



Key Aspects of the Economics of Technical and Vocational Education and Training (TVET)

Lessons Learned and Gaps to be Filled

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1 Introduction

The economics of Technical and Vocational Education and Training (TVET) focuses on the **costs** and **benefits** of TVET for the individual or the company, but also for the society and the state, as well as the financing of activities within the TVET system. To achieve a fair allocation, costs must be borne by different actors according to their benefits. This remains a topic of discussion, as the quantification of costs and especially of benefits is based on various assumptions.

The economics of TVET is of utmost importance for the establishment of TVET models that facilitate the development of high-skilled employees, the competitiveness of companies and the overall development of countries. As developing countries face scarce resources, it is very important for governments to know which investments in education pay off the most. However, the economics of TVET has so far been neglected by both scientists and practitioners.

In the cooperation with partner countries, it was realised that there is a shortage of research in the field of TVET economics. The lack of empirical data and research results obviously constrained the advisory work. In addition, it was difficult to find hard evidence that TVET really pays off. TVET, which suffers in many countries from a second-rate image, needs excellent arguments in its favour in competing with academic education. In order to fill at least part of this gap, studies have been carried out focusing on concrete questions: What is known in the field? What is still missing? Such studies include:

- ▶ **Bellmann, L., Hartung, S., & Janik, F.** (2006): Lohnt sich die betriebliche Berufsausbildung? Der Nutzen für die Ausbildungsbetriebe.
- ▶ **Dohmen, D.** (2007): Economics of Vocational Education and Training.
- ▶ **Lipsmeier, A., Walter, G., & Idler, H.** (2003): Dealing with Financing of Vocational Education: A guide for advisors, planners and their partners.
- ▶ **Lotz, G.** (2006): Engagement von Unternehmen in der beruflichen Qualifizierung von Mitarbeitern: Anregungen für die Berufsbildungszusammenarbeit.
- ▶ **Lutz, R.** (2008): Vorschläge zur Aufarbeitung und Neuausrichtung der Aktivitäten in der Sektorvorhabenteilkomponente „Berufsbildungsökonomie“ der Deutschen Gesellschaft für Technische Zusammenarbeit (GTZ).
- ▶ **Walden, G.** (2006): Kosten und Nutzen betrieblicher Ausbildung.

As is evident, empirical knowledge in the economics of TVET is still far from sufficient. Country studies have to be conducted to obtain a clearer view. But it remains a challenge and hopefully the economics of TVET can in general attract greater attention to this topic. From a state budget perspective, it is important to know which mixture of education and training best promotes profound human resource development. For individuals and for companies, it is perhaps even more important to have relevant information that enables good decision-making.

This paper is mostly based on the studies listed above and addresses the following questions:

- ▶ Why do companies¹ invest in training? What are their costs and benefits?
- ▶ What are the individual costs for and benefits of TVET?
- ▶ What are the social costs and benefits of TVET?
- ▶ How can state involvement in TVET be justified? What role should the state play?
- ▶ What kinds of TVET financing exist, and which of them is the most reasonable from a socioeconomic point of view?

The paper uses a broad definition of TVET. It includes school-based vocational education as well as company-based training or a mixture of both. The discussion focuses on formal **initial vocational training**. **Continuing professional training** is addressed only marginally². Informal methods of vocational training of any kind are not

1 The terms 'company' and 'firm' are used synonymously.

2 If not otherwise indicated, the word 'training' refers to company-based initial training that allows entry into the labour market upon completion. See also the Glossary.

1 Introduction

considered here, as the data needed are not yet available. Nonetheless, informal and non-formal TVET are very important in developing countries, for two main reasons. First, the vast majority of companies are in the informal sector, which is often a central aspect of a country's economic performance. Second, company training is not institutionalised due to a lack of resources and the fact that formal TVET structures seldom exist.

After a short overview of the existing literature on education in economic research, the contribution of TVET to the economy of a country will be briefly explained in Section 1. Section 2 deals with the costs and benefits of TVET for the stakeholders of the TVET system. Section 3 discusses various methods of financing. Finally, conclusions are presented in Section 4.

1.1 TVET and General Education in Economic Research

The economics of education is an integral part of various academic disciplines. It is a subject of study in the educational sciences as well as in economics and business administration and thus has an interdisciplinary character. The following issues are addressed by the research:

- ▶ investment in education;
- ▶ the costs and financing of education;
- ▶ the benefits generated by education; and
- ▶ the relationship between the costs and benefits of education.

The analysis of education from an economic perspective has become a research field since the **human capital theory** was developed during the 1960s (see, e.g., Becker, 1964 or Schultz, 1962). Many such analyses were carried out in the late 1990s.

Reviewing the current literature and (internet) databases, it can be concluded that the economics of TVET as a research field is not as prominent as other areas of education. It even seems that so far TVET has been neglected by education economists. Heise & Meyer (2004) state

that 'compared with the tremendous amount of research on education, literature on vocational training and occupational careers seems to be rather small.' (p. 335). This holds true especially for the investigation of individual decisions whether to participate in TVET or not.

It should be noted that many studies may touch upon the field of TVET indirectly when referring to secondary education, as TVET is part of it in many countries. However, this could also indicate a lack of research, which may result from the limited role of TVET in many countries. The understanding of the term TVET differs from country to country, since the concrete approaches vary. This leads to the conclusion that studies of TVET cannot be summarised and presented without accounting appropriately for the different designs of vocational TVET (Dohmen, 2007). The relevance of general education and TVET for economic growth has been investigated without satisfying results so far. While some scientists have demonstrated the great importance of general education for economic growth, it seems that no thorough investigation of the impact of TVET on economic growth has been carried out thus far.

While the human capital theory is coherent, the results of empirical studies concerning TVET are very limited and, in fact, largely incomparable, due to the different structures and roles of TVET in different countries. Furthermore, with regard to individual benefits, important differences between people enrolling in academic educational institutions and those enrolling in vocational educational programmes are often not taken into account (Dohmen, 2007).

Another issue raised by researchers is that the quality of human capital is as crucial for economic growth as it is for the individual him- or herself and for the productivity of companies. It seems to be an even more important factor than the quantity of human capital, which is measured by years of schooling or level of education. Therefore, raising the quality of education should be at the centre of human capital policies (Descy & Tessaring, 2005, p. 34).

1.2 The Role of Education and Training in Economic and Social Development

Sustainable economic development and TVET are interdependent. Economic growth is a basic condition for the reduction of unemployment and poverty. However, it does not automatically lead to more jobs and less poverty. It can only contribute to poverty reduction if broad sections of society find productive work which offers a decent wage (BMZ, 2005). This can be achieved only if different policies and mechanisms, which focus on employment and broad access to work and TVET, can be implemented. Economic development cannot take place without the development of human resources. Therefore, well-qualified professionals must be trained in order to raise the competitiveness of companies, countries, and regions.

Although the development of human resources through TVET is not a sufficient condition for economic and social development, it can make a crucial contribution to it.

In fact, both the economics of education and comparative vocational training research have yet to provide convincing results demonstrating a causal relationship between the structures of the education system and a country's economic success (Lipsmeier et al., 2003). Even industrialised countries have highly diverging TVET systems as well as different types of qualification and models of labour organisation. The TVET characteristics that are regarded in some countries as a prerequisite of a functioning TVET system do not exist in other countries; and what appears as a discrepancy between education and employment in one economy is considered an advantageous precondition for economic and social development in another.

So far, development cooperation has not managed to use the experience in vocational training for the formulation of a convincing, uniform model of vocational training in developing countries (ibid.). In order to create a basic model which can be applied with adjustment to local conditions, further research is needed in both, theoretical research (how to measure costs and benefits) as well as empirical research in developing and transition countries.

It should also be mentioned that almost no research exists on the contribution to economic and social development of vocational training versus general education, and no conclusions can be drawn so far in this respect (Descy & Tessaring, 2005).

2 Costs and Benefits of Participation in the TVET System

The TVET system has various stakeholders. The direct stakeholders are the trainees and the companies offering training. But also the state and the society can be characterised as indirect stakeholders of the TVET system as well as to a certain extent companies not engaged in training. These indirect stakeholders benefit through external positive effects that TVET generates and thus can be expected to bear some of the costs. Direct stakeholders can decide whether they offer or receive training. This decision-making process cannot be limited to the economic perspective, as the decision depends on far more conditions than costs and benefits. Nevertheless, the consideration of economic factors plays a very important role in reaching a decision.

The costs and benefits for the various actors involved in TVET are determined by numerous factors. The extent to which they incur to various actors depends on different factors – the:

- ▶ organisation of the system (more school-based vs. more workplace-based);
- ▶ kinds of professions and economic sectors (e.g. industrial vs. service sector);
- ▶ various characteristics of the country/region, e.g. the legal and administrative system, the financial sector;
- ▶ content of education (general vs. specific); and
- ▶ characteristics of trainees (young vs. old, upper vs. lower social class).

Thus, empirical studies and theoretical analyses are always based on several assumptions. Therefore the generalisation of the results can only be very limited.

The qualitative elements of costs, and especially benefits, cannot be assessed monetarily at all or only under strict assumptions. For example, the company offering the training benefits by taking on the trainees and hence does not need to carry out a costly recruitment process.³ These benefits can rarely be determined monetarily, although they are nonetheless of crucial importance. In almost the same manner, this holds true for the individual: the

3 See Section 2.1.2 for more discussion of company benefits.

trainee's benefits from a higher salary after the training can only be estimated under strict subjective assumptions. Empirical studies often show divergent results regarding costs and benefits because of different assumptions on the amount and composition of qualitative costs and benefits (Lutz, 2006).

Due to the fact that assumptions are formed subjectively, one can conclude that the costs and benefits of TVET can be determined neither generally nor objectively.

2.1 Employer

Economic considerations play an important role in the decision of companies whether they will train or not. The cost-benefit ratio is one of the crucial influencing factors. Simply said, if the total benefits exceed the total costs, the investment in vocational training is economically rational for companies. Therefore, as a basis for decision-making, costs and benefits have to be calculated. High expenses for the measurement of costs and benefits may restrain enterprises, so they might underestimate the benefits or overestimate the costs. Another reason why underinvestment in TVET is likely is that costs are more obvious and easier to measure. While the costs of TVET for a company can be measured and quantified, albeit at times requiring great effort, this does not always hold true for all kinds of benefits. Nevertheless, a sound decision based on cost-benefit analysis is only possible if, in addition to quantitative dimensions, qualitative dimensions of benefits are involved. However, qualitative dimensions of benefits must be quantified under assumptions that benefits will occur in the future.

2.1.1 Costs of Training to the Employer

When offering TVET, the company faces several kinds of costs⁴. The total costs of training for a company may consist of:

- ▶ personnel costs incurred by the trainees

4 The following section is based on research by Federal Institute of Vocational Education and Training (BIBB); see Bellmann et al., 2006, Lotz, 2007 and Walden, 2007.

2 Costs and Benefits of Participation in the TVET System

- ▶ wages, salaries paid
- ▶ contributions to social security systems
- ▶ personnel costs for trainers and instructors
- ▶ wages, salaries for full-time trainers
- ▶ wages, salaries for part-time trainers
- ▶ equipment and material costs
- ▶ work station
- ▶ consumables, raw materials, spare parts
- ▶ land, buildings and infrastructure, etc.
- ▶ other costs
- ▶ fees for courses in public or private training institutions⁵
- ▶ training materials and equipment
- ▶ depreciation of investment commodities, etc.

The sum of all training costs is called **gross costs**. The differences in gross training costs are due to a lot of factors, e.g.: size, sector, or salary levels. However, the decisive factor for the company to invest in TVET is the amount of **net costs**. These result from gross costs less the monetarily valued productivity of the trainee. Thus, differences between companies regarding net costs result from differences in the productivity of trainees. The higher the trainee's productivity, the lower the net costs. That means that if the trainee's productivity is higher than the total gross costs of training, the company even incurs a net revenue from training.

For the calculation of costs, it is important to differentiate between total costs and direct costs.

▶ Total cost approach

The total cost approach takes into account the complete valued assignment of human and physical resources that is caused by the investment of a firm into TVET. The approach considers the entire input of human resources and equipment during the time of training invested by a company.

▶ Direct cost approach

The total cost approach used for the calculation of the operational cost of training has been criticised in the past. An argument against this approach is that some fixed costs which the company has to bear even if it does not offer training are added to the costs caused directly by the training. Therefore, in the direct cost approach, part-time instructors or employees who work partly in the administration of training are not taken into account. It can be assumed that the (fixed) personnel costs for these employees would be incurred anyway and thus are not relevant to the decision to train.

In order to evaluate the company's decision to train, it is important to recall that one can distinguish between two different models: the productivity-driven model and the investment-driven model.

According to the so-called **productivity-driven model**, the incentive for a company to offer TVET is the productivity of the trainee during the training. Trainees are seen as mainly a low-cost equivalent to regular manpower and therefore a substitute for low-skilled workers. They also can replace skilled workers to a minor extent.

In contrast, the **investment-driven model** takes into account future benefits from the trainee assuming she/he stays in the company after the training. Following human capital theory, the higher qualification increases the trainee's productivity. Thus, after the training is completed, the employer can expect an amortisation of her/his invested costs. The period considered relevant to the decision to invest in TVET should therefore not be limited only to the training phase. A company with a long-term planning horizon might be willing to offer training even if the net return will only be positive if the worker remains in the company after the completed training. Thus the company not only has to pre-finance the costs but also bear the risk that the trainee leaves the company.

However, at this point, it is also important to distinguish between general human capital and company-specific human capital. The former includes skills which can be applied in other companies; whereas company-specific

⁵ In some cases to be borne by the trainee, see Section 3.1.2.

2 Costs and Benefits of Participation in the TVET System

human capital determines knowledge, which increases productivity only in the training company and consequently gets lost when a trainee moves to another company. If a company invests only in general human capital, its costs must be, in accordance with the theory, paid off during the period of training. Otherwise the company would have to bear the cost of training alone and would not benefit from its investments if the trainee were to leave the company upon completing her/his training (Wolter, 2008).

2.1.2 Benefits of Training for the Company

As mentioned above, the company's benefit is the contribution of the trainee to the company's productive outcome. However, this benefit is sometimes not evident in the same time period as the costs. The fact that future benefits must also be taken into account makes the calculation more complex. Another issue is that the benefits of TVET are difficult to measure or to quantify.

The benefits can be classified according to the following dimensions outlined by the Federal Institute for Vocational Education and Training in Germany⁶:

1. Benefits gained through the trainee

This dimension refers to the benefit to the company during the training. This benefit arises in the form of returns through the productivity of apprentices integrated into the operational work. The higher the productivity of a trainee, the lower the company's net costs.

2. Benefits gained through the trained employee

This dimension only applies if the company employs the trainee after the completion of training. In that case, the following benefits may result for the company:

- ▶ **Avoidance of recruitment and induction costs, as well as costs arising from inappropriate hiring and needless staff turnover.**

When employing trainees after the training, the company does not have to bear the same costs for the recruitment of skilled workers as other companies in the labour market

6 See also Bellmann, 2006; Lotz, 2007 and Walden, 2006.

do. The time and other resources needed for the former trainee to adjust to the new job is usually minimal, since the employee is already integrated into processes and is familiar with company-specific conditions and the requirements of the job.

The risk of hiring the 'wrong person' and the resulting costs (of dismissal, etc.) is much lower, as the company knows well the behaviour, way of working, and productivity of the trainees from their training in the company.

▶ Higher productivity

It can be assumed that the productivity of trained employees lies above the productivity of externally recruited professionals. In this context, a further benefit for the company employing a skilled worker is the effect which this worker may have on the productivity of his or her colleagues. It can also increase the productivity of an unskilled worker who learns by observing the skilled worker⁷.

▶ Avoid replacement costs

When vacancies cannot be filled adequately, the company incurs costs and a loss of time. These risks can be reduced if the company employs trainees after the completion of the training. It can be estimated that they are more likely to meet the requirements of the position than a newly recruited employee.

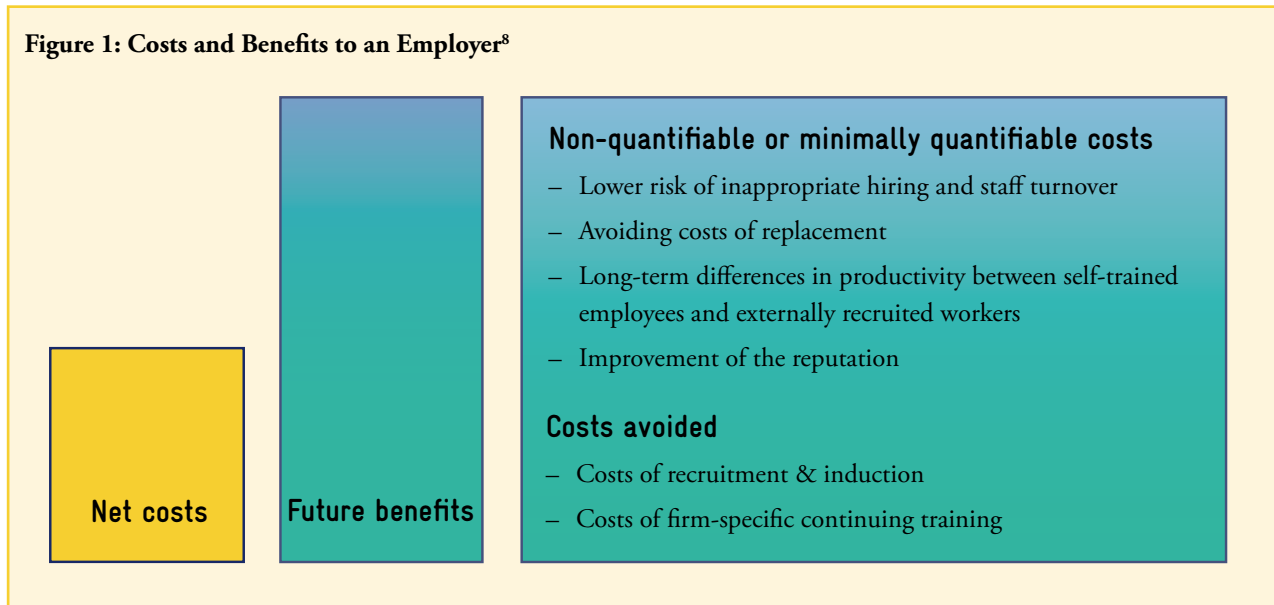
3. Indirect benefits of training

It can be assumed that offering TVET increases the company's reputation as a socially responsible enterprise. This can have an impact on the company's brands as well on its attractiveness as an employer. The relevance of this aspect also depends on the particular economic context. For example, while the reputation of a small trader will not rise if he offers training, the participation in TVET can be highly relevant to the reputation of a multinational company.

7 One may distinguish between two effects: a spill-over effect and a demonstration effect. The former occurs unintentionally. Thus it is a real intra-firm externality, as the skilled worker does not get paid. In contrast, the latter is intended and is a kind of informal on-the-job training (Dohmen, 2007).

2 Costs and Benefits of Participation in the TVET System

Figure 1: Costs and Benefits to an Employer⁸



2.1.3 Cost-Benefit Ratio

A sound decision for the investment in TVET from an economic perspective requires that costs must be compared with the different dimensions of benefits. The following issues should thereby be considered. First, since only some benefits can be quantified, the comparison must also consider the qualitative elements in order not to underestimate the benefits of TVET for companies. The ‘benefits gained through the trainees’ can usually be identified and valued monetarily during the training process. Thus the quantified benefits of productive trainees can be directly subtracted from the **gross costs** in order to determine the **net costs**. When calculating the cost-benefit ratio, it must be taken into account that the benefits are sometimes generated later than the costs. For example, the potential benefit of the trained employee may occur years after the company’s invested costs, and only under the assumption that the trainee does not move to another company. Also some parts of this benefit dimension are partly quantifiable (saved costs for recruitment) and partly not (lower risk of fluctuation). Nevertheless, the dimensions of future benefits must be part of the cost-benefit ratio as shown in Figure 1. The figure suggests that if all benefits are taken into account, the benefits will outweigh the costs.

Since at the moment of decision and during the training, it is unpredictable whether and to what extent the benefit actually will occur, the costs or operating expenses incurred by training have the character of future-oriented investments. Therefore, investments in training amortise usually only over the long term. Thus the various dimensions of benefits that only have an effect after the completion of training and subsequent employment in the same firm should be taken into consideration. If all the dimensions of benefits are taken into account, the expected benefits will exceed the costs.

2.2 Trainee

An individual invests in her/his education if the expected return is higher than the costs of that investment. Following human capital theory, training results in higher productivity and, thus, in higher wages. Such higher earnings as well as other **monetary** and **non-monetary**⁹ returns comprise the training benefits to the individual. This section discusses the costs and benefits to a trainee.

⁸ Adapted from Walden, 2006.

⁹ See the Glossary.

2 Costs and Benefits of Participation in the TVET System

2.2.1 Costs and Benefits of Training for the Trainee

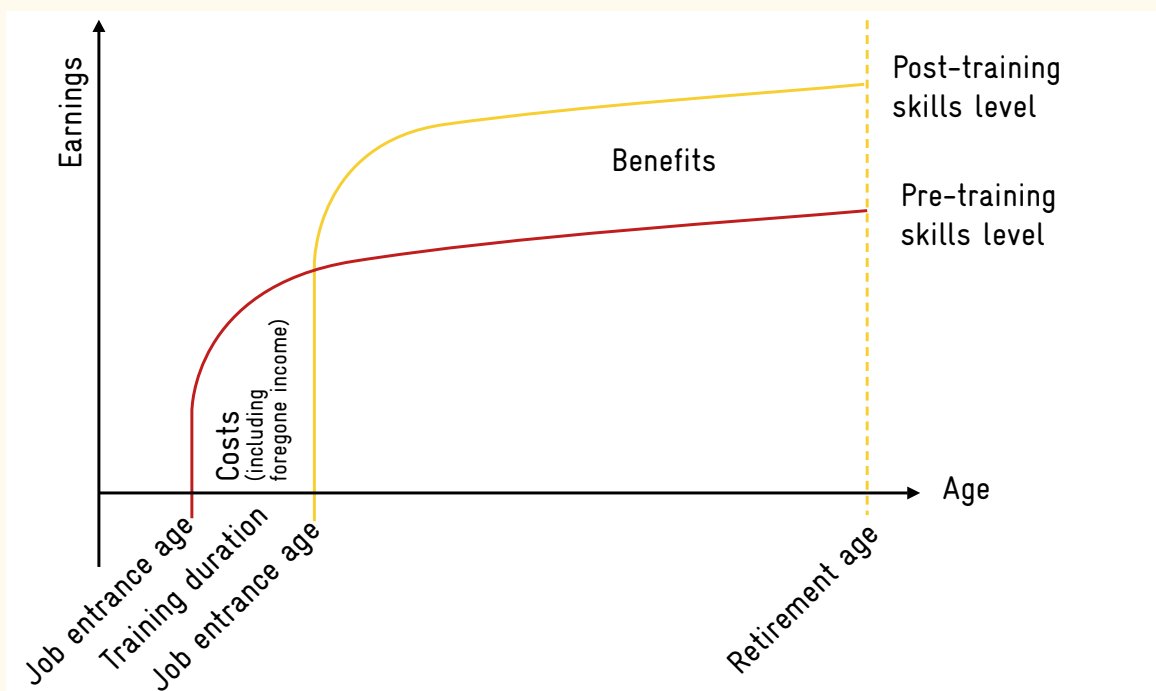
The individual costs of training cover:

- ▶ direct and indirect costs of training;
- ▶ textbooks;
- ▶ other training or educational materials;
- ▶ fees;
- ▶ opportunity costs;
- ▶ foregone income.

Opportunity costs refer to the fact that when entering the labour market as an unskilled worker, an individual would earn the respective income of an unskilled worker instead of investing in training. In case the trainee gets a salary, the opportunity costs are lower and determined

by the difference between her/his salary and the labour market wage for unskilled employees. In addition, if opportunity costs are not covered adequately, the returns to other investments in education, e.g. higher education, are overestimated. However, as training improves, the trainee's skills and thus his/her productivity increases. After the completion of the training, the trainee is likely to earn a higher wage than an unskilled employee. This wage differential is the benefit of training. The net benefit is calculated by subtracting the total costs of training (direct and indirect costs as well as opportunity costs) from the wage differential. Another important beneficial aspect in many developing/transition countries is that the skilled worker is less likely to become unemployed. Besides the wage differential, better prospects for employment and the unlikelihood of becoming unemployed are two of the crucial benefits of TVET for the individual.

Figure 2: Individual Benefit from Training and Education¹⁰



¹⁰ Wolters 1999 and Psacharopoulos 1995, cited in Jäger 2003.

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The figure suggests that individuals entering the labour market will earn an income, whereas individuals who participate in training have to bear costs during the training. These costs represent private investment in training. After training, the trained employee earns an income which is generally higher than that of an employee without training. Calculated on the basis of the expected life income, this gives the benefit, or the rate of return on investment (Jäger, 2003).

As the individual outcome of TVET is not limited to higher productivity, higher wages, nor better employability, so-called non-monetary benefits, which cannot be determined financially, may be considered as well. Such benefits can include the satisfaction resulting from the contents of the training, social contacts, or improved chances of employment or promotion, in-house reputation, work satisfaction, etc.. Insofar as the increase in income linked to qualification extends consumption, social status etc., vocational training also gives rise to additional, indirect benefits (Lipsmeier et al., 2003). Other non-monetary benefits accrue due to better health and safety in the workplace, reduced risk of an unplanned pregnancy, etc. (Grubb and Ryan, 1999; Wolfe and Zuvekas, 1997; McMahon, 1997, 1999, all cited in Dohmen, 2007). As non-monetary effects are probably more relevant as benefits than costs and are thus less obvious, returns are likely to be underestimated.

Another reason why young people decide against training might be the bad reputation of particular occupations, especially in trade or handicraft fields. Even when TVET is economically rational and offers better chances in the labour market, individuals often prefer higher (university) education although they are not able to make use of it. Others even might prefer to work in an unskilled job instead of participating in training.

2.2.2 Additional Aspects of TVET Benefits for Trainees

The measurement of the individual's return is based on the net income, i.e. subtracting tax payments and social insurance contributions from gross salary. As already

mentioned, the difference between costs and benefits is the net benefit of training. Similar to the firm, most of the trainee's benefits appear later than the costs. As with any calculations involving investment and expected future benefits, there is considerable uncertainty for trainees – they may not complete their training; they may not be able to use their knowledge and skills because of unemployment, or they may be not willing to use their knowledge and skills because of change.

In addition to positive income effects, training also has a positive effect on occupational status, as the likelihood of unemployment for trained workers is lower, whereas the likelihood of promotion tends to increase through qualification (Descy & Tessaring, 2005).

In the case of a decision whether to invest in TVET or in higher education, the trainee's salary is an opportunity cost for the student. In fact, if TVET is part of upper secondary education, the rates of return to TVET as well as higher education are to be discounted to the point of entry to upper secondary education and not to higher education. It appears that most rate-of-return analyses do not take into account trainees' salaries (Dohmen, 2007). Thus, the return to higher education is usually overestimated, while in contrast, returns to TVET are underestimated.

2.2.3 Empirical Evidence

Heise and Meyer (2004) found out in their comparison of educational returns and working careers in Europe that educational benefits do not converge across European countries, neither in terms of the rates of return nor the likelihood of employment. Apart from that, they point to different European-wide benefits of general education and TVET. They identify higher entry wages, higher wages throughout working life, increased job opportunities and a reduced risk of becoming unemployed, as well as 'an indication of potentially high returns of more education for socially disadvantaged individuals who reached only a low level of education' (p. 349).

A review of the economic literature reveals that many studies have been conducted on the costs and benefits of education and rates of return. Yet, by far most of the

2 Costs and Benefits of Participation in the TVET System

studies refer to secondary and tertiary education without distinguishing between general and vocational secondary education. Furthermore, most of them are limited by methodological issues; particularly the control for selection bias is missing. The studies provide very divergent results, using different methods. Whereas some studies estimate lower returns to general education compared to vocational education, others find that the income effects of vocational qualifications lag behind. Taking into account the length of time of studying and the earnings foregone, the returns to vocational training approximate the returns to academic qualifications (Machin/Vignoles, 2001 cited in Dohmen, 2007)¹¹.

Having reviewed the empirical evidence on individual returns to TVET, one can conclude with two statements. Firstly, the number of studies estimating the individual returns to TVET is fairly small and often limited by methodological standards. Secondly, the role and understanding of TVET varies considerably across countries. Therefore, it is rather difficult to evaluate studies without detailed knowledge of TVET in the particular economic context of a country. In addition, rates of return are often calculated without distinguishing between vocational and general education (ibid.).

These findings suggest that more research is needed that estimates the returns to TVET, accounting for different enrolling and selection patterns, as well as for differences in the structure of education systems. Furthermore, international comparisons need to account for structural differences and the different roles played by training, vocational training, and vocational education. Finally, a distinction should be drawn between **initial, pre-employment** and **on-the-job training** as part of **continuing training** (Dohmen, 2007).

2.3 Social Costs and Benefits and Externalities

The major difference between **private** and **social costs** and **benefits** is that the latter cover all costs and benefits of TVET which arise within a country. The most important distinction between social and private returns arises from positive externalities leading to underinvestment in training, thereby justifying public intervention. Social benefits include the economic growth effects of education, training and inventions.

2.3.1 Social Costs and Benefits

A major component of social costs is foregone income, which has to be calculated on the basis of gross earnings, while individual (opportunity) costs are estimated on a net basis. Similarly, social monetary benefits are to be estimated on the basis of gross income while private benefits are based on net income (Dohmen, 2007).

Furthermore, it should be noted that many studies measure the benefits of training solely on the basis of labour income. Other benefits are therefore neglected or underestimated. Another deficiency of many studies is that they do not take into account other social costs, e. g., due to the lower unemployment rates of highly skilled people.

As the major aim of training in developing countries is to prepare people to earn their livelihood on their own, it appears to be justified to rely on wage income first. But the full benefits cover more than just labour market outcomes (Lipsmeier et al., 2003).

2.3.2 Externalities

If externalities exist, private returns diverge from the social returns to TVET. Thus, the market will provide insufficient training because individuals and companies decide solely on the basis of their own benefits and do not take into account social benefits. When the total social benefits are higher than perceived by individuals or companies, underinvestment in human capital will occur (Dohmen, 2007).

¹¹ For more details on empirical studies, see Dohmen, 2007, pp. 13 etc. seq.

2 Costs and Benefits of Participation in the TVET System

This section provides a short overview of circumstances in which externalities relevant to TVET occur.

Poaching

The ‘poaching’ of skilled workers, when employers simply recruit skilled workers trained by other companies, causes market failures which lead to underinvestment in training. As training increases the productivity of the employee, investment in human capital is advantageous for the company. This also means that it is in the firm’s interest that the trainee stay in the firm after the training is completed. Otherwise, the company would not be able to recoup the costs of the training the person was given, and the future employer will profit from this training for free. If the training company provides only firm-specific training, the trained worker will not move to another firm. But the more general the training, the higher the possibility that a worker quits after training, and the smaller the opportunity for the firm to earn the returns of training¹². This could lead to an underinvestment in training and the market will then provide a suboptimal number of skilled employees (Stern 1995, cited in Dohmen, 2007), possibly affecting the economic development of a branch, region or economy. Thus, getting the entire sector involved in financing training, e.g., through the introduction of a training levy, mitigates the risk of ‘poaching’. As everyone contributes to training expenses in their sector, the risk is dispersed, and employees gain more opportunities for training¹³.

12 Theoretically, poaching leads to companies having no incentive to offer TVET, but rather to poach skilled workers trained by other companies. Thus, every firm would prefer to act as a free rider in the training market, instead of providing training. This would lead to an insufficient number of skilled workers to serve the labour market properly. However, those few who are skilled in that particular area will be very attractive to companies and thus gain a very high reward, i.e. a high salary that would make these skills attractive. Thus, the number of trainees would increase, even if the costs of training have to be borne by the individual so that the training rewards are reduced. Assuming perfect markets, someday the number of trainees (skilled workers) will be exactly as high as the companies’ demand. Trainees and companies will share the costs and the market will work efficiently. However, this process may take a very long time.

13 Section 3.2.3 will review possible co-financed funding schemes.

Poaching does not necessarily suggest a levy system¹⁴; another way to penalise poaching would be to require firms to pay some kind of transfer payment.

Finally, it should be noted that the risk of losing a trained worker to another company depends on the particular market structure and environment, but also on social norms, like the personal relationships between employers and employee. The higher the exchange value of the qualification on the (external) labour market, the greater the external effect will be (Dohmen, 2007).

Capital Market Imperfections

Capital market imperfections are one of the most important reasons for public intervention in education. This discussion is not only relevant for general education and school-based vocational education, but also for company-based training, even if it is often associated with payments high enough to cover maintenance and training costs (Dohmen, 2007).

Due to an insufficient ability to secure human capital investments, problems of **adverse selection** and **moral hazard**¹⁵ arise. The risk of adverse selection leads to an unwillingness among banks to provide loans; otherwise they would have to charge an interest rate far beyond the current market rate, making human capital investment unprofitable. The introduction of a loan system for educational investments seems reasonable. Loans are of particular interest for people who start from a disadvantaged position on the labour market¹⁶.

Moral hazard is relevant because there is an incentive either not to earn at all or to reduce work in order to avoid repaying the loan. Even without having the intention of defaulting on the loan, there is a risk of non-graduation

14 See Section 3.2.2 for a discussion of levy schemes.

15 See the Glossary.

16 Section 3.2.1 discusses aspects of the provision of (subsidised) loans.

2 Costs and Benefits of Participation in the TVET System

and/or unemployment¹⁷. Thus, the capital market would provide too few loan opportunities.

The rise in interest rates for educational loans as a result of the aforementioned risks would lead to differing individual and social rates of return, justifying public intervention into the financing of general education and TVET, at least by providing interest subsidies for loans or debt guarantees.

Capital market constraints, as a problem for financing higher education and TVET, have been mentioned quite often (e.g. Lynch, 1994; Greenhalgh and Mavrotas, 1994; Acemoglu, 1996, all cited in Dohmen, 2007). But it is questionable whether it is sufficient to facilitate access to credit or to provide loan guarantees. These approaches can make capital markets work more efficiently, but they do not automatically reduce risk aversion, which is most probably negatively related to parental income and hinder particularly children of low socioeconomic background from participating in TVET. Thus, even if the capital market problem might be overcome, an equity problem could still occur. Consequently, public intervention might be necessary to avoid problems of equity and equality of opportunity.

Moreover, capital market constraints or financial constraints are not only a problem for trainees but for companies as well, in particular small and micro enterprises (World Bank, 1997a; Middleton et al, 1993, all cited in Dohmen, 2007), as they also might be not eligible to get credit from a bank.

Risk and Uncertainty of Individuals

As mentioned above, investment in education and training is risky for individuals. Individuals neither know in advance whether they will graduate, nor do they know whether they will find an (adequate) job with an appropriate salary after the training. The uncertainty and risks are not necessarily bigger for TVET than for other

investments. But when investing in human capital, individuals usually cannot diversify their risks. Either they invest in TVET or not. This is especially important for individuals from low-income backgrounds, whereas high-income individuals can disperse their risk by investing in financial assets or by saving.

Those who can only invest in human capital must fear that their investment yields no or only a low return. They often even use savings or take out a loan, which means that if their only investment in human capital fails, they have to live in poverty. Because of this high risk, individuals might decide not to invest in human capital but to remain unskilled, even though this might increase the risk of unemployment, etc. Thus, government intervention could improve income security by reducing individual risk, e.g. an inverse insurance which could – under certain conditions – overcome the risk aspect of human capital investment (Ritzen, 1989, cited in Gasskov, 2000).

Complementarities between General and Specific Training

Stern and Ritzen (1991) assume that general and specific training are complementary. On the one hand, the individual should have basic knowledge in her/his occupation before she/he begins to specialise. On the other hand, general firm-based training must be deepened by special training. 'Inherent in complementarity is that general training pays off more if it is combined with specific training, and that specific training is more profitable when it is done jointly with general training. Complementarity then means that employers will not invest in specific training unless workers have sufficient general training' (ibid, p.5). Consequently, workers will not invest in general training unless they know that specific training will follow.

The company faces the danger that its investment in general and specific training will not bring any returns if the trainee changes company. If long-term contracts exist, the employer might be willing to cover some of the costs of general training. If the turnover of employees is high, the company will not be willing to pay, resulting in underinvestment in training.

¹⁷ Women face even more difficulties in getting a loan as they are likely to become pregnant and be responsible for childrearing, which might lead to the loan repayments becoming unaffordable.

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Other Externalities of Training

Recent research indicates that other, partly non-market, externalities also exist. Wolfe and Zuvekas (1997, cited in Dohmen, 2007) mention social cohesion, technological change, and crime reduction. Another non-market externality is the better health status of the individual as well as of family members. It can be assumed that this has positive external effects in terms of a reduction of the contribution to health insurance by other insured individuals. Health, the reduction of child mortality and teenage pregnancy are particularly important aspects in developing countries (e.g. Glewwe, 1999; Lam and Duryea, 1999, cited in Dohmen, 2007).

Snower (1996) points to another externality, which links or leads to a 'low skill, bad-job trap': Industries offering 'bad' jobs are characterised by low productivity and low wages. Additionally, they are often characterised by a high number of low-qualified staff and just a few, if any, highly qualified employees. As such firms face difficulties in filling vacancies for highly qualified staff; they do not have an incentive to provide training. This leads to low incentives to acquire human capital, because the returns will be low. A downturn cycle of low productivity and unqualified work will result (Dohmen, 2007).

2.4 Summary: Who Benefits from Training?

The section offered an overview of costs and benefits of TVET for companies, individuals and society and presented some empirical findings. Cost-benefit analyses as well as estimates of the rates of return are important instruments for evaluating the outcome of TVET. However, as already explained such calculations are based on several assumptions and conditions and often neglect specific social aspects. Hence, it is disputed to what extent one can rely on economic approaches, such as cost-benefit analyses. The analysis of rates of return is just one useful instrument for assessing the impact of training, but it cannot be the one and only criterion as it does not detect externalities and long-term effects (Lipsmeier et al., 2003). However, these

aspects should be taken into account in order to arrive at a more profound conclusion on participation in TVET.

Another issue to consider is that even if companies invest in TVET, they often do not record special TVET costs. Accordingly, companies often do not know the exact costs of training. An important reason might be the expense of measuring costs and benefits. Companies are also often not aware of the potential benefits of training. This is particularly true for companies not engaged in training. The underestimation of benefits, the overestimation of costs, or the lack of recorded data regarding costs and benefits can result in an underinvestment in training.

Concerning social costs and benefits, a major shortcoming is the fact that estimating them is often based on wage differentials, not accounting for differences in unemployment rates. Since unemployment rates are particularly high for low-qualified people, the returns to TVET might be underestimated.

A broader overview of the international evidence on whether training pays off reveals a fairly mixed picture, caused by the fact that systems of TVET differ from country to country. However, it seems that the most important reason is that most of the studies by far do not account for selectivity bias; i.e., the target group for TVET, and particularly for vocational training, is different from the target group for general education. Thus, a comparison between the rates of return to general education and TVET is necessarily biased towards general education. Secondly, many studies refer to labour income only, neglecting other benefits. Thirdly, opportunity costs for general and particularly higher education may be underestimated, if trainees' wages are not considered.

It has to be noted that the rates of return are different for each stakeholder depending on the particular mode of delivery associated with different financial arrangements and contributions. Thus, one can follow McMahon (1988, cited in Dohmen, 2007), who asks: 'Are the benefits worth the costs? The evidence suggests that under certain conditions they definitely are; under other conditions they are not.'

3 Models of Financing TVET

In general, TVET financing mechanisms should reflect the principle that its beneficiaries should bear the costs (Gaskov, 1998 & 2000). Following this principle, the main sources of TVET funding would come from the immediate stakeholders: the trainees and the companies offering the training. But, as explained before, companies not offering training and the state benefits through externalities, thus justifying the involvement of the government and of non-training companies. The companies can contribute directly by providing resources in cash or in kind or indirectly by paying taxes or levies.

The number of studies reviewing, discussing and suggesting funding concepts for education in general and TVET in particular, is large. The extensive literature on the financing of TVET reaches the unanimous conclusion that exact analyses in this domain are very difficult: 'There are major gaps in data on VET funding in all countries. The main problem lies in the paucity of data on private investments, whether by individuals or enterprises' (Green et al., 2001, p. 74, cited in Lipsmeier et al., 2003).

The following section provides an overview and a short discussion of incentives to financial training, as each source of funding can be considered as an incentive from the viewpoint of the stakeholders – trainees, employers (training or non-training) and/or the government.

3.1 Privately Financed TVET

Training improves the skills of trainees. Thus, they can expect benefits in terms of higher salaries, career prospects, etc. As TVET generates individual benefits, it is reasonable to expect that trainees contribute to the financing of the training. However, the level of this future additional income depends on many uncertainties. For example, a degree of uncertainty always exists about how labour markets evolve over time, so there is no satisfactory measure of how high the individual contribution should be. Trainees contribute either by accepting reduced earnings during training periods or by paying training fees.

3.1.1 Wage below Productivity during Training

In a traditional, privately organised training system, the trainee would get either no salary or a payment which is below the salary associated with her/his productivity level. If her/his productivity is very low and training causes net costs for the employer, the trainee would even have to pay a training fee¹⁸.

However, to the extent that the wage[s]/salary of the trainee is[are] lower than her/his productivity, she/he bears the costs of training and reduces the financial burden of the employer. A payment which is below the productivity level of the trainees can be justified by the lower productivity of the trainer and/or other direct and indirect costs of training to be borne by the company which offers the training (Dohmen, 2007).

How much of the training costs the company will try to recover through wage reductions depends on the likelihood of the trainee leaving the company. The following factors are to be taken into account:

- ▶ The degree to which training is firm-specific or general (Becker, 1964). If training is more firm-specific, the trainee has few incentives to leave the company after the training, because she/he will only be able to apply the skills in the company. The more general the training, the higher the incentive to change company.¹⁹
- ▶ The structure of the TVET and labour market or the drop-out rates of students.
- ▶ Traditional structures: If it is common to leave companies often or not.

If the wage reduction is higher than the total costs of training, the firm would gain a **net benefit** at the end of training. Since this reduces the risk that companies will incur net costs, it may raise the number of firms providing training. However, this inherits the risk of insufficient demand for trained employees as it will be cheaper for firms to employ trainees instead of trained employees. In

¹⁸ See Section 3.1.2.

¹⁹ Empirical analyses suggest that employers bear more of the costs, as appears to be justified by the share of firm-specific training (Dohmen, 2007).

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this case, trainees may be trained, but will be unemployed afterwards (Wolter, 2008).

3.1.2 Tuition and Apprenticeship Fees

In many countries students or trainees have to pay a fee covering the total or a share of the education or training costs, mostly for school-based TVET. The same applies to small enterprises for their training, which was common in some West African countries (Dougherty, 1989, Dougherty & Tan, 1997, Velenchik, 1995, all cited in Dohmen, 2007). The most common argument for a general introduction of fees is the same as for wage reduction: The individual benefit from training. Otherwise the firms providing training or the government would have to bear the total costs of TVET.

Other arguments in favour of the introduction of fees are the expectation that fees can enhance the efficiency of training measures, as participants are likely to pay for training if it is of a good quality and can bring personal benefits and high private rates of return (Bolina, 1996). Fees can also be adjusted according to the supply of and demand for training. They can be raised if demand is higher than supply and vice versa.

The biggest disadvantage of fees is that they increase the costs to the trainee. They are to be added as direct costs to the factor of foregone earnings. The high costs affect individuals from low socioeconomic backgrounds even more. This would reduce their access to training because of unaffordable fees. However, participants are likely to pay for training if it is of good quality and can bring personal benefits and thus high rates of return (Gasskov, 2000). If the amount of fees is linked to levels of quality so that better training institutions request a higher fee rate, a disadvantage arises: Individuals from poor households would not be able to defray the costs of high quality education at expensive institutions. Thus, the social consequences of differentiated fee systems need to be considered and adjusted by the government.

The introduction of fees must not lead automatically to the reduction of public spending. If public spending is not reduced through the introduction of fees or the

expectation of rising fee levels, the quality of TVET may improve.

3.1.3 Enterprise-Financed TVET

Similar to trainees, it is reasonable to involve training companies in the funding of TVET, as they benefit, e.g., from the productivity of the trainee, the higher productivity of the trained worker, and increased earnings. An employer can finance TVET by providing enterprise-based training but also, e.g., by paying fees for vocational school.

Regarding the problem of poaching, as explained in Section 2.3.2, firms, which could be interested in avoiding investments in training and rather recruit already trained workers. This would lead to an under-supply of training. The risk of a permanent under-supply in (company-based) TVET can only be prevented by institutional regulations – be it with or without governmental involvement – which are considered to be fair regarding the cost-bearing.

3.2 Publicly Financed TVET

TVET has both an economic as well as a socio-political dimension. On the one hand, it is part of a comprehensive education system. On the other hand, its reference system is primarily the labour market. Thus, it shifts between a public service, which should be accessible to all citizens, and a service that follows the market economy. That means that there are three major arguments, which – following the principles of a social market economy – justify public intervention and the financing of TVET.

The most important issue is that TVET is linked to benefits for large groups of the population, such as higher national employment, productivity and income, increased competitiveness etc. However, these benefits for the society are disincentives for the private investor, as she/he doesn't benefit to the full extent of her/his investment. This can lead to under-investment, if decisions on education and TVET are made by individuals and companies only.

Another economic aspect is market failure or market imperfections, which may constrain private investment in training by employers and individuals. These include

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the mobility of labour and the loss of training investment (poaching), capital market imperfections, etc. (Gasskov, 1998). In order to adjust market inefficiencies and allocate costs fairly according to the accrued benefits, government intervention is reasonable.

The third argument for public support of TVET is to ensure social equity for those who cannot afford to bear the costs of education or TVET on their own and to guarantee equal opportunities for all citizens. Since public spending reduces individual costs, it is suitable to support particular training opportunities for socially disadvantaged groups (Bolina, 1996).

Distributional and Social Aspects of Public Intervention

A consensus exists that some kind of public intervention is necessary for distributional and social aspects, e.g., equality of opportunity and equity. The World Bank (1991, cited in Dohmen) justifies public intervention for equity reasons for the poor, women, and minorities when it is carefully targeted for these groups. According to their strategy and understanding, this cannot be rectified with public provision of TVET or global subsidisation, as the benefits are distributed to all people, even to those who are neither poor nor disadvantaged (ibid.).

Public responsibility, however, does not mean that all kinds of education should be for free. A diversification of financing sources and cooperative approaches are inevitable, particularly in developing countries, where chronic underfunding is common.

The intention of public funding is that it contributes to covering the expenditures and costs of training which are initially borne by the immediate stakeholders, i.e. the companies providing and/or paying for training, and the trainees. Thus, public funding reduces the costs to the stakeholders within the TVET system.

Diverse TVET financing mechanisms exist, and they all serve as incentives for their respective beneficiaries. Each of these mechanisms has limitations and produces various results depending on the particular environment. TVET

financing mechanisms can be distinguished in terms of the:

- 1) sources and methods of redistribution;
- 2) types of administrative authority; and
- 3) allocation formulas.

The following sections present some funding mechanisms for TVET.

3.2.1 Financing Through General Tax Revenues

Direct Payments and Subsidies

A direct subsidy either to training institutions or firms by the government is a common way to provide incentives for education. The government is to bear the costs of public or private TVET schools or to subsidise the costs of firms providing training. Direct public financing of training is common even in countries with dual TVET.

Tax Reductions/Tax Rebates

Tax reductions and tax rebates provide an incentive for firms to cover the costs of training by reducing their net costs. According to Bolina (1996), a tax reduction is directed to a cost-sharing among those who benefit from the training.

On the other hand, Barr (1998, p. 325, cited in Dohmen) argues for the tax deductibility of training costs: 'Education, to the extent that it raises an individual's future earnings, increases his/her future tax payments; in absence of any subsidy, an individual's investment in education confers a "dividend" on future taxpayers.' Thus, if a tax system relies on individual earnings, training expenses should be tax-deductible or training costs should be reduced through subsidies.

The training expenses of companies in a number of countries are tax deductible. The analysis of the effects of tax reductions on the net costs of training depends on the concrete mechanism applied. In principle, one can distinguish a reduction of the tax base and a reduction of the tax payment. The first is called a tax allowance or a tax exemption while the latter is a tax credit.

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A crucial issue with regard to the reduction of training expenses from the tax base in progressive tax systems, as applied, e.g., in Germany or Austria, is that the net costs of training (after taxes) decrease with the tax base, i.e., the net costs of training decrease with an increasing income. This suggests that the training investment is higher for those with a higher income, while those with a low income do not invest at all or only to a minor extent (Dohmen, 2007).

Vouchers/Entitlements

The most common demand-driven instruments for financing TVET are vouchers or entitlements. These are supposed to encourage people who are not able to bear the costs of training to participate. Commonly, the person receives a voucher which enables him/her to attend training. The voucher has a certain face value which is paid by the government to the training institution. According to Dohmen (2007), so far, vouchers are more relevant for the financing of child care, school and continuing education. Specific training sections contain some elements of a voucher system. Vouchers for **initial** and **further** training are used, e.g., in Austria, Belgium, Germany and the United Kingdom. An example for developing countries is Kenya, where vouchers were introduced in 1994, as described in Box 1.

Top-up vouchers²¹ may conflict with social equity policies as trainees from low-income families cannot afford the payment of the top-up fee (Dohmen, 2007).

Loans

Besides vouchers, loans that are subsidised by the government can be used to foster TVET. Booth and Snower (1996) indicate that loan policies appear to be far more accepted for secondary and higher education than for TVET. Evidence shows that even for further training, where some loans for individuals and companies exist, the demand is rather limited, although it appears that such loans are

Box 1: Voucher System in Kenya

In Kenya's VET system vouchers have been introduced in the 'Jua Kali Pilot Voucher Programme' to finance skill upgrading in small and micro enterprises. The programme was established to target entrepreneurs and their employees to improve the productivity of micro and small enterprises and to increase their income. Furthermore, the demand for training and the supply of training providers catering to the sector should be enhanced as well as the competition between training providers. According to a first assessment of the programme, undertaken immediately after the end of the four-month pilot project, the programme has achieved many of its objectives. It has not been evaluated whether the programme has achieved its objectives to enhance productivity and earnings due to the timing of the mission immediately after the end of the pilot. It is somewhat difficult to assess the top-up that the trainee has to pay out of her/his own pocket. On the one hand, a number of approved vouchers have not been used, possibly due to the top-up fee. On the other hand, people receiving training said they were prepared to pay a 20% top-up fee. Furthermore, some training providers reduced their requested payments to a level below the top-up; thus, the trainees did not have to make any contribution. This is may be due to cost reductions, which would be an advantage because of enhanced cost-effectiveness. On the other hand, it could lead to windfall profits if trainees hand over their (reimbursable) vouchers to training providers without receiving training.

important in financing programmes that are more costly (Dohmen, 2007).

One of the most promising experiments in this respect was the introduction of HECS, the Higher Education Contribution Scheme, in Australia. As it fully relies on future income, because its repayment is a certain share of future monthly earnings, it overcomes the problem of high repayment rates in case of low earnings, which is connected to mortgage loans.

²⁰ Dohmen, 2007.

²¹ See the Glossary.

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3.2.2 Levy-Based Funding Schemes

Due to the external effects of TVET, which has some aspects of a local public good for employers in need of employees with a certain qualification, training could be financed by a training levy or payroll tax. In practice, two general approaches to levy systems can be distinguished. The first one is the so-called revenue-generating scheme, where companies (of a particular branch) contribute to the fund with a certain share of their **payroll**, usually to finance public provision of training institutions. The other approaches are the **levy-exemption** and **levy-grant** schemes, where the levy is used to repay the company's costs of training or to reduce the contribution of firms which train their staff themselves²².

Revenue-Generating Levies

Revenue-generating schemes have been the most secured and reliable source of financing training and are commonly used in the countries which encounter a persistent shortage of public education funds. A revenue-generating tax is commonly assessed as a percentage of the enterprise payroll as well as of the employee wages. Less commonly, training taxes are assessed on a company's production value or export value or the value of its work contracts.

Payroll levies are collected as a percentage of company payrolls by the national social security institutions and remitted to the government budget or directly to training agencies. An advantage of payroll-revenue-generating levies is that the collected levies constitute a reliable source of funding for national training systems. But there are some disadvantages. Levies do not provide great incentives to offer enterprise training, as the evidence shows (see Dohmen, 2007). Moreover, levies are collected by governments and can easily be isolated from employer influence. Levy-based funds can be misused; training services may not be received by employers in proportion to their payments. Finally, a big disadvantage regarding levies is that levy-financed agencies are subject to bureaucracy and often accumulate unspent surpluses.

Levy-Exemption Schemes

A levy-exemption mechanism allows companies to eliminate or reduce their obligations by the amount of training they provide or purchase. The government fixes the percentage of a payroll to be spent by employers on training or granted to any training institution. In compliance with these regulations, employers manage their compulsory training allocations. Training expenditures relating to the compulsory allocation are reported to the tax commissioner; unspent allocations are transferred to a government-established account or fund.

This approach assumes that firms know their training needs and will spend their money on appropriate training programmes. The major advantage of this mechanism is that it eliminates the burden of employers having to pay a levy at the beginning of a financial year. Funds earmarked for training remain with the employer, who prepares a plan for spending them effectively. The levy-exemption mechanism operates through employers' individual actions and is normally supervised either by ministries of labour or the national revenue service. However, as a levy exemption deals with each employer individually, it provides less opportunity to develop national or sector training policies and activities. Such funding schemes nonetheless have strong advantages in comparison to other schemes in terms of: the satisfaction of employers with their relative freedom of training and funding operations, as they are free to plan and manage their funds and to administer training; the low cost of administration as no central administration is required; and the true impact on industry training to be established.

But also disadvantages should be mentioned: The compulsory allocation may be spent ineffectively by both employers and employees. In contrast to the payroll-levy scheme, training activities lack enterprise contributions (Gasskov, 2000).

²² Sections 3.2.2 and 3.2.3 are based on Gasskov (1998, 2000).

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Levy-Grant Schemes

Levy-grant funding schemes assume that payroll contributions are collected from enterprises/employees using specially established funds and distributed between firms/individuals as grants. Grants are offered to firms on a case-by-case basis according to certain criteria. Usually, grants do not closely reflect firms' levy payments and can be targeted towards priority training programmes, strengthening training facilities in individual enterprises, the development of sector training curricula, advisory services, etc. A levy-grant scheme allows a much greater redistribution of levy-based funds towards firms which train. Some levy-paying firms may receive no training grants at all if they do not offer training or if their activities do not follow training priorities. This is to be seen as a disadvantage. Also, the administration of levy-grant schemes requires authorities, as they involve many case-by-case decisions, thus requiring management competences and being very costly. Levy-grant systems can be used to finance training for the unemployed and paid educational leave.

3.2.3 Cost-Sharing Mechanisms

Regarding declining financial state resources and the unwillingness or the inability of companies to provide resources for training, it is of utmost importance to offer incentives to participate in the TVET system. Cost-sharing between companies and the state is one such incentive. The structure and the degree of the commitment depend on the arrangement between the partners: the government, teaching institutions, and companies. The various arrangements between the government and employers include the following major features:

- ▶ Companies have no legal obligations regarding training and its financing (e.g., Canada, the Netherlands, Sweden, the United Kingdom and the United States);
- ▶ Employers voluntarily take significant responsibility for the legally recognised financing of employee training (e.g. Germany, Japan, and Switzerland);

- ▶ Employers and unions set up training development funds under the training clauses of collective labour agreements (e.g. Belgium, Denmark and the Netherlands);
- ▶ Governments offer training incentives to enterprises (e.g. Chile, Germany, the Republic of Korea, Pakistan, and the United Kingdom);
- ▶ Governments introduce compulsory training schemes (e.g. Denmark, France, India, Ireland, the Republic of Korea, Pakistan, Malaysia, Nigeria, Singapore, and various Latin American countries);
- ▶ Governments and enterprises co-finance paid educational and training leave for workers (e.g. Belgium and France).

The arrangements are not discrete. Governments may refrain from using compulsory measures, but still influence enterprises' training activities by extending incentives (Gasskov, 2000).

Sector-based Training Development Funds

Through sector funds, close employer-government cooperation has been achieved in some countries (such as Denmark, the Netherlands and Belgium) where the concept has been applied under the joint responsibility of the government and social partners. Depending on the arrangement, the commitments of partners vary from legal obligations to voluntary pledges. Governments may co-finance industry training funds or promote particular types of training, for example, apprenticeships and training for low-skilled employees. They may even supervise the agreements. Collective training arrangements usually cover only part of the workforce in a country and channel relatively small financial contributions, giving freedom to employees to decide on their training policies. Although individual employers usually invest in training amounts far exceeding their contributions to the training funds, the funds have the important advantage of focusing on sector-based collective training activities and, sometimes, on the training of those employees who for some reason have been excluded from enterprise training programmes so far.

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The following conclusions on funds can be drawn:

- ▶ Funds are set up under sectoral labour agreements and administered by bipartite boards;
- ▶ Funds finance the development of sectoral training policies and course curricula rather than the actual provision of training;
- ▶ The major part of fund budgets comes from levies, with the remainder made up of government subsidies;
- ▶ Levies vary across sectors and are most often paid by employers. In some sectors employees also contribute to TVET;
- ▶ Training remains the firm's responsibility, as the average rate of sectoral levies is low (Gasskov, 2000).

3.3 Summary: The Optimal Way of Financing TVET

Market competition will not be able to completely reach the socially optimal level of enterprise training expenditure. When market demand for goods and services weakens, the employers' interest in offering training will follow. Recent developments in Germany, Austria and Switzerland, which have always been known for their very high employer commitment to financing training, have demonstrated that stagnated markets may strongly affect enterprise willingness to invest considerable amounts in TVET (Gasskov, 1998). Also the pressure for companies on competitive globalised markets to gain short-term benefits instead of investing with a long-term perspective might influence companies to decide not to offer training, as it is a long-term investment and hence risky.

As explained above, government participation is justified for many reasons and, where necessary, should be strengthened. The government should encourage industry, both legally and financially, to develop its own training initiatives. However, measuring the socially desirable investment in TVET remains a challenge for government and for enterprises (ibid.).

One can conclude that an optimal funding mechanism does not exist. Instead, schemes are to be considered in detail from case to case. The decision to adopt a financing mechanism for TVET requires the consideration of existing structures, i.e., the political and social environment, training cultures, etc.

3.3.1 Advantages and Weaknesses of Incentive Schemes for TVET

The major advantage of incentive schemes is their ability to raise and maintain a high degree of employer-based training and contribute to the development of enterprise facilities. On the other hand, incentives may not be strong enough to mobilise additional training within the companies. As a result, the state may end up subsidising programmes that would have been provided by firms in any case – whether they have already well-established training programmes or not (Ziderman, 1990, cited in Gasskov, 1998). Under incentive schemes, many firms tend to implement programmes that accomplish little beyond meeting the compulsory training level and do not bring about any real change. Therefore, the content and quality of training require supervision, which can be expensive and problematic, as sometimes supervision is carried out by tax auditors or other departments that lack training competence on their own (Geber, 1993, cited *ibid.*).

Competent supervision and technical assistance thus often require the creation of a special bureaucracy, which can present its own problems and costs. In addition, under levy-grant and reimbursement mechanisms, employers never cover their full contribution. Procedures for the bill payment are often cumbersome and scare smaller firms away. Special efforts should be made to administer incentive schemes at low cost and with higher flexibility. Sharing decision-making between employers and employees would do much to improve the quality of levy-financed training. Employers tend to make prudent decisions about what types of training should be undertaken. In most countries, such choices are the employers' prerogative. Large enterprises with a well-established training administration tend to benefit disproportionately much from

3 Models of Financing TVET

incentive schemes. Many smaller firms pay levies, but for various reasons fail to participate, thus losing money.

Most incentive schemes impose rather strict conditions for the receipt of financial support. The dominant factors include training content, course duration, unit costs, and even the age of the trainees. Under such conditions, governments try to balance the preferences of individual employers with society's future training needs. Levy-based interventions, for example, are often undertaken without sufficient attention being given to their long-term effects. Mechanisms should not be applied without being aware whether or not a national training culture can be developed and, if so, in what time frame.

Although a time frame for the reasonable and sustainable growth of employer training is hard to predict, monitoring should take place and management should act in accordance with achieved progress. If employer training expenditures consistently increase and the training market shows evidence of strength, it might prove useful to revise levy rates and conditions. For instance, in the French levy-exemption scheme, the rate has been raised several times in order to correct the training demand and raise training expenditures. Therefore, it is believed that even after the very long history of levy-financed employer training in France, a solid training culture has not yet developed. Incentive schemes should be matched by policies that encourage the development of training markets and provide economic incentives for more successful firms.

4 Conclusion and Summary

4.1 Results

Many different factors influence the costs and benefits to the individual and the company participating in TVET. Considering the fact that there are subjective assumptions underlie the estimation of benefits, general statements on TVET are not possible. This shows the widely divergent international evidence. This also holds true for the social costs and benefits, generated through external effects and market failures, which again are two reasons for state intervention in TVET. Another reason is the assurance of equal opportunity, which a social-market-oriented state is obliged to make.

In order to ensure an efficient allocation of resources, various actors within an economy are to be involved in the financing of the TVET system. Consequently, trainees (e.g., in form of fees or wages below the productivity level) as well as companies should bear the costs. Less obvious is the involvement of non-training companies in the financing of TVET, e.g., via a training levy or tax and the involvement of the state, e.g., via subsidies. A justification for the involvement of non-training companies is the possibility of poaching trained workers, which might cause externalities.

Since some of the advantages of vocational training cannot be attributed solely to individual actors, it is important to take into consideration an additional perspective on a higher aggregation level. Thus, society (e.g., in terms of social inclusion), the national economy (e.g., through increased innovation and competitiveness), and the state (e.g., in the form of higher tax revenues through growth and the employment effects of TVET) benefit from positive external effects. These externalities justify a corresponding involvement of the government in the financing of TVET. However, state involvement and the extent of its investment will remain an issue for discussion/to be discussed.

4.2 Outlook & Recommendations

Drawing conclusions on the results mentioned so far, the following aspects should be considered when consulting a partner country²³.

- ▶ A co-funding arrangement is highly dependent on the existence of sufficient participating enterprises. In addition, tax collection and redistribution mechanisms must be appropriate, favouring the increase of training and supporting small enterprises. The administration of a 'training fund' has to be efficient as it otherwise induces costs. In some countries state-employer cooperation has no institutionalised tradition or is asymmetrically dominated by government. On the one hand, such a case requires the will of participating parties to make compromises. On the other hand, it offers the chance to set up a new form of cooperation.
- ▶ All payroll taxes have a negative influence on the hiring of labour, and levies are a disincentive for companies to engage in training themselves. The distribution and use of levy funds can become a reason for discord between partners. In particular, if the funds are managed by the government, large sums accumulate and public officers are slow in identifying the necessary training activities that fulfil fixed criteria and follow standard procedures. In the case of levy-grant or levy-reimbursement schemes, many companies, especially small and medium-sized enterprises, will not see any direct benefit or return on their payments, because they do not fulfil the criteria.
- ▶ It is important to create incentives for enterprise-based training and strengthen the potential for self-administering TVET. In most countries there are a few select companies providing training beyond their obligation. But small companies rarely have a tradition of contributing to TVET and usually have weak representation in fighting for their specific interests. Individual companies may react to incentives like tax deductions, tax rebates and direct state subsidies for training. The

²³ The following explanations are based on Dohmen, 2007, Gasskov, 2000 and Lipsmeier et al., 2003.

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monitoring of federations or associations in the various sectors and at the national as well as local level is an obligation of the companies – wherever possible they should be involved in the design of the training and the control over the use of training funds. The incentive that fosters TVET the most has to be determined from case to case.

- ▶ Co-financing and cost-sharing arrangements between the (national and local) government, employers and individuals seem to be a promising mechanism for involving all stakeholders and thus achieving an increase in the supply of and demand for training. Co-financing can take many forms, e.g., it can be based on legislation, the good will of companies, compulsory training schemes, obligations set up by the government, as well as training funds run by the government and/or social partners.
- ▶ If companies treat their contribution to TVET funding like a tax (as is likely in the case of the levy system), they tend to withdraw from the training scene and just build the cost into their pricing. But even solutions that require a high degree of commitment have a good chance of being accepted if they involve the social partners in setting the rates and in controlling the use of funds.
- ▶ The cost recovery of vocational schools through fees also increases the influence of market forces – if there are choices available. When introducing fees, the government must ensure that low-income households are not excluded from TVET. Therefore tuition fees can be subsidised by the government to allow equal opportunities for all individuals.

Research and consulting in the field of TVET economics has not developed very much thus far. Scientific and empirical research has to be strengthened in order to be able to properly advise the partner countries. The following questions and areas of investigation should be researched and analysed further:

- ▶ How can the importance of informal and non-formal training be measured?
- ▶ Can a basic model of TVET, which can be adjusted to national needs and frameworks, be developed? What needs to be done?
- ▶ Which measurement tools are appropriate to measure costs and benefits? How can qualitative factors be quantified? In this context, it is also recommended to strengthen the examination of non-monetary costs and benefits.

It should also be recommended that GTZ's future activities concerning TVET economics should involve empirical case studies in partner countries. Further analyses should be clustered in order to identify the most significant factors, as well as the cost and benefit structures of stakeholders. As a result, different forms of financing and state intervention should be derived. These country studies are important, as the degree of state involvement highly depends on framework conditions (e.g. the education system, development stage of the financial sector, the particular industry sector, but also social norms), which differ from country to country.

Glossary

The Human Capital Theory: a modern extension of Adam Smith's explanation of wage differentials by examining the so-called net (dis)advantages between jobs. The costs of learning the job are a very important component of net advantage and have led economists such as Gary S. Becker and Jacob Mincer to claim that, other things being equal, personal incomes vary according to the amount of investment in human capital; that is, the education and training undertaken by individuals or groups of workers. Critics of human-capital theory point to the difficulty of measuring key concepts, including future income and the central idea of human capital itself. Not all investments in education guarantee an advance in productivity as judged by employers or the market (www.encyclopedia.com).

Initial and pre-employment training prepares graduates for direct entry into the labour market and into specific occupations. In contrast, **on-the-job and continuing (or further) training** is performed when the person has already entered the labour market.

Adverse selection and moral hazard: Both effects are based on asymmetric information. **Adverse selection** refers to the problem a lender has in distinguishing between good-risk and bad-risk investments, because the borrower has information that the lender does not have.

Moral hazard arises if the borrower behaves differently from the way she/he would behave if she/he were fully exposed to a particular risk.

Top-up vouchers: Vouchers for education in a certain amount, but to which an extra amount can be added.

Monetary vs. non-monetary: While some aspects can be valued financially (e.g. wages), factors like personal satisfaction or reputation can hardly be determined in figures.

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