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**Education and training: from consumption goods  
to investment goods**

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## **Abstract**

Because of the prisoner's dilemma, free-riding, hold up and liquidity constraints schooling and training of adult employed workers fail to reach the socially-optimum level. It is argued that cooperation and agreements between the social partners and the extension of collective labour agreement are solutions to these market failures. In their decision making and accounting practice not only private enterprises, also national governments treat education and training as consumption goods and not as investment goods. Some practical solutions are suggested to bridge the existing gap between human capital theory and accounting practice, and to improve the quality of decision making.

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## **1. Introduction**

Human capital is a crucial factor that determines productivity of a country and is a key engine of economic growth. For employers it is an important factor that influences the competitive position on the product market. For employees human capital investment improves their position on the labour market and is an important determinant of individuals' earning capacity and employability. Education is also associated with other personnel and social welfare benefits, including greater happiness, better health and greater longevity (see *e.g.* Booth and Snower 1996; Temple 2001; Ok and Tergeist 2003). Human capital formation concerns initial education and maintenance, company training. Underinvestment in general and firm-specific human capital is a reality. In this paper fostering education and training, *i.e.* workers' employability is motivated on theoretical grounds and on practical grounds. The paper explores which institutions are essential explaining factors for the scope, the participation, the content and the quality of education and general and specific company training. The focus is on the industrial relations system and the daily practice of bookkeeping in private enterprises and the government budget. Some practical policy solutions are brought forward to consider and treat education and training more like real investments and to bridge the existing gap between human capital theory and accounting practice, and to improve the quality of decision making related to education and training.

## **2. Theoretical importance of human capital**

Not only in the human resource management literature also according to the human capital theory and the endogenous growth theory human capital is an important determinant of competitiveness of economies and individual firms. The human resource management theory starts from the notion that employees with their effort and dedication and qualities are the key to success and the most important production factor of an enterprise (see *e.g.* Bratton and Gold 2003). The workforce constitutes a vital and valuable organisational asset. Capabilities must be developed, knowledge must be

acquired, maintained and renewed and shared in order to reinforce competitiveness and enhance performance of organisations.

Following economists like Mincer (1958), Becker (1964) and Schultz (1961) ‘human capital’ is a common word used in social sciences as well as daily life. Human capital refers to all acquired characteristics of workers that make them more productive. Human capital is acquired through formal education prior to entrance in the labour market (initial schooling), and after entrance in the labour market via on-the-job training, learning by doing or courses and/or experience. Parallel to the definition of durable means of production, *i.e.* fixed assets, human capital is seen as a stock of skills, knowledge and experience or a bundle of achievements/performances that generate a stream of income, *i.e.* productive capacity.<sup>1</sup> Post-school learning accounts for one third to one half of all skill formation in a modern economy (Heckman 2000).

Central in the human capital theory is the proposition that an employee with a higher educational attainment possesses more capacities and hence a higher labour productivity than a lower educated employee. The human being is not considered to be a machine, but is seen as a capital good and the expenditure on schooling and training are considered a kind of investment. Many economic analyses of education and training are derived from the investment theory in economic science. The amount of investment in education and training is based on weighing costs and benefits: expected investment (time and money, forgone wage) and the present value of the expected benefits (productivity and wage). In the first instance it concerns for most the micro-economic importance of human capital for the individual employer and the individual employee. Financial returns are the incentive for training. Job training is either the result of a choice by the worker or by the worker and his employer.

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<sup>1</sup> The analogy between schooling and training of an individual and investment in machinery goes back to Adam Smith: “A man educated at the expense of much labour and time to any those employments which require extraordinary dexterity and skill may be compared to one of those expensive machines.” (A. Smith 1776. *An Inquiry into the Nature and Causes of the Wealth of Nations*, Chapter X, Part 1 (2), The Modern Library, New York, 1937).

There is no asset market for human capital. This is related to the abolition of slavery and indentured servitude. Workers are not owned by the firm and cannot be sold. Property rights are a key issue that distinguishes human capital from physical capital. People cannot sell rights to their future labour earnings to lenders in order to secure financing for their human capital investments (Heckman 2000). Human capital is intangible. Human capital is an atypical good: its volume and value do not diminish when it is used. On the contrary, by using it its volume and its value increase. Other important differences between physical and human capital are that workers can leave a firm or are able to strike, may be absent or incumbent workers are able to shirk. As a result investment in human capital is more uncertain than investments in physical capital. This explains why a considerable part of the costs of education are paid by the state. Also the collective good feature of training, *i.e.* externalities justify subsidies to training.

Becker's (1964) theory of investment in human capital is a neoclassical equilibrium theory. He presupposes a perfect market. Those who invest in human capital act rationally, external effects do not exist and market failures do not occur. Initial education and training are considered *substitutes*, implying that the lack of initial training in the early years can be compensated by further training in the adolescent years. Firms invest in specific training while employees are mainly interested in general training. General human capital involves skills that are of equal value in many different organisations, for instance a widely used word processing program. General training also increases the productivity of the worker in other firms. Specific human capital involves skills that are of value only to a single employer, either because he is a monopolist, *i.e.* the only user of that type of worker, or because of special methods, routines, and equipment with which workers must become familiar. Specific training cannot be used gainfully in other firms, *i.e.* does not influence the outside option wage. Hence, according to Becker (1964) all training which can be used by more than one specific firm or institution is in principle general. This makes specific training an empty box (Stern and Ritzen 1991). Becker's distinction is crucial in defining who bears the investment costs. In a perfect market the wage rate rise is exactly equal to the increase in marginal productivity. If firms try to appropriate part of the returns on general training, the trained employee would quit and

go to work elsewhere. Workers are willing to pay these costs since it raises future wages. Hence it is the trainee not the firm who bears the costs of general training and profits from the returns. They may pay for general training through a lower wage during the training period (Becker 1964; Leuven 2005). Firm specific investments require the sharing of initial costs and future returns between employee and employer to give both parties an incentive to continue the employment relation. From the human capital theory it follows that uncertainty about the return will result in sharing costs and benefits of investments in specific human capital. Employers are not prepared to pay the full company training because of the risk that the employee will change job after completion of the training and the investment disappears. The employee is not willing to bare the full costs because of the risk to be fired and the investment becomes valueless. Moreover, investment in specific human capital creates rents to continuing a relationship, which the parties can bargain over (Hashimoto 1981; Leuven, 2005). Firms will concentrate their specific investments on workers whose expected likelihood of staying is perceived to be higher. To avoid quits firms are willing to pay the trained worker a wage higher than the outside option, but below the worker's productivity.

Investments in human capital have an impact on the productivity *level* through the 'worker effect' and the 'allocative effect' as well as on productivity *growth* through the 'diffusion effect' and the 'research effect' (see Cörvers 1999). The 'worker effect' refers to the positive marginal productivity of education with respect to the production of a particular good, *i.e.* better educated are more efficient in working with the resources at hand. The 'allocative effect' concerns the greater (allocative) efficiency of better educated workers in allocating all input factors to the production process between alternative uses. Not only the choice of inputs, also the choice of the outputs and the choice of the production processes improve. The 'diffusion effect' refers to the fact that better educated workers are more able to adapt to technological change and will introduce new production techniques more quickly and more successfully. The 'research effect' refers to the role of higher education as an important input factor in research and development. It implies that technological progress is not exogenous given, but is driven

by investments in human capital. The latter two effects suggest complementarity between technological change and human capital.

Besides the micro-economic importance of human capital there also is macro-economic importance of human capital. Since the introduction of the human capital theory there is much interest in the effects of education and training on the economic growth of a country. Human capital is an important input factor for research and development in many endogenous growth models. In the endogenous growth theory of economists like Nelson and Phelps (1966), Romer (1986) and Lucas (1988) economic growth is most of all determined by the volume of investment (accumulation) in human capital (knowledge and skills) and physical capital (stock of capital goods). Participation in the production process not only results in goods, it also may result in inventions that can be used in the future. Such learning effects are stronger for educated people or people with more capacities. Technological innovations and investments in knowledge (education and learning by doing) in firm X also have an impact on the productivity in other firms. These external spill-over effects result in positive scale effects (Acemoglu 1996; Trostel 2004). For a review of the growth effects of education see Temple (2001). The endogenous growth theory not only is able to explain why an economy of a country moves towards a higher growth path, also why the economic growth rates of countries differ permanently. The endogenous growth theory implies that it is possible by means of (government) policy to permanently increase the speed of growth of the economy. Hence good quality vocational training and qualitative high valued education and training and educational policy are very important for future economic development and employment. There is a (policy) dilemma between knowledge creation and knowledge diffusion. Mobility of knowledge workers between firms spreads the knowledge over the economy. However, labour mobility also implies that the employer is not able to appropriate the returns of his investments in human capital.

### **3. Increasing practical importance of human capital**

Apart from theoretical grounds, fostering education and training, *i.e.* workers employability can also be motivated on practical grounds. One of the main differences between the labour policies in the major countries is in their attitude towards human capital. In theory two efficient equilibriums (economic orders) can be distinguished: a low training and high quit equilibrium and a low quit high training equilibrium. Poaching of personnel may result in high turnover and a unique economic equilibrium with a better allocation of employees over jobs. Such an economy (*e.g.* the United States) may be less efficient because the level of training is relatively low. Since workers and employers cannot fully capture returns to investments through higher wages and profitability, they will underinvest. An economy where poaching is limited because of dismissal protection or the power of works councils (*e.g.* Germany) the economy may be in equilibrium with much training. Theoretically it is impossible to indicate which of the two forces is dominant (Acemoglu and Pischke 1998). This is determined to a significant degree by the structural characteristics of the economy. There is no single peak set of capitalist institutions. No economic system is superior every time and everywhere. Preference for an economic system depends upon the specific economic environment (Delsen and De Jong 1998; Freeman 2000).

The increasing interest in employability is connected with technological, organisational, economical and demographic developments. Employability refers to the lasting deployment of employees or their capacity to obtain and keep jobs. Employability is seen as a reply to the increasing uncertainty caused by the degradation of the social security system, internal flexibilisation and the increasingly businesslike relation between employer and employee. In the current turbulent environment, individual employees are expected to take more responsibilities with regard to their own professional development. An active career management directed towards lifelong employability is increasingly considered a necessity. Lifelong employability also implies that employers grant their employees the opportunity to take this responsibility for their own career. Employers too need to invest in training and to offer more variation and customised functions.

As a result of the reduction in transport and communication costs economic activity become foot loose. Increasing competition resulting from the internationalisation of economies augments the importance of human capital as a competitive factor. The comparative advantages, which determine the competitive position of a country, are determined less and less by traditional factors such as location and presence of raw materials and more and more by investments in human capital. Human embodied knowledge, human competences, is an important intangible asset that determines a firm's competitive success (see Bailey *et al.* 1993; Porter 1990). After all, if capital is completely mobile, the level of education of the labour force is the most prominent decisive factor of international trade. Aging and rejuvenation of the labour force imply that an increasing number of companies have to acquire knowledge via incumbent employees. Continuous education after initial education is necessary for maintaining compatibility in the rapidly changing knowledge economy. Young well trained workers will become scares. Recruitment as well as poaching of fresh human capital will become more difficult if not impossible. Retraining and training on-the-job of adult workers are becoming increasingly important due to these demographic and technological developments. Explaining why at present in trade and industry life-long learning is an important policy issue. For instance, according to the European Council: "People are Europe's main asset and should be the focal point of the Union's policies. Investing in people and developing an active and dynamic welfare state will be crucial both to Europe's place in the knowledge economy and for ensuring that the emergence of this new economy does not compound the existing social problems of unemployment, social exclusion and poverty."<sup>2</sup>

#### **4. Sources of underinvestment in human capital: market failures**

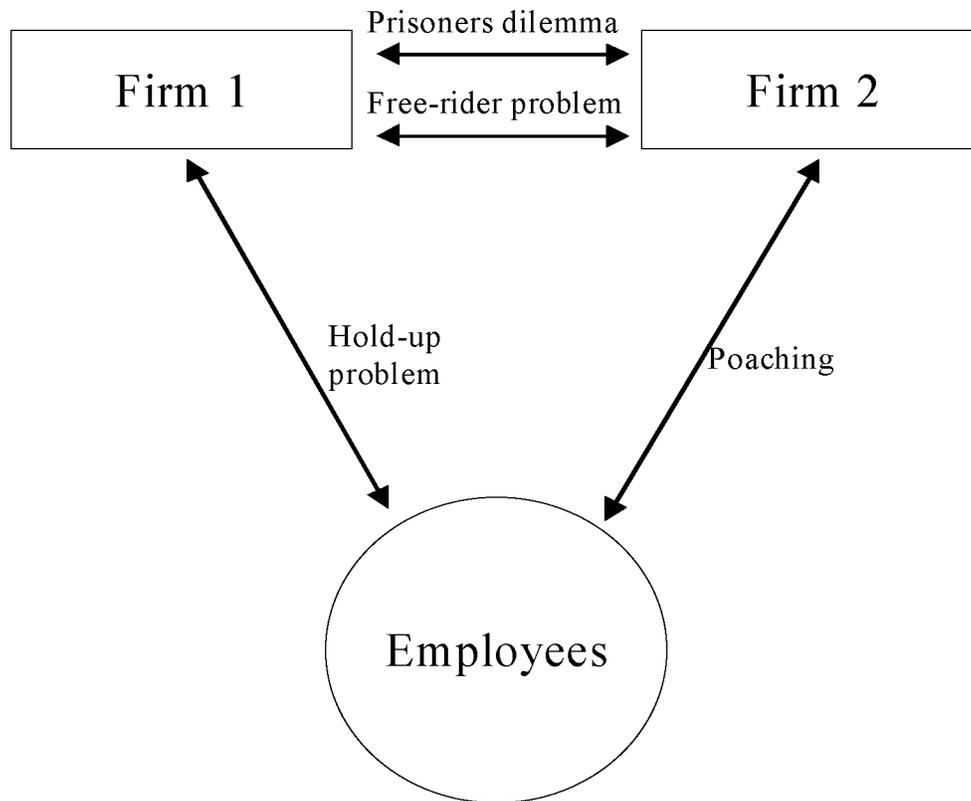
Because of market failures schooling and training fail to reach the socially-optimum level. Underinvestment of training implies that individuals and enterprises spend less than justified by the rate of return on training. An empirical indication for underinvestment in

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<sup>2</sup> Presidency conclusions Lisbon European Council, 23 and 24 March 2000, Lisbon, point 24.

training is that the rates of return to training far exceed rates of return to other investments (see Stern and Ritzen 1991; Booth and Snower 1996). These market failures concern the prisoner's dilemma, free-riding and the hold-up problem, external effects, spill-over effects, liquidity constraints and incomplete information (see Figure 1). The prisoner's dilemma and the free-rider problem pertain to general training and schooling and concern the relationship between employers. In a competitive labour market underinvestment occurs, for firms have no incentive to provide training. Training is a risky investment: financial returns of general and specific training are uncertain, because time horizons are shortened by labour turnover and poaching skills. The positive external effects of general training create reticence among employers in training professionals themselves because they run the risk that an employee trained by the company will be poached after conclusion of the professional training by another company that does not devote (as much) attention to professional training. To reduce the poaching risk, firms will not invest in general training in the hope to poach workers trained elsewhere or invest in less transferable firm specific training. Although individual employers are convinced of the importance of investments in human capital, the training and schooling do not materialise because they are caught in a prisoner's dilemma. Thus even though it is in the collective interest of businesses to supply training, it is not in the interest of the individual businesses to do so because the returns on the investment are uncertain. Positive external effects can also result in free-rider problems, because the competitor reaps the rewards of the investments in schooling while that competitor does not pay a fitting price. In other words, the investing employer is subsidising the competition. The prisoner's dilemma and the free-rider behaviour illustrate how the market fails: the individual rationality of certain employers is inefficient from the perspective of the business sector and society. Ok and Tergeist (2003: 23) conclude that trained workers are not more likely to stay in a firm than their non-trained counterparts. This evidence lends support to the poaching problem. As a result of these externalities private and social benefits of training do not coincide and underprovision of training occurs. When the businesses that need the same type of skilled workers do not consult with one another, the ultimate result will be that there will be no schooling.

**Figure 1: Market failures and investments in human capital**



The hold-up problem is related to contract renegotiation and pertains to company specific human capital and concern the relationship between the employer and the employee in the same company. Also firm-specific training is a risky investment for both employee and employer and underinvestment occurs. Employees that have invested in (specific) human capital may be deceived by the employer that does not pay the higher wage after the investment. Inefficient destruction of human capital occurs when an employee leaves or is forced to leave the firm. There is no insurance available to protect against this loss (Stern and Ritzen 1991). Hence, it may not be the nature of the training that determines whether and how much employers pay for training. Company-specific investments not only make the employer vulnerable, but also weaken his future negotiation position with reference to the employee's wages. Wage negotiations on the business level result in a hold-up problem. Due to the uncertainty regarding the division of the surplus in the future, employer and employee suspend their specific investment because they expect

that future wage (re)negotiations about the surplus resulting from business-specific investments will rob them of part of the return, because contracts or agreements are *incomplete*. Transaction costs occur. As a result, less is invested in specific training than is socially desirable. The market fails. Both parties have an interest in solving this hold-up problem.

Training an employee not only has an impact on the productivity of that particular worker, but also on the productivity of co-workers, and spill-over effects imply a positive impact of training on the productivity in other firms. Also liquidity constraints and limitation of borrowing by the employee are market failures causing underinvestment in general and specific training (Booth and Snower 1996; Leuven 2005). Firms have more possibilities to pool the risks in the returns to specific training than individual workers. Workers have fewer means to pool the risks in the returns to general training. Payback clauses in individual contracts or collective agreements encourage firms to undertake the cost associated with training programs and impose a penalty on workers who quit within a certain period. They reduce the risk of poaching for the employer and permit sharing of costs of training even in the presence of serious individual credit constraints by *de facto* borrowing from their employer. The application of pay-back clauses may be limited because of problems of contractibility of training contents (see OECD 2003). Payback clauses require certification.

Not only incomplete contracts, also incomplete information may explain underinvestment in training by both employer and employee. Good information is a condition *sine qua non* for efficient investment decisions (Stern and Ritzen 1991). Lack of contractibility of training content and quality prevent an efficient sharing of the costs of and the benefits from training partly explain under-provision. Completion of training often does not lead to certification. Certification of skills increases transferability of skills and hence labour mobility, for it reduces asymmetric information, and represents a disincentive to train for firms. However, if certification improves the effort put into training by the worker it may be in the interest of firms to invest in certified-skills acquisitions. Moreover certification of acquired skills may induce trainees to contribute to the cost of investing in training,

because of the higher returns they can reap in the labour market. For the recruiting firm it takes time and money to assess the value of the training. The transaction costs involved in signalling to other employers the outcome of general training indicates market failure. Transaction costs may also result from the fact that employees have insufficient information on the value of their investment in general human capital for the employer. The introduction of transaction costs implies that the specificity of the training depends on circumstances other than the nature of the training alone. In an imperfect market specific training also includes all those types of training for which the transaction costs are higher than the benefits of moving to another firm. These transaction costs include selling and buying a house etc. Stern and Ritzén (1991) consider training to be specific if the difference between the value of that training in other firms and the value in the firm of training is smaller over a longer period of time than the transaction costs of moving.

Investment in general training may not fully be transformed into a higher wage, due to asymmetric information. Other employers are not fully able to observe the quantity and quality of the investment in human capital. This monopolistic situation allows the employer to invest in general training of his employees, for he can appropriate part of the productivity gains. The information asymmetry between the training firm and outside employers renders general training thus effectively specific (Leuven 2005: 103). Moreover training firms may be better informed about the abilities of its workers giving rise to adverse selection. This adverse selection dampens the response of market wages to human capital investments. Low-ability workers will leave the training firm. The best workers are trained and retained.

Human capital, *i.e.* continuous education and training (CET), is heterogeneous and difficult to measure (OECD 1996; Ok and Tergeist 2003; Borghans *et al.* 2001). In practice training has a mixed character: it contains general and specific elements or is relevant for a limited number of firms. General and specific training are complementary and are difficult to separate (OECD 1991: 137). Markets fail to provide training because of this complementarity between general and specific training; substantial turnover of labour reduces the payoff to general as well as specific training. The mixed character

implies that employees can not appropriate the complete return of their investment in training on the labour market. It discourages investment in general training by the employee. Also employers invest too little in training because the general component of the employee training causes positive external effects: a poaching firm can obtain part of the surplus of the shared training investment by the employee and the training firm. The positive external effect moreover increases the leave option of the employees. Partly as a result of transferable skills there is under-provision of formal training, despite some market power of employers to appropriate part of the benefits from training (OECD 2003).

In the neoclassical theory the productivity-age and wage-age curves coincide. According to the human capital theory young employees at the start of their career and employers invest a lot in human capital. This investment can only pay itself back if the productivity increases faster than the wage. This leads to young employees earning a wage that is higher than their productivity, while older employees are rewarded below their productivity. This may induce shirking. The age-earnings curve of trained persons is steeper than that of untrained persons, the difference being greater the greater the investment (Stern and Ritzen 1991). According to the contract theory, however, the wage of young employees lies below their productivity and the wage of older employees lies above their productivity. The younger employees 'subsidise' the older employees. For the employer, in theory, this is without cost consequences, but it does generate a commitment from both the younger as well as the older employees. Both will apply themselves: the younger employee has a lot to gain by staying with the company for a long time and the older employee has a lot to lose in case of dismissal. The implicit contract is also a solution to the hold-up problem and encourages investment in company-specific human capital. In western economies age-productivity-wage profiles are in accordance with the contract theory (see Skirbekk 2003).

According to Becker (1964) employees pay for general on-the-job training by receiving wages below what they could receive elsewhere. However, this is seldom the case. Empirical results show the opposite: relative to the marginal productivity higher in stead

of lower start salaries and in general the employees pay little or nothing for their general training. Most continuous vocational training (CVT) is entirely paid by employers. This is at odds with the human capital theory (OECD 1994: 146; OECD 2003: 246-247; Acemoglu and Pischke 1998; 1999). This implies very high returns to general training for employees. For employers the rate of return must be lower, for they pay all or most of the costs. Hence the social rate of return is higher than the rate of returns for employers, who control the amount of general training provided, explaining underinvestment of general training in practice.

## **5. Industrial relations to overcome market failures**

Training cannot be left to the market. Market failures imply undersupply of training and that without intervention in training competitiveness of firms and the rate of economic growth will suffer. Moreover, the market alone cannot assure an equal opportunity for all categories of workers (OECD 1994: 146; Ok and Tergeist 2003: 28).

Central collective agreements make training and other skill-upgrading arrangements easier while offering unions the possibility of trading between wages and schooling or other matters, including working conditions and job opportunities for weaker groups on the labour market ('good causes') (Delsen 2002). Also the Organisation for Economic Co-operation and Development (OECD) concludes that without some institutional arrangements such as strong unions or employer organisations, workers and firms often will not be able to generate the best arrangements on training investment (OECD 1991: 137; OECD 1994: 145-158). Unions may encourage training by improving the commitment on wage contracts and reducing the hold-up problem, by reducing labour turnover, by reducing wages between trained and un-trained employees and by internalising poaching externalities. Brunello and De Paola (2004) conclude from their literature review that empirical research on the relationship between training incidence and union coverage in collective bargaining and union density produces mixed results.

Research performed by the OECD (1997: 130) shows that job uncertainty as perceived by the employees is significantly lower in countries where the level of coverage of collective negotiations is higher and in countries with central negotiations about employment conditions. These last two in turn reflect the ability of unions to protect employees against uncertainty. Anglo-Saxon countries with more decentralised negotiations show a higher uncertainty figure. This has a detrimental impact on the training effort of employees and employers. In a deregulated labour market – for instance the United Kingdom and the United States – where the company is the dominant negotiation level, it is more cost effective for employers to poach skills from their competitors than to invest in training their own personnel (see Soskice *et al.* 1998; Gospel and Foreman 2006). This can nevertheless only happen without detrimental effect if and when the individual employees sufficiently train themselves. However, in a decentralised, uncertain labour market, employees will not be willing to do so. Schooling and training fail to reach the socially-optimum level as a result. The greater perceived job uncertainty, the higher personnel turnover, the limited possibilities for individual employers to force their employees to remain in their jobs and the minimisation of schooling costs explain the lower expenditures for general training by businesses as well as the limited attention for the quality of company training in the United Kingdom and in the United States (see Acemoglu and Pischke 1998; Layard *et al.* 1994; Lynch 1994; Prais 1995).

Lack of information is a fundamental obstacle to a smooth functioning of markets for further training. Information for employers and employees about the availability cost and quality of training might be provided through employers' organisations, trade unions. As employers and employees are well informed about the current skill needs, collective labour agreements also represent a guarantee for the labour market relevancy of the schooling, and better address the issues of who is entitled to the training and what rights they have (duration, reimbursement, type of schooling) (Delsen 2002; Addison and Belfield 2004). Works council involvement could increase efficiency of further training by reducing asymmetric information on costs and benefits, building trust and facilitating worker co-operation (Ok and Tergeist 2003: 32 and 41-42; Zwick 2006). However, decentralised training decisions limit the opportunity for coordination and the

development of national or sectoral training policies. Market failures may occur. This may explain why in the OECD member countries related to training an increase dialogue is recorded, while industrial relations show a decentralisation of bargaining (Ok and Tergeist 2003: 38-39).

Cooperation on the branch and sector levels and agreements on a level that is higher than the company level can prevent the prisoner's dilemma and the free-rider problem from causing training and schooling to stagnate at a sub-optimum level. Recent case studies evidence in the UK indeed shows that employers' cooperation prevents the prisoner's dilemma and free-riding and has a positive effect on both the quality and the quantity of training (Gospel and Foreman 2006). Also collective labour agreements, the mandatory extension of collective labour agreements as well as collective financing of company training could be solutions to both the prisoner's dilemma and the free-rider problem, and could therefore prevent these sources of market failure (Delsen 2002). In theory this could combat both overinvestment and underinvestment in company training. General training can be stimulated by collective labour agreements concerning schooling that is not directly related to the position held. The legal extension of provisions in collective agreements to all employers in the industry prevents unorganised employers from poaching trained employees because it does away with wage competition. The fact that training is obligatory for the entire business sector stimulates employers to invest in human capital. An industry training system also implies that diplomas are universally accepted, making it easier for employees to change employers. This promotes the external job mobility. It stimulates employees to participate in the company training. However apart from market failure, also institutional failure may be a source of inefficient investments in human capital. For instance, levies and compulsory investment schemes may encourage inefficient and inappropriate training. Large enterprises benefit disproportionately from such schemes (Booth and Snower 1996; Ok and Tergeist 2003).

Collective financing prevents free-rider behaviour and stimulates use of the training opportunities by both employers and employees. Joint governance of collective training funds by the social partners decreases the marginal schooling costs for employers and

makes the number of available training slots less sensitive to the business cycles. It also reduced poaching externalities, notwithstanding their potential and actual shortcomings (Ok and Tergeist 2003). By pooling resources economies of scale and scope in the provision of training could be generated.<sup>3</sup> Collectively-financed schooling funds can also compensate for the segmentation trends on the labour market and improve the distribution of training opportunities. Collective labour agreements can move training from the category 'bonus' into the category of 'rights'. This is particularly important for the weaker groups on the labour market, including the lower skilled and older employees. Because of market failures demand and supply of training are insufficient for these groups. It can also improve access to training funds for smaller businesses (Delsen 2002; Ok and Tergeist 2003; OECD 2003). From actual practice in the OECD countries it is evident that consultation institutions and the training funds have been unable to close the training gap between small and large businesses. The unequal participation in company training has not disappeared, either. Employees with a low educational level, older employees, women, part-time employees and flex-workers participate relatively less in CET. This may be efficient, for the period to amortise the costs of training may be too short for both employer and employee (see Ok and Tergeist 2003). Better educated individuals are more involved in both general and specific training (Acemoglu and Pischke 1998; Brunello and De Paola 2004). Also this is efficient for early learning begets later learning; there is complementarity between education and training. Skill acquired early make later learning easier. More able people find learning easier; ability and training are complements (Becker 1964; Acemoglu and Pischke 1998; Heckman 2000). Formal education is often less efficient than training provided by firms (see Stern and Ritzen 1991). Heckman (2000) concludes that efforts should be made to shift training subsidies to the private sector. Private training programmes will train workers who are likely to benefit most, and they can tailor their training programmes to market needs. For vulnerable groups in the labour market employment promotion, *i.e.* learning while working is more efficient than training programmes in the public sector.

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<sup>3</sup> Economies of scale exist when the average cost of a firm decreases as production increases. Economies of scope exist if unit costs are decreased as the variety of products produced increases.

Coordinated or solidaristic industrial relations are an incentive for firms to undertake workforce training for two reasons: labour turnover is lower and finding trained employees outside is costlier. Coordination of training investment as well as mandatory training solves the free-ride problem. Lower wage dispersion is an incentive for firms to upgrade the skills of the workforce (Acemoglu and Pischke 1998), for it allows firms to appropriate the difference between the marginal productivity of the skilled workers and the wage; wage dispersion diminishes the rent from training that the firm can appropriate and discourages investment in training. Wage compression might be induced by a minimum wage or union wage bargaining. This is in sharp contrast with Becker's analysis. Increased profits due to imperfect labour markets (compressed wage structure) imply that the supply of training by firms is higher than in perfect competition. The lower wage gain from training implies that the demand for training by employees is lower than in perfect competition. The impact on demand is stronger than the impact on supply, because the employer gains only if the employee stays in that firm, *i.e.* there are externalities (Stevens 1999: 23).

As returns of relation-specific investments are lost if the relationship is terminated, the resulting hold-up problem, may be avoided by the provision of job security, explicit dismissal rules or a long-term work contract. However, it may also lead to lower effort. The hold-up problem may be avoided by a large enough rent and rent sharing and by implicit contracts that reduce shirking. These conclusions are derived from theoretical models that rely on perfect rational individuals (Anderhub, Königstein and Kübler 2003). The hold-up problem may also be solved by reputation mechanisms, *i.e.* the firm gets a reputation for rewarding skill collection. A good reputation will keep employers from behaving opportunistic concerning his employees (see Leuven 2005; Brunello and De Paola 2004).

Another solution to the hold-up problem can be found in defining the wage level for the future at the beginning of the labour relationship. As a result, the need for future negotiations is removed. Fixed wage scales, however, have limitations. If the contract wage level is lower than elsewhere, the employee may leave, or when the costs are higher

than the costs of replacement, termination looms. Modification of the contract is in the best interest of both parties, because otherwise the relationship may be unilaterally terminated. Re-negotiations nevertheless result in the hold-up problem. There is no optimum situation. The best wage contract is therefore a contract that minimizes the chance of re-negotiations. This is a contract that specifies the wage level for the majority of the cases. If a contract of this type is to apply for a longer period, it must be possible to modify the wage level to the changing macro-economic conditions. If this is done through re-negotiations, the hold-up problem once again comes into play. This is where corporatist organisations can play a part. Negotiations about contract modifications are delegated to organisations on a higher aggregation level. Coordinated wage negotiations between employers and employees on a level higher than the company are a solution to this hold-up problem (see Soskice *et al.* 1998; Teulings and Hartog 1998). As a result, an individual employer and his employee can bypass the hold-up problem because they cannot influence the outcome of the negotiations by suspending their specific investments. The wage negotiations are uncoupled from the daily employment situation. The legal extension of collective labour agreements plays an explicit part: the hold-up problem for new employees is prevented by determining the wage level prior to the employment, by means of mandatory extension to all businesses in a sector. In theory, this could combat both overinvestment and underinvestment in company training.

## **6. Investments in human capital in business administrations**

In market economies the financial accounting and reporting systems of training and labour force qualifications provide incomplete information; better information contributes to transparency and predictability and improves the efficiency and effectiveness of decision making. There is a gap between theory and practice. Most businesses do not treat the expenses for company training in their accounts as an investment in a capital good, as an asset, but as 'out of the pocket expenses' (like the cost of heating), meaning that expenditure and costs coincide. Regardless of the period over which an enterprise expects to enjoy the benefits of training. It also means that further training has no identifiable consequence for an enterprise's balance sheet. Despite its investment

character, the training costs are registered in full in the profit and loss account in the period in which they are incurred. As a result, in the short term an investment in human capital by the employer renders a cost disadvantage in comparison to competitors. This makes investments in human capital extremely more fragile and sensitive to economic cycles than investments in physical capital.

Economic and financial barriers are a reality. The government could stimulate training and schooling by companies financially by means of levies, spending requirements, grants, subsidies, vouchers and fiscal facilitation and reduce poaching by taxation. Co-financing is a better tool for the provision of adequate incentives to employers and training providers than full financing (see OECD 2003; Brunello and De Paola 2004). Institutional arrangements favouring cost sharing among private parties are important to foster training. Also improved information on training courses and training wages improve the efficiency of the training market (Stern and Ritzen 1991).

A more fundamental approach is to capitalise training costs and to introduce depreciation instead of regarding training costs as operational ‘out of the pocket’ costs. This also requires changes to existing reporting conventions in management accounting and financial accounting (OECD 1994: 149; OECD 1996). The enterprise could reflect its training investment as an asset, based on the cost of training or some valuation of the knowledge or competences acquired in further training, to be depreciated over the useful life of the training. If a trained employee left, the un-depreciated value of that asset would be written off against income. This will not necessary result in more training by enterprises, it would potentially improve the transparency of apparent training costs, by spreading these over the time in which further training provides benefits. These benefits depend on the time the training remains useful, and hence on the depreciation and obsolescence rate of the training over time. By ensuring that the results of training expenditure is reflected in the enterprise’s balance sheet it provides transparent justification for pursuing human resource management strategies aimed at protecting those assets from being poached away (OECD 1994: 149).

One often mentioned reason why human capital is not activated on any balance sheet - exceptions to this rule are football clubs like Ajax Amsterdam - is related to the fact that the production factor labour is not owned by the firm. However, putting human capital as an asset on the balance sheet does not imply that people degenerate to machines or a livestock, nor that people are depreciated, neither the introduction of slavery as is often suggested in business economic literature. The accounting profession also points towards difficulties in measuring the value of and establishing transferable title to human capital that make it difficult to introduce accounting standards that allow human capital to be treated as an asset in financial reporting (see *e.g.* OECD 1996: 43 and 91). Activating human capital on the balance sheet does imply that knowledge and skills of employees are actually seen as capital goods, as assets and are treated accordingly in the accountancy. That is like real investment and that periodically depreciation is applied. This depreciation represents the reduction in value because of economic obsolescence as a result of technological development. The established depreciation fund has to be large enough to bring and keep up to the mark again the obsolete knowledge of the personnel. The essential question is whether future cash inflows are likely to be large enough to warrant making the investment. With that is achieved that the education and training expenditure are expressed in the period in which the benefits are realised stemming from these spending. From this the management obtains a better picture of the results and probably the management decision concerning investment in human capital will improve. This links up better with the way companies process durable tangible assets like buildings, machinery and means of transport in the annual accounts. For as a rule these are activated and depreciated, making it easier to spend wealth on such assets like schooling and training. Present and future benefits of physical capital are made comparable through the use of discount rates, while costs are measured through depreciation. However, this also requires changes to existing conventions in management accounting and financial accounting. The government could stimulate this transition towards depreciation of training by means of financial incentives. The introduction of investment premiums or investment tax deductions is relevant here to stimulate the education and training expenditure of trade and industry in a particular direction.

In the case of human capital counting costs or benefits over any period of time does not apply, only in the immediate accounting period. Is physical and human capital so different to justify the very large differences in treatment under financial and reporting practices? Four conditions must be met for human capital to be treated as an asset (OECD 1996: 44): human capital must be measurable (output potential); fruits of investments in human capital can be appropriated by the investor; costs (rental; buying) of human capital must be objectively determinable; recognition of estimates of value of output potential of human capital investments by labour market and capital market. The first two obstacles to parallel treatment of physical and human capital are not insurmountable. Condition 3 (costing) and 4 (market recognition) are contingent on conditions 1 and 2. The key issue is appraisal, not the intrinsic nature of human capital as intangible (OECD 1996: 46). The problem then is to create an inter-temporal market when the asset cannot be sold as a separate commodity. This starts with prior recognition of output potential of specific human competences. Record-keeping conventions and operational decisions by individuals, firms and governments play a major part in determining whether or not conditions 3 and 4 can be met in ways that establish the inter-temporal asset status of human capital (OECD 1996: 52). Hence there are solutions to the problems related to the parallel treatment of human and physical capital in accounting.

## **7. Investments in human capital in government budgets**

In public finance there is no or too little attention for the wealth position of the national state. Investments in physical and human capital are sacrificed for the sake of reducing government budget deficit or reducing government debt. This one-sidedness is partly the result of the applied administrative scheme. Many governments use cash not accrual accounting methods. The present government budget and account only look at the year in which the cash effect occurs, *i.e.* the actual spending takes place. In other words the expenditure and the receipts are imputed to the period in which the actual expenditure and receipts occurred. The scheme is focused on the short term and does not offer insight into the long-term impact of the policy. Unlike the practice in trade and industry all investment expenditure on physical capital are included in the budget of the year in which

the decision was taken. As capital goods are expensive and high costs imply losses, these spending often lose out on consumption expenditure in case of cut backs. Accrual accounting is the way to engage in inter-temporal calculation and valuation of training and labour force qualifications and to inter-temporal human capital investment decision making. When applying the accountancy custom (matching in accrual accounting) used in the private sector related to physical capital the annual expenditure amount is lower. The introduction of the capital account will imply that the profits and losses of an investment are attributed to the year they concern. In accrual accounting revenues are recorded when realised and expenses are recorded when incurred, without regard for the time of cash receipt or payment, and the matching of revenues realised with the costs expired (expenses) (OECD 1996: 38).

This once again underlines the desirability of re-introducing the division between the current account and the capital account (capital budget) of the government budget. The current account (current budget) contains current income (tax receipts) and current expenditure (consumption expenditure, including salaries and annual interest burden and annual depreciation). The balance of the current account determines the *change* in state capital during a given year. The current account can be compared to the profit and loss account of any private enterprise. The capital account can be compared to the system of gains and losses, in which depreciation represents the debiting as the depreciation of possessions as a result of economical or technical wear, even though this depreciation does not entail immediate expenditure. By the time the capital goods have been written down, the loan has been redeemed and new investment goods can be purchased with the loan. The capital account contains expenditure (acquisition of investment goods) and capital revenue (sale of capital goods and shares), which lead to a change in the *composition* of state capital. On the current account, expenditure is in principle covered by current income. The government is allowed to take out loans for the benefit of the capital account. The underlying thought is that future government investments would result in revenue or sustainable use (such as dikes and roads) and could therefore be financed via future expenditure (interest payments and repayments).

The introduction of the capital account will provide government investments with improved protection against cutbacks. There is a risk that expenditure important to the social-economic structure but not regarded as investments will be pressurised if loans are only permissible for expenditure on the capital account. Examples include expenditure on education and training (human capital) and social security expenditure aimed at encouraging harmonious social relationships (social capital: social relationships, norms and values). On the other hand, ministers could as a result attempt to have their expenditure viewed as investments in order to avoid cutbacks. Society benefits from stable labour relations. The capital budget shows that government spending often results in the acquisition of durable productive capital and thus is valuable to society's welfare.

## **8. Conclusions and recommendations**

Bookkeeping practice within enterprises and government budgets and policies concerning education and training differ considerably from the human capital theory, the human resource management theory as well as from endogenous growth theory. In their decision making and accounting practice not only private enterprises, also national governments treat education and training like consumption goods (costs) and not like investment goods (assets). Underinvestment in training by the individuals, the firms as well as the governments is the result. Fostering workers' employability requires changes in the way education and training and retraining (human capital) are treated in bookkeeping and government budgets. Also consultative institutions are an important solutions to market failure and improving the scope, the participation, the content and the quality of company training and therefore for the competitive strength and the growth of an economy.

## **References**

- Acemoglu, D. 1996. "A microfoundation for social increasing returns in human capital accumulation." *Quarterly Journal of Economics* 111: 779-804.
- Acemoglu, D., and J. Pischke. 1998. "Why do Firms Train? Theory and evidence." *Quarterly Journal of Economics* 113: 79-119.
- Acemoglu, D., and J. Pischke. 1999. "Beyond Becker: Training in Imperfect Labour Markets." *Economic Journal* 109: F112-F142.

- Addison, J. T. R., and C. Belfield. 2004. "Unions, Training, and Firm Performance: Evidence from the British Workplace Employee Relations Survey." IZA Discussion Paper 1264. Bonn: Institute for the Study of Labor.
- Anderhub, V., M. Königstein, and D. Kübler. 2003. "Long-term Work Contracts Versus Sequential Spot Markets: Experimental Evidence on Firm-specific Investment." *Labour Economics* 10: 407-425.
- Baily, M., G. Burtless, and R. Litan. 1993. *Growth with Equity. Economic Policymaking for the Next Century*. Washington: Brookings.
- Becker, G. 1964. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. New York: National Bureau of Economic Research.
- Booth, A. L., and D. J. Snower. eds. 1996. *Acquiring Skills: Market Failures, their Symptoms and Policy Responses*. Cambridge: Cambridge University Press.
- Borghans, L., F. Green, and K. Mayhew. 2001. "Skills Measurement and Economic Analysis: an Introduction." *Oxford Economic Papers* 53: 375-384.
- Bratton, J., and J. Gold. 2003. *Human Resource Management: Theory and Practice*. London: Palgrave Macmillan.
- Brunello, G., and M. De Paola. 2004. "Market Failures and the Underprovision of Training." Paper for the Joined EC-OECD Seminar on Human Capital and Labour Market Performance, 8 December, Brussels (mimeo).
- Cörvers, F. 1999. *The Impact of Human Capital on International Competitiveness and Trade Performance of Manufacturing Sectors*. Maastricht: Research Centre for Education and the Labour Market (Dissertation).
- Delsen, L., and E. De Jong, eds. 1998. *The German and Dutch Economies: Who Follows Whom?* Heidelberg: Physica Verlag.
- Delsen, L. 2002. *Exit Polder Model? Socioeconomic Changes in the Netherlands*. Westport: Praeger Publishers.
- Freeman, R. B. 2000. "Single Peaked vs. Diversified Capitalism: The Relationship Between Economic Institutions and Outcomes." Working Paper 7556. Cambridge: National Bureau of Economic Research.
- Gospel, H., and J. Foreman. 2006. "Inter-Firm Training Co-ordination in Britain." *British Journal of Industrial Relations* 44: 191-214.
- Hashimoto, M. 1981. "Firm-specific human capital as a shared investment". *American Economic Review* 71: 475-482.
- Heckman, J. J. 2000. "Policies to foster human capital." *Research in Economics* 54: 3-56.
- Layard, R., K. Mayhew, and G. Owen, eds. 1994. *Britain's training deficit. The Centre for Economic Performance Report*. Aldershot: Avebury.
- Leuven, E. 2005. "The economics of private sector training: A survey of the literature." *Journal of Economic Surveys* 19: 91-111.
- Lucas, R. 1988. "On the mechanisms of economic development." *Journal of Monetary Economics* 22: 3-42.
- Lynch, L., ed. 1994. *Training and the private sector: international comparisons*. Chicago: The University of Chicago Press.
- Mincer, J. 1958. "Investment in human capital and personal income distribution." *Journal of Political Economy* 66: 281-302.
- Nelson, R., and E. Phelps. 1966. "Investment in Humans, Technological Diffusion and Economic Growth." *American Economic Review* 56: 69-75.

- OECD. 1996. *Measuring what People Know. Human Capital Accounting for the Knowledge Economy*. Paris: Organisation for Economic Co-operation and Development.
- OECD. 1991; 1994; 1997; 2003. *Employment Outlook*. Paris: Organisation for Economic Co-operation and Development.
- Ok, W., and P. Tergeist 2003. "Improving Workers' Skills: Analytical Evidence and the Role of the Social Partners." OECD Social, Employment and Migration Working Papers No. 10, Paris: Organisation for Economic Co-operation and Development.
- Porter, M. 1990. *The Competitive Advantages of Nations*. London: Macmillan.
- Prais, S. J. 1995. *Productivity, education and training, an international perspective*. Cambridge: Cambridge University Press.
- Romer, P. 1986. "Increasing Returns and Long-run Growth." *Journal of Political Economy* 94: 1002-1037.
- Schultz, T. 1961. "Investment in Human Capital." *American Economic Review* 51: 1-17.
- Skirbekk, V. 2003. "Age and Individual Productivity: A Literature Survey." MPIDR Working Paper WP-2003-028. Rostock: Max Planck Institute for Demographic Research.
- Solow, R. 1956. "A Contribution to the Theory of Economic Growth." *Quarterly Journal of Economics* 70: 65-94.
- Soskice, D., B. Hancké, G. Trumbull, and A. Wren. 1998. "Wage Bargaining, Labour Markets and Macroeconomic Performance in Germany and the Netherlands." In *The German and Dutch Economies: Who Follows Whom?*, edited by L. Delsen and E. de Jong, pp. 39-51. Heidelberg: Physica Verlag.
- Stern, D., and J. M. M. Ritzen, eds. 1991. *Market Failure in Training? New Economic Analysis and Evidence on Training of Adult Employees*. Berlin: Springer Verlag.
- Stevens, M. 1999. "Human Capital Theory and UK Vocational Training Policy." *Oxford Review of Economic Policy* 15: 16-32.
- Temple, J. 2001. "Growth Effects of Education and Social Capital in the OECD Countries." *OECD Economic Studies* 33: 57-101.
- Teulings, C., and J. Hartog. 1998. *Corporatism or Competition? Labour Contracts, Institutions and Wage Structures in International Comparison*. Cambridge: Cambridge University Press.
- Trostel, P. A. 2004. "Returns to Scale in Producing Human Capital from Schooling" *Oxford Economic Papers* 56: 461-484.
- Zwick, T. 2006. "The Impact of Training Intensity on Establishment Productivity." *Industrial Relations: A Journal of Economy and Society* 45: 26-46.