section will present different theoretical dimensions of the concept of optimal training levels. It will also present some of the problems with the different theoretical definitions, and the related problems of operationalising and measuring whether or not sufficient education and training are provided. Finally, it will show how these problems are tackled in this chapter, and how different indicators are used to enhance the validity of the findings.

7.4.2 Defining optimality and sub-optimality

There is a clear distinction in the literature between the neo-classical and other, more or less explicit, definitions of an optimal training level. A crucial consequence of the neo-classical assumptions is the idea of single, optimal long-term equilibrium of skill supply and demand, which would occur in a perfectly competitive market. However, in practice there may be, and are, multiple departures from perfect competition. In neo-classical theory, these departures typically imply that there are short- and medium-term fluctuations in the supply and demand. Consequently, there may be skill shortages, usually measured as recruitment problems, until wage adjustments ensure that supply meets demand.

However, several authors have argued that neo-classical theory takes a too narrow view of the skill supply problems that may occur. A core point of these alternative theoretical definitions of optimality and sub-optimality is that employers do more than increase wages when faced with a skill supply problem; businesses choose their business strategies based on assessments of available skills in the labour market. Therefore, skill supply problems may be directly transformed into a product market problem if businesses have to choose inferior product market strategies. Moreover, since training is a long-term investment, which could be a requirement for growth and development of industries that may be important in the future, assessments of skill supply optimality and sub-optimality might only be done in the long term, and with hindsight.

Several authors have advocated the view that the neo-classical emphasis on recruitment problems and wage adjustments is too narrow (Finegold and Soskice 1988; Green and Ashton 1992; Lester, Solow, and Dertouzos 1989). However, while they find the idea of a different definition of optimal or sub-optimal provision plausible, they have still not come up with satisfactory theoretical definitions of optimal or sub-optimal amounts of education and training. Moreover, these contributions encounter some substantial problems when attempting to find operational measures of sub-optimality.

Thus, when attempting to measure whether or not there is sufficient education and training in different industries, there seems to be a clear trade-off between narrow definitions of sub-optimality, that may be relatively easy to measure, and the wider definitions, which cover additional important characteristics of optimal or sub-optimal provision, but are inherently very difficult to measure validly and reliably.

With the possible exception of neo-classical theory, the literature lacks satisfactory, explicit theoretical definitions of the optimal level of training. The debate has been concerned not so much with what characterises the optimal level as with what sorts of departures there are from the theoretical model of perfect competition, and what impact these

have on the type of sub-optimal solutions that may occur. However, this section will show that the different more or less implicit definitions of optimal training provision vary along at least four dimensions. The empirical part of this chapter will be based mainly on a fairly narrow and static definition of optimality, with a focus on the current skill needs of employers. But this theoretical discussion shows that this is only one of several different approaches to the difficult question of establishing criteria for evaluating optimality or sub-optimality, and the empirical part of the chapter will give also some evidence of other possible indicators of sub-optimal training provision.

First, definitions of optimality vary regarding whether current production and capacity or future skill needs constitutes the basis for evaluation. The neo-classical definition is based on the current demand of employers, even if at the core of human capital theory is the presumption that education and training are long-term investments. Given the long-term nature of these investments, one could argue that the basis for a definition of optimal training provision should be the future demand for skills. The obvious problem for a future-based definition of optimality is that it could be assessed only *ex post.* Still, this is not *per se* a sufficient reason for rejecting the theoretical definition, even if it raises some fundamental problems of operationalisation and measurement.

The present-future dimension of optimality is closely related to the question of whether optimality should be defined only in terms of the perceived requirements of existing organisations, or whether it should, in theory at least, include the idea that education and training can facilitate or hinder future growth and innovation. The latter definition would theoretically comprise the demand of employers that do not yet exist. For example, in an industry expected to grow substantially in the future, say bio-tech firms, one could choose to base an assessment of current training levels on to what extent the pool of competent engineers and researchers can facilitate the innovation and growth of existing and new firms. Theoretically it is a well-founded point that if there is insufficient

education and training, this may deter the establishment of new, profitable firms. The question arises, however, of whether these consequences of sub-optimal training provision are at all possible to test empirically. As the discussion later shows, one possible measurement strategy is to do *ex post* assessment of growth and innovation, and attempt to investigate whether or not these were linked with education and training.

A third dimension, along which different theoretical definitions of optimality differ, is whether or not some public interest wider than the individual firms and employers is included. While the neo-classical definition of optimality is concerned with the recruitment problems of individual employers, one may also regard skill supply as a necessary requirement for economic growth that can finance public services. However, strictly speaking this is more a matter of emphasis than of different definitions.

The fourth question a theoretical definition of optimality and sub-optimality must address, is whether or not wage adjustment is the most important mechanism for adjusting skill supply and demand. The core point is that employers' adjustments to skill shortages may undermine the observed difference between supply and demand as a valid indicator of sub-optimal skill supply. This is the most important of the four dimensions, and requires some further discussion.

In neo-classical theory, there is one optimal level (theoretically), around which the actual level fluctuates. Because of market imperfections, for example limited labour mobility and lengthy training, there may be deviations from the optimal level. However, employers use wage adjustments as part of a general adjustment to ensure that supply meets demand.

The alternative view, which provides the basis for the concept of skill *deficiencies*, says that employers use many other options than increasing wages in reaction to a situation with insufficient education and training, and the use of these tactics varies between different groups of

employers. These 'skill deficiencies' restrict the employers' choice of product market strategies and lead to under-performance in the product market. In practice this is usually measured by using the most successful comparable country or industry as a benchmark, and then studying if and how the choice of a less successful strategy has been a consequence of inadequate training levels.[7]

Moreover, Finegold and Soskice (1988) argue that the actions of employers, trainees and the government interact so that there may be several different equilibria, for example a 'high skill equilibrium' and a 'low skill equilibrium'. A core characteristic of the low skill equilibrium is that action by one of the parties only, for example the offering of wage increases by employers, will not suffice to bring the situation closer to a high skill outcome. The inclusion of interaction effects between supply and demand, apart from the wage mechanism, leads to significantly different accounts of the antecedents and nature of skill sub-optimality, as well as potential solutions to the skill supply problem.

7.4.3 Skill shortages and skill deficiencies

The two different views of what constitutes an optimal level of training are inherently tightly linked to possible operational measures of optimality and sub-optimality. This section first discusses 'skill shortages', which cover sub-optimality in the neo-classical framework. It then treats some of the theoretical problems with this theoretical and operational measure of sub-optimality, which leads to the alternative definition of sub-optimal training provision: 'skill deficiencies'.

The most straightforward approach to the issue of skill shortages is to ask employers if they have had difficulties recruiting any types of personnel. Skill shortages 'exist when employers do not have enough people available with the skills needed to do the jobs they require' (Smith

[7] The problems of measuring this are discussed later in the section.

1990: 1). Since such shortages are highly cyclical, what is more specifically an indicator of inadequate skill supply are persistent skill shortages, or shortages even at the bottom of the business cycle. The advantage of this approach is clearly its simplicity and transparency. Nevertheless, there are several problems, which have all been the basis for alternative measures of skill shortages.

First, employers' answers are based on their subjective evaluation of the difficulty of filling vacancies, and are therefore formed by employers' view of what is 'difficult' (Smith 1990: 3). If their basis for evaluation is past recruitment, the measure might be a valid indicator of changing skill shortages over time for one particular group, but does not necessarily give valid measures of differences between different occupational groups or different industries. Average duration of a skilled vacancy, used by Haskel and Martin (1993) in an analysis of the effect of skill shortages on productivity, is an indicator that solves this problem of subjectivity.

But a second problem is that both reported recruitment problems and average duration of vacancies could be the result of choices by employers, and their preferences for filling the vacancy quickly versus increasing wages to attract employees. Thus, they may choose between either offering a low wage and waiting a long time to fill a vacancy, or offering a high wage to fill the position immediately (Card and Krueger 1995).

Another problem with the simple skill shortage indicator is that it may reflect only that individual employers, or types of jobs are unattractive to employees, for example because of reputation and working conditions, and not necessarily that there is a too small number of people with the particular skill in the labour market. An alternative approach is therefore 'the market perspective,' which says that 'a shortage exists only if recruitment difficulties reflect genuine lack of appropriate people in the market, to fill existing posts at going wages' (Meager 1986: 240). Still, reported recruitment problems may be an indicator of 'genuine lack of

appropriate people' if one assumes that the difference between the reported and the 'genuine' skill shortages does not vary too much between industries or change too much over time.

Yet another problem for the above-mentioned measures, which is particularly important in the case of further training, is that existing staff not having the required skills may constitute a skill gap. A related problem is that employer surveys of recruitment difficulties assume that employers cover their skill needs primarily through recruitment (Liff 1992: 84). Since the propensity to use the external labour market for skill supply varies between industries and between countries, neglecting skill gaps may give invalid results (Green and Ashton 1992: 290). In other words, if employers primarily fill positions by internal promotion, and not recruitment from the external labour market, a skill supply problem is not necessarily a recruitment problem. According to Smith (1990: 1) skill gaps are 'impossible to measure objectively using survey research techniques.' There have however been several attempts to measure skill gaps. Larsen et al. (1997: 70) study skill gaps at the macro level of the Norwegian economy, based on questions to employers about what level of education and what amount of job experience would be most productive in a specific position. They estimate that in the private sector in 1992, 38 per cent of those in positions where employers said higher education was most productive did not have higher education. Research on competence needs, de-skilling and up-skilling (Gallie 1991; Penn, Rose, and Rubery 1994) provides other ways of assessing skill needs in different jobs, which may be a basis for skill gaps analyses. Moreover, employers themselves often perform skill gap analyses of their own employees. Finally, the empirical analysis, later in this chapter, will show how skill gaps in some cases may be measured using other types of data, for example teachers' educational background. Still, no generally acknowledged method exists for estimating the magnitude of skill gaps for particular groups, industries or occupations.

Another problem with using recruitment problems as an indicator of insufficient training is based on the neo-classical assumption that if employees and employers are free to set the wage rate in a free market, it will be set so that supply equals demand. However, short-term shortages may exist if there are market rigidities, for example because workers are immobile and training takes time (Blaug and Ahamad 1973: 6; Bosworth, Dutton, and Lewis 1992: 2).[8] Thus, in the short to medium run there may be shortages, since the supply of labour is not perfectly elastic. In the case of education in particular, there may be a substantial lead-time before a wage increase leads to a higher number of graduates. Employers will then address the problem by offering higher wages, which will increase the supply of and reduce the demand for skills, so that in the longer run supply will again equal demand.[9] Thus, skill shortages are for a given wage level only.

Instead of, or in addition to, increasing wages employers can use several different means to overcome skill shortages. The wage structures of internal labour markets may deter employers from raising wages for one group because it might require a readjustment for the whole firm or a significant fraction of it (Folk 1970: 156; Osterman 1984: 3). If they are experiencing difficulties in recruiting skilled employees, employers can

---

[8] Since no training analysed in this thesis lasts more than 18 months, it ignores the problems that may occur for long education and training because students base their choice on current wage levels instead of wage levels after completing training (Bosworth and Warren 1992; Freeman 1971).

[9] This type of adjustment is the basis for another indicator of skill shortages, since before skill supply meets demand, skill shortages will show as a higher wage growth for skills in short supply than for other comparable skills. Cain, Freeman and Hansen (1973: 62) therefore argue that 'the most complete indicator of an optimal number in an occupation is the rate of return on investments needed to enter the occupation...A long term shortage would show up as a persistent and significantly higher rate of return for this occupation than for other comparable investments.' Yet according to Meager (1986: 237) this approach 'yielded no practical methods for determining the existence and severity of shortages.'

choose to let current employees work more over-time, retrain existing staff, sub-contract work, reduced entry requirements, intensify recruitment efforts, reduce production, give up plans to increase production or redesign jobs (Folk 1970; Hart 1992; Smith 1990). These actions are typically seen in recruitment surveys as possible employer responses to skill shortages, but they can, at the same time, reduce the probability of experiencing recruitment difficulties in the longer run.

The use of both these two types of adjustment varies between different groups, different industries and different countries, depending on to what extent employers have wanted, or been able, to adapt to a situation with a low supply of a particular skill. For example, legal requirements and occupational licensing may make it difficult for employers to alter the organisation of work to reduce the problems caused by skill shortages. Moreover, employers' ability to use wages to solve problems of skill shortages varies considerably between industries. If the wage structure is flexible, wage adjustments are likely to ensure that skill shortages do not persist. If, on the other hand, wage adjustments are restricted, for example by collective agreements, a shortage may become persistent. Hence, differences in the persistence of skill shortages may reflect differences in wage setting or employers' ability to make types of adjustments other than the supply of training.

Given all these problems with the skill shortage as an indicator, it is clear that even if skill shortages give an indication of at least one type of under-provision of training, it should be complemented with alternative indicators of sub-optimal provision.

Acknowledging the problems of using skill shortages as the sole indicator of inadequate training, it can be complemented with either simpler or more complex measures. However, these have other shortcomings. While the amount of training provided is simpler and more likely to be reliably measured than skill shortage, it does not address the problem of how training is related to skill demand. On the contrary, the concept of 'skill deficiencies' accounts for many of the problems with the

skill shortage indicator, but is inherently extremely difficult to measure precisely.

The amount of training provided is included because it can contribute to the understanding of the nature of possible skill problems in the different cases, and that the success of different institutional solutions in ensuring adequate training provision depends on the success measures applied. However, the amount of training in itself is an unsuitable indicator of whether or not enough training is provided since it does not measure whether or nor skill supply meets demand. It simply does not account for the fact that skill-intensive industries require more highly skilled employees than non-intensive industries do. Thus, a high skill branch may have high levels of training and shortages while a low skill branch has little training and no shortages. Even given that employers demand the same level of skill, the amount of training does not say anything about how the mix of skills relates to the mix of skills employers demand.

Instead of neglecting demand for skills, as does the amount of training indicator, or including only employers' actual demand for skills, as does the skill shortage indicator, the skill deficiency approach is based on the assumption that actual demand for skills does not reflect an 'optimal level.' A 'skill deficiency' is defined 'in the abstract as the difference between current and some suitably-defined optimum level of skills' (Green and Ashton 1992). In the following, skill deficiency is used to denote recruitment problems and skill gaps as well as skill supply problems not reflected in any of these measures.

The rationale for constructing this alternative definition of what constitutes sub-optimal training provision is that 'the level of skill employed in productive activities is a function of the interaction of the general level of skill available in the labour market...with the ways in

which employers decide to make use of their technology' (Green and Ashton 1992: 293). [10]

The adjustments employers make when faced with recruitment difficulties is one reason why the sum of filled positions and actual vacancies might not reflect what would be the optimal level of skills. Green and Ashton (1992: 288) claim that 'there are a host of reasons why companies' actual demand for skilled labour may be socially non-optimal.' For example, they argue that 'it would be a mistake to characterise recruitment difficulties as reflecting the structural skills problem of the UK economy.' One reason is that employers adjust to the problems of recruiting skilled labour, and might choose business strategies that do not require such skilled workers (Finegold 1991; 1988). For example, employers may shift recruitment and training strategies from dependence on an external labour market to a strategy of on-the-job training for unskilled workers.[11] This adjustment alone is a sufficient reason for questioning recruitment difficulties as a reliable indicator of insufficient

---

[10] Thus, the interaction between skill supply and skill demand makes it necessary to establish a new definition. This is not only a critique of the recruitment difficulty approach discussed later. It is also implicit that wages do not have to be particularly high for skills in short supply if employers have organised work so that these skills are not needed, or cannot be utilised effectively (Blaug, Peston, and Ziderman 1967; Gannicot and Blaug 1973; Steedman 1993).

[11] Snower (1996) gives one example of this interplay between the supply of skills and demand for skills. He argues that when employers choose between offering high- or low-skilled jobs, they consider not only the wage difference, but also the number of skilled people. The fewer skilled people, the more difficult it will be to fill the position. This gives rise to a 'training supply externality' because employers will benefit directly if more people do the training. At the same time individuals *deciding* whether or not to invest in training are interested not only in the wages they can expect, but also the number of jobs where the skills are utilised. Thus, there is a 'vacancy supply externality'. These two externalities reinforce each other, which means that there is a tendency for sectors to end up either in a 'low-skill, bad-job trap' or a 'high-skill, good-job equilibrium'.

training, except in the short run. Moreover, it questions the validity of wage developments as indicators of the optimality of skill supply.[12]

Using the skill deficiency approach, it may be that both the employers and the employees could have been better off in a situation with more further education and training, even if employers currently report no problems in recruiting employees with this type of training. The reason is that employers have chosen their business strategy and organisation of work on the basis of the supply of these skills. For example, it has been suggested that Britain's most important skill problems were not caused by insufficient supply, but rather by lack of demand for skills and inadequate skill utilisation (Glynn and Gospel 1993; Keep and Mayhew 1996; Metcalf 1995).

It is evident that employers, to varying degrees, choose their production strategies and organisation of work based on assessments of what skills are available in the labour market and at what cost. Nevertheless, there are two considerable problems with replacing the skill shortage measures with the concept of skill deficiency. The first is to define what the optimal amount of skills is, and the second is how to find operational measures of gaps between actual and optimal skill provision. In addition to the problem of finding a suitable benchmark with which to compare performance, the application of the skill deficiency concept in empirical studies requires us to establish a link organisational policies with market outcomes, by demonstrating that under-performance in the product market is caused by problems in the supply of skills.

An analysis of skill deficiencies requires both a theoretical and an operational definition of 'some suitably-defined optimal level of skills'. Green and Ashton (1992: 288) do not suggest any definition of such an optimum, but refer to research that has taken what they call 'a pragmatic approach to skills deficiency.' In this pragmatic approach, 'implicitly, the

---

[12] Later in this chapter, the link between endogenous transferability and optimal training is discussed.

optimal skill level is seen as that which is used in economies operating at the skills frontier...The explicit criterion for judging other countries' solutions to be optimal is frequently taken to be that of competitiveness.'

The problem with the 'implicit' criterion is that it is based on the assumption that the higher the skills, the closer to the optimum. If this criterion is used, this approach is in principle the same as just using the 'amount of training' as an indicator. The 'explicit' criterion relies on the questionable assumption that investments in training will necessarily improve competitiveness and that the skill level is a crucial factor in determining the competitiveness of firms. One first problem with these assumptions is that it is not necessarily true that investments in training will increase competitiveness. As with other investments, investments in training do not always improve companies' competitiveness or increase their profits. Moreover, many other factors might be considerably more important for the competitiveness of firms than the training their employees get. Even if it might be shown that, on average, training improves the economic performance of firms, economic performance cannot be a reliable indicator of skill deficits as long as training is not a necessary and sufficient condition for economic success.

An optimal level is difficult to determine empirically. The cost minimising use of production factors will depend on the cost of each of the factors, and the optimal input of a given production factor will therefore depend on its relative price (Shackleton 1992: 19-20).[13] Thus, the optimal level will depend on characteristics of the labour and product market in which the skill is applied. However, the problem of defining one optimal level may be avoided in a comparative study, if it is shown that the case with higher skills is also the most successful, as measured, for example, by relative profitability (or relative export growth or shares etc.). Then one does not have to define one optimal level, but can rely on

[13] A basic proposition of micro-economic theory is the assumption that production factors are more or less substitutable, and that a given quantity of a product can be produced with different combinations of the production factors.

the difference between two or more cases to draw conclusions. This has been attempted in a series of comparative studies of plants in Britain and countries on the continent, which concluded that the relatively low levels of skills in British companies was a major reason why they were less competitive than their German counterparts (Mason, van Ark, and Wagner 1996; Prais 1995; Steedman 1993).[14] But if the focus is on the supply of training, as it is here, it must also be shown that the reason why employers have chosen the less efficient and cost-effective strategy is that they have faced problems in recruiting skilled employees (Marsden 1995: 92). Moreover, since one cannot generalise from these studies to other sectors or other countries, it is still possible that both firms with low-skills strategies and firms with high-skills strategies prove equally profitable and successful so that it in principle it is impossible to specify an optimal level of skills (Ashton and Green 1996; Cappelli and Crocker-Hefter 1993; Shackleton 1992). For example, countries may adopt different competitive strategies in order to exploit their comparative advantages.[15]

All in all these points suggest that even if the skill deficiency concept comprises important aspects not included in the definition of skill shortages proposed earlier, studies applying the skill deficiency approach must solve other substantial validity and reliability problems. The empirical analysis will next attempt to answer the question of whether or not there are skill deficiencies in the four sectors by discussing to what extent there are problems caused by inadequate further training offers,

---

[14] In fact, for example Mason, van Ark and Wagner (1996) do not show directly that German producers are more profitable than their British counterparts. They show that German companies produce higher-quality products (biscuits), and that this is likely to be explained by the differences in skill levels between the two countries. But since British producers to a large extent produce for their domestic market, and there is little international trade, the British strategy is not necessarily inferior to the German, but only reflects a difference in taste and preferences between the two countries.

[15] Logically, 'skill deficiency' can also be 'negative,' implying that the current skill level is higher than the 'suitably-defined optimum level of skills,' but this possibility is not discussed by Green and Ashton (1992).

deficient skill utilisation, or forced business strategy choices because of insufficient training. The analysis will indicate what some possible deficiencies are, depending on the institutional solutions in the different cases, by comparing the results on the three sets of indicators.

7.4.4 Selecting indicators of insufficient training

The points above on the theoretical dimensions of optimality have bearings on way sub-optimality of training provision could and should be measured. The over-riding problem is to make the trade-off between reasonably good measures of a narrow concept or more questionable measures of broad one. In this thesis the first option is selected, but as this theoretical discussion would suggest, and the empirical evidence will support, this might have significant implications for the conclusions to be drawn from the case studies.

The hypotheses presented at the beginning of the chapter refer to an optimal amount of skills. Instead of discussing optimal skill levels directly, the empirical study will use a negation of the optimality concept, assessing different forms of sub-optimality. Persistent skill shortages, skill shortages that remain even during a downturn, constitute the main test of sub-optimal training that will be used. However, as the discussion has shown, such shortages do not necessarily fully reflect possible problems of skill provision. Therefore, the measures of skill shortages will be supplemented by the broader concept of 'skill deficiencies.' Finally, given the potential problems of these first two complex measures, the simple measure of amount of training provided is used as an additional indicator. This use of multiple indicators is in line with previous studies of skill shortages and skill deficiencies, which strongly recommend that several different indicators should be used (Meager 1986: 242; Senker 1992: 10). Liff (1992: 84) argues that

> The current state of research suggests that one has to make the best of a variety of approaches with strengths and weaknesses. In such

circumstances it is important to use the widest range of measures available in order to be in the best position to distinguish between contradictory evidence.

The conclusion will also show the importance of using different indicators by suggesting that the two theories tested will tend to perform systematically differently on the three different measures.

7.5 Outcomes

This part presents the results from the four cases, to see to what extent the predictions from the two rival theories are supported or not. To facilitate comparison between the four cases, the results for all sectors are compared for each of the three types of indicators discussed above.

7.5.1 Skill shortages and gaps

First, some data that directly compares skill shortages and gaps in the four cases are presented. However, these are not sufficiently detailed and will therefore be complemented with more specific information on skill shortages in each case. A problem with measuring skill shortages, in the case of further training, is that of distinguishing between problems caused by further training and not only by initial training. The skill shortages presented must necessarily measure combinations of initial and further training. Yet, as the results will show, the available data effectively distinguish between skills from initial and further training in a way that makes it possible to draw conclusions about whether or not the problems are primarily related to initial or further training.

There have been changes in the reporting of recruitment problems and vacancies in the 1980s and 1990s, so one single time series cannot be used to show persistent skill shortages. Nevertheless, the data, especially from the Norwegian Recruitment Survey, give valuable results from comparing the four cases in this study. The main benefit of this survey is

that it is based on vacancies advertised in newspapers and journals, in addition to those reported to the job centres, which is a considerable advantage since many employers do not use the job centres in the recruitment process.

The Recruitment Survey shows that, in 1995, 11.5 per cent of vacant positions remained vacant after the recruitment process was completed. The same ratio was 13.5 per cent in 1993. The most important reason why they remained vacant was the lack of qualified candidates (Larsen 1996: 58-59). Of the total number of vacant positions, 5 per cent of positions in 1993 and 6 per cent of positions in 1995 were not filled because the employers had not found qualified candidates (Larsen 1996: 64-65).

Table 7.5 Percentage of vacant positions that remained vacant because of lack of qualified candidates by industry

Industry	1990	1991	1993	1995
Health and veterinary services	12	13	13	12
Metal industry	11	13	(5)	4
Financial sector (banking, insurance etc.)	7	8	4	4
Teaching and research	4	6	5	2
National average	8	8	5	6

Note: ( ) denotes that there are less than 40 observations in the cell. N for each cell is not reported, but except for metal industry in 1993 there are more than 40 observations in each cell. The data for 1990 are the simple average of the surveys in February and in August.
Source: Larsen (1991: 33; 1992: 45; 1996: 64-65).

Table 7.5 indicates that in the first part of the 1990s employers in the health service, including the hospitals, experienced skill shortages more often than the three other industries. During all the four years shown in this table, one in eight vacant positions in health and veterinary services remained unfilled due to lack of qualified candidates. For the three other industries, and Norwegian employers in general, the proportion of unfilled vacancies fell from 1990/1991 to 1993/1995. The financial sector

and teaching and research in all four periods reported fewer skill shortages than employers in the health sector did. Finally, while employers in the metal industry experienced skill shortages similar to the health services in 1990/1991, the shortages were below the national average in the two latest periods.

The problem with table 7.5, for the purpose of this chapter, is that it does not say for which particular groups within the industries the skill shortages occur. Partly because of the limited size of the data sets, since such data are available only for 1987. The data then showed that among the cases in this study, there were most shortages of nurses. Employers in the health sector then had what was called 'unmet needs' of 13 per cent more nurses than they currently employed.[16] The same ratio was 10 per cent for engineers in the metal industry and only 1 per cent for general teachers (Arbeidsdirektoratet 1987: tables 3 and 4).

Table 7.6 Percentage of vacancies remaining vacant because of lack of qualified candidates, by type of higher education preferred in the position.

Preferred education	1993	1995
Health care (including nurses)	14	12
Technical or science (including engineers)	18	4
Culture and education (including teachers)	10	8
Average higher education	8	7

Note: Each cell has at least 40 observations. The average also includes 'no subject specified' and 'subject of no importance'. *Source:* Larsen (1996: 76).

Table 7.6 shows the pattern for three of the four occupational groups more recently, but this is not confined to those industries that constitute the four cases in this study.[17] This table supports the impression from

[16] The problem with the concept 'unmet needs' is that it may either mean unfilled vacancies, but it can also relate to 'needs' that are not reflected in vacancies, for example if hospitals, due to budget constraints, cannot afford to hire more nurses, even if this negatively affects the patients' health.

[17] Previous editions of the recruitment survey did not distinguish between lack of qualified candidates and other reasons why positions remained unfilled.

table 7.5 that there have been significant skill shortages of nurses in general hospitals. There also seems to have been more shortages of teachers than of other groups of employees in the teaching and research sector. For engineers, the 1993 figure of 18 per cent unfilled vacancies suggests that there may have been more shortages of engineers than of other groups in the metal industry, but the figure in 1995 is much lower, reflecting the volatility of shortages in the engineers' case. Data for 1996 and 1997 confirm that skill shortages are largest for nurses and smallest for teachers, while more fluctuating for engineers (Arbeidsdirektoratet 1997: 34-35).

All in all these data have shown unequivocally that there have been most skill shortages among nurses. There have been much smaller shortages of general teachers, while the shortages of engineers in the metal industry have been smaller than for nurses and larger than for teachers. The shortages among engineers have varied more over time than for these two other groups. These data do not, however, distinguish between those who have and those who do not have further training, so additional information about each case is necessary to provide valid indicators of possible shortages of skills from further training.

More detailed information about the nurses' case confirms that there have been persistent skill shortages among nurses, and that they have been especially large for specialist nurses. Already in 1986, 7.1 per cent of nurse positions in non-psychiatric hospitals were vacant or filled with other than qualified nurses (Hofoss and Buxrud 1987: 33), and the lack of specialist nurses was a matter of particular concern (Skaar 1988).

According to the Ministry of Health and Social Affairs, available official statistics do not adequately measure the number of vacant nursing position in hospitals. But a study done by the Nurses Association indicates that more than one in four positions for anaesthesia nurses, intensive and operation nurses are either vacant or filled with nurses without specialist training (St meld nr 44 (1995-96): chapter 5). Thus, skill

shortages of specialist nurses are clearly larger than for those without specialist training.

One report focussing specifically on intensive care nurses gives more information about skill shortages of this type of nurse with internal specialist training. A study by The Norwegian Board of Health in December 1998 showed that 17 per cent of intensive nurse positions were vacant and had been vacant for at least four months (Statens helsetilsyn 1999).[18] However, since hospitals may choose to employ nurses without specialist training, if they cannot get specialist nurses, the magnitude of the skill shortage is even larger than the vacancy figure indicates. On average 33 per cent of nursing positions in intensive care units were filled with nurses without specialist training. Hospitals do not necessarily want all positions in intensive care units filled with specialist nurses, given the higher cost of those compared to nurses without specialist training. Yet, there is little doubt that skill shortages have forced hospitals to hire a larger proportion of nurses without specialist training than they would otherwise have.[19] So there is clear evidence of significant and persistent skill shortage of nurses with specialist further training.

Nevertheless, using an approach similar to the 'market approach' to skill shortages, Skaar (1988) claims that the lack of specialist nurses is not caused by a too small stock of nurses with such further training. The problem is rather that too few of those with specialist training work in specialist nurse positions, that is, a matter of allocation rather than the supply of skill *per se*.[20] She demonstrates that there are enough specialist nurses to fill all specialist nurse positions, but argues that there are skill shortages because 50 to 60 per cent of them work in other positions (Skaar

---

[18] The results for each hospital are presented in Appendix 4.

[19] Given the relatively small wage premium given to specialist nurses, there is little to suggest that hospitals have preferred nurses without specialist training to reduce costs.

[20] Skaar describes the situation in the 1980s, but the question is relevant for the 1990s, too, given the persistent shortages of specialist nurses.

1988: 10-13).[21] However, this example shows why this 'market approach' to skill shortages is questionable. The same report shows that specialist nurses on average have longer tenure in their current positions than nurses and auxiliary nurses in general (Skaar 1988: 20). Moreover, it shows that 22 per cent of all nurses with specialist training work in leading positions or are teachers (Skaar 1988: 12). These are positions where they are likely to make good use of skills from the specialist further training. Thus, the problem for this market approach interpretation is to establish whether the problem in practice is one of skill supply rather than of allocation of skilled people. Claiming that the problem is one of allocation if there are more skilled people than the total number of positions where the particular skill is demanded, neglects the fact that people may not be mobile or that some, sooner or later, may want to change their job tasks. So even if one argues, as Skaar does, that skill shortages would be smaller if the specialist positions were made more attractive through a better work environment or through higher wages, it is problematic to use the data to claim that it is not a problem of skill supply. What is important over time is that the skill supply meets the demand, and the number of skilled people who take other jobs is one factor that affects demand.

The results above showed that skill shortages among teachers apparently are smaller than for nurses with specialist training. But in the teachers' case vacancy data underestimate the further training problem. The reason is that general teachers have the right to teach all subjects in primary and lower secondary schools independently of which subjects they have specialised in. Thus, positions may be filled, but they are not necessarily filled by teachers who have the educational background schools prefer. Such skill gaps have been a matter of concern and debate in the teachers' case (Grunnskolerådet 1989; Lærerutdanningsrådet 1985; Næringslivets Hovedorganisasjon 1991; Statens lærerkurs 1994). The

[21] The exception is for intensive nurses, who would not fill all vacant intensive nurse positions even if all with such specialist training worked in these positions.

reason is that, at least in lower secondary school, it may be difficult for teachers without sufficient educational background in the subject to give high quality teaching, even if experience to some extent can compensate for lack of formal specialisation.[22]

Table 7.7 Teachers' educational background in subjects they teach. Lower secondary school. Per cent. 1994

Subject	<10 credits	10 - 19 credits	20+ credits	Sum	N
Religion	74.0	6.8	19.2	100	5,367
H. E.	54.4	8.7	36.9	100	2,278
Mathematics	50.3	20.9	28.8	100	6,342
Art	48.4	14.8	36.8	100	3,612
P.E.	47.1	15.3	37.6	100	4,773
Sami	46.5	25.6	27.9	100	43
Norwegian	44.4	14.0	41.6	100	7,176
Music	40.8	15.5	43.7	100	2,168
Social studies	39.7	13.1	47.2	100	6,252
Science	33.8	19.4	46.8	100	4,502
English	26.8	15.2	58.0	100	5,840
German	24.0	2.3	73.7	100	2,185
French	17.8	3.3	78.9	100	488
Weighted average	44.4	14.0	41.2	100	51,026

Note: Teachers usually teach more than one subject, so the sum of N is larger than the sum of respondents.
Source: Statens lærerkurs (1994).

Table 7.7 shows that on average 44 per cent of teachers in lower secondary school have less than 10 credits, a half year's full time study, in the subjects they teach. Foreign language teachers have the strongest educational background according to the table, while only one in four religion teachers have 10 credits or more in the subject. Moreover, in science and social studies the lack of specialisation is underestimated. The

[22] More details on this debate were given in chapter 5.

reason is that studies in biology, chemistry or physics all are sufficient to be counted as educational background in science. Likewise, studies in history, geography, political science or sociology all count as social studies education. Half the teachers in mathematics, one of the basic subjects, have less than a half-year study in the subject. Hence, table 7.7 lends support to the claim that there is a skill gap that does not show in vacancy and recruitment data.

For the topic of this chapter, it is of special interest to what extent the problem has been persistent and to what extent further education has reduced the problem over time. Table 7.8 shows the development from 1974 to 1994. Since new teachers have been recruited during the period, the table shows not only the effect of further education and training. Moreover, it does not include teachers who have taken further training but do not teach the subject they have taken further training in. Thus, some changes may be due to changes in the allocation of teaching tasks rather than changes in teachers' educational background. Still, the table gives a good indication of to what extent skill shortages have persisted, and what the combined effect of further training and new recruitment has been.

Table 7.8 Teachers by educational background in subjects they teach. Average. Per cent

Educational background	1974	Change 1974 – 1984	Change 1984 – 1994	Total change 1974 – 1994	1994
Less than 10 credits	59.1	-10.4	-4.8	-15.2	43.9
10 – 19 credits	2.1	6.2	5.0	11.2	13.3
20 credits or more	38.8	4.2	-0.2	4.0	42.8
Sum	100	0	0	0	100

Note: Sami and French are excluded, as they were not included in 1974. N for 1994 is the same as in Table 7.6. Total N in 1984 was 2,423, while N in 1974 is not reported.
Source: Statens lærerkurs (1994: 8).

Table 7.8 shows that the share of teachers with at least 10 credits in subjects they teach has increased by 15 per cent over the 20-year period from 1974 to 1994. However, the larger share of this increase has been among teachers with less than one year (30 credits) of education, and the table also shows that the increase was larger in the first period than in the later.

Table 7.9 Teachers' educational background in subject they teach, by subject. Per cent

	1974	1974 – 1984	1984 – 1994	1974 – 1994	
Subject	% with at least 10 credits	Change in % with at least 10 credits	Change in % with at least 10 credits	Change in % with at least 10 credits	Of which, change in % with at least 20 credits
Religion	15.1	7.6	3.3	10.9	5.3
P. E.	26.4	17.8	8.7	26.5	14.1
Norwegian	34.5	14.4	6.7	21.1	9.3
Maths	35.8	6.0	7.9	13.9	-4.1
Art	37.0	7.9	6.7	14.6	1.5
Music	37.2	17.9	4.1	22.0	10.0
Social studies	38.9	24.0	-2.6	21.4	9.3
Science	44.5	20.2	1.5	21.7	4.4
H. E.	48.2	1.2	-3.8	-2.6	-10.3
English	56.3	13.4	3.5	16.9	5.1
German	75.3	-15.7	16.4	0.7	-0.8
Average	40.8	10.4	4.8	15.2	4.0

Note: Sami and French are excluded, as they were not included in 1974. N for 1994 is the same as in Table 7.6. Total N in 1984 was 2,423, while N in 1974 is not reported.
Source: Statens lærerkurs (1994: 8).

The question then is to what extent the gaps have decreased most in the subjects where there were most gaps. Table 7.9, where the subjects are

ranked according to the proportion of teachers who had at least 10 credits, shows that there is no indication of such a trend. Thus, recruitment and further training combined have overall reduced skill gaps, but there is little evidence that they have reduced them any more or any less in subjects where few had at least 10 credits in 1974. Table 7.9 also shows that, except for Home Economics and German, the share of teachers with at least 10 credits in the subjects they teach has increased by more than 10 per cent from 1974 to 1994. But only in physical education and music has the share of teachers with at least one year of education risen by more than 10 per cent.

Another question is to what extent the reductions in skill gaps in 'core subjects' have differed from those in other subjects. NHO claims that too few teacher students choose to specialise in 'core subjects,' such as Norwegian, English, mathematics and science, and that this 'bias' is not reduced through further education and training (Næringslivets Hovedorganisasjon 1991: 7). According to table 7.9, NHO is incorrect in claiming that fewer teachers have specialisation in core subjects than in other subjects. However, the organisation is right in claiming that the decrease in skill shortages over time is not larger for these skills than for others. Table 7.9 shows that the increase in share of teachers with at least 10 credits is largest for physical education and music, but also that the increase for Norwegian, English and Science has been above average. Thus, the changes in skill gaps do not differ significantly between 'core' and 'non-core' subjects.

As in the teachers' case, there is reason to believe that data on vacancies and recruitment problems may not suffice as indicators of sub-optimal skill provision in the insurance case. The reason is a 'recruitment stop' *(ansettelsesstopp)* triggered by the introduction of improved IT systems. Therefore, insurance companies recruited few new employees in the late 1980s and the first part of the 1990s, even if there was not a literal

halt to all recruitment. Instead, the employers sought to fill skill needs with their existing employees.[23]

Table 7.10 Percentage of managers in the insurance industry very or somewhat dissatisfied with their employees' skills and knowledge compared to job requirements, by subject. Per cent

Subject	%
Business administration	23
Organisation and management	21
Economics	21
English	20
Damage prevention	19
Reinsurance	19
Financing, mortgage law, etc.	17
Insurance law	13
Mathematics and statistics	13
Marine insurance	13
IT	12
Group insurance	11
Business insurance	11
Life insurance	10
Structure and organisation of the insurance industry	8
Fire and combined insurance	4
Other non-life insurance	4
Motor insurance	3
Average	12.7
N	126

Source: MMI (1989).

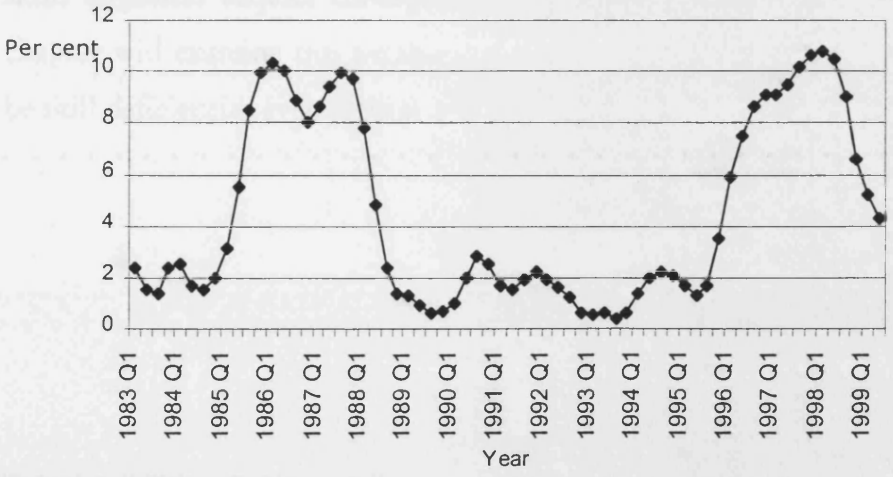
Survey data from 1989, presented in table 7.10, are the newest available on skill gaps in the insurance industry. It shows that on average only 12.7 per cent of managers in the insurance industry were somewhat or very

[23] According to FL representatives, this was partly due to pressure from the employees'

dissatisfied with their employees' skills listed in the table.[24] Managers are most satisfied in insurance specific skills, and most dissatisfied in areas such as business administration, management, economics and English. In other words, NAI training, formal internal training and informal training have given employees sufficient skills in most directly insurance-related areas. Additional data in the survey showed that employees were most interested in taking further training in those same areas where managers were dissatisfied with their skills, which is an advantage for employers who want to bridge the skill gaps (Johansen 1999: 59; MMI 1989). Thus, even if the data are not updated enough to give results that are necessarily valid in the 1990s, the results indicate that employers in the insurance industry have had only limited recruitment problems, but also that the skill gaps have been modest.

In the engineers' case, there have been skill shortages of engineers, but these seem primarily to have been cyclical. Moreover, it is difficult to see whether there have been particularly large shortages for engineers with specific types of further training.

Figure 7.2 Percentage of employers in manufacturing reporting lack of labour restricting production. *Source:* Statistisk sentralbyrå (1999: table 16).



organisations. Interviews with FL representative and Group of FL representatives.

[24] The question did not distinguish between whether the problem was that too few had these skills or that the employees had a too low level of competence in these areas.

Figure 7.2 shows how skill shortages in manufacturing more generally have varied over the business cycle. While between 8 and 11 per cent of employers reported skill shortages restricting production in the two periods of high activity 1986 to 1988 and 1997 to 1998, this share was under 3 per cent for most of the period from 1983 to 1999.

Thus, it is as expected that employers in the metal industry reported considerable recruitment problems for engineers at the peak of the business cycle in 1998, and that fewer did so in 1999. In 1998, 36 per cent of employers reported that it was 'very difficult' to recruit engineers, while the corresponding figure had fallen to 28 per cent in 1999 (Teknologibedriftenes Landsforening 1998; 1999).[25] Still, the evidence presented here combined with tables 7.5 and 7.6 clearly suggest that skill shortages of engineers in the metal industry first and foremost are a cyclical phenomenon, and not persistent. Even if recruitment problems for engineers overall are modest, there could be severe and persistent shortages of engineers with some types of skills, for example skills acquired from further training. Nevertheless, no figures, reports or interviews suggest that there have been persistent skill shortages of the skills engineers acquire through further training. The next part of the chapter will examine this paradox by assessing to what extent there may be skill deficiencies even if there are few skill shortages.

[25] Unfortunately, earlier versions of the publications do not contain this question, so the figures cannot be compared directly to recruitment problems previously. A likely explanation of why the questions of skill shortages were not included earlier is that these, as expected from figure 7.2, were not perceived to be significant in previous periods.

Table 7.11 Summary of revised predictions and outcomes: skill shortages and gaps

	Nurses	Teachers	Insurance	Engineers
Revised H_0 prediction of skill shortages and gaps	Many	Many	Few	Few
Revised H_{alt} prediction of skill shortages and gaps	Many	Many, because of nature of collective agreement	Few	Many
Outcome	Yes	Some	No	Few, volatility

Table 7.11 summarises the skill shortages results, and compares them with the revised predictions of the two theories. It shows that in those three cases where the two revised predictions are most similar, the results also confirm both theories. In the nurses' case, skill shortages are most severe, which is as predicted by both but for different reasons. While the problem according to H_0 is that wage premiums for undertaking further training has not been high enough, the H_{alt} explanation is that the collective action problem of the costly specialist training has not been solved. Similarly, while both theories predicted few skill shortages in the insurance case, a prediction that was confirmed, the logic differed. While the H_0 explanation is based on the employers' ability to adjust wages to encourage employer investment in the type of training employers need, the H_{alt} prediction is based on the collective action by employers to increase the amount of training. In the teachers' case, the problem according to both H_0 and H_{alt} is that the collective agreements include no link between employers' needs and employees' further training. Thus, the only case that can differentiate between the two theories is the engineers.' As the table shows, the results are clearly most in line with H_0. Thus, the results give clear support to H_0, and less to H_{alt}.

Still, the differing logic that the two theories use to get the similar predictions in the nurses, teachers' and insurance cases, prompts a closer examination. This will be done first by analysing the results on the amount of training and skill deficiencies, and then by studying how employers' collective action and market adjustments can contribute to explaining the findings on the three indicators.

7.5.2 Amount of training and skill deficiencies

While the previous section has shown the variation of skill gaps and shortages between the four cases, this section will supplement these findings with an analysis of the extent these skill shortages reflect deficiencies and whether there are skill deficiencies not reflected in the data presented above. Finally, the findings on the first two indicators will be complemented with measures of how much further training is undertaken This leads to a discussion of how the findings on the three indicators may be interpreted. The results will show that even if the teachers and nurses undertake most formal training, there are clear problems of skill provision, mainly reflected through skill shortages. In the engineers' case, there is less further training, but no persistent skill shortages. Still, there is some evidence that there is a skill deficiency not reflected in the measures of skill shortages. Finally, in the insurance case, there is little evidence of either skill shortages or skill deficiencies.

A problem associated with studying skill deficiencies in the teachers' and nurses' cases is this: that the notions of skill deficiencies and low skill equilibrium usually denote problems of skill provision in private sector cases, where a shift to higher skill and higher quality production could lead to increased profits (Finegold 1991; 1996; Finegold and Soskice 1988). There is no direct link between quality and income within the Norwegian system of hospital and school financing. Therefore, an analysis requires a case-by-case consideration of whether or not apparent skill deficiencies are caused only by the fact that there may be no budget to pay for higher skilled workers. Given the severe negative consequences of the

lack of specialist nurses and all attempts by hospitals to attract them, and moreover the overall limited wage premium for specialists, there is little support for the interpretation that the problem is mainly one of cost considerations. In the teachers' case this conclusion is even clearer, since the problem has not been that employers have not remunerated further training, but rather the way remuneration has not reflected employers' needs.

Previous studies have compared skills, organisation and productivity in the same industries in different countries to draw conclusions on skill deficiencies. Such studies which require, as described earlier, very careful analysis to infer the link between skills and productivity, have been unavailable for this study. Instead, given the limits to available data, the analysis here is a discussion of to what extent the skill shortages are indicators of employers having severe skill problems in the running of their organisations and to what extent there are indicators of problems of skill provision and utilisation that are not represented by skill shortage indicators.

In the nurses' case, the problem of skill provision is primarily the skill shortages described earlier. There is clear evidence that shortages of specialists have restrained production significantly over a long period of time. A government-appointed committee in 1997 said that the lack of specialist nurses and doctors was a problem not only for patients who had to wait for treatment, but that the shortages created quality differences between different regions, made management spend too much time and resources on recruitment, and increased strains on employees because of high turnover and lack of personnel (NOU 1997:2 : chapter 9). The severity of the problem was underlined by a 1999 study which found that skill shortages of specialist nurses were the most important cause of capacity problems in intensive care units, with 29 of 30 hospitals reporting lack of specialist nurses as a factor restricting production (Statens

helsetilsyn 1999: 2).[26] The regional hospitals in 1996 said that 'one of the bottlenecks in hospitals is the lack of specialist nurses' (Holter et al. 1996: 6). However, the problem has existed even longer. Already in 1988, the government's explanation for long waiting lists for operations at hospitals was a lack of specialist nurses already in 1988 (Skaar 1988: 1). So in the nurses' case there is little doubt that the persistent skill shortage has reflected a severe skill supply problem.

The hospitals have not done very much to change production strategies or organisation of work to cope with the shortages. The most important exception is the attempt to reduce the need for operation nurses by giving auxiliary nurses up-grading training.[27] In practice, such up-grading training could make it possible for employers to replace one of two nurses assisting doctors during operations with an auxiliary nurse, and thus reduce the need for specialist nurses.[28] The move has however been strongly opposed by the Nurses Association, and nurses have taken action to oppose employers' attempts to replace nurses with auxiliary nurses.[29] Still, up-grading training of auxiliary nurses has not so far reduced by very much the overall demand for specialist nurses.

In the other public sector case, for the teachers, the skill gaps described earlier in the chapter show a significant skill provision problem. However, it has been a matter of long-lasting debate how critical these skill gaps are and if skill deficiencies not covered by these measures are not at least equally important. Teachers have been more dissatisfied with how

---

[26] By comparison, figure 7.2 shows that even at the peak of the business cycle in 1998, around 11 per cent of employers in manufacturing reported that lack of labour restricted production.

[27] Interviews with RHHS representative, Representative of the Norwegian Board of Health and Personnel manager for hospitals outside Oslo

[28] Interview with Personnel manager of hospital outside Oslo.

[29] In 1995, the Labour court favoured KS in its case against the Nurses Association, saying that the Nurses Association had violated the collective agreement and acted unlawfully by not *acting* to stop actions by their members to oppose up-grading training for auxiliary nurses (Kommunenes sentralforbund 1996).

their basic training fitted their work tasks than other comparable groups have (Jordell 1991), and consequently one must expect significant skill deficiencies if further training does not compensate for inadequacies in the basic training. Formal education in particular subjects may then be only one of several areas where further training is needed. For example, it may be that the more important problems are that teachers lack other types of skills, such as pedagogical skills, or skills primarily obtained through informal training. A sticking point is whether pedagogical skills or educational background in a particular subject are the more important in comprehensive schools. The law regarding Teacher training incorporates the view that pedagogical skills are more important, since it argues that general teachers *(allmennlærere)* have the right to teach any course in comprehensive schools. However, teacher training might not ensure sufficient knowledge of the subject to ensure good teaching, at least not in the lower secondary school.[30] There have therefore been discussions and reports regarding whether or not subject specialisation should be a criterion not only in recruitment, but also as a condition for teaching a subject in lower secondary school (Næringslivets Hovedorganisasjon 1991; St meld nr 40 (1990-91)). For example, the national Comprehensive Education Council *(Grunnskolerådet)* and the Teacher Training Council in 1989 recommended that general teachers should not automatically be allowed to teach all courses in lower secondary school (Grunnskolerådet 1989). The Ministry of Education and Research argued, however, that strict conditions requiring teachers to have a half or one year of education in a subject to be permitted to teach it in lower secondary school would lead to too much inflexibility. Moreover it would, in practice, be difficult for small schools to recruit good teachers (St meld nr 40 (1990-91): 125). Hence, there is currently no legal restriction on what general teachers can teach in comprehensive schools, but schools must provide information about which subjects they need teachers for when they advertise vacant

[30] Interview with the Teachers Association representative.

positions.[31] The case has not only been a matter of practicalities and pedagogical views, but also a conflict between the two major teachers' organisations.[32] NL, whose majority of members have general teacher *(allmennlærer)* training, has argued that this pedagogical education is suitable for teaching at all levels in comprehensive schools. The Teachers Association, whose members are mainly teachers with a more specialised university education, has on the other hand claimed that a general teacher education is not sufficient to teach in subjects such as maths and science at the lower secondary level.[33]

Skill shortages for engineers were shown to be cyclical and short-lived. However, it has been argued that there is still a skill deficiency in this case. Based on in-depth studies of a small number of firms, Havn and Huitfeldt (1994: 114) claim that there is under-utilisation of engineers' skills, and that further training for engineers is, to a large extent, 'arbitrary, ad hoc, and directed at satisfying short-term needs.' These results are however not directly generalisable. Moreover, it is difficult to see how Havn and Huitfeldt can make a valid judgement about the engineers' case without explicitly comparing them to other groups or to engineers in other countries or industries. Thus, there remains a lack of data that may convincingly show whether or not, or to what extent, there is a skill deficiency in the case of engineers' further training. Any such study will however face significant problems.

One problem is that employers may adapt to skill deficiencies in subtle ways because there are no clear and strict boundaries between the tasks of technicians, engineers and graduate engineers, and employers therefore can partially substitute engineers with those from either of the

---

[31] Interviews with the Section for Continued Training of Teachers representative and the Teachers Association representative.

[32] Interviews with the Section for Continued Training of Teachers representative and the Teachers Association representative.

[33] In recent years the differences between the two unions have decreased since they have recruited members with similar educational backgrounds (EIRO Online 1998).

two other groups (Benum 1975; Eldring and Falkum 1995; Halvorsen 1994; Havn and Huitfeldt 1994; Holter 1961; Sørensen 1989). Such changes may be very difficult to trace.

Another problem is that management and engineers may have very different opinions on the existence of such deficiencies. Interviews from one turbine producer may illustrate the problem. These personnel and training managers said:

> What we have seen is that we have more than enough engineers and technical competence, but what we usually lack in day-to-day running is better understanding of economics and business.[34]

The NITO representative in the company, on the other hand, said:

> In technical skills, it [further training] has been virtually non-existent. The only such training, comes about if individual employees ask for training, and then it is usually in some computer programme...It is not basic technology, which we actually depend on when we develop a product, as we do.[35]

With such conflicting assessments of the situation, any study would have to make delicate decisions concerning the basis of any evaluation.

The final, perhaps most difficult problem in the engineers' case, is the difficulty of assessing, even at the level of the individual engineer what it means to have sufficient skills within an area. An engineer in an offshore company illustrated the problem:

> It is clear that what you always long for is to know if you could have done it [a job task] in a better way. It is not the case that you lack competence and don't know how to tackle the job. I believe that it is rather that you could have done things differently.[36]

Hence, it would be very difficult to assess to what extent there is a skill deficiency in the engineers' case despite the small and non-persistent

---

[34] Interview with Personnel manager, turbine producer (B)

[35] Interview with NITO representative, turbine producer (B).

[36] Interview with NITO representative, offshore contractor.

skill shortages. The conclusion of this chapter will discuss different theoretical interpretations of the engineers' case, focusing on the link between amount of training, skill shortages and skill deficiencies.

The insurance case is the only one where there are no data to suggest that there have been significant persistent skill deficiencies. The Norwegian insurance industry has overall tackled what internationally has been called a great challenge, namely that of adapting a workforce with an increasing average age and little formal education to considerable changes in the industry (Bertrand and Noyelle 1988).[37] One might argue that the challenge has been overstated, because the older employees have been more adaptable than presumed, or because further training is not the main reason why employers have managed to cope with an ageing stock of employees and major changes without many dismissals or skill shortages. Nevertheless, even if it cannot be taken directly as an indicator of the success of training policies, there are least no indications of the opposite.

While this limited analysis of skill deficiencies confirms the pattern of skill shortages, with the possible exception of the engineers' case, the amount of training provided, estimated in appendix 4, shows little correlation with these first two indicators. It shows that teachers and nurses clearly are the two groups who undertake most formal further education and training.

7.5.3 Conclusion outcomes

Table 7.12 summarises the outcomes on each of the three indicators, and compares these with the two revised predictions.

[37] Interviews with Personnel manager, large insurance company (A), FL representative, Group of FL representatives, NAI representative and FA representative.

Table 7.12 Summary of revised predictions and outcomes: skill shortages, skill deficiencies and amount of training

	Nurses	Teachers	Insurance	Engineers
Revised H_0 prediction of skill shortages	Many	Many	Few	Few
Revised H_{alt} prediction of skill shortages	Many	Many, because of nature of collective agreement	Few	Many
Skill shortages and gaps	Yes	Some	No	Few, volatility
Skill deficiencies	Yes, reflected in skill shortages	Yes, reflected in skill gaps	No evidence suggests deficiencies	Some indications
Amount of training	High	High	Medium	Medium

The results are broadly in line with the revised H_0 predictions since, with the possible exception of the engineers' case, the pattern of skill deficiencies is the same as for skill shortages.

However, the resemblance between the two revised predictions makes it difficult to use the outcomes directly to support either theory, and therefore leaves the confirmation or weakening of the two theories to the interpretation of each individual case. This interpretation is a matter not only of theoretical support; it also has significant policy implications. The nurses' case is a clear example. According to H_0, skill deficiencies are caused by the limits to wage premiums employers can give to specialist nurses, which means individuals have insufficient incentives to invest in further training. According to H_{alt}, on the other hand, the problem is that there has been no collective action to ensure that employers provide enough specialist training. The ultimate test would have been to see what impact the significant wage increases after 1997, if they were more widespread, would have had on training if specialist training remained

internal.[38] If more nurses did specialist training, and there were fewer shortages, H_0 would be confirmed. If, by contrast, there were less training, H_{alt} would be confirmed. Finally, if there were less training, but fewer shortages, it would confirm that wage flexibility might be more important for adapting to skill shortages than providing sufficient training.

The remaining part of this chapter will critically evaluate the link between the two theories and the three different indicators of 'success', and question the inference that the outcomes support the human capital explanation.

One question is how to interpret the finding that even if teachers and nurses do most further training, these are also the cases with most skill shortages and the clearest deficiencies. The simplest explanation would lie in the argument that theoretically there is no necessary link between amount of training and skill shortages, since only the latter measure is related to employer demand for skills. However, the next section will show that there is another plausible, yet less straightforward explanation. This is based on the assumption that employer demand for skills from formal further training are not independent of employers' collective action, and that one must distinguish between providing the right amount of training and adjusting to a situation with skill shortages.

The indications of skill deficiencies in the engineers' case trigger the second set of questions, namely whether or not there is a deficiency, and if there is, why it is not reflected in persistent skill shortages of engineers with further training. A first possible position is that the results show that there is no skill deficiency, but that employers either have little need of skills from engineers' further training, or that the industry relies on informal training instead. The second is that there is sub-optimal provision of training, but that wage increases quickly eliminate such shortages. However, since wage increases from technical further training are small for engineers, this interpretation seems unlikely. The final

[38] From 1996, the KS agreement included no upper limits on nurses' wages.

position is that the skill deficiency in the engineers' case is caused by the inability to establish transferable further training offers due to lack of collective action. The basis for these positions will be discussed in the next section.

7.6 Why employers' collective action and flexible wages may solve different problems

The purpose of this section is to show that the outcomes shown earlier in this chapter could be explained as anticipated problems with the two theories and the two conditions claimed to ensure optimal training provision, namely employers' collective action (H_{alt}) and flexible wage structures ensuring that wages equal marginal productivity (H_0). This section will show why skill shortages may be anticipated if there is collective action, while the problem if there is no collective action is lack of transferable training offers. Moreover, distinguishing between the optimal provision of training and employers' adjustment to skill shortages, also reveals a critical problem with the human capital prediction, and underlines a problem with using skill shortages as an indicator of sub-optimal training provision.

Collective action theory predicts that employers' collective action will increase the amount of training provided. This and the previous chapters have shown that in the four cases this has been done through ensuring that training is transferable and improving individuals' incentives to invest in training. This suggests that collective action means skill deficiencies are less likely.

However, demand in the external labour market will increase if skills are made transferable, partly by definition and partly as a result of skills being transferable. If, on the other hand, the collective action problem of ensuring transferability is not overcome, demand in the external labour market for skills from further training is lower, for

example because employers do not organise vacancies to match these skills. For completely specific skills there is no external demand, so skill shortages measured by recruitment problems will not occur (even if there may be skill *gaps*). Thus, solving the collective action problem of transferability may in itself make it more likely that skill shortages occur.

An adjacent argument is the 'social construction of competence categories,' which implies that, to some extent, skill shortages depend on the construction of categories with which to measure shortages (Büchter 1999: 8-9; Johansen 1999: 61). This is in line with the assumption that transferability is endogenous, since transferability requires common categories of training and skills. On the one hand there are some clear examples of competence categories given directly by job categories, such as that for specialist nurses and for many types of initial training. However, especially for further training, there is a problem of finding competence categories that reflect employers' demand. In the teachers' case, categories where constructed based on the amount of education each teacher has in a subject. The case most different from the nurses' case on this account is the engineers', where there are no or very few categories constructed to measure shortages or gaps of skills acquired after basic training. A similar argument is that differences in the amount and quality of data on skill shortages and skill deficiencies in the different cases, to some extent reflect that perceived shortages or deficiencies have prompted data collection.

The fact that transferability increases demand, means that the risk of skill shortages is higher if there is not an adequate response of supply to demand. This requires not only the right amount of training, but also the right mix of different types of training. Even if the supply of training is also expected to be higher if there is collective action, there are three reasons to anticipate that skill shortages are more likely with than without collective action. The first is that some degree of rigour is a prerequisite for transferability, since too frequent changes will damage employers' ability to design vacancies to fit the training, and in practice reduce the

information they have about the contents of training. Moreover, the institutional changes that are required, in the case of employers' collective action, are likely to take considerably longer than individual employers' adjustments. Finally, in those cases where collective agreements are an integral part of the collective solution, it may hinder adjustment of skill supply to demand, as in the teachers' case. There, the wage system that ensures that teachers get wage increases independently of which subjects they specialise in, has meant that there is 'still...a large shortage of teachers with education in certain subjects, for example science, even if there has generally been very extensive further training [of teachers]' (Kirke-utdannings- og forskningsdepartementet 1992: 12). Thus, if there is collective action, a likely outcome is high transferability, high amount of training, but possibly skill shortages.

If there is not collective action, skills are less likely to be transferable, which in itself is a skill deficiency. Moreover, if skills are less transferable, it reduces individuals' incentives to investing in training, which in turn reduces the amount of training, since the increased propensity of employers to invest is unlikely to outweigh the reduction in trainee contributions, as shown by Stevens in chapter 2. Therefore, the amount of training is likely to be smaller.[39] Thus, if there is no collective action, a likely outcome is less training, fewer shortages, but a possible deficiency because skills are less transferable than would have been optimal.

Still, one cannot necessarily draw the conclusion that formal transferable training is superior to less transferable, informal training. For example, in the engineers' case, there is clear evidence of widespread informal training, for example through reading the manual for new software and equipment, which to some extent can substitute for formal

[39] However, if employers choose to 'fall back' on their internal labour markets and provision of less transferable skills because the collective solution failed to provide the sufficient amount of skills, training provision may increase because employers are willing to bear a larger share of training costs.

training. One engineer said that: 'from day to day, there will always be some training. We do not depend on sending people on courses to achieve that. We have plenty of competence within our department, and we help those who need it.'[40] Another engineer's impression was that 'we mainly get our stimulus from product development, and that is how we develop [our knowledge].'[41] However, even if many engineers said that daily work was an important source of learning, some were critical of employers' dependence on such learning. One engineer said that:

> [The company's management] claims that the best learning is through doing one's job, and that is the way it has been done here [in this company], too. But that is just a very good excuse when one does not have any clear strategy at all on further education and training[42]

Thus, in the engineers' case informal training to some extent replaces more transferable training. However, the evidence is not clear on whether or not this reflects a skill deficiency caused by the inability to ensure transferable further training.

The second basis for re-evaluating the outcomes is dual role of wage flexibility in human capital theory. The condition that wages equal marginal productivity guarantees not only that the optimal amount of transferable training is provided. It also means that skill shortages that occur will not persist, because wages will adjust so that skill supply equals skill demand. Therefore, the reason why cases with wage flexibility are those with least skill shortage is not necessarily that skill supply is more optimal in these cases, but may be caused by their more rapid adjustment to sub-optimal provision. In other words, flexible wages in human capital theory solve two problems, training provision and market adjustments to skill supply, and the reason that there are not persistent skill shortages may be due to either of the two. Thus, results will tend to be in line with

---

[40] Interview with NITO representative, offshore contractor.

[41] Interview with NITO representative, telecom equipment manufacturer.

[42] Interview with NITO representative, turbine producer (A).

H_0 predictions, even if the reason might be based on allocation of labour and adjustment of supply and demand rather than the amount of training employees finance.

This might contribute to explaining the paradox that in the two public sector cases with most further training there are most severe skill shortages. A probable reason is that the individual employers have had fewer possibilities for adjusting wages, so that supply equals demand, than employers in the two private sector cases have. So to the extent that such adjustments, rather than the incentives for employees to train, explain the pattern of skill shortages, the H_0 explanation is weakened. Similarly, if wages are flexible, it also contributes to solving the problem of allocating employees with further training to jobs where their skills are most valuable. As mentioned earlier in the chapter, Skaar (Skaar 1988) argues there is not a 'real' lack of specialist nurses, but that the shortages occur because many nurses with specialist training work in jobs other than specialist positions. One may also find that in the teachers' case employees have specialisation in subjects they do not teach. A related, yet distinct, point is that employers in the different industries vary in their ability to adjust organisation of work, and consequently adjust to a skill deficiency in a way that reduces persistent skill shortages without solving the underlying problem of skill provision. Given the national regulation in the teachers' and nurses' cases, it is likely that such adjustments are also more likely in the two private sector cases. The main point here, however, is that the dual effects of wage flexibility have shown a potentially critical problem in human capital theory, through the way it may ensure that skill shortages do not persist without solving the basic problem of skill provision. In other words, if there are skill shortages, provision of training is definitely sub-optimal, but problems may be worse in situations without reported skill shortages.

An additional point is that while compared with individual negotiations, collective bargaining is more inflexible in the short run regarding wage increases to attract employees in short demand, it may

have other flexibility advantages in the longer run. On the one hand, as argued above, collective agreements limit individual employers' ability to increase wages, which could lead to the persistence of recruitment difficulties. In the short to medium run, this might be the case particularly if there are regional or other differences in the severity of the shortages. On the other hand, collective re-negotiation may in other ways facilitate change or flexibility. For example, Marsden (1999: 83) argues that collective negotiations 'can help average out temporary power imbalances [between employers and employees] and facilitate a more steady approach to change'. Moreover, Teulings and Hartog (1998) claim that an essential virtue of collective bargaining is the possibilities for re-negotiation in order to accommodate aggregate shocks. For the topic of this thesis, however, it is likely to be more important that collective bargaining might offer a sort of flexibility that ensures the predictability of skill categories and wage rates, the importance of which was discussed in chapter 6.

7.7 Conclusion

This chapter has shown mixed success for the predictions of the two theories. Neither the H_0 prediction of wage setting nor the H_{alt} predictions of collective action were strongly confirmed. In the second part of the chapter, it was shown that three of the cases were broadly in line with both the revised predictions. Therefore, the engineers' case was critical, because this was the case where predictions differed most. The result was that, in line with H_0, there were no persistent skill shortages, but in line with H_{alt} there were also indications of skill deficiencies. Therefore, overall the results could not support one hypothesis more than the other.

The final part of the chapter emphasised the importance of studying different aspects of sub-optimal training, and showed how employers' collective action and flexible wage setting may solve two

different problems of skill provision in a way that may explain the mixed results.

8. Conclusion

8.1 Introduction

The purpose of this thesis was the study of the conditions for, and the nature and consequences of employers' collective action on further education and training. Instead of giving a detailed account of the empirical findings in each case, this chapter will suggest how they can be used to modify the theoretical models presented in chapters 2 and 3. Since the potential collective action problem of transferable training exists in all labour market settings, the theoretical development suggested here is valuable beyond the four cases in the empirical study.

One of the chapter's aims is to present the implications of the thesis for the research on transferability, cost sharing, skill shortages and employers' collective action. The second is to suggest how the insights should be developed further, either integrated into human capital theory or towards an independent alternative.

The implications of the results are considerable. For example, the integration of collective action in human capital theory means that paradoxically the labour markets with many small employers are not necessarily the ones most similar to a 'perfect labour market.' Moreover, the results suggest that the fundamental question should not be: 'Why do employers finance transferable training?' but rather 'What ensures transferable training' and 'How can one encourage employee investment in such training?'

8.2 Summary results

This study was designed as a strategic test of two rival theories and sets of hypotheses: H_0 and H_{alt}. The intention of such tests is to enable researchers to draw an unequivocal conclusion about which of the theories the results support, since an empirical result supporting one theory's hypotheses should automatically weaken the other's. But the empirical chapters 5, 6 and 7 showed that there was not consistent support for either of the hypotheses.

Table 8.1 Summary support of human capital and collective action theory

	Human capital theory	Collective action theory
Transferability of training	Weak support since employer action to improve transferability, and these actions significantly affected transferability	Strong support. Employers' collective action in cases where predicted, and strong link between these actions and transferability
Cost sharing	Support because cost sharing broadly reflected incentives, but could not explain the variation of these incentives	Support because collective action occurred where predicted, but weakened because collective action did not increase the share of training costs borne by employers. Support for new explanation based on collective action reducing employers' share through improving trainees' incentives
Amount of training and skill shortages	Support of predicted link between lack of wage flexibility and skill shortages, but flexibility might only cover up and not solve underlying skill supply problem	Weak support because predicted conditions for collective action had little influence on skill shortages, but some evidence that collective action solved problems not reflected in skill shortage indicator

Table 8.1 summarises the support for the two theories. Since the support varied so much between the chapters' findings, and most notably since the

cost sharing results differed so much from H_{alt} predictions, the results call for a critical evaluation of collective action theory as well as human capital theory. While H_{alt} was strongly supported in the findings reported in chapter 5, those in chapter 6 showed that in line with H_0 trainees' incentives, and not directly collective action, determined the way training costs were shared between employer and employee. Yet, chapter 6 also showed that collective action was crucial as a determinant of the incentives that motivated trainees to invest their spare time in further training. Finally, chapter 7 showed that employers' collective action and wage flexibility rather than being two solutions to the same problem might solve two different problems of skill provision. Because of the inherent problems of measuring skill deficiencies accurately there was no decisive support for either theory.

Given the mixed support for both theories, and the attempt in chapter 6 to integrate collective action theory with the incentive explanation of cost sharing, a pressing question is whether collective action theory is a strong alternative to human capital theory, or whether a synthesis of the two theories is preferable. This question is addressed in the final part of this chapter. First, the implications of the research for each of the three main topics are analysed, before the H_{alt} predictions of the conditions for and the nature of employers' collective action are revisited in light of the evidence in chapters 5, 6 and 7.

8.3 Implications for the main topics

This section analyses the implications of the results in the previous chapters for research on transferability, cost sharing, skill shortages and deficiencies as well as the conditions for, and nature of collective action by employers' collective

The results from this study were not intended to and cannot be directly generalised statistically to other sections of the Norwegian labour markets or to other labour markets. The purpose was, as described in

chapter 4, that the results should be generalisable to theoretical propositions, i.e. 'analytical generalisation' (Yin 1994). The two preconditions for this type of generalisation are that the hypotheses be logically and reasonably derived from the respective theories and that the empirical study provides a valid test of the two sets of hypotheses.

Analytical generalisation is thus possible if one accepts that the hypotheses developed in chapters 2 and 3 can be used to test the two theories and that the operationalisation, measurement and analysis in chapters 4 – 7 suffice to confirm or weaken the hypotheses. To ensure that the study fulfilled these criteria, the hypotheses were based on a thorough analysis of the two theories, the cases were selected on the basis of clear and explicit criteria to test the hypotheses, and each empirical chapter contained careful operationalisation and discussion of measurement problems. Moreover, both processes and outcomes were presented and compared for each hypothesis. Finally, a wide variety of data sources were used. An additional criterion for the results to be relevant also to the analysis of other cases and other countries, is that the problem of supplying sufficient transferable training is a generic problem in labour markets, and not restricted to the four cases in this study. The discussion of previous research in chapter 2 and 3 suggests that this is the case. Hence, if one accepts that the above-mentioned conditions are met, the results can be used to draw conclusions that are relevant to other labour markets too.

8.3.1 Transferability and 'endogenisation'

One of the most important implications of the results in the previous chapters is 'endogenisation' of transferability. The assumption that transferability is endogenous, i.e. significantly shaped by employers' action, has important consequences for the research on transferability and the constitution of labour markets. Since transferability has been analysed as exogenous in human capital theory, it has been seen primarily as a determinant of cost sharing between employers and trainees. However, if

one accepts that transferability is endogenous, it becomes an important link between employers' action, institutions and labour market competition.

This thesis has shown how transferability is endogenous by using a definition of transferability that differs from Becker's (1993) distinction between general and specific training. One important problem with previous research on 'general training' is that it has been defined too loosely as training that is 'useful in other firms.' Another critical problem is that by measuring transferability by wage increases only, empirical studies have not distinguished between usefulness and market conditions as determinants of whether or not training is general. In effect, they have assumed perfect labour markets in all industries. This study has shown that since the nature of wage setting varies considerably between industries, for example because of collective agreements, a more careful analysis of the nature, determinants and consequences of transferability is required. Transferability has therefore been studied using the organisational features of groups of employers as indicators. By excluding labour market competition as a determinant of transferability, this enables the study of how employers' actions on transferability can affect labour market competition. Chapter 5 showed that such actions are consequential, which suggests that transferability is 'endogenous.'

A crucial assumption for the notion of endogenous transferability is that transferability is not absolutely determined by the technology employees use. Microsoft's certificates for users of their software is a good example of how this assumption is supported. Even if the same, well-known technology is used by a large number of employers, there has still been demand for ways to ensure that skills are transferable.

There are in fact strong reasons why skills tend not to be transferable even if the same technology is applied in different firms. Katz and Ziderman (1990) emphasise, as shown in chapter 2, that reliable information is important since the firm must bear the cost if an employee is put in a position without the required skills. These costs are not only

the costs of mistakes the employee might make, but also recruitment costs and costs of firing employees that do not have the assumed skills. An additional reason, not stressed in human capital theory, is that the value of skills depends on utilisation of these skills in different firms. Therefore, differences in job design between employers can lead to low transferability even if the firms use the same technology and produce the same sorts of products.

The core of the 'endogenisation' thesis is that employers' collective action can offset this tendency for skills to be non-transferable. While individual employers have many ways to resist or reduce transferability, they have limited ability to improve or ensure transferability, even if they try. Individual employers may improve information about the training that they provide, but they have few incentives to do so, and in practice some sort of co-ordinated action is required to increase transferability. One important reason is that transferability, by definition, is a collective phenomenon; it is not a characteristic of individual employers, but of features of a group of employers.

This thesis has suggested three ways in which such employers' collective action can improve transferability: choosing common training, harmonising internal training or improving information about training. These actions, described in chapter 5, make concrete the theoretical idea of endogenisation, and thus provide the necessary link between the assumption that employers may influence transferability and different degrees of transferability in different groups.

'Endogenisation' accentuates the effect of employers' choice of training and skill supply strategies on the constitution and development of labour markets. As shown in chapter 1 and 5, Osterman (1984b) argues that employers have significant discretion when choosing between relying on skill supply through the external labour market or by internal training. While this thesis does not ignore the impact of these individual choices, it also shows that individual employers' options and strategies are likely to be strongly influenced by institutions and employers' collective

action. Thus, studies focussing on individual employers' action might only overlook variation caused by differences in collective action between industries.

One type of study that could benefit from a coupling of employer-level and aggregate-level analysis, is research on the determinants and impact of different personnel management strategies, on the type of training employees receive and companies' involvement in collective training organisations. The reason is that human resource management policies that increase training efforts overall, through emphasising the importance of employees' skills for productivity and competitiveness, might have negative unintended consequences for the labour market as a whole. More specifically, there is a potential contradiction between employers' 'strategic human resource management' and employers' actions to establish and uphold collective training organisations, as was illustrated in the insurance case in chapter 5. Employers' actions to adapt training to company strategies, and using training to gain competitive advantage, might pose a threat to employer co-operation on training. More generally, increased reliance on internal training designed to meet company needs might reduce transferability of skills. A major challenge for organisations concerned with both the competitiveness of firms and a well-functioning external labour market, is therefore the development of solutions that solve this potential conflict between individual and collective goals.

By accepting that employers' collective action may be necessary to ensure transferability, the paradoxical conclusion is that employer collaboration may be necessary to ensure labour market competition. Thus, encouraging employer collaboration on training may be a way of increasing labour market competition. However, in practice employer collaboration to ensure collaboration may be combined with other types of actions that effectively reduce labour market competition, for example collective agreements that restrict opportunities for poaching. Thus, if transferability is endogenous, there is no simple trade-off between competition and co-operation in labour markets.

8.3.2 Cost sharing

One of the most essential results shown in chapter 6 was that there was no support for the prediction that employers' collective action would increase the share of training costs borne by employers. Instead, the results suggest that collective action indirectly reduces the share of training costs borne by employers, through increasing transferability leading to improved incentives for employees to finance training in other ways. At the same time, more training can be provided, and employers can enjoy the additional benefits resulting from a labour market with employees with transferable skills. The two roles have diametrically opposed implications for the impact on how training costs are shared, an issue to the forefront of economic theoretical discourse since Becker's (1993) seminal work.

The view presented in chapter 3 suggests that collective action may be necessary to induce employers to share parts of the costs of transferable training. By contrast, employers' collective action may, in some cases, be necessary to develop training options that can induce employees to finance part of the training. At least, collective action can induce employees to finance a larger part of training costs, and more training, than they would without such action.

This alternative view on the impact of collective action on cost sharing gives a different outlook on the role, the nature and impact of employers' collective action on how training costs are shared.

This thesis has shown the importance of analysing employees' incentives to invest in training, even when explaining the share of training costs borne by employers (and the amount of training provided). Focussing on employees' incentives makes it easier to explain both a high share of employer financing and under-supply of transferable skills than if the focus were only on employers' willingness to finance training. In practice, trainees' incentives must also be at the focal point for employers' collective action, if such action aims to increase the amount of training

and reduce the share of training costs borne by employers. What is important, is how incentives are shaped and how employee financing is ensured. The core question is then, 'What characterises training that individuals are *willing* and *able* to invest in?' Transferability increases considerably employees' willingness to invest in training, and therefore a significant indirect effect of employers' collective action to increase transferability of training is that it improves employees' incentives. In human capital theory, employees' willingness to invest in training reflects the average wage they can expect after training. However, the opportunities to get a particular type of job may also be a partially independent incentive for employees. For example, nurses' incentives to invest in mid-wife training reflect not only the wage increases they can get after training, but also the non-pecuniary benefits of being allowed to work as mid-wives. A second objection to the use of average wage increase as a measure is that employees are likely to value predictability when they consider whether or not to invest in training. Thus, if employers' collective action can provide this predictability for employees by showing that all employers in the industry are committed to using and valuing one type of skills, employees' incentives to invest in training increase.

Yet, employees' willingness to invest in training must be coupled with ability to do so. Chapter 6 showed the importance of studying spare time as investment in the case of further training. By comparison, special trainee rates of pay, for example in collective agreements, is the key to employee investment in the case of on-the-job training. Moreover, bonds may also increase employees' ability to invest in training, as described in chapter 5. Finally, for full-time education, loans are the most important source of individuals' investments, at least in the Norwegian case.

As this thesis has emphasised, collective agreements are important determinants of both employees' willingness and ability to invest in training, and they can both increase and decrease either of the two. For example, a collective agreement may give employees' very strong incentives to invest in training by ensuring high wage increases after

training, but at the same time restrict employees' ability to invest in training because all training must be carried out within working hours without any special trainee rates of pay.[1]

This example clearly illustrates a crucial point about cost sharing, namely that cost sharing and incentives for employers and employees, first and foremost, are not of interest *per se*, but rather as preconditions for an adequate solution to the problem of training provision. A high share of employer financing cannot be a goal in itself, but it is likely rather to indicate a training provision problem in an industry. If employers finance a large share of training costs for transferable training, the consequence is likely to be low levels of training, strict selection of participants and skill shortages if there is not collective action to ensure that employers provide enough.[2] Moreover, chapters 6 and 7 suggest that employers' collective action is less effective in increasing employer supply of training than improving individuals' incentives to invest in training. The amount of training and skills shortages is the topic of the next section.

8.3.3 Amount of training and skill shortages

Chapter 1 showed that previous research has presented several reasons why there may be a market failure in the provision of transferable training. What has been lacking are empirical studies with industry comparisons to test the impact of market failures in different settings, as well as analyses of institutional solutions to such failures in the case of further training.

The study has shown that the extent and nature of market failures varied considerably between the four cases, and that employers' collective

---

[1] A later section will show that collective agreements are important too because they reflect the important role of employee involvement, and agreements may constitute one form of solution to the collective action problem.

[2] As shown in chapter 2, employers may also finance a high share if training is only apparently transferable, but includes specific human capital elements, for example because of asymmetric information.

action provided no simple solution to all these failures. While collective action is likely to solve some problems, it is also liable to make other problems more likely.

This qualified support was based on an analysis of three different types of measures of sub-optimal training provision: skill shortages, skill deficiencies and amount of training. The thesis illustrated both the problems with basing conclusions on only one indicator and the value of studying different indicators of 'success' of institutional solutions to the problem of transferable training.

The implication of the results is that wages reflecting marginal productivity, the condition for optimal provision according to human capital theory, and employers' collective action, solve different problems of training provision, and both have inherent problems. Thus, neither collective action by employers nor flexible wage setting is sufficient to ensure adequate provision of transferable training.[3]

The results imply that the main reason why employers' collective action may contribute to adequate supply of transferable training is that such action can improve transferability and employees' willingness to invest in training. In contrast, employers' collective action aimed directly at ensuring that employers provide enough training are of less importance, at least in the four cases in this study. Overall, collective action seems more likely to succeed when aiming to increase the amount of training through encouraging employee investment than through forcing firms to finance enough employer-financed highly transferable training.

Yet, even if collective action is successful in ensuring that training is transferable, and employees have incentives to finance such training, skill shortages may be at least as likely with as without collective action. Part of the reason is, as argued in chapter 7, that there are no visible skill shortages if skills are not transferable. But shortages may also last longer because collective solutions are rigid, for example because training

[3] The condition is that transferability is endogenous, as the argument below shows.

institutions are slow to respond to new needs (Crouch, Finegold, and Sako 1999).[4] Thus, skills may in principle be transferable, but outmoded, so that they are of little value to all employers. Moreover, collective agreements that are parts of the collective solution, as for example in the teachers' case, may restrict the necessary wage adjustments to ensure that skill supply meets demand. If the collective action relies on employer financing and limited wage increases after training, there is a substantial risk of failure if there is not sufficient pressure on employers to uphold high training investments.

This leads to the main point of the human capital account, namely that flexible wages are necessary to ensure the right amount and mix of training. However, chapter 7 also showed that even if wage setting is clearly a key to understanding how training provision relates to employers' demand for skills, there is also a spurious relationship between flexible wage setting and skill shortages. The reason is that flexible wages may ensure that skill shortages are short-lived without solving the underlying problem of sub-optimal provision.

The main problem with flexible wages as a solution to the problem of transferable training is that they do not ensure that training is transferable. Therefore, there are likely to be few visible skill shortages, but there may still be skill deficiencies. Hence, if transferability is endogenous, skill shortages are inadequate measures of the extent of the skill provision problem. Moreover, policies aimed at reducing skill shortages may overlook possibly more severe problems in industries where there are not skill shortages because skills are not transferable, but the fundamental training problem is not solved.

---

[4] In the German dual system of initial training, employers 'may object that they cannot shape training sufficiently in accordance with their short-term needs'. Nevertheless, according to Lane (1990: 249), 'this may be a necessary price to pay for the extensive benefits of the system for the long-term development of both individuals and the whole economy'.

This has important policy implications because the two problems of skill shortages and skill deficiencies require radically different solutions. The first calls for an analysis of possible unsolved collective problems caused by a high share of employer financing and few opportunities for employee investment, or possibly the wage-setting process fails to ensure a link between supply and demand of skills. The second, on the other hand, requires an analysis of why there are no training offers that are highly valued by employers. Thus, if the diagnosis of the problem in an industry is not right, the cure will not be either.

8.3.4 Conditions for and nature of employers' collective action

The collective action theory presented in chapter 3 made the simple prediction that employers' collective action would be most likely if there were few employers in the labour market, or else there was an powerful superordinate body that could force employers to comply with its decisions.

By studying both processes and outcomes, the thesis provides a basis for the evaluation of these predictions. Moreover, the empirical study confirmed and reiterated the importance of distinguishing between the different forms of employers' collective action in the training area. One important distinction is between establishing a collective organisation and recruiting employers as members, and the problem of making the members comply with the organisation's policy (Bowman 1998). For example, even if employers have established transferable further training options, there is not necessarily any collective action to ensure that employers provide sufficient amounts of such training. In the nurses' case, it was clear that collective action had ensured that further training was highly transferable, but there was little collective action to make employers finance enough of such training. Thus, the results of the study can be used to stress the significance of not discussing whether or

not there is employers' collective action on training, but also what form such action should take, and what the purpose of the action should be.

The results confirm that both concentration and a powerful body significantly increase the probability of employers' collective action, but also suggest that the impact of employees' organisations and collective agreements is overlooked in the version of collective action theory presented in the first part of the thesis.

Even if the study has shown that peer pressure and informal co-operation may play a significant role in collective solutions, it does not give sufficient evidence to suggest that informal co-operation can be a fully independent alternative to a powerful body in solving the collective action problem of transferable training. In the insurance case, and partly in the nurses' case, it was shown that informal co-operation between a small number of employers played a significant part in upholding a collective solution and shaping the type of training employees received. However, in none of these cases was there any example of a small group of large employers establishing a separate training organisation independently of a powerful superordinate body. Most notably in the insurance case the establishment of the common training organisation was a result of institutional support, and not independent of co-operation between a few employers.

The results have shown the significant impact of a powerful body, the state in the teachers' and nurses' cases, in affecting training outcomes. Still, the study has also shown that the employees' organisations have played an important role in pushing action by the state in a way that was not integrated into the theory. Actions by the nurses' and the teachers' organisations have been crucial as an impetus towards the policies the national government has then implemented.

More generally, the role of employees' organisations is inadequately treated in the original version of the model presented in chapter 3. Training is important for employees for many reasons. It is a major determinant of income and employability. Unequal access to

training can therefore create or reinforce other inequalities, and employees with a particular skill may want to restrict access to this skill (the insider-outsider problem). Yet, this does not explain why employers would choose to involve employees in training provision. The simplest explanation of this is given by applying the cost sharing view, developed in chapter 6, based on individuals' incentives to invest in training. From this perspective, collective training solutions are not only a fundamental method of ensuring employer contributions towards training costs, but a way of ensuring that employees are willing to bear a large share of these costs. Therefore employee involvement, including involvement by employees' organisations, is important to ensure the quality of training that employees consider to be a worthwhile investment, that trainees are not exploited as cheap labour, and that the training organisation is seen as a legitimate representative of both employers' and employees' interests (Green 1999: 389).

The second major addition to the collective action theory, as described in chapter 3, should be the role of collective agreements. The teachers' case was the prime example of how collective agreements can be highly influential in determining the type of further training employees take, how the costs are shared and even the amount and type of training provided. In this case, the collective agreement itself constituted the solution to the collective action problem, by ensuring strong incentives for employees to invest in training and discourage poaching.

Collective agreements are essential for determining the incentives individuals have to finance further training. The agreements can more or less directly favour some types of training over others, for example if employees have the right to certain types of training, if employees are guaranteed wage increases from a given type of training, or if the agreements define what sort of training should be criteria for getting certain jobs or performing certain tasks. Moreover, the role of collective agreements once again suggests that a significant shortcoming of the initial

version of the collective action theory was its neglect of the role employees' organisations play for collective training solutions.

Thus, it is clear that new versions of the collective action theory should not only integrate the impact of employees' organisations in creating and upholding collective training policies, but also accommodate collective agreements as important parts of collective solutions to the problems of transferable training provision.

8.4 Synthesis or alternative?

Earlier in the chapter it was argued that the empirical chapters did not consistently refute or corroborate either of the two theories. The results can however be used to suggest possible areas for further theoretical development. According to McNabb and Whitfield (1994: 16) 'there is no doubt that the human capital approach is dominant... [but] at the very least, it needs to be augmented with concepts from a more sociological or institutional approach.'

A paper developing Becker's model to cover imperfect labour markets claims to go 'beyond Becker' (Acemoglu and Pischke 1999). One can however argue that this, and other attempts to accommodate the possibility of imperfect labour markets, does not go beyond the basic principles of Becker's model, but simply develop a theme that Becker chose not to develop himself (Eckaus 1963: 504; Stevens 1994c:557; Ziderman 1978: 23).[5]

Collective action theory, on the other hand, provides insights that clearly go *beyond* Becker's theory. In line with human capital theory, cost sharing and amount of training, to a greater or lesser extent, are determined by transferability of training and the incentives individuals

[5] Stevens (1994c:557) says that her arguments 'do not conflict strongly with those made by Becker, except to the extent that he implied that all types of training were covered by his analysis in terms of general and specific.'

have to invest in training, but collective action theory is necessary to explain how transferability and incentives are shaped.

The most important point for human capital theory is the role employers' collective action plays in affecting transferability of training and the incentives individuals have to invest in training. Some insight concerning the possible effect of collective agreements may be drawn from contributions that consider the effect of different forms of wage-setting on training (e.g., Stevens 1994b and Acemoglu and Pischke 1996; 1999); but the major role of collective action in shaping incentives, shown in chapter 6, remains to be integrated into human capital theory. Here the focus is on the other way that collective action is 'beyond' human capital theory, namely such action's effect on transferability of training, or examples of how transferability of training is 'endogenous.'[6]

The question is whether the insights of this thesis should be used to suggest a further development of collective action theory as an alternative to human capital theory, or parts of the former should be integrated into the latter.

There are weighty arguments for both positions. A combination of three factors substantiates the argument that parts of collective action theory, mainly the point concerning endogenisation, should be integrated into human capital theory. The first is the significance of assuming that transferability is endogenous and not exogenous, as illustrated in this thesis. The second is the call for human capital analysis to be supplemented with institutional analysis, as illustrated above. Finally, collective action theory provides this institutional supplement, and at the same time shares with human capital theory most of the basic assumptions.[7]

---

[6] Increased transferability also increases employees' incentives to finance training.

[7] An additional argument for integration is that human capital theory is the most important economic theory of training.

The core of a possible synthesis should be endogenisation, described in chapters 3 and 5, and the collective action explanation of incentives described in chapter 6. These two parts of collective action theory both imply that collective action by employers is primarily important as a market facilitator. At the same time, the interaction between employers' actions and the structure of the market, for example, because of the effect on transferability, means that one cannot leave these actions out by simply distinguishing between the constitution of the market and both parties' incentives, on the one hand, and the effect this has for cost sharing and training supply on the other. One important effect of integrating endogenisation of skills in this way is that it effectively questions the superior status of 'perfect labour markets' with a large number of employers without market power. The reason is that since small group interaction, according to collective action theory, may improve the probability of transferable skills and consequently labour market competition, it conflicts with the human capital assumption that a high number of employers is necessary, or sufficient, to ensure competition. Thus, the integration of insights based on collective action theory could have wide-ranging implications for some of the basic principles of human capital theory.

The argument for developing collective action theory, as an independent alternative to human capital theory, is that the complexity and richness of collective action, and the institutional support for and intervention in labour markets, cannot fit within the strict human capital framework. Moreover, if attempts were made to adequately capture these processes with human capital theory, the theory would loose one of its strongest virtues: simplicity.

By contrast, the discussion of the conditions for and the nature of employers' collective action above suggests that the role of employees' organisations and collective agreements should be integrated into the theory. This is a call for a more sophisticated analysis of institutions and

processes, rather than the simplification that integration into human capital is likely to require.

An institutional analysis can either aim to supplement or be a direct alternative to human capital theory. A supplement strategy is based on the assumption that there is, in practice, a distinction between the processes that determine transferability and individuals' incentives to invest in training, and the processes that determine cost sharing and the amount of training provided based on these conditions. Such a distinction may be useful, as illustrated in this thesis by the treatment of the processes influencing transferability being allotted a separate chapter. However, this thesis has also stressed the strong relationship between transferability and employers' actions regarding training provision, cost sharing and skill deficiencies. If the constitution of labour markets and the transactions in this market are treated separately, the analysis effectively plays down the importance of the interaction between the training employers provide and transferability, i.e. endogenisation.

However, the initial version of collective action theory, as presented in chapter 3, is not only a supplement, but also a direct alternative to human capital theory. The reason is that collective action may not only be a requirement for labour market competition, but may also disturb the market mechanism in a way perhaps not adequately explained as only a 'market failure'. For example, in chapter 7 the two theories gave sharply contrasting explanations of the nature and causes of skill shortages and deficiencies in the four cases. A core issue, when deciding how to develop the collective action theory of transferable training, is to what extent the assumptions of the initial version of the theory, presented in chapter 3, should be maintained. While the initial version was based on assumptions very close to those of human capital theory, these may be too restrictive in a more sophisticated theory of the conditions for and the nature of employers' collective action.

The results have shown that new versions of the collective action theory must integrate the role of employees' organisations and collective

agreements. But chapter 6, in particular, has illustrated the importance of integrating aspects of human capital theory, for example, in the way incentives shape how training costs are shared. Thus, the question is whether collective action theory should be used as a basis, and insights from human capital theory integrated, or whether insights from collective action theory should be integrated in human capital theory. The answer to this is that the only basis for deciding which strategy is superior, is the ability to predict empirical results.

8.5 Reconciling institutions and markets

A recurrent problem in social science is how to analyse the relationship and interaction between agents and structures, between individuals' actions and their context. Explanations based only on individual agents' actions run the risk of overlooking the significant impact of institutions, norms and interaction (Granovetter 1985). By contrast, explanations based only on the institutional level will tend to underestimate the importance of individual agents' scope for choice. In studies of labour markets this theoretical problem is one of 'reconciling institutions and markets' (Soskice 1994a).[8]

Collective action theory, despite the shortcomings discussed earlier in the chapter, is particularly valuable because it manages to capture individual employers' actions, institutions and markets, and the interaction between these.[9] The theory has explained how individual employers and employees' incentives have generated collective action and

---

[8] While Soskice refers mainly to a practical problem for training systems, the concept is used here as a characteristic of a basic theoretical problem.

[9] Rubery (1994: 67) stresses the need for this type of analysis: 'An institutional approach to the organization of employment cannot stop at the establishment or the company door. It needs to extend this analysis to the iterative relations between organizations and the operations of the labour market, in the hope that a direct analysis of the institutional relationship through which markets are created and structured will at last serve to reduce the pervasive power of the myth of the invisible hand.'

the structure of the labour markets. At the same time, it has explained how collective action, institutions and labour market characteristics have affected employers' and employees' training choices. Studies of the constitution of labour markets and market behaviour separately cannot capture this interaction between individual employers' actions and the structure of labour markets. Therefore, collective action theory is an excellent starting point for attempts to reconcile institutions and markets in labour market analysis.

Appendix 1. Case selection

Tables A1.1 to A1.4 provided the basis for concentration measurement, and consequently case selection, as described in chapter 4.

Table A1.1 Metal industry employers, by share of total employment in industry. 1999

Size (no. of employees)	Establishments	Employees	Share of employment %	Cumulative %
Five largest	5	8,300	8.8	8.8
500+ (excl. five largest)	31	18,600	20	28.8
200 - 499	110	26,000	28	56.8
100 - 199	150	16,700	18	74.8
50 - 99	230	13,000	14	88.8
20 - 49	330	8,300	9	97.8
<20	360	2,700	3	100.8
Sum:	1,216	93,600	100.8	

Note: Data on employment in five largest firms obtained directly from TBL. Employment and number of firms in other categories estimates based on total employment, number of firms and share of employment in each size category.
Source: Teknologibedriftenes Landsforening (1999a) and data from TBL.

Table A1.2 Insurance firms, by share of total employment in industry

Firm	Employees	% of employees	Cumulative %
Storebrand	4,232	34.1	34.1
Gjensidige	3,294	26.5	60.6
Vesta	1,230	9.9	70.5
Samvirke	958	7.7	78.2
Vital	732	5.9	84.1
Next 5	881	7.1	91.2
Next 62	1,090	8.8	100.0
Total	12,417	100.0	

Note: Some of the smallest employers are not insurance companies, but other members of the Insurance Academy.
Source: Forsikringsakademiet (1996a: Appendix 2).

Table A1.3 Municipalities, by share of total number of man-years in comprehensive education. 1997

Municipality	Man-years	% of total	Cumulative %
1. Oslo	4,686	8.5	8.5
2. Bergen	2,274	4.1	12.6
3. Trondheim	1,464	2.6	15.2
4. Stavanger	1,109	2.0	17.2
5. Bærum	1,086	2.0	19.2
Next 5	3,468	6.2	25.4
Next 10	4,729	8.6	34.0
Next 10	3,339	6.0	40.0
Next 10	2,760	5.0	45.0
Remaining 395	30,486	55.0	100.0
Total	55,401	100.0	
N: 435			

Source: Statistisk sentralbyrå (1998c: appendix 2).

Table A1.4 Counties, by share of total number of man-years in general (somatic) hospitals. 1997

County	Man-years	% of total	Cumulative %
Oslo	2,906	14.9	14.9
The state	1,842	9.5	24.4
Hordaland	1,804	9.3	33.7
Sør-Trøndelag	1,398	7.2	40.9
Rogaland	1,311	6.7	47.6
Next 5	4,755	24.4	72.0
Next 5	3,241	16.7	88.7
Next 5	2,031	10.4	99.1
Private	152	0.8	99.9
Total	19,440	99.9	

Source: Statistisk Sentralbyrå (1998a).

Appendix 2. Data collection

A2.1 The data collection procedure

A wide range of different data sources has been used. The first step was to go through available secondary data, and establish how far these could answer the research questions. There was extensive relevant written material available concerning the two public sector cases in particular. The secondary data consisted of published and unpublished reports, official statistics, government publications, internal documents from companies and organisations, annual reports and other publications. The next step was to do interviews, and attempt to fill the gaps. Within the four industries, the interview subjects were selected to represent a wide variety of interests and views. The interview guide and the list of interview subjects are presented below. The Norwegian version of the guide is published in Johansen (1999). In order to let the subjects talk freely where possible, the sequence of the questions varied between interviews. Moreover, not every person was asked all questions in the guide. For example, when speaking with individual employees and employers, the detailed questions of the management and financing of training institutions were dropped. In many cases the interplay between interviews and secondary data repeated itself throughout the interview period of 10 months. The interviews often led to new data sources, for example unpublished reports and previously unpublished statistical material that is used in the thesis.

A2.2 Interview guide

Name: _____

Title: _____

Organisation/firm: _____

Been there since: _____

Date: _____

Time: _____

Duration: _____

Recorded? (y/n): _____

A. Introduction

The purpose of the study

Background

The purpose of the interview

B. Description of further education and training offers

Type of training (course guide available?)

Purpose

How long are the courses?

Typical course

Working time or spare time? Classroom or distant education?

Tailor-make courses? (if yes, how much/often?)

Educational methods

Number of participants

Development in numbers of participants

Characteristics of participants

Does the training lead to formal competence?

Does the further training build on basic training?

Systems for documentation of non-formal learning? (describe)

Changes, trends [detailed, examples rather than opinions and predictions]

C. Organisation and government of training institution

Organisation and government of the institution (annual reports?)

Who is on the board?

How is the board elected?

How are administrative staff and teachers recruited?

Relations with other organisations or the government

Who decides course contents (institution, employer, employers' organisations, trade unions, hearing, ministry)?

Typical processes (routines, rules and actual process)

Has anyone more influence/power than others (How can we know?)

Veto powers?

Changes?

Examples!

[Be aware of possible conflicts]

D. Financing the institution

How are costs shared?

Income and costs for the different types of training

Financial support from the government

How much does the individual employee pay?

Financing – sources

Financing – criteria for support/payment

Variable and non-variable costs and incomes

Get estimates (shares) if exact figures not available

Development – changes – crises? (Are the budgets for the last ten years available?)

E. Other training suppliers

Description of the other most important suppliers of further education and training

Which of these are most important?

Briefly describe their activities

Strengths and weaknesses

Industry training versus university or college education

E. Regulation of further education and training

Regulated by laws or agreements?

Educational leave (if yes, paid?)

Agreements – what do they say about further education and training?

What individual rights does the individual employee have?

Do the agreements say anything about wage increases after further education and training? – Describe [possible to get copy of the agreements?]

Changes? [reorganisation of tasks, functional flexibility]

F. Standardisation of jobs

Regulation, occupational licensing? - Is it necessary to have a particular type of further training for any jobs?

Standardised jobs (easy to switch between firms?)

Demarcation of job tasks – strict or not

Changes?

G. The firm's further education and training decisions

Who makes decisions? (top management, HR department, middle manager, employee)

Internal vs. external training – which considerations are made. Advantages and disadvantages of each type

Examples of large, training programmes by firms? [if yes, describe in detail]

Development – changes [describe in detail, motives and actions]

Who pays? (employee, employer)

Bonds? (If yes, for what types of training?)

H. Effects of further education and training

Wage setting (collective negotiations – individual, local – central)

Performance related pay?

Pay according to formal competence?

What are the most important recruitment criteria?

How is non-formal learning (experience) rewarded compared with formal competence?

Do further education and training have any effect on wages, promotion opportunities, opportunities in the external labour market?

I. Technological and organisational changes

Describe the most important technological, organisational and market changes in the last ten – fifteen years

What have been the challenges? (technology, organisation, market)

What are the current/future challenges? [focus on the past]

Organisational changes? (functional flexibility, outsourcing, upgrading)

Effect of technological changes

Effect of changes on skill requirements

What have been the most important factors affecting skill requirements in recent years?

J. Skill situation

Changes in employment/unemployment during the last 10 – 15 years

Skill surpluses/deficits? - perception

Perception of 'mismatch' in the labour market

How have the employers tackled skill surpluses/deficits – examples of actions

Competition in the labour market – strong, weak, inducements [poaching?]

Wage developments – indicate skill surplus/deficit?

K. Skill utilisation

How do you try to get an impression of what employers need?

What sources do you use to get information on employers' training needs?

Do you collect such information in a systematic, routine way, or on a more ad hoc basis?

How do you try to get an impression of what employers think about your training offers?

Which methods do you use to elicit their views?

Do you think that your further education and training meet the firms' needs well or not particularly well? What is the basis for this impression?

How are skills from further education and training utilised? How is this measured?

L. Co-operation

Refer to what has been said about financing and organisation

Has there been any attempt to change the institution? [Describe in detail]

Have any employers ever tried to break out? What happened? [Describe in detail]

Are there ways of influencing firms in order to make them obey? (positive, negative)

How has further education and training been an issue in negotiations? [Describe in detail]

There are examples of conflicts between employers and employees on further education and training. Do you remember if there have been examples of differing interests in your industry? [Describe in detail]

M. Other information

Anything to add?

How can what have said be documented?

Other information? Own surveys/reports?

Suggestions of whom to contact

A.2.3 Interview subjects

NITO representative

NIF representative

National Council for Engineering Education representative

Personnel manager, ship yard

NITO representative, ship yard

Factory manager, car part manufacturer

NITO representative, car part manufacturer

Personnel manager, turbine producer (A)

NITO representative, turbine producer (A)

Leader of administrative section, telecom manufacturer

NITO representative, telecom manufacturer

Personnel manager, turbine producer (B)

NITO representative, turbine producer (B)

Managing director, traffic system supplier

NITO representative, traffic system supplier

Organisational development manager, offshore contractor

NITO representative, offshore contractor

NAI representative

Personnel manager, large insurance company (A)

FA representative

FL representative

Organisational development manager, large insurance company (B)

Personnel manager of small insurance company (A)

Personnel manager of small insurance company (B)

NAF representative

Group of FL representatives

NSF representative

KUF representative

Personnel manager of hospital outside Oslo

Senior nursing officer at an Oslo hospital

RHHS representative

Representative of the Norwegian Board of Health

Teachers Association representative

NL representative

Section for Continued Training of Teachers representative

Head of an Oslo primary and lower secondary school

Appendix 3. Estimation of cost sharing

The purpose of this appendix is to give additional information about how costs and cost sharing presented in chapter 6 were estimated.

In the nurses' case, a detailed study of the costs of specialist training made in 1997 was the basis for the cost estimates (Kirke- utdannings- og forskningsdepartementet 1998). The estimates from this report are broadly in line with previous estimates, allowing for inflation. In 1992 the National Council for Health and Social Work Education (RHHS) estimated the costs per student per year to NOK 254,000, about 10 per cent less than the KUF estimate (Rådet for høgskoleutdanning i helse- og sosialfag 1992: 7). The average costs of specialist training per nurses at the five regional hospitals were estimated at NOK 384,000 in 1995,[1] which is the same as the RHHS estimate, given that the training on average lasts 18 months (Holter et al. 1996).

Trainee wages are in most cases somewhat lower than nurses would have received in a normal nursing position. Of the nine hospitals presented in detail in the KUF report, three hospitals pay normal wages, two hospitals pay 75 per cent of normal wages, two hospitals pay nurses reduced wages for the first six months and then normal wages without service increment, while finally one hospital pay their students approx. 50 per cent of normal wages (Kirke- utdannings- og forskningsdepartementet 1998: appendix 2a). In the estimates it is assumed that nurses get 75 per cent of their normal wages during training. Thus, the normal wage costs for 18 months would be NOK 381,000 (286,000/0.75).

---

[1] This is a weighted average based on participation data from NSF (Norsk sykepleierforbund 1996).

The KUF estimates lack the value of trainee output. A 1992 survey showed than on average 62 per cent of the training is practice (Rådet for høgskoleutdanning i helse- og sosialfag 1992: 6), and the 1998 report shows similar figures for the nine selected hospitals (Kirke- utdannings- og forskningsdepartementet 1998: appendix 2a). No studies have attempted to measure the value of trainee's output, even if the informants suggested that towards the end of the training period the trainee nurses were 'valuable help'.[2] Assuming that a trainee on average gets 75 per cent of normal wages, and their output is 30 per cent of a trained nurses' output, and 62 per cent of the training is practice, the value of their output during the training is NOK 71,000 (381,000 × 0.62 × 0.3).

Table A3.1 Cost sharing internal specialist training for nurses. 18-month programme. NOK. 1997

		Costs		
	Item	Per item	Total	%
Costs borne by employer	Wage costs	286,000		
	+Personnel costs	107,000		
	+Other costs	29,000		
	- Output	-71,000	351,000	79
Costs borne by employee	+ Wage reduction	95,000	95,000	21
	Total net cost	446,000	446,000	100

The estimate is shown in table A3.1. The nurses' investment is the earnings foregone while they are doing the training. If one assumes that nurses on average earn 75 per cent of what they would receive, their investment is effectively one third of the wages they receive.[3] Table A3.1 shows that employers bear four fifths of the costs of specialist internal

[2] Interviews with RHHS representative and Representative of the Norwegian Board of Health.

[3] The tax rate is assumed to be constant.

training, while nurses bear the remaining one fifth. The value of the output is however uncertain, and this should be accounted for in the estimate. If the output were 20 per cent instead of 30, the share of training costs borne by employers would be 84 per cent. If, on the other hand, the output were as high as 40 per cent, the employer share would be 73 per cent. Therefore, the estimate of employer financing in the case of internal specialist trianing is 75 - 85 per cent.

Table A3.2 Estimated cost sharing for college-based specialist training in 'training on demand' system. 18 month programme. NOK

		Costs		
Costs borne by	Item	Per item	Total	%
Employer	+Payment to college	136,000		
	- Output	-71,000	65,000	15
State	Colleges' costs	136,000		
	- Payment from hospital	-36,000		
	Loans and grants	30,000	30,000	7
Employee	Alternative wages	381,000		
	- Loans and grants	-30,000	351,000	79
	Total net cost	446,000	446,000	101

The proposed training on demand system will reduce the costs to employers considerably, as shown in table A3.2. Assuming that hospitals must pay the colleges as much as their current non-wage costs (NOK 107,000 + NOK 29,000), and continue to pay wages to the nurses in this new system, their average contribution per trainee will be reduced from NOK 351,000 to NOK 65,000. It is also assumed that the proportion of practice in the training does not change significantly.[4] Moreover, it is

[4] If we assume that the trainees' productivity increases during the training period, a reduction of the training period will effectively reduce the net output of trainees' work more than the product of the reduced time and the average net output.

assumed that nurses receive support from the State Education and Loan fund of NOK 30,000.[5] Assuming that the total costs are the same as in table A3.1, the share of total costs borne by the employers will be reduced from 79 per cent to 15 per cent. However, if the output were only 20 per cent of a trained nurse's, the share would be 19 per cent. On the other hand, if output were 40 per cent, the share would be only 10 per cent. Thus, the estimate of employers' share in the case of the 'training on demand' system is set at 10-20 per cent.

For normal college-based training, employers usually do not bear any of the costs, but since some hospitals provide scholarships for their nurses, the estimate is that employers bear 0-10 per cent of costs.

In the teachers' case, cost sharing for different types of further training is clearer than in the three other groups. One reason is that up-dating training is done within working hours, and up-grading training in teachers' spare time. Moreover, in contrast to the engineers' and the insurance employees' cases, the schools do not finance the direct costs of extensive further training teachers undertake in their spare time. So in principle the schools bear 100 per cent of the costs of up-dating training, and none of the costs of up-grading training. But in some cases employers have chosen to give teachers on educational leave some financial support. This has usually been the so-called service increment, which denotes the difference between the teacher's actual wage and the starting wage for a teacher at that formal competence level. In 1999, this 'increment' was NOK 29,600, or 13 per cent of current annual salary for one who had 15 years tenure as a general teacher (Norsk lærerlag 1998). This financial support during up-grading training covers only a minority of teachers who take up-grading training (Kirke- utdannings- og

[5] This support is partly scholarship, and partly subsidised loans. For the purpose here a detailed estimate of the value of the support is not made, since variation in this sum would not have altered the conclusion on cost sharing significantly.

forskningsdepartementet 1992),[6] but to allow for this and other possible contributions from employers, for example, because part of the training in some cases may be done within working hours, it is estimated that employers may, in total, pay up to 10 per cent of up-grading training costs.

Employees do not finance 100 per cent of the costs of up-grading training, since it is carried out at state financed colleges and universities, but since the focus in this thesis is on the sharing of costs between employers and employees, the state contribution towards up-grading training has not been studied in more detail.[7] Moreover, in some cases employees spend some of their spare time, or have small expenses in relation to, up-dating training. It is therefore estimated that employers finance 90 to 100 of the costs of up-dating training.

Table A3.3 Estimated cost sharing for 1-credit NAI course. Costs from employer's and trainee's perspective. NOK

		Costs from employer's perspective			Costs from trainee's perspective		
Cost borne by	Item	Per item	Total	%	Per item	Total	%
Employer							
	Reading day and exam day	3,000			1,500		
	Course fees	4,000	7,000	33	4,000	5,500	44
Employee							
	Reading	14,000	14,000	67	7,000	7,000	56
Total							
	Total net cost	21,000	21,000	100	12,500	12,500	100

[6] Interviews with Section for Continued Training of Teachers representative, Head of an Oslo primary and lower secondary school and NL representative

[7] State contributions towards further training for teachers has been estimated by the Ministry of Education and Research (Kirke- utdannings- og forskningsdepartementet 1992).

The example in table A3.3 is a 1 credit course at the NAI, costing NOK 5,000, which the employer pays. It is assumed that the total amount of required reading is 77.5 hours.[8] It is also assumed that the employee does most of the reading in unpaid spare time, but is allowed one paid reading day, and also the exam day off. With a 7.5 hours working day, this means that 70 hours of reading are unpaid, while the employer pays the employee for the remaining 15 hours. The employer also pays the course fees of NOK 4,000. Moreover, it is assumed that the hourly wage is NOK 167.[9] Assuming that social costs are 20 per cent, the cost of one working hour to the employer is NOK 200. Employees, on the other hand, have to pay taxes, and assuming a marginal tax rate of 40 per cent, the opportunity cost of training is NOK 100 per hour.

The distinction between 'employer's perspective' and 'employee's perspective' reflects this distinction between the costs to employers and the income of employee from a working hour. The rationale for introducing this distinction, is that it may contribute to explain why both employers and employees find it sensible that employers pay course fees if employees use their spare time for training. Table A3.3 shows that the employer contribution is larger from the employee's perspective than from the employer's. The reason is that because of social costs the costs of labour to the employer is higher than the wage rate, while taxes make the employee's income lower than the wage rate.[10] This means that in this example the course fees for the employer is only 19 per cent of the total

---

[8] According to the NAI, a 1 credit course requires at least 5 hours per week during the term, which is assumed to last for 15 weeks (Forsikringsakademiet 1996b: 7).

[9] The estimate is derived from the Statistics Norway report that says average monthly salary in the insurance industry in 1997 was NOK 25,005 (Statistisk sentralbyrå 1998d), assuming 150 working hours per month.

[10] In this example only 20 per cent social costs are added to the wage rate, which probably is a low estimate. For example, the process of finding stand-ins or adapting production may incur significant costs. The larger this mark-up is, the larger the difference between costs, from an employers' perspective compared to an employees.'

costs, while they constitute 32 per cent of the total costs from the employee's perspective.

Table A3.3 tends to underestimate the time employees use since voluntary weekend seminars organised as part of the training are not included. If this time is included, assumed to be two days of 7,5 hours each, the share of employer financing is reduced from 33 to 29 per cent. The estimate of employer financing, given these uncertainties, is set to 25 – 35 per cent.

Table A3.4 Cost sharing for BI course. NOK

		Costs		
Costs borne by	Item	Per item	Total	%
Employer	Reading day + exam day (15 hours)	3,000		
	Course fees	11,400	14,400	40
Employee	Reading (109 hours)	21,800	21,800	60
	Total net cost	36,200	36,200	100

The direct costs of training are higher at private colleges, for example BI, than at NAI, and the employers therefore bear a larger share of the total costs. The price of the course 'Insurance' at BI's Centre for Finance Education cost NOK 11,400 in 1999. The training is organised similarly to training at NAI, with two voluntary seminars. In table A3.4 it is assumed that the required reading is 1.5 times as much as for the NAI course. Table A3.4 shows that in this example, the share financed by the employer is increased to 40 per cent compared with 33 per cent in the NAI example. Moreover, the insurance companies do not always cover all direct costs for BI training. For example, one large employer finances course fees by 100 per cent if the training is 'necessary' in the job, 75 per cent if it is 'of much use', and 50 per cent if it is 'of little use.'[11] Given that

[11] Interview with Personnel manager, large insurance company (A).

employees may share some of the direct costs, and also participate in the seminars, the estimate for BI training is that employers finance between 30 and 40 per cent of total costs.

In most cases employers fully finance engineers' further training. A NITO course is used here as an example of such short training. In 1997, a typical three-day course cost NOK 5,000 for NITO members, excluding travel and hotel expenses. The average cost of a working day is assumed to be NOK 1,500 per day.[12] If one adds travel expenses of NOK 500, and excludes possible hotel costs, the total cost of the three day course is NOK 10,000. Training costs may be lower in some cases because there are no course fees. For example, suppliers are important providers of further training for engineers, and supplier training is usually given free of charge (Johansen 1998; Larsen et al. 1997; MMI 1997). The costs are however likely to be higher than the NITO estimate in many cases, either because travel and hotel expenses are added, or because course fees are higher, or simply because training is longer. For example, a 2 weeks course at NTNU, where the course fees are typically NOK 12,000, would cost NOK 27,000 with the same assumptions as in the NITO example. All these costs are borne by employers.

For some types of training, typically for business administration or management training, engineers share a part of the costs through using their own spare time. Since this training is similar to the BI example in the insurance case, the estimate of employer financing is 30 to 40 per cent in the engineers' case too.

[12] The estimate is based on the average for engineers in the private sector, which was approx. 305,000 in 1996 (Norges ingeniørorganisasjon 1997a: 6), 240 working days per year, and social costs of 20 per cent of wages.

Appendix 4. Estimation of training outcomes

This appendix shows how the amount of training for each of the four groups is estimated. It also presents a table of skill shortages in intensive care units.

A4.1 Amount of training

A significant proportion of nurses take extensive formal further training at some stage during their careers. Table A4.1 shows that 49 per cent of nurses have completed formal further training equivalent to at least six months full time training, and a further 13 per cent are currently undertaking such training or are planning to do so.[1] By comparison, 14 per cent of Norwegian employees have done at least six months of further training during the last five years before they were interviewed (Opinion 1998).

[1] These figures cover nurses with all employers, not only general hospitals, since the breakdown on groups by years since completed basic training was not available for general hospitals only. But since the share of nurses general hospitals who had taken further training equals the average for all nurses, the pattern in table A4.1 is assumed to reflect the pattern at general hospitals. Overall, 48 per cent of nurses at general hospitals have completed further training, and 14 per cent are undertaking or planning such training (Havn 1996: 48).

Table A4.1 Percentage of nurses with further training equivalent to at least 6 months full time training, by years since completed basic training.

	Years since basic training				
	1 - 5	6 - 10	11- 20	21+	Total
Completed further training	11	37	63	62	49
Is currently undertaking or is planning further training	31	22	9	4	13
No further training	57	41	28	34	37
Sum	99	98	100	100	99
N	322	305	559	615	1801

Source: Havn (1996: figures 5.2 and 5.3).

On average, the nurses who have taken further training have done 19 months of such training. This means that the average for all nurses is more than 9 months of formal further training.[2]

A 1996 survey shows that of those who had taken further training, 76 had taken professional specialisation, 36 per cent had taken administrative training, 9 per cent pedagogical further training, while 12 per cent had taken further training in other subjects (Havn 1996: 52).[3]

Like the nurses, teachers undertake a considerable amount of extensive, formal further training. But previous estimates have differed significantly in how much time teachers spend on up-grading training. A study by the Ministry of Education and Research estimates that in 1992 teachers on average spent 40 hours on up-dating training and 149 hours on up-grading training per year (Kirke- utdannings- og forskningsdepartementet 1992).[4]

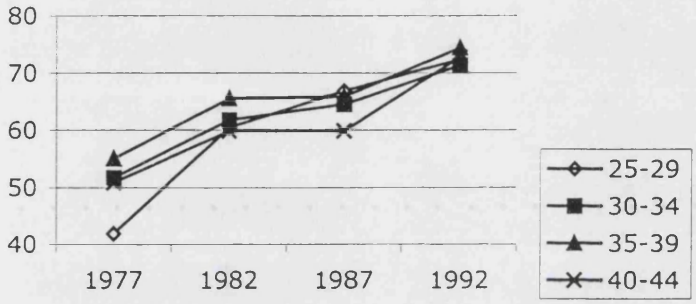
[2] This number only includes a formal further training equivalent of six months full time training or more. Thus, the number underestimates the total amount of further training nurses have received.

[3] The sum is over 100 per cent because some nurses had taken more than one type of further training.

[4] The estimates in the Ministry's report are 5.0 and 13.6 days, respectively.

By comparison, Jordfald and Nergaard (1999: 16) find that teachers on average spend 36 hours on up-dating training and 33 hours on up-grading training.[5] So while the estimates of up-dating training are similar, the latter estimate of up-grading training is less than a quarter of the former.[6]

Instead of basing the analysis on any of the previous, contradictory results, a time series can show the amount of up-grading training teachers



have undergone.

Figure A4.1 Share of teachers of grade 2, 3 or 4 in 1977, 1982, 1987 and 1992 by age cohorts in 1977. *Source:* Statistisk sentralbyrå (1978: Table 42; 1983: Table 44; 1988: Table 41; 1993: Table 23)

Figure A4.1 shows the increase in the share grade 2, 3 and 4 teachers over the period from 1977 to 1992. The remaining teachers are all grade 1 teachers. Hence, the figure illustrates the up-grading training undertaken by five cohorts over the 15-year period. The figure shows that

---

[5] One reason for the vast difference is that many teachers do not know how many hours they have spent on up-grading training. Less than half of those who had taken up-grading training reported how many hours they had spend on such training (Jordfald and Nergaard 1999: 9). The Ministry of Education and Research estimate was not based on a survey, but on participation data from colleges and universities.

[6] Another survey showed that employers financed three days of further training for teachers during the last 12 month before the interview (Nergaard 1994: 28).

in 1992 more than 70 per cent of the teachers were grade 2, 3 or 4. 15 years earlier none of the cohorts had a share larger than 55 per cent.

Table A4.2 Number of teachers, by age in 1977

Age group in 1977	1977	1982	1987	1992
25 - 29	6228	5933	6116	6442
30 - 34	7268	5781	5943	6748
35 - 39	4175	3204	3113	3846
40 - 44	2118	1820	1665	2115

Source: Statistisk sentralbyrå (1978: Table 42; 1983: Table 44; 1988: Table 41; 1993: Table 23).

The data are from the Statistics Norway's figures on primary and lower secondary schools. There are two problems associated with using these data in a time series. One is that these are not panel data, so one cannot control for the effect of members leaving or joining the cohort groups during the period. For example, table A4.2 shows that the size of all groups is reduced from 1977 to 1982.

This may be related to the second problem, namely that the methods of data collection and reporting may have changed over time, with effects that cannot easily be distinguished from actual changes in the educational level of teachers. These problems mean that interpretation of these tables should be based on broad comparisons over more than one time period.

Table A4.3 Net change in teachers' educational background from 1977 to 1992, by age cohorts in 1977. Per cent

	Net change % grade 1 teachers 1977–1992	Net change % 2/3 teachers 1977 - 1992	Net change % 4 teachers 1977 - 1992
25 - 29	-30.5	26.0	4.5
30 - 34	-19.6	14.5	5.1
35 - 39	-19.4	7.7	11.8
40 - 44	21.9	3.9	17.9

Source: Statistisk sentralbyrå (1978: Table 42; 1983: Table 44; 1988: Table 41; 1993: Table 23).

The pattern shown in figure A4.1 and the differences between the age groups are shown more precisely in table A4.3. This table shows that in the 25-29 years of age cohort of 1977, a 30.5 per cent smaller share was made up of grade 1 teachers in 1992. The net increase of share of grade 2 and 3 teachers was 26.0 per cent, while the equivalent for grade 4 teachers was 4.5 per cent. For the three other groups, the decrease in the share of grade 1 teachers was lower, about 20 per cent. But in the older groups the share of grade 4 teachers had grown more than in the younger groups. This means that while the up-grading training for the younger groups was primarily from grade 1 to 2 or from 2 to 3, a larger part of up-grading training for the older groups was from grade 2 or 3.[7]

Since the information about up-grading from grade 2 to grade 3 is unavailable, the figures here underestimate the amount of up-grading teachers have undergone by a considerable amount. But even if we exclude this type of up-grading training, which is likely to be no smaller than up-grading from grade 1 to grade 2, the share of teachers who have done up-grading training of at least one year in this period is considerable. In the youngest cohort, the share is 35 per cent, for those between 30 and 34 in 1977 it is 25 per cent, for those between 35 and 39 in 1977 it is 30 per cent, while the share for the oldest group is 38 per cent. Table A4.1 showed that six out of ten nurses who completed training at least 10 years ago had undertaken formal further training. This share is higher than the share of teachers above. But since further training for nurses needed to be only a minimum of six months, while the amount required for teachers was one year, and the important type of up-grading training from grade 2 to 3 could not be estimated, the amount of formal training teachers get is unlikely to be much, if at all, lower than for nurses.

---

[7] There are no available data on the amount of upgrading from grade 2 to grade 3. Thus, one cannot know how extensive this type of up-grading training is compared to upgrading from grade 1 or to grade 4.

The insurance industry data show that employees get a considerable amount of formal further training, but the amount is smaller than for nurses and teachers.

Table A4.4 Estimated percentage of employees participating in NAI training, by company. 1996

Insurance companies, ranked by size	NAI participants as ratio of total no. of employees in 1996	Estimated no. of participants	Employees
Storebrand	16%	680	4,306
Gjensidige	19%	624	3,273
Vesta	20%	283	1,432
Samvirke	28%	255	924
Vital	24%	170	703
Norske Liv	51%	113	222
Andre	35%	709	2,016
Total	22%	2,834	12,876

Source: Forsikringsakademiet (1997).

In this estimate it is assumed that all NAI participants are employees in companies that are NAI members.

NAI training plays an important part in further training of insurance employees. A 1989 survey shows that 71 per cent of insurance employees had done some NAI training (MMI 1989). The most important source of training in addition to NAI is internal training. Companies to some extent use internal training as an alternative to NAI training. In line with the resource explanation of collective action, presented in chapter 3, larger companies are most likely to organise internal training, and a smaller share of employees in large companies therefore do NAI training, as shown in table A4.4.[8] There is no representative survey of the amount

[8] The pattern in Table A4.4 could also reflect that employees in the larger companies overall get less training than employees in the small companies, but there is no support for this interpretation in the interviews with informants in the industry.

of internal training employees receive, but detailed information from one of the largest companies showed that employees on average did 23 hours of internal training per year (Johansen 1999: 56). In addition, assuming that on average the NAI participants take a 1 credit course, and as assumed in Appendix 3 this takes 85 hours, insurance employees on average receive 19 hours of NAI training per year (22% × 85). Since employees in large companies get a fair amount of internal training, relatively speaking, and less than average NAI training, this suggests that a rough estimate for all insurance employees is that they get one week of further training either internally or at NAI per year. In addition, some take training at private or public colleges, but the number of participants there is likely to be much lower.[9]

While the estimate is uncertain, it still clearly suggests that the amount of further training is lower in the insurance case than in the nurses' case. Given that nurses on average have undergone 9 months of long, formal further training, and their average time since completed basic training is 16.5 years (Havn 1996: 8), they have spent on average almost two and a half weeks per year on this type of training. All short training nurses receive is excluded. Thus, there is clear support for the conclusion that insurance employees receive less further training than nurses do.

The difference from teachers and nurses is not only that the amount of training is somewhat lower, but also, and more clearly, that fewer take extensive further training. Insurance employees can combine NAI training into larger units, as the Insurance Exam or the Higher Insurance Exam, but few do so compared to the amount of extensive further training teachers and nurses take. In the period from 1980 to 1992, a total of 576 people had commenced the fourth term of the Higher Insurance Exam (Gunhildsbu 1994: 6).[10] This was slightly less than 5 per cent of the total number of employees in the insurance companies in 1992.

---

[9] No data on such participation exist.

[10] Not all of these completed the program.

Even if one must add those who have take extensive further training at other colleges, there is nothing to suggest that adding these will make the share of employees who have taken extensive further training similar to teachers and nurses.

Table A4.5 Percentage of engineers with further training equivalent of at least 6 months full time training, by years since completed basic training.

	Years since completed basic training				
	0 - 5	6 - 10	11 - 20	21+	Total
6 months or more of further training	24.3	27.6	35.5	32.0	31.2
No training, or up to 6 months	75.7	72.4	64.5	68.0	68.8
Sum	100.0	100.0	100.0	100.0	100.0
N	280	297	583	647	1,807

Source: Norges ingeniørorganisasjon (1997b).

Table A4.5 shows that 31 per cent of engineers have taken 6 months or more of further training since they completed initial training. This can be compared to Table A4.1, where 49 per cent of nurses said they had completed further training equivalent to six months. However, the difference between the two groups is larger than these figures suggest. The reason is that the data on nurses include only those who have taken one type of further training that lasted more than six months, while the data on engineers include those who have taken several types of further training which in sum has lasted more than six months. [11] Thus, even if a

[11] But the data do, to some extent, also underestimate the amount of training engineers undertake, because if engineers take further training to be graduate engineers they will leave NITO, and thus disappear from the survey sample (in 1997, 2 of 2002 respondents in NITO's member survey were graduate engineers (Norges ingeniørorganisasjon 1997b)). Still, since the vast majority of engineers who take graduate engineer training do it soon after completing training, this has been defined as basic training, as explained in chapter 4.

substantial share of engineers have done a lot of further training, the amount is significantly lower than for nurses, and consequently lower than for teachers too. There are not sufficient data to make an accurate comparison of the amount of training in the engineers' and insurance cases.

Table A4.5 shows that among engineers the group that finished basic training 11 - 20 years ago is the one where the largest share has taken further training of six months or more. Those who most recently completed basic training are least likely to have taken further training. Since the most experienced group has taken further training less often than the second most experienced one, the table suggests not only that engineers are more likely to have taken further training, the longer it has been since they completed basic training, but there are also differences between cohorts. However, the table cannot show how strong this difference between 'generations' of engineers is, or if the younger cohorts will take more further training than the more experienced cohorts have. A comparison of table A4.5 with the equivalent table for nurses, table A4.1, shows that the differences between the four cohorts are much smaller for engineers than for nurses. Without a time series available, it is impossible to analyse the reasons for this difference between the two groups.

A4.2 Shortages of specialist nurses

Table A4.6 Vacancies, number of positions, percentage of specialist nurses in filled positions, number of specialist nurses and total number of filled positions in Norwegian hospitals' intensive care units. 1999.

	Positions vacant more than 4 months	Total no. of positions (both filled and vacant)	% of positions vacant more than 4 months	% of specialist nurses in filled positions	No. of specialist nurses	Filled positions
Akershus	6	101.6	64	49.3	18.0	35.5
Hammerfest	11.6	24.5	47.5	67.0	8.6	21.6
Bærum	6.7	17.0	39.1	47.1	4.9	15.9
Telemark	24.5	76.3	32.1	56.6	29.3	57.6
Aker	16	62.0	25.8	42.0	19.3	52.1
Fredrikstad	16	65.0	24.6	63.3	31.0	54.6
Ringerike	7	29.8	23.5	85.7	19.5	27.7
Tromsø	13.5	60.0	22.5	89.4	41.6	51.9
Lillehammer	6	37.7	15.9	80.0	25.4	35.5
Vestfold	6	44.8	13.4	84.5	32.8	42.1
Rogaland	10	76.9	13	77.4	51.8	69.2
Buskerud	4.7	40.2	11.7	45.5	16.1	38.3
Vest-Agder	7	69.3	10.1	58.8	36.6	64.5
Ullevål	6	60.0	10	55.6	30.0	56.4
Kongsvinger	2	20.8	9.6	37.8	7.1	20.4
Sogn og Fjordane	2.5	29.4	8.5	77.9	21.0	28.7
Haukeland	3.75	50.7	7.4	87.3	41.0	48.8
Namdal	1	20.4	4.9	51.7	10.0	20.2
Haugesund	1.25	29.1	4.3	94.6	26.3	28.7
Hedmark	1.75	53.0	3.3	81.2	41.6	52.1
Molde	0.8	25.0	3.2	62.9	15.2	24.8
Harstad	0.5	22.7	2.2	84.3	18.7	22.6
Kristiansund	0.4	25.0	1.6	96.1	23.6	24.9
Trondheim	0	44.5	0	62.5	27.8	44.5
Aust-Agder	0	44.5	0	96.8	43.1	44.5
Møre og Romsdal	0	44.5	0	74.1	33.0	44.5
Nordland	0	44.5	0	65.1	29.0	44.5
Gjøvik	0	44.5	0	97.8	43.5	44.5
National Cancer Hospital	1.5	26.8	5.6	–	–	–
Average			16.7	66.8		
Sum	215.4	1,290.5			745.8	1,116.6

Note: – denotes missing. Number of positions at hospitals with no vacant positions estimated as average of number at other hospitals. National Hospital missing. *Source:* Statens helsetilsyn (1999: 12).

Literature

Acemoglu, Daron. 1996. Credit constraints, investment externalities and growth. In *Acquiring skills: Market failures, their symptoms and policy responses*, edited by A. L. Booth and D. J. Snower. Cambridge; New York: Cambridge University Press.

Acemoglu, Daron, and Jörn-Steffen Pischke. 1996. *Why do firms train? Theory and evidence, NBER working paper; no. 5605*. Cambridge, Mass.: National Bureau of Economic Research.

Acemoglu, Daron, and Jörn-Steffen Pischke. 1998. Why do firms train? Theory and evidence. *Quarterly Journal of Economics* 113:79-119.

Acemoglu, Daron, and Jörn-Steffen Pischke. 1999. Beyond Becker: Training in imperfect labour markets. *The Economic Journal* 109 (February):F112-F142.

Althauser, Robert P., and Arne L. Kalleberg. 1981. Firms, occupations and the structure of labor markets: A conceptual analysis. In *Sociological perspectives on labor markets*, edited by I. Berg. New York: Academic Press.

Arbeidsdirektoratet. 1987. *Behov for arbeidskraft.* Oslo: Arbeidsdirektoratet.

Arbeidsdirektoratet. 1997. *Kvartalsrapport om arbeidsmarkedet. Nr. 4/97.* Oslo: Arbeidsdirektoratet.

Armstrong, Peter. 1988. Labour and monopoly capital. In *New technology and industrial relations*, edited by R. Hyman and W. Streeck. Oxford: Basil Blackwell.

Ashton, D. N., and Francis Green. 1996. *Education, training, and the global economy.* Aldershot; Brookfield, Vt.: Edward Elgar.

Atkinson, John, and Nigel Meager. 1986. *Changing working patterns: How companies achieve flexibility to meet new needs.* London: National Economic Development Office.

Axelrod, Robert M. 1984. *The evolution of cooperation.* New York: Basic Books.

Becker, Gary S. 1962. Investment in human capital: a theoretical analysis. *Journal of Political Economy* 5 (2):9-49.

Becker, Gary S. 1993. *Human capital: A theoretical and empirical analysis, with special reference to education.* 3rd ed. London: University of Chicago Press.

Beer, Michael. 1984. *Managing human assets.* New York: Free Press London: Collier Macmillan.

Benum, Edgeir. 1975. 'Dannelse, 'Tillid' og 'Autoritet'. In *Makt og motiv: Et festskrift til Jens Arup Seip 1905 - 11. oktober - 1975*, edited by E. Bull, O. Dahl, G. Hølmebakk, P. Maurseth and K. Mykland. Oslo: Gyldendal.

Berg, Peter B. 1994. The German training system. In *Britain's training deficit: The Centre for Economic Performance report*, edited by K. Mayhew, G. Owen and R. Layard. Aldershot; Brookfield, Vt.: Avebury.

Bertrand, Olivier, and Thierry Noyelle. 1988. *Human resources and corporate strategy: Technological change in banks and insurance companies: France, Germany, Japan, Sweden, United States.* Paris: OECD.

Bishop, John. 1991. Employer training & skill shortages: A review of the state of knowledge. Ithaca: Center for Advanced Human Resource Studies, Cornell University, ILR School.

Bishop, John. 1992. On-the-job training of new hires. In *Market failure in training: New economic analysis and evidence on training of adult employees*, edited by D. Stern and J. M. M. Ritzen. London: Springer-Verlag.

Blaug, Mark. 1972. *An introduction to the economics of education.* Harmondsworth: Penguin.

Blaug, Mark. 1992a. The empirical status of human capital theory: A slightly jaundiced survey. In *The economic value of education: Studies in the economics of education*, edited by M. Blaug. Aldershot: Edward Elgar.

Blaug, Mark. 1992b. *The methodology of economics: Or how economists explain.* 2nd ed, *Cambridge surveys of economic literature.* Cambridge: Cambridge University Press.

Blaug, Mark, and Bashir Ahamad. 1973. Introduction. In *The practice of manpower forecasting: A collection of case studies*, edited by M. Blaug and B. Ahamad. Amsterdam: Elsevier.

Blaug, Mark, Maurice Peston, and Adrian Ziderman. 1967. *The utilization of educated manpower in industry: A preliminary report.* Edinburgh: Oliver and Boyd.

Blyton, Paul, and Peter W. Turnbull. 1992. HRM: Debates, dilemmas and contradictions. In *Reassessing human resource management*, edited by P. Blyton and P. W. Turnbull. London: Sage.

Booth, Alison Lee, and Dennis J. Snower. 1996. Introduction: Does the free market produce enough skills? In *Acquiring skills: Market failures, their symptoms and policy responses*, edited by A. L. Booth and D. J. Snower. Cambridge; New York: Cambridge University Press.

Bosch, Gerhard. 1997. Flexibility in the Norwegian labour market in a comparative perspective. In *Making solidarity work? The Norwegian labour market model in transition*, edited by J. E. Dølvik and A. H. Steen. Oslo: Scandinavian University Press.

Bosworth, Derek, and Richard Pearson. 1992. Shortages of professional scientists and engineers. In *Skill shortages: Causes and consequences*, edited by D. L. Bosworth, P. A. Dutton and J. Lewis. Aldershot: Avebury.

Bosworth, Derek, and Paul Warren. 1992. Modelling skill shortages. In *Skill shortages: Causes and consequences*, edited by D. L. Bosworth, P. A. Dutton and J. Lewis. Aldershot: Avebury.

Bosworth, Derek, Rob Wilson, and Abebe Assefa. 1994. A human capital approach to training: Second draft. In *The market for training: An overview*, edited by R. McNabb and K. Whitfield. Aldershot; Brookfield, Vt.: Avebury.

Bosworth, Derek L., Patricia A. Dutton, and Jackie Lewis. 1992. Introduction. In *Skill shortages: Causes and consequences*, edited by D. L. Bosworth, P. A. Dutton and J. Lewis. Aldershot: Avebury.

Bowman, John R. 1989. *Capitalist collective action: Competition cooperation and conflict in the coal industry*. New York; Cambridge: Cambridge University Press.

Bowman, John R. 1998. Achieving capitalist solidarity: Collective action among Norwegian employers. *Politics & Society* 26 (3):303-336.

Brandt, Ellen. 1989. *'Vi satser på kompetanse': Opplæringspolitikk i tolv høyteknologi- og servicebedrifter, Melding; no. 1989:7*. Oslo: NAVFs utredningsinstitutt.

Brandt, Ellen. 1991. *Continuing education for managers and engineers: From a study of Norwegian firms and course providers, Report; no. 2/91*. Oslo: Norwegian Institute for Studies in Research and Higher Education.

Braverman, Harry. 1974. *Labor and monopoly capital: The degradation of work in the twentieth century*. New York; London: Monthly Review Press.

Brown, Clair. 1994. Training, productivity and underemployment in institutional labour markets. In *The market for training: An overview*, edited by R. McNabb and K. Whitfield. Aldershot; Brookfield, Vt.: Avebury.

Brækken, Gro. 1997. Tiden er inne for et åpent universitet. *Aftenposten*, 12 June.

Büchter, Karin. 1999. Guidelines for determining skill needs in enterprises. *European Journal Vocational Training* (16):7-13.

Buechtemann, Christoph F., and Dana J. Soloff. 1994. Education, training and the economy. *Industrial Relations Journal* 25 (3):234-246.

Cain, G. G., Richard B. Freeman, and W. L. Hansen. 1973. *Labor market analysis of engineers and technical workers.* Edited by S. A. Levitan, *Policy studies in employment and welfare number 18.* Baltimore: The John Hopkins University Press.

Campbell, Donald T. 1994. Foreword. In *Case study research: Design and methods*, edited by R. K. Yin. London: Sage.

Cappelli, Peter, and Anne Crocker-Hefter. 1993. *Distinctive human resources are the core competencies of firms.* Philadelphia, Penn.: National Center on the Educational Quality of the Workforce.

Cappelli, Peter, and Nikolai Rogovsky. 1994. New work systems and skill requirements. *International Labour Review* 133 (2):205-220.

Card, David E., and Alan B. Krueger. 1995. *Myth and measurement: The new economics of the minimum wage.* Princeton, N.J: Princeton University Press.

Cedefop. 1996. *Glossarium: vocational training: A comparison of concepts from 12 member states of the European Union in 9 languages.* Thessaloniki: CEDEFOP - European Centre for the Development of Vocational Training.

Christensen, Tom, and Morten Egeberg. 1994. *Forvaltningskunnskap.* 2nd ed. Oslo: TANO.

Clement, Werner, Keith Drake, Pang Eng Fong, and Gregory Wurzberg. 1993. *Industry training in Australia, Sweden, and the United States.* Paris: Organisation for Economic Co-operation and Development.

Crouch, Colin. 1993. Co-operation and competition in an institutionalised economy: The case of Germany. In *Ethics and markets: Co-operation and competition within capitalist economies*, edited by C. Crouch and D. Marquand. Oxford: Blackwell.

Crouch, Colin. 1995. Organized interests as resources or as constraint: Rival logics of vocational training policy. In *Organized industrial relations in Europe: What future?*, edited by F. Traxler. Aldershot: Avebury.

Crouch, Colin. 1998. Skills-based full employment: The latest philosopher's stone. *British Journal of Industrial Relations* 35 (3):367-291.

Crouch, Colin, David Finegold, and Mari Sako. 1999. *Are skills the answer?* Oxford: Oxford University Press.

Diakonhjemmets sykehus. 1996. *Kompetanseutviklings- og etterutdanningsplan for kliniske sykepleiere.* Oslo: Diakonhjemmets sykehus.

Dixit, Avinash K., and Barry Nalebuff. 1991. *Thinking strategically: The competitive edge in business, politics, and everyday life.* 1st ed. New York: Norton.

Doeringer, Peter B., and Michael J. Piore. 1971. *Internal labor markets and manpower analysis.* Lexington, Mass.: Heath Lexington.

Dore, Ronald, and Mari Sako. 1989. Chapter 6: Training in the enterprise. In *How the Japanese learn to work.* London: Routledge.

Drake, Keith. 1991. Interventions in market financing of training in the European Community. In *International comparisons of vocational education and training for intermediate skills*, edited by P. Ryan. London: The Falmer Press.

Dølvik, Jon Erik, Mona Bråten, Frode Longva, and Arild H. Steen. 1997. Norwegian labour market institutions and regulations. In *Making solidarity work? The Norwegian labour market model in transition*, edited by J. E. Dølvik and A. H. Steen. Oslo: Scandinavian University Press.

Dølvik, Jon Erik, and Arild H. Steen, eds. 1997. *Making solidarity work? The Norwegian labour market model in transition.* Oslo: Scandinavian University Press.

Dølvik, Jon Erik, and Torgeir Aakvaag Stokke. 1998. Norway: The revival of centralized concertation. In *Changing industrial relations in Europe*, edited by A. Ferner and R. Hyman. Malden, Mass.: Blackwell.

Eckaus, R. S. 1963. Investment in human capital: A comment. *Journal of Political Economy* LXXI (5):501-504.

Econ. 1997. *Etter- og videreutdanning: Hindringer og incentiver, ECON report; no. 36*. Oslo: Econ.

EIRO Online. 1998a. *Collective bargaining and continuing vocational training in Europe*. EIRO Online.

EIRO Online. 1998b. *Merger of teachers' unions proposed*. EIRO Online.

EIRO Online. 1998c. *Report on the financing of continuing vocational training*. EIRO Online.

Eldring, Line, and Eivind Falkum. 1995. *Framtidens ingeniørarbeid, Fafo report; no.180*. Oslo: Fafo.

Eldring, Line, and Sveinung Skule. 1999. *Kompetansedokumentasjon for ingeniører: Praksis, behov og utfordringer, Fafo working paper; 1999: 16*. Oslo: Fafo.

Espeli, Harald. 1995. *Private konkurransereguleringer innenfor forsikringsnæringen i Norge 1900-1985 og myndighetenes holdning til disse*. Oslo: Norges Forskningsråd.

Feuer, Michael J., Henry A. Glick, and Anand Desai. 1987. Is firm sponsored education viable? *Journal of Economic Behavior and Organisation* 8:121-136.

Feuer, Michael J., Henry A. Glick, and Anand Desai. 1992. Firm financed education and specific human capital: A test of the insurance hypothesis. In *Market failure in training: New economic analysis and evidence on training of adult employees*, edited by D. Stern and J. M. M. Ritzen. London: Springer-Verlag.

Finegold, David. 1991a. The implications of 'Training in Britain' for the analysis of Britain's skills problem: A comment on Paul Ryan's 'How much do employers spend on training?'. *Human Resource Management Journal* 2 (1):110-115.

Finegold, David. 1991b. Institutional incentives and skill creation: Preconditions for a high-skill equilibrium. In *International comparisons of vocational education and training for intermediate skills*, edited by P. Ryan. London: The Falmer Press.

Finegold, David. 1996. Market failure and government failure in skills investment. In *Acquiring skills: Market failures, their symptoms and policy responses*, edited by A. L. Booth and D. J. Snower. Cambridge; New York: Cambridge University Press.

Finegold, David, and Colin Crouch. 1994. A comparison of national institutions. In *Britain's training deficit: The Centre for Economic Performance report*, edited by K. Mayhew, G. Owen and R. Layard. Aldershot; Brookfield, Vt.: Avebury.

Finegold, David, and David Soskice. 1988. The failure of training in Britain: analysis and prescription. *Oxford Review of Economic Policy* 4 (3):21-53.

Folk, Hugh. 1970. *The shortage of scientists and engineers*. Lexington: Heath Lexington.

Forsikringsakademiet. 1990. *Årsrapport med regnskap 1989*. Oslo: Forsikringsakademiet.

Forsikringsakademiet. 1995. *The Norwegian Academy of Insurance*. Oslo: Forsikringsakademiet.

Forsikringsakademiet. 1996a. *Årsrapport med regnskap 1995*. Oslo: Forsikringsakademiet.

Forsikringsakademiet. 1996b. *Kurskatalog 1996-97*. Oslo: Forsikringsakademiet.

Forsikringsakademiet. 1997. *Årsrapport med regnskap 1996*. Oslo: Forsikringsakademiet.

Forsikringsakademiet. 1998a. *FAK nytt* (2).

Forsikringsakademiet. 1998b. *FAK nytt* (6).

Forsikringsfunksjonærenes Landsforbund. 1997. *FLs Strategiske plan 1997 - 1999*. Oslo: Forsikringsfunksjonærenes Landsforbund.

Forsikringsselskapenes Arbeidsgiverforening (FA), and Forsikringsfunksjonærenes Landsforbund (FL). 1996. *Tariffavtale mellom Forsikringsselskapenes Arbeidsgiverforening (FA) og Forsikringsfunksjonærenes Landsforbund (FL).* Oslo: Forsikringsfunksjonærenes Landsforbund.

Franz, Wolfgang, and Wolfgang Soskice. 1995. The German apprenticeship system. In *Institutional frameworks and labor market performance: Comparative views on the U.S. and German economies*, edited by F. Buttler, W. Franz, R. Schettkat and D. Soskice. London: Routledge.

Freeman, Richard B. 1971. *The market for college-trained manpower: A study in the economics of career choice.* Cambridge, Mass.: Harvard University Press.

Freeman, Richard B. 1976. *The over-educated American.* New York; London: Academic Press.

Freeman, Richard B. 1997. Are Norway's solidaristic and welfare state policies viable in the modern global economy? In *Making solidarity work? The Norwegian labour market model in transition*, edited by J. E. Dølvik and A. H. Steen. Oslo: Scandinavian University Press.

Gallie, Duncan. 1991. Patterns of skill change: Upskilling, deskilling or the polarization of skills? *Work, Employment and Society* 5:319-351.

Gannicot, Kenneth, and Mark Blaug. 1973. Scientists and engineers in Britain. In *The practice of manpower forecasting: A collection of case studies*, edited by M. Blaug and B. Ahamad. Amsterdam: Elsevier.

Gehin, Jean Paul, and Phillippe Mehaut. 1995. The German dual system: A model for Europe? *Industrielle Beziehungen* 2 (1):64-81.

Gintis, Herbert. 1992. Education, technology and the characteristics of worker productivity. In *The economic value of education: Studies in the economics of education*, edited by M. Blaug. Aldershot: Edward Elgar.

Glynn, Sean, and Howard Gospel. 1993. Britain's low skill equilibrium: A problem of demand? *Industrial Relations Journal* 24 (2):112-125.

Gooderham, Paul, Olav A. Kvitastein, and Odd Nordhaug. 1996. Strategier for menneskelig ressurser: Norske bedrifter i europeisk perspektiv. Bergen: SNF.

Gran, Ellen Kristine, and Sigrid Tofte. 1989. *Holdningsundersøkelse i Gjensidige Forsikring*. Sandvika: Bedriftsøkonomisk institutt.

Granovetter, Mark. 1985. Economic action and social structure: The problem of embeddedness. *American Journal of Sociology* 91 (3):481-510.

Green, Andrew, Thomas J. Leney, and Alison Wolf. 1999. *Convergences and divergences in European education and training systems.* Luxembourg: Office for Official Publications of the European Communities.

Green, Francis. 1994. The determinants of training of male and female employees, and some measures of discrimination. In *The market for training: International perspectives on theory, methodology and policy*, edited by R. McNabb and K. Whitfield. Aldershot; Brookfield, Vt.: Avebury.

Green, Francis. 1996. *Skill, training, organisational commitment and unemployment: The economics of a labour management strategy, Discussion paper; no. 313*. London: Centre for Economic Performance.

Green, Francis. 1999. Skills-based full employment: The latest philosopher's stone: Discussion. *British Journal of Industrial Relations* 35 (3):367-384.

Green, Francis, and David Ashton. 1992. Skill shortage and skill deficiency: A critique. *Work, employment and society* 6 (2):287-301.

Grunnskolerådet. 1989. *Krav til kompetanse for lærere i grunnskolen*. Oslo: Grunnskolerådet/Lærerutdanningsrådet.

Gunhildsbu, Bodil. 1994. *Forsikringsbransjens mellomlederutdanning - suksess eller fiasko? Evaluering av Høyere Forsikringseksamen 1980 - 1992.* Oslo: University of Oslo.

Halvorsen, Tor. 1994. *Profesjonalisering og profesjonspolitikk: Den sosiale konstruksjonen av tekniske yrker*. Bergen: University of Bergen.

Hansen, W. Lee. 1992. Nonmarket failure in government training programs. In *Market failure in training: New economic analysis and evidence on training of adult employees*, edited by D. Stern and J. M. M. Ritzen. London: Springer-Verlag.

Hardin, Russell. 1982. *Collective action*. Baltimore: Johns Hopkins University Press.

Hart, Peter. 1992. Skill shortages in the United Kingdom. In *Skill shortages: Causes and consequences*, edited by D. L. Bosworth, P. A. Dutton and J. Lewis. Aldershot: Avebury.

Hashimoto, Masonori. 1981. Firm-specific human capital as a shared investment. *American Economic Review* 71 (3):475-482.

Haskel, Jonathan, and Christopher Martin. 1993. Do skill shortages reduce productivity? Theory and evidence from the United Kingdom. *The Economic Journal*.

Havn, Vidar. 1996. *Videreutdanning blant sykepleiere, ergoterapeuter og radiografer*. Trondheim: Sintef IFIM.

Havn, Vidar, and May Thorseth Huitfeldt. 1994. *Teknologisk kompetanse - effektiv eller strategisk?* Trondheim: Sintef IFIM.

Hendry, Chris, Michael B. Arthur, and Alan M. Jones. 1994. *Strategy through people: Adaptation and learning in the small-medium enterprise*. London; New York: Routledge.

Heyes, Jason. 1996. A formula for success? Training, reward and commitment in a chemicals plant. *British Journal of Industrial Relations* 34 (3):351-369.

Hirschman, Albert O. 1970. *Exit, voice, and loyalty: Responses to decline in firms, organizations, and states*. Cambridge, Mass; London: Harvard University Press.

Hoel, Marit. 1991. *Sykepleieryrket: Fra kvinneyrke til profesjon?, Report; no. 91:2*. Oslo: Institute for Social Research.

Hoel, Marit, Arne Mastekaasa, and Clara Åse Arnesen. 1990. *Overganger fra offentlig til privat sektor blant høgskoleutdannede: Lønnsforskjeller,*

lønnsnivå og yrkesmuligheter, Report; no. 4/90. Oslo: NAVFs utredningsinstitutt.

Hofoss, Dag, and Elisabeth Gjerberg Buxrud. 1987. *Sykepleiermangelen: Årsaker, utvikling, tiltak, Report; no. 4 - 1987.* Oslo: Gruppe for helsetjenesteforskning.

Holter, Inger-Margrethe, Liv Anne Berven, Liv Inger Erntsen, Svein Erik Gisvold, Lars Erik Flatø, and Rolf Kåresen. 1996. *Utredning om utdanning av spesialsykepleiere ved regionsykehusene.* Unpublished.

Holter, Peter Andreas. 1961. *Ingeniøren og hans stilling: Om profesjon - arbeid - personlighet.* Trondheim: Institutt for industriell miljøforskning, NTH.

Hustadnes, Halldor. 1997. KS lokker og truer... *Aftenposten*, 7 December.

Høgskolen Stord/Haugesund. 1997. *Eur ing-studium i sikkerhetsfag.* Haugesund: Høgskolen Stord/Haugesund.

Ingeniørutdanningsrådet. 1995. *Ingeniørutdanningen representerer mange teknologisk kompetansesentre, hvordan skal vi utnytte dem?* Oslo: Ingeniørutdanningsrådet.

Ingeniørutdanningsrådet. 1996. *Samarbeid om kompetanseutvikling mellom arbeidslivet og høgre teknisk utdanning: Sluttrapport for prosjektet 1993 - 1997.* Oslo: Ingeniørutdanningsrådet.

Ingeniørutdanningsrådet. 1997. *Høyere teknisk naturvitenskapelig utdanning 97.* Oslo: Ingeniørutdanningsrådet.

Ingenjörsvetenskapsakademien. 1994. *Engineers in lifelong learning: A study conducted by the Royal Swedish Academy of Engineering Sciences, IVA, on behalf of the Ministry of Education and Science in Sweden.* Stockholm: The Royal Swedish Academy of Engineering Sciences.

International Labour Office. 1986. *Vocational training: Glossary of selected terms.* Geneva: International Labour Office.

Johansen, Lars-Henrik. 1998. *Ansvar for egen læring? Etter- og videreutdanning for ingeniører i teknologibedriftene, Spesialnotat for TBL.* Unpublished.

Johansen, Lars-Henrik. 1999. *Bak de store ord: Sammenlikninger av etter- og videreutdanning mellom bransjer og internasjonalt, Det 21. århundrets velferdssamfunn. Fafo report; no. 278.* Oslo: Fafo.

Jones, Ian S. 1986. Trainee pay and the costs of vocational training in Britain and West Germany. In *Social Europe: Supplement on youth pay and employers' recruitment practices for young people in the community*, edited by Commission of the European Communities. Luxembourg: Office for Official Publications of the European Communities.

Jordell, Karl Øyvind. 1991. Er lærere utilfredse? In *Utdanning og arbeismarked 1991: Tendenser og perspektiver*, edited by E. Brandt. Oslo: NAVFs utredningsinstitutt.

Jordfald, Bård, and Kristine Nergaard. 1999. *Etter- og videreutdanning blant lærere i grunnskolen og den videregående skolen.* Oslo: Fafo.

Kalleberg, Arne L., and Torger Reve. 1993. Contracts and commitment: Economic and sociological perspectives on employment relations. *Human Relations* 46 (9):1103-1132.

Kanter, Rosabeth Moss. 1984. Variations in managerial career structures in high-technology firms: The impact of organizational characteristics on internal labor market patterns. In *Internal labor markets*, edited by P. Osterman. Cambridge, Mass.: MIT Press.

Kanter, Rosabeth Moss. 1990. *When giants learn to dance.* New York: Simon & Schuster.

Katz, Eliakim, and Adrian Ziderman. 1990. Investment in general training: The role of information and labour mobility. *The Economic Journal* 100 (December):1147-1158.

Keep, Ewart, and Ken Mayhew. 1996. Evaluating the assumptions that underlie training policy. In *Acquiring skills: Market failures, their symptoms and policy responses*, edited by A. L. Booth and D. J. Snower. Cambridge New York: Cambridge; University Press.

King, Gary, Robert O. Keohane, and Sidney Verba. 1994. *Designing social inquiry: Scientific inference in qualitative research.* Princeton, N.J: Princeton University Press.

Kirke- utdannings- og forskningsdepartementet. 1992. *Etter- og videreutdanning av lærere: Oversikt over foreliggende tilbud. Innnstilling fra en arbeidsgruppe i Kirke-, utdannnings- og forskningsdepartementet.* Oslo: Kirke-, utdannnings- og forskningsdepartementet.

Kirke- utdannings- og forskningsdepartementet. 1996. *Kompetanseutvikling knyttet til innføringen av den nye læreplanen for grunnskolen: Plan for perioden 01.01.96 - 31.12.99.* Oslo: Kirke-, utdannings- og forskningsdepartementet.

Kirke- utdannings- og forskningsdepartementet. 1997. *Rapportering i forhold til delmålene i departementets plan for kompetanseutvikling for perioden 01.01.96-31.12.99.* Oslo: Kirke-, utdannings- og forskningsdepartementet.

Kirke- utdannings- og forskningsdepartementet. 1998. *Rapport: Overføring av bedriftsinterne videreutdanninger i sykepleiehøgskolene.* Oslo: Kirke-, utdannnings- og forskningsdepartementet.

Kirke- utdannings- og forskningsdepartementet. 1999. *The competence reform report no. 42 to the Storting (1997-98).* Oslo: Kirke-, utdannnings- og forskningsdepartementet.

Kjær, Knut N. 1992. *Strukturendringer i det norske forsikringsmarked og tilpasning til EF.* Oslo: NORAS.

Koch, Randi-Helene. 1983. *Formelle kompetanseforskrifter for tilsetting av lærere: En oversikt over rammer, krav og ansettelsesprosedyrer.* Oslo: Pedagogisk forskningsinstitutt.

Kochan, Thomas A., and Paul Osterman. 1994. *The mutual gains enterprise: Setting the agenda for workplace innovation.* Boston: Harvard Business School Press.

Kommunenes sentralforbund. 1996. *KS-nytt* (22. mars).

Lane, Christel. 1990. Vocational training and new production concepts in Germany: Some lessons for Britain. *Industrial Relations Journal* 21 (4):247-259.

Lange, Even. 1996. *Konkurranse og samarbeid: strukturendringer i norsk forsikring 1960-1990.* Oslo: Norges forskningsråd.

Larsen, Knut Arild. 1991. *Rekrutteringsundersøkelsen 1990.* Oslo: Arbeidsdirektoratet.

Larsen, Knut Arild. 1992. *Rekrutteringsundersøkelsen 1991.* Oslo: Arbeidsdirektoratet.

Larsen, Knut Arild. 1996. *Søking og rekruttering til ledige stillinger: Rekrutteringsundersøkelsen 1995.* Oslo: Arbeidsdirektoratet.

Larsen, Knut Arild. 1999. *For mye utdanning?, Horisont 21; no. 4/99.* Oslo: ECON, Senter for økonomisk analyse.

Larsen, Knut Arild, Frode Longva, Arne Pape, and Anders N. Reichborn. 1997. *Bedriften som lærested: En gjennomgang av etter- og videreutdanning i norske bedrifter, Fafo report; no. 212.* Oslo: Fafo.

Lauvdal, Torunn, Espen Rymoen, and Bent-Ole Grooss. 1998. *Kommuner og lærere - 'Farlige forbindelser'? Om konsekvenser av plassering av forhandlingsansvaret for lærerne.* Oslo: Work Research Institute.

Layard, Richard. 1994. The welfare economics of training. In *Britain's training deficit: The Centre for Economic Performance report*, edited by K. Mayhew, G. Owen and R. Layard. Aldershot; Brookfield, Vt.: Avebury.

Lefdal, Marianne. 1993. *Ledere og profesjoner: En casestudie av UNI Storebrand.* Sandvika: Bedriftsøkonomisk institutt.

Lester, Richard L., Robert M. Solow, and Michael L. Dertouzos. 1989. *Made in America: Regaining the productive edge.* London: MIT Press : New York : Harper.

Lewis, Jackie. 1992. Technological change and skill shortages. In *Skill shortages: Causes and consequences*, edited by D. L. Bosworth, P. A. Dutton and J. Lewis. Aldershot: Avebury.

Liff, Sonia. 1992. Patterns of innovation and skill shortages. In *Skill shortages: Causes and consequences*, edited by D. L. Bosworth, P. A. Dutton and J. Lewis. Aldershot: Avebury.

Lowenstein, Mark A., and James R. Spletzer. 1998. Dividing the costs and returns to general training. *Journal of Labor Economics* 16 (1):142-171.

Lukes, Steven. 1974. *Power: A radical view, Studies in sociology*. London: Macmillan.

Lynch, Lisa Michele. 1993. The economics of youth training in the United States. *The Economic Journal* 103 (September):1292-1302.

Lærerforbundet. 1995. *Spørreundersøkelse i Lærerforbundet om grunnskolereformen*. Oslo: Lærerforbundet.

Lærerutdanningsrådet. 1985. *Grunnskolelærernes utdanningsbakgrunn*. Oslo: Lærerutdanningsrådet.

MacDuffie, John Paul, and Thomas A. Kochnan. 1995. Do U.S. firms invest less in human resources? Training in the world auto industry. *Industrial Relations* 34 (2):147-168.

Marsden, David. 1986. *The end of economic man? Custom and competition in labour markets*. Brighton: Wheatsheaf.

Marsden, David. 1995. A phoenix from the ashes of apprenticeship? Vocational training in Britain. *International Contributions to Labour Studies* 5:87-114.

Marsden, David. 1999. *A theory of employment systems: Micro-foundations of international diversity*. Oxford: Oxford University Press.

Marsden, D., and P. Ryan. 1990. Institutional aspects of youth employment and training policy in Britain. *British Journal of Industrial Relations* 28 (3):351-369.

Marwell, Gerald, and Ruth E. Ames. 1981. Economists free ride, does anyone else? Experiments on the provision of public goods. *Journal of public economics* 15:295-310.

Mason, G, B. van Ark, and K. Wagner. 1996. Workforce skills, product quality and economic performance. In *Acquiring skills: Market failures, their symptoms and policy responses*, edited by A. L. Booth and D. J. Snower. Cambridge; New York: Cambridge University Press.

Maurice, Marc, Francois Sellier, and Jean-Jacques Silvestre. 1984. The search for a societal effect in the production of company hierarchy: A comparison of France and Germany. In *Internal labor markets*, edited by P. Osterman. Cambridge, Mass.: MIT Press.

Maurice, Marc, Francois Sellier, and Jean-Jacques Silvestre. 1986. *The social foundations of industrial power: A comparison of France and Germany.* Cambridge, Mass; London: MIT Press.

Maxwell, Joseph Alex. 1996. *Qualitative research design: An interactive approach, Applied social research methods series; no. 41.* Thousand Oaks, California: Sage.

McNabb, Robert, and Keith Whitfield. 1994. The market for training: An overview. In *The market for training: International perspectives on theory, methodology and policy*, edited by R. McNabb and K. Whitfield. Aldershot; Brookfield, Vt.: Avebury.

Meager, Nigel. 1986. Skill shortages again and the UK economy. *Industrial Relations Journal* 17 (3):236-248.

Mehaut, Phillippe. 1988. New firms' training policies and changes in the wage-earning relationship. *Labour and Society* (4):443-456.

Melby, Kari. 1990. *Kall og kamp: Norsk Sykepleierforbunds historie.* Oslo: Norsk Sykepleierforbund and J.W. Cappelens Forlag A.S.

Metcalf, Hilary. 1995. *Future skill demand and supply, PSI research report; no. 798.* London: Policy Studies Institute.

Meyer, John W., and Brian Rowan. 1991. Institutionalized organisations: Formal structure as myth and ceremony. In *The new institutionalism in organizational analysis*, edited by W. W. Powell and P. DiMaggio. Chicago: University of Chicago Press.

Milgrom, Paul R., and John Roberts. 1992. *Economics, organization, and management.* Englewood Cliffs, N.J: Prentice-Hall.

Mincer, Jacob. 1962. On-the-job training: Costs, returns, and some implications. *Journal of Political Economy* 5 (2):50-79.

Mincer, Jacob. 1992. Human capital and the labor market: A review of current research. In *The economic value of education: Studies in the economics of education*, edited by M. Blaug. Aldershot: Edward Elgar Publishing.

MMI. 1989. *Undersøkelser om kjennskap og holdninger til Forsikringsakademiet. Juni/juli 1989.* Oslo: MMI.

MMI. 1997. *Telefonundersøkelse om opplæring i arbeidslivet blant TBLs medlemsbedrifter mai 1997.* Oslo: MMI.

Mofossbakke, Camilla, and Anne-Kari Herrebrøden. 1995. *Er NITOs etterutdanningstilbud for ingeniører konkurransedyktig? Diplomoppgave NMH.* Oslo: NHM.

Musgrave, Richard A., and Peggy B. Musgrave. 1989. Public provision for social goods. In *Public finance in theory and practice.* New York; London: McGraw-Hill.

National Institute of Technology. 1996. *Norway: Access to continuing vocational training.* Oslo: National Institute of Technology.

NAVFs utredningsinstitutt. 1989. Fire kvinneyrker og ett mannsyrke: En undersøkelse av arbeidsmarkedssituasjonen blant kvinner og menn for tre årskull nyutdannede høgskolekandidater. Oslo: NAVFs utredningsinstitutt.

Nergaard, Kristine. 1994. *Arbeidsmiljø blant pedagogisk personale i grunnskole og videregående skole: Spesialkjøringer for Norsk Lærerlag på basis av Arbeids- og bedriftsundersøkelsen 1993.* Oslo: Fafo.

Noon, Mike. 1992. HRM: A map, model or theory? In *Reassessing human resource management*, edited by P. Blyton and P. W. Turnbull. London: Sage.

Nordhaug, Odd. 1993. *Human capital in organizations: Competence, training, and learning.* Oslo: Scandinavian University Press.

Nordhaug, Odd, and Paul Gooderham. 1996. *Kompetanseutvikling i næringslivet.* Oslo: Cappelen Akademisk Forlag.

Norges ingeniørorganisasjon. 1997a. *Årsrapport 1996.* Oslo: Norges ingeniørorganisasjon.

Norges ingeniørorganisasjon. 1997b. *Medlemsundersøkelse 1997.* Oslo: Norges ingeniørorganisasjon.

Norsk lærerlag. 1998. *Hovedtariffavtalen i staten 1998 - 2000.* Oslo: Norsk lærerlag.

Norsk sykepleierforbund. 1996. *Bemanning og opptak ved videreutdanningene i sykepleie 1995.* Oslo: Norsk sykepleierforbund.

Norsk sykepleierforbund. 1999. *Lønnsplassering for sykepleiere i Staten, fylkes-/kommunene, Oslo kommune: August 1999.* Oslo: Norsk sykepleierforbund.

Norske Sivilingeniørers Forening. 1997. *Årsberetning 1996.* Oslo: Norske Sivilingeniørers Forening.

North, Douglass C. 1990. *Institutions, institutional change and economic performance.* Edited by J. Alt and D. North, *The political economy of institutions and decisions.* New York: Cambridge University Press.

NOU 1985:26. Dokumentasjon av kunnskaper og ferdigheter: en utredning om voksnes rett til dokumentasjon i samsvar med lov om voksenopplæring paragraf 3. Oslo.

NOU 1988:28. Med viten og vilje. Oslo.

NOU 1988:32. For et lærerrikt samfunn. Oslo.

NOU 1992:26. En nasjonal strategi for økt sysselsetting i 1990-årene. Oslo.

NOU 1996:22. Lærerutdanning: mellom krav og ideal. Oslo.

NOU 1997:2. Pasienten først! Ledelse og organisering i sykehus. Oslo.

NOU 1997:25. Ny kompetanse. Oslo.

NTB. 1999. Lovfestet rett til permisjon ved utdanning. *Verdens Gang*, 19 September.

NTNU. 1997. *Etterutdanning i teknologifag og ledelse.* Trondheim: Senter for etter- og videreutdanning.

Næringslivets Hovedorganisasjon. 1991. *Allmennlærerutdanningen: Arbeidsrapport 1.* Oslo: Næringlivets Hovedorganisasjon.

Oatey, Michael. 1970. The economics of training with respect to the firm. *British Journal of Industrial Relations* 8 (1):1-21.

OECD. 1993. Enterprise tenure, labour turnover and skill training. In *Employment Outlook.* Paris: Organisation for Economic Co-operation and Development.

OECD. 1997a. *Manual for better training statistics: Conceptual, measurement and survey issues, OECD documents.* Paris: Organisation for Economic Co-operation and Development.

OECD. 1997b. *OECD economic surveys: Norway*. Paris: Organisation for Economic Co-operation and Development.

OECD. 1998. *OECD economic surveys: Norway*. Paris: Organisation for Economic Co-operation and Development.

OECD. 1999. *Education at a glance: OECD indicators, 1998*. Paris: Organisation for Economic Co-operation and Development.

Offe, Claus, and Helmut Wiesenthal. 1980. Two logics of collective action: Theoretical notes on social class and organizational form. In *Political Power and Social Theory*, edited by M. Zeitlin. Greenwich: JAI Press Inc.

Olberg, Dag. 1995. Interne arbeidsmarkeder i servicesektoren: Organisasjonsendring og opplæring i bank. In *Endringer i arbeidslivets organisering*, edited by D. Olberg. Oslo: Fafo.

Olson, Mancur. 1971. *The logic of collective action: Public goods and the theory of groups, Harvard economic studies; vol.124*. Cambridge, Mass.; London: Harvard University Press.

Olson, Mancur. 1982. The logic. In *The rise and decline of nations: Economic growth, stagflation, and social rigidities*. New Haven; London: Yale University Press.

Opinion. 1998. LO Velferd II: Survey om lønn, omstilling, etterutdanning og fagorganisering. Oslo: Opinion.

Osterman, Paul. 1984a. Introduction: The nature and importance of internal labor markets. In *Internal labor markets*, edited by P. Osterman. Cambridge, Mass.: MIT Press.

Osterman, Paul. 1984b. White-collar internal labor markets. In *Internal labor markets*, edited by P. Osterman. Cambridge, Mass.: MIT Press.

Osterman, Paul. 1994. How common is workplace transformation and who adopts it? *Industrial and Labor Relations Review* 47 (2):173-188.

Osterman, Paul. 1995a. Skill, training, and work organization in American establishments. *Industrial Relations* 34 (2):125-146.

Osterman, Paul. 1995b. Work organization and training in American enterprises. In *Institutional frameworks and labor market performance:*

Comparative views on the U.S. and German economies, edited by F. Buttler, W. Franz, R. Schettkat and D. Soskice. London: Routledge.

Penn, Roger, Michael Rose, and Jill Rubery. 1994. *Skill and occupational change*. Oxford, England New York: Oxford University Press.

Pfeffer, Jeffrey. 1994. *Competitive advantage through people*. Boston: Harvard Business School Press.

Piore, Michael J. 1968. On-the-job training and adjustment to technological change. *Journal of Human Resources* 3 (4):435-449.

Piore, Michael J., and Charles F. Sabel. 1984. *The second industrial divide: Possibilities for prosperity*. New York: Basic Books.

Powell, Walter W., and Paul DiMaggio. 1991. The iron cage revisited: Institutional isomorphism and collective rationality in organisational fields. In *The new institutionalism in organizational analysis*, edited by W. W. Powell and P. DiMaggio. Chicago: University of Chicago Press.

Prais, S. J. 1995. *Productivity, education, and training: An international perspective, National Institute of Economic and Social Research occasional papers; no. 48*. Cambridge; New York: Cambridge University Press.

Prosessindustriens Landsforening. 1997. *Industri og kompetanse: En rapport om kompetanseutvikling i prosessindustrien 1997*. Oslo: Prosessindustriens Landsforening.

Rainbird, Helen, and Wyn Grant. 1985. *Employers' associations and training policy: A study of industrial training arrangements in four industries; food processing, chemicals, machine tools and construction, Institute of Employment Research, Research report*. Coventry: University of Warwick.

Reich, Robert B. 1992. *The work of nations: Preparing ourselves for 21st century capitalism*. New York: Vintage Books.

Reichborn, Anders N., Arne Pape, and Kjersti Kleven. 1998. *Papir på egen dyktighet: Dokumentasjon av realkompetanse fra arbeidslivet*. Oslo: Fafo.

Ritzen, Jozef M. M. 1992. Market failure for general training and remedies. In *Market failure in training: New economic analysis and*

evidence on training of adult employees, edited by D. Stern and J. M. M. Ritzen. London: Springer-Verlag.

Rolfe, Heather. 1994. *Employers' role in the supply of intermediate skills, PSI research report; no. 789.* London: Policy Studies Institute.

Rose, Michael. 1985. Universialism, culturalism and the Aix group: Promise and problems of a societal approach to economic institutions. *European Sociological Review* 1 (1):65-83.

Rubery, Jill. 1994. Internal and external labour markets: Towards an integrated analysis. In *Employer strategy and the labour market*, edited by J. Rubery and F. Wilkinson. Oxford ; New York: Oxford University Press.

Rubery, Jill, and Damian Grimshaw. 1999. *Training, skill and the changing production and employment system: Paper presented at the SASE conference in Madison, Wisconsin, 1999.*

Ryan, Paul. 1980. The costs of job training for a transferable skill. *British Journal of Industrial Relations* 18 (3):334-352.

Ryan, Paul. 1984. Job training, employment practices, and the large enterprise: The case of costly transferable skills. In *Internal labor markets*, edited by P. Osterman. Cambridge, Mass.: MIT Press.

Ryan, Paul. 1991. How much do employers spend on training? An assessment of the 'Training in Britain' estimates. *Human Resource Management Journal* 1 (4):55-76.

Rådet for høgskoleutdanning i helse- og sosialfag. 1992. *Sykehusinterne spesialistutdanninger for sykepleiere.* Oslo: Rådet for høgskoleutdanning i helse- og sosialfag.

Sandler, Todd M. 1992. *Collective action: Theory and applications.* Hemel Hempstead: Harvester-Wheatsheaf.

Schelling, Thomas C. 1978. *Micromotives and macrobehaviour.* New York: Norton.

Schøne, Pål. 1996. *Virksomhetsintern opplæring: Bedriftsspesifikk eller overførbar kompetanse?, Report; no. 96:3.* Oslo: Institute for Social Research.

Scoville, James G. 1969. A theory of jobs and training. *Industrial Relations* 9 (1):36-53.

Scoville, James G. 1972. *Manpower and occupational analysis: Concepts and measurements*. Lexington, Mass.: Lexington Books.

Senker, Peter. 1992. Skill shortages and Britain's international competitiveness. In *Skill shortages: Causes and consequences*, edited by D. L. Bosworth, P. A. Dutton and J. Lewis. Aldershot: Avebury.

Senker, Peter. 1996. The development and implementation of National Vocational Qualifications: An engineering case study. *New Technology, Work and Employment* 11 (2):83-95.

Shackleton, J. R. 1992. *Training too much? A sceptical look at the economics of skill provision in the UK, Hobart papers; no. 118*. London: Institute of Economic Affairs.

Shapiro, Carl. 1986. Investment, moral hazard and occupational licensing. *Review of Economic Studies* LIII (5):843-862.

Skaar, Solveig. 1988. *Mangel på spesialsykepleiere: Et spørsmål om utdanningskapasitet eller arbeidsvilkår?* Trondheim: IFIM.

Smith, Edwin. 1990. *Skill needs in Britain 1990*. London: IFF Research.

Snower, Dennis J. 1996. The low-skill, bad-job trap. In *Acquiring skills: Market failures, their symptoms and policy responses*, edited by A. L. Booth and D. J. Snower. Cambridge; New York: Cambridge University Press.

Snower, Dennis J., and Alison Lee Booth. 1996. Conclusions: Government policy to promote the acquisition of skills. In *Acquiring skills: Market failures, their symptoms and policy responses*, edited by A. L. Booth and D. J. Snower. Cambridge; New York: Cambridge University Press.

Sorge, Arndt, and Wolfgang Streeck. 1988. Industrial relations and technical change: The case for an extended perspective. In *New technology and industrial relations*, edited by R. Hyman and W. Streeck. Oxford: Basil Blackwell.

Soskice, David. 1994a. Reconciling markets and institutions: The German apprenticeship system. In *Training and the private sector: international comparisons*, edited by L. M. Lynch. Chicago: University of Chicago Press.

Soskice, David. 1994b. Social skills from mass higher education: Lessons from the US. In *Britain's training deficit: The Centre for Economic Performance report*, edited by K. Mayhew, G. Owen and R. Layard. Aldershot; Brookfield, Vt.: Avebury.

Spence, Michael. 1973. Job market signaling. *Quarterly Journal of Economics* 87 (3):355-374.

St meld nr 37. (1990-91). *Om organisering og styring i utdanningssektoren.* Oslo: Kirke-, utdannings- og forskningsdepartementet.

St meld nr 40. (1990-91). *Fra visjon til virke: Om høgre utdanning.* Oslo: Kirke-, utdannings- og forskningsdepartementet.

St meld nr 44. (1995-96). *Ventelistegarantien: Kriterier og finansiering.* Oslo: Sosial- og helsedepartementet.

St prp nr 1. (1997-98). *Statsbudsjettet medregnet Folketrygden for budsjetterminen 1998.* Oslo: Finans- og tolldepartementet.

Statens helsetilsyn. 1999. *Gjennomgang av landets sykehus - delrapport 2: Kartlegging av kapasitets- og driftsforhold ved intensivavdelingene.* Oslo: Statens helsetilsyn.

Statens lærerkurs. 1993. *In-service and further training of teachers (continued training of teachers) in Norway: A short survey.* Oslo: Statens lærerkurs.

Statens lærerkurs. 1994. *Lærerstoda i grunnskolen: Utdanning i einskilde fag m.v. Pr. 1. januar 1994.* Oslo: Statens lærerkurs.

Statens lærerkurs. 1997a. *Melding om virksomheten 1996.* Oslo: Statens lærerkurs.

Statens lærerkurs. 1997b. *Rammeplan for modulbasert videreutdanning i naturfag.* Oslo: Statens lærerkurs.

Statistisk sentralbyrå. 1978. *Education statistics: Primary and lower secondary schools. 1 October 1977.* Oslo: Statistisk sentralbyrå.

Statistisk sentralbyrå. 1983. *Education statistics: Primary and lower secondary schools. 1 October 1982.* Oslo: Statistisk sentralbyrå.

Statistisk sentralbyrå. 1988. *Education statistics: Primary and lower secondary schools. 1 October 1987.* Oslo: Statistisk sentralbyrå.

Statistisk sentralbyrå. 1993. *Education statistics: Primary and lower secondary schools. 1 September 1992.* Oslo: Statistisk sentralbyrå.

Statistisk sentralbyrå. 1998a. *Ukens Statistikk* (50).

Statistisk sentralbyrå. 1998b. *Aktuell utdanningsstatistikk 1998 5/98.* Oslo: Statistisk Sentralbyrå.

Statistisk sentralbyrå. 1998c. *Aktuell utdanningsstatistikk 1998 7/98.* Oslo: Statistisk Sentralbyrå.

Statistisk sentralbyrå. 1998d. *Lønnsforhold for ansatte i forsikringsvirksomhet og i utvalgte forsikringsselskap pr. 1. september 1997.* Oslo: Statistisk sentralbyrå.

Statistisk sentralbyrå. 1998e. *Statistisk årbok 1998.* Oslo: Statistisk sentralbyrå.

Statistisk sentralbyrå. 1999. *Konjunkturbarometeret 2. kvartal 1999.* Oslo: Statistisk Sentralbyrå.

Steedman, Hillary. 1993. Do work-force skills matter? *British Journal of Industrial Relations* 31 (2):285-292.

Stevens, Margaret. 1993. Some issues in the economics of training. D. Phil. thesis, Oxford.

Stevens, Margaret. 1994a. An investment model for the supply of training by employers. *The Economic Journal* 104 (May):556-570.

Stevens, Margaret. 1994b. Labour contracts and efficiency in on-the-job training. *The Economic Journal* 104 (March):408-419.

Stevens, Margaret. 1994c. A theoretical model of on-the-job training with imperfect competition. *Oxford Economic Papers* 46 (1994):537-562.

Stevens, Margaret. 1996. Transferable training and poaching externalities. In *Acquiring skills: Market failures, their symptoms and policy responses*, edited by A. L. Booth and D. J. Snower. Cambridge; New York: Cambridge University Press.

Streeck, Wolfgang. 1987. *The role of the social partners in vocational training and further training in the Federal Republic of Germany*. 1st ed, *CEDEFOP document*. Berlin: CEDEFOP - European Centre for the Development of Vocational Training.

Streeck, Wolfgang. 1991. Interest heterogeneity and organizing capacity: Two logics of collective action? In *Political choice: institutions, rules, and the limits of rationality*, edited by R. M. Czada and A. Windhoff-Héritier. Frankfurt am Main: Campus.

Streeck, Wolfgang. 1992. *Social institutions and economic performance: Studies of industrial relations in advanced capitalist economies*. London: Sage.

Sørensen, Knut Holtan. 1988. *Sivilingeniørers utdanningssystem og karrieremønster: En norsk modell? En problemoversikt*. Dragvoll: Universitetet i Trondheim, Senter for teknologi og samfunn.

Sørensen, Knut Holtan. 1989. *Sivilingeniørstudier: Fra kritikk av profesjonsteorien til analyse av den teknologiske kunnskapens struktur*. Dragvoll: Universitetet i Trondheim, Senter for teknologi og samfunn.

Taylor, Michael. 1987. *The possibility of cooperation*. Edited by J. Elster and G. Hernes. Rev. ed, *Studies in rationality and social change*. Cambridge: Cambridge University Press.

Teknologibedriftenes Landsforening. 1996. *Hovedstrategier 1996-1998*. Oslo: Teknologibedriftenes Landsforening.

Teknologibedriftenes Landsforening. 1998. *Konjunkturrapport: TBLs aktivitetsundersøkelse 97/98*. Oslo: Teknologibedriftenes Landsforening.

Teknologibedriftenes Landsforening. 1999a. *Industristatistikk 1999*. Oslo: Teknologibedriftenes Landsforening.

Teknologibedriftenes Landsforening. 1999b. *Konjunkturrapport 1999*. Oslo: Teknologibedriftenes Landsforening.

Tessaring, Manfred. 1998. *Training for a changing society: A report on current vocational education and training research in Europe*. Luxembourg: Office for Official Publications of the European Communities.

Teulings, Coen, and Joop Hartog. 1998. *Corporatism or competition? Labour contracts, institutions, and wage structures in international comparison*. New York: Cambridge University Press.

Thurow, Lester C. 1970. *Investment in human capital*. Belmont: Wadsworth.

Torp, Hege. 1995. *Labour market institutions and development: Norway baseline study*. Oslo: Institute for Social Research.

Torp, Hege, and Arne Mastekaasa. 1990. Arbeidstakernes kunnskap og erfaringer. In *Organisasjon, arbeidsmiljø og mobilitet: Resultater fra Arbeids- og Bedriftsundersøkelsen*, edited by H. Torp and K. H. Skollerud. Oslo: Institute for Social Research.

Training Agency. 1990a. Training in Britain: A study of funding, activity and attitudes: Employers' activities. London: Training Agency.

Training Agency. 1990b. Training in Britain: A study of funding, activity and attitudes: Employers' perspectives. London: Training Agency.

Training Agency. 1990c. Training in Britain: A study of funding, activity and attitudes: Main report. London: Training Agency.

Traxler, Franz. 1991. The logic of employers' collective action. In *Employers' associations in Europe: Policy and organisation*, edited by O. Jacobi and D. Sadowski. Baden-Baden: Nomos Verlagsgesellschaft.

Traxler, Franz. 1993. Business associations and labour unions in comparison: Theoretical perspectives and empirical findings on social class, collective action and associational organizability. *British Journal of Sociology* 44 (4):673-691.

Udehn, Lars. 1996. *The limits of public choice: A sociological critique of the economic theory of politics*. New York: Routledge.

Varian, Hal R. 1993. *Intermediate microeconomics: A modern approach*. 3rd ed. New York: W.W. Norton.

Waarden, Frans van. 1991. Two logics of collective action? Business associations as distinct from trade unions: The problems of associations of organisations. In *Employers' associations in Europe: Policy and*

organisation, edited by O. Jacobi and D. Sadowski. Baden-Baden: Nomos Verlagsgesellschaft.

Warmerdam, John, and Harry van den Tillaart. 1998. *Sectoral approach to training: Synthesis report on trends and issues in five European countries, CEDEFOP document.* Thessaloniki: CEDEFOP European Centre for the Development of Vocational Training.

Williamson, Oliver E. 1975. *Markets and hierarchies: Analysis and antitrust implications: A study in the economics of internal organization.* New York: Free Press.

Yin, Robert K. 1994. *Case study research: Design and methods.* 2nd ed, *Applied social research methods series; no. 5.* London: Sage.

Ziderman, Adrian. 1978. *Manpower training: Theory and policy.* London: Macmillan.