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The Benefits of VET

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Preface

This report provides an overview of the **state of research** in the following four **areas of vocational education and training (VET)**:

(a) the benefits of VET
(b) VET and employment-related mobility and migration
(c) governance of the VET system
(d) labour market groups at risk

Each chapter first of all analyses **relevant research questions and challenges** in Austria before presenting and discussing the **main findings** of available research projects. In the final **synopsis**, conclusions are drawn from research findings and implications for further research work demonstrated. A **summary** preceding each chapter enables readers to gain a quick overview of the content.

The **selection** of these four topics is closely linked with current educational policy debates on VET in Austria, which have been triggered not least by European developments. The topic of "governance", for example, has regained importance due to activities in connection with the development of a lifelong learning strategy. Debates related to creating and implementing a national qualifications framework and a European credit point transfer system have again put the subject of "employment-related mobility and migration" increasingly on the educational policy agenda. Precisely because of the diversity of VET programmes, the promotion of equality of opportunity in VET and the implementation of measures for groups disadvantaged on the labour market are central topics in Austria, like the benefits of VET.

One **reason** why VET plays a major role in Austrian research is its high relevance in the **Austrian education landscape**. This is shown, on the one hand, by the high attractiveness of VET programmes for young people: some 80% of all pupils who have completed compulsory schooling opt for a VET path. On the other hand, the major significance of VET can also be seen in the diversity of programmes. A pronounced differentiation both in the school-based and in the dual VET sector ensures that every young person is able to optimally develop their strengths and talents. The success of the Austrian VET system is reflected in the low youth unemployment rate and the international recognition of Austrian skilled workers.

This report has been prepared by **authors** from the 3s research laboratory and the Institute for Advanced Studies (IHS). For **coordination and editing** the Institute for Research on Qualifications and Training of the Austrian Economy (ibw) was responsible. Valuable feedback and useful comments were submitted by the Federal Ministry for Education, the Arts and Culture (BMUKK), in particular Ms Sonja Lengauer, for which all people involved in this report would like to extend their thanks at this point.

This report is part of a series of country reports on national research priorities in the field of VET in the EU member states, Norway and Iceland (*National VET Research Report*). It was drawn up within the framework of ReferNet – the reference and information network of Cedefop (http://www.cedefop.europa.eu/EN/about-cedefop/networks/refernet/index.aspx).

To complement this report, information about the Austrian VET system can be found in the report *VET in Europe. Country Report Austria*. Additional information about VET policy is included in the *VET Policy Report*.

Sabine Tritscher-Archan

Reports on Austrian VET within the framework of ReferNet

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The Benefits of VET

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This contribution focuses on the returns to investment in initial and continuing education and training (IVET and CVET). There are a small number of research projects in Austria that deal either exclusively or mainly with the benefits of IVET and CVET in the sense it is understood here. Many of the available research projects look at the returns to investment in education in general, comprising the broad-spectrum of general education and VET. As the upper secondary level of the Austrian education system has a pronounced focus on VET and vocational specialisations, the estimated rates of return to upper secondary education can mainly be attributed to the dual system (apprenticeship training), as well as to VET schools and VET colleges. At the centre of this country report there are the monetary effects of VET, which also includes the effects on the economic efficiency and productivity gains for companies. Most existing research projects and publications look at the individual labour market outcomes of education and training, whereas findings about productivity effects, contributions to economic growth, as well as effects on the entire society are rare.

1. National research issues and goals

1.1. Older research and methodological bases

In the late 1990s and the early 2000s, several research projects and publications about the economics of education were published that analysed monetary returns to private investment in education and training. Linking to the human capital theory and especially to the work of Becker (1964) and Mincer (1974), these works mainly focused on schooling in general. Each of them estimated the wage effect that is associated on average with an additional year in the education system beyond compulsory schooling. Among other findings, these research projects demonstrated that between 1981 and 1999 the private rate of return to investment in education in Austria decreased over time and dropped relatively sharply until about the mid-1990s, for both men and women. In that period, the percentage growth of net hourly wages for men decreased per additionally completed school year from 9.4% to 6.6%, for women the drop was even more pronounced from 11.3% also to 6.6% (Fersterer and Winter-Ebmer, 1999; Fersterer 2000; Fersterer and Winter-Ebmer, 2001; Fersterer and Winter-Ebmer, 2003). This means that towards the late 1990s, every additional year of formal education beyond compulsory schooling (independent of whether in general or vocational education) translated on average in net hourly wages that were some 7% higher than the wage of someone who left school immediately after compulsory schooling.

In methodological terms, these wage effects – which in economic literature are frequently referred to as the private rates of return to schooling – have been assessed on the basis of the

standard earnings function proposed by Mincer (1974): This is a semilogarithmic OLS regression[1], which relates the natural logarithm of (hourly) wages as dependent variable to the years of schooling and the years of professional experience. In this econometric specification, the coefficient of school education can be interpreted as the average rate of return to an additional year of schooling gained across the entire professional career, independent of what educational qualification this additional school year refers to.

A number of methodical problems make any causal interpretation of estimated effects more difficult, because income disparities are usually not directly caused by educational disparities. Frequently, returns to education are confounded with other effects, such as with unobserved individual characteristics. If e.g. a person with greater ability opts for learning more, the income earned by him or her is not only due to the acquisition of higher qualifications but also to his or her higher-level ability, i.e. this person would also have attained a higher income than a person with less ability if he or she had not completed the additional programme ("ability bias"). In some cases it has therefore been attempted in research projects to minimise the endogeneity problem (the correlation of the explanatory variable of school education with the error term of the model) by using instrument variable (IV) approaches. However, the available data often do not constitute an instrument variable that is highly correlated with the schooling variable but uncorrelated with the error term. Although in practice the assumptions of Mincer's model specification are frequently violated, different methodological variants and particularly the wealth of available international empirical findings, taking into account different measurements for general and innate ability, as well as twin and sibling study designs have shown that Mincer's estimators are relatively robust (cf. Psacharopoulos, 1994; Card, 1999). Psacharopoulos and Patrinos (2004) draw the conclusion that the estimation method makes only little difference on returns to education. The results of estimations, however, very much depend on the quality of the used data, as has been shown e.g. by de la Fuente and Domenech (2006) regarding the effects of human capital on economic growth.

The estimation of returns to an additional year of schooling is based on the assumption that every year will produce constant wage gains. This is opposed to the view that only the acquisition of educational qualifications will send the decisive signal implying that the acquired credentials can be implemented profitably on the labour market ("sheepskin effect"; cf. Card, 1999). Accordingly, when applying educational certificates as a measure of schooling, the estimated effects then represent the average percentage wage differential between people with different qualifications. This allows assessments of the returns to some vocational school types: dual training (apprenticeship), VET schools (BMSs), and VET colleges (BHSs). These can be contrasted to the returns to compulsory schooling (no upper secondary qualification) as well as graduates of secondary academic schools (AHSs) and Higher Education degrees (HE). Compared to people with compulsory schooling only, apprenticeship graduates on average earn net hourly wages that are some 15% higher, for graduates of VET schools this pay differential amounts to some 30%. In relation to compulsory schooling, these wage gains were constant in the period of observation and approximately equally high for women and men. In the mid-1990s AHS and BHS graduates earned on average 40% to 50% more, with men who had BHS qualifications showing slightly

[1]) Ordinary Least Squares (OLS)

higher returns than women. For people with university degrees, the wage differential compared to people with compulsory schooling is about 80% on average. Analyses by education levels reveal that declining returns to education by the mid-1990s are mainly due to declining returns to higher education levels: whereas apprenticeship and BMS qualifications have developed constantly in relation to the compulsory schooling category, higher school qualifications (AHS, BHS) show slight and university qualifications stronger losses over time (Fersterer, 2000, p. 99).

The above mentioned analyses (Fersterer and Winter-Ebmer, 1999; Fersterer 2000; Fersterer and Winter-Ebmer, 2001; Fersterer and Winter-Ebmer, 2003) mainly focus on private monetary returns to education: on the basis of differentials in the net wage of people with different schooling it is possible to assess the individual profitability of an investment in education. In addition, these research projects mention social returns where the model applies, in place of net wages, gross wages as a dependent variable. It is clear that this can only cover a tiny part of total social returns. The major expenditure areas for a comprehensive assessment of social returns remain unconsidered, i.e. public and private expenses on tuition, different costs for unemployment depending on education level, etc. Where the social returns assessed in that way exceed private returns, the public benefits from additional education, because it is associated – due to the progressive wage tax classification – with a tax revenue that is higher on average.[2] According to results published by Fersterer (2000, p. 97), the social returns assessed in that way are higher by about one percentage point on average for both men and women than private returns. But as the considerable public expenses for the education system on the one hand and social productivity and spill-over effects in the applied model on the other hand remain unconsidered, these results do not furnish any evidence about the educational returns for society as a whole.

Lassnigg and Steiner (2001) carried out a cost-benefit analysis with exclusive focus on the Austrian VET system. In this work, public education expenses were compared, broken down into school-types, with the benefits of schooling in terms of income and employment. They did not estimate any net rates of return but presented the rough cost-benefit relations of the various education programmes as compared to compulsory schooling. Regarding income effects, the costs of the different upper secondary education programmes (in relation to the compulsory schooling category) always exceed the expected benefits. As a measure for the benefit, the individual rates of return to education by Fersterer (2000) were applied. The reverse picture emerges when analysing employment (measured by the risk of becoming unemployed): compared to compulsory schooling, the benefit of the analysed upper education qualifications exceeds their costs (Lassnigg and Steiner, 2001). Where in dual training, in addition to public expenses for part-time vocational schools, the companies' net costs are considered, the cost-benefit ratio becomes worse: cost structures do not differ from those of BMSs, but the benefit relation is more unfavourable.

[2]) In a linear tax classification, social and private returns would be identical in this specification.

2. Main results of current research

2.1. Returns to formal IVET

Lassnigg et al. (2007) have presented a summary of the available relevant national and international findings on the external efficiency of the Austrian education system. External efficiency is the cost-benefit ratio in the education system that results from comparing inputs and outcomes. Outcomes are the medium- and longer-term effects of the education system that go beyond the immediate output (competences, educational qualifications) at social and individual level, which can in this context be rated as equivalent to the benefits of education. The study presents: a) results related to private returns to education (according to the above-mentioned national research projects and additionally also to the available international comparative research projects: de la Fuente, 2003; London Economics, 2005); b) impact of education on productivity and growth; and c) the social returns in a wider sense.

(a) Regarding individual educational returns, Lassnigg et al. conclude that they are relatively high in Austria in an international comparison, for which reason the incomes to be expected in the future are largely associated with the qualifications obtained. Due to relatively low private costs for participation in education (at least in initial education), the authors deduce from the findings that there exist major incentives for an investment into upper education and training in Austria. They also address the issue of social justice where higher later incomes are subsidised to a very large degree by the community and educational participation after compulsory schooling in Austria is very strongly connected with socio-economic background variables.
(b) Regarding productivity and growth, the study quotes research by Bassanini and Scarpetta (2001) that analysed the contribution of human capital to the economic growth in 21 OECD countries and stated that further education supplies a substantial contribution to growth. Growth in Austria, which already starts out from a relatively high GDP level compared to the OECD average, is mainly due to the component of above-average human capital stock.
(c) For the presentation of overall social returns, again the results of the economic profitability of de la Fuente (2003) are used. To assess social returns, all state and private educational investments on the cost side and on the returns side the effects on the entire productivity are considered. It must be stated that there is no scientific consensus about the specification of the growth model that de la Fuente bases his estimations on and which, due to the large number of model assumptions required, is not held to be very robust. Results show that social returns are always lower than individual returns, with Austria revealing an above-average difference, mainly due to the relatively high public education expenditure level combined with relatively low private expenses.

Steiner et al. (2007) reported about a recent estimation of individual educational returns in Austria for the years 1999 to 2005. In terms of methodology, the authors linked into predecessor research projects to be able to maintain the time series. For the field of formal

initial education, the focus was on whether the educational inflation[3] observed until the end of the 1990s in Austria had continued or not. In addition, this work provides the first estimations of returns for the different occupational specialisations based on an aggregation of the training fields in which the highest qualifications were attained (cf. Cedefop and Eurostat 1999). Thus the empirical information basis for assessing the labour market returns to qualifications from VET schools and VET colleges as well as HE institutions has clearly improved.

The data basis, sample data of the microcensus (gender, educational level and field of specialisation, working time, CVET participation and intensity), was linked with the income data of wage tax statistics. This had become necessary because since 1999 the microcensus no longer collects any income data. The merged data file used for the estimation procedure comprises employed wage earners, excluding apprentices, pensioners and occasional part-timers. As only the taxed income data can be collated, it is likely that the returns are slightly underestimated. This will, however, be negligible due to various adjustments (particularly by excluding any "outliers" towards the top and bottom, i.e. people with clearly below- or above-average hourly pay).

Despite the different data basis, findings of Steiner et al. link well up to earlier estimations. For the year 1999, the individual educational return of some 7% (related to the net hourly wage) is only slightly above earlier estimations for 1997 (6.6%, see above). In the period of observation 1999 to 2005, the returns developed relatively steadily. Thus, following the declines of educational returns until the mid-1990s, there was not any further devaluation of formal initial education until 2005. Broken down by educational levels, recent estimations also show a relatively constant progression, after the previous decline mainly took place in the higher educational levels (AHS, BHS, University, Fachhochschule). Only among men with a BMS qualification did returns appear to decline slightly between 1999 and 2005, after they had not changed until the mid-1990s compared to compulsory school graduates. In 2005 employees with HE qualifications on average obtained up to 80% higher net hourly wages than people with compulsory schooling only. In the early 1980s, this difference for men was an average of more than 100%, for women as much as 120%. Thus, for example, in 1981 women with a BHS qualification achieved a higher average return than women with an HE qualification two decades later, each time in relation to people with compulsory schooling as the highest educational attainment. Rates of return to educational qualifications from higher schools (AHS, BHS) dropped slightly, the wage edge of apprenticeship and BMS graduates over people with a compulsory school qualification has hardly changed since the early 1980s. In general it can be stated that at that time the extent of income disparity was larger for women than for men. Due to the sharper decline of female educational returns this situation has reversed: since about the mid-1990s, the wage differentials between educational levels are smaller for women than men.

With respect to VET qualifications it becomes obvious that – as a general trend – an apprenticeship diploma and/or BHS qualification is more profitable for men than for women. By the end of the observation period and in contrast to BHS, returns from BMS qualifications

[3] Experts speak of an educational inflation if a permanent excessive supply of qualified labour leads to a devaluation of educational qualifications. If formally highly qualified people do not find employment that matches their training and switch to positions with lower requirements, people with lower qualification levels will also be pushed from the labour market.

are slightly higher for women than men[4]: therefore the difference between BMS and BHS is clearly smaller for women than men. In terms of returns, AHS qualifications lie between BMS and BHS for men and women.

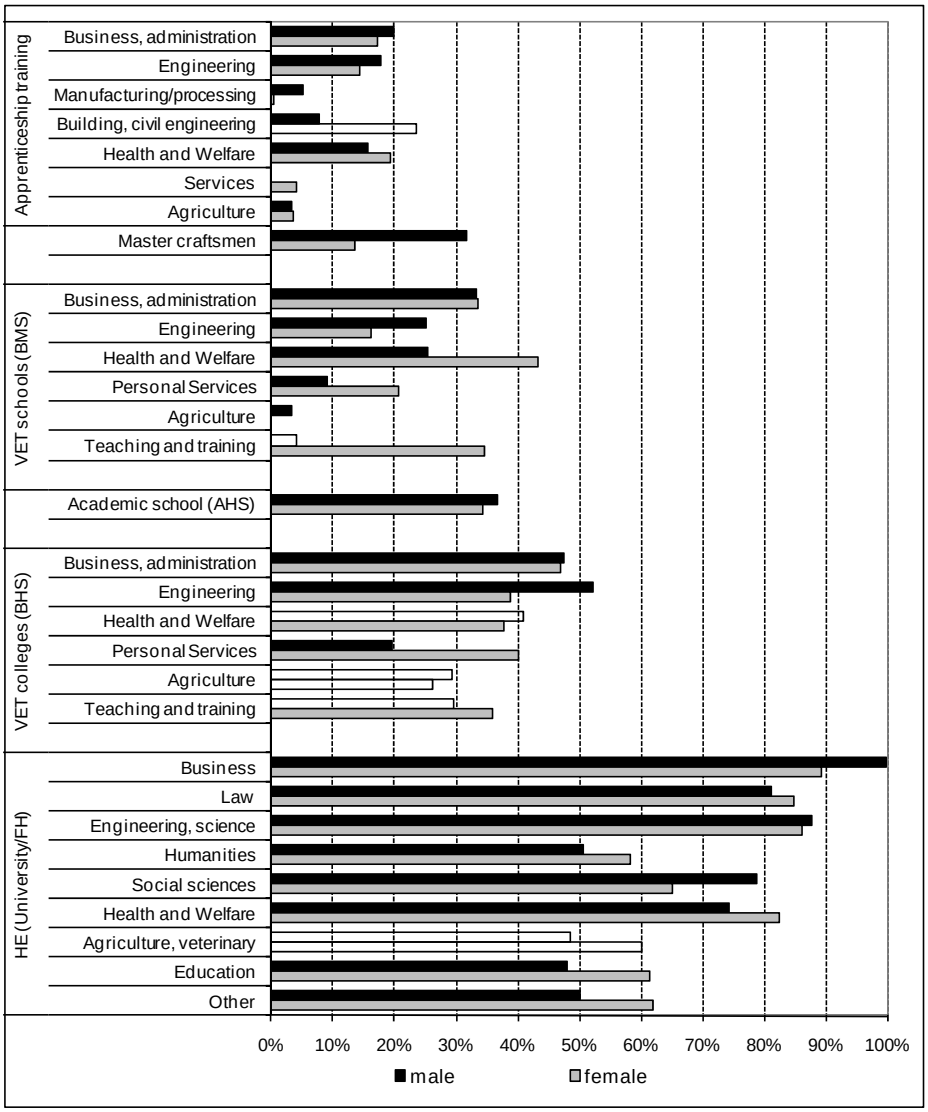
When analysing the education returns by specialisation of the completed programme, marked differences can be found in some cases. In the apprenticeship sector and in VET schools and VET colleges, business-oriented and technical specialisations are always most profitable. Here apprenticeship graduates earn approx. 15% to 20% more than people with compulsory schooling. For BHS graduates, this income edge of some 40% to 50% is slightly above the margin of AHS graduates (about 35%), who received a general academic oriented upper secondary education. In the field of service and in agriculture and forestry, however, hardly any income advantage can be found for holders of apprenticeship or BMS certificates, as compared to compulsory school finishers. It must be stated with certain constraints, however, that the data basis only comprises information about the employed wage earners and it is therefore not possible to make any statements about the self-employed in these fields.

For women, the returns to a BHS qualification are about the same in all specialisations. Male BHS graduates in the sphere of business occupations, by contrast, achieve clearly lower incomes on average than those in other specialisations. The average wage of HE graduates is in some cases clearly higher than the pay of people with lower educational qualifications. Only among men, humanities and/or teacher training qualifications do not bring higher returns than technical and business-related BHS qualifications. This finding can be interpreted as yet another piece of evidence that graduates of HTL (engineering college, i.e. technical BHS) and HAK (college of business administration, i.e. commercial BHS) can truly translate their qualifications profitably into professional positions on the labour market. However, obtaining a HE degree in these fields on average pays off, since the estimated returns clearly exceed the returns associated with a BHS certificate in the corresponding fields.

The most profitable courses are in economics and law as well as technical and scientific disciplines. They are closely followed by medicine (higher returns for women) and social sciences (higher returns for men, cf. fig. 1).

[4]) This is mainly connected with the fact that schools of nursing, which are mainly attended by women, are allocated to the BMSs and are connected, within the BMS category, with the largest returns for women (cf. Fig. 1 "VET schools - health and welfare").

Fig. 1: Educational returns of women and men broken down by level and specialisation of training in 2005, in each case compared to people with compulsory school as the highest educational attainment



Source: Steiner/Schuster/Vogtenhuber (2007)
If a cell had fewer than 100 employees, the mean value from analyses for 2004 and 2005 was formed. In the case of fewer than 50 employees per category, bars are depicted as transparent.

By using quantile regressions, Steiner et al. (2007) have tested the robustness of OLS estimators and also examined whether educational returns vary according to the different quantiles of income distribution – among people with the same formal school education. As opposed to the standard OLS estimation, which estimates the educational effect on the arithmetic means of conditional income distribution, quantile regressions enable the entire conditional income distribution to be characterised. The conducted quantile regressions at the median confirm the robustness of the OLS estimators. When analysing by educational levels it becomes obvious that among men and women in the lower educational levels there are no or hardly any differences in educational returns between the upper and lower quartiles (.25 and .75 quantile). As the educational level rises, however, the educational returns for recipients of higher incomes also increase: male HE degree holders at the upper income quartile have an educational return that is about two to three percentage points higher than those at the lower income quartile; among women this difference is clearly smaller with about

one percentage point. In the higher educational levels therefore, on the one hand, the variability of returns and, on the other, the spread in hourly wage are higher than in the lower educational levels, which applies to employed men in particular. Fersterer and Winter-Ebmer (1999, p. 13) discuss four explanation approaches that are used to interpret the increasing variability in the returns of people with the same (higher) school education: firstly, investment in additional education has become increasingly more risky; secondly, it is perceived as a sign of overqualification if, to an increasing extent, highly qualified people cannot find an employment that is appropriate to their educational attainment; thirdly, higher educational returns in the upper spheres of income distribution imply that the income disparity among people with the same educational attainment increases with the educational level attained; and fourthly, these higher returns at the upper end of income distribution indicate a complementarity between general abilities and education. If the residuals of the earnings function are mainly based on the differences in individual abilities, this means that individuals with more abilities benefit more from additional education than less able people. Hence quantile regressions provide clues about what effects unobserved covariates have on educational returns.

2.2. Returns to apprenticeship training (dual system)

Although apprenticeship training is part of formal IVET, a recent study is treated separately from IVET in its own subchapter, because the recent study focuses exclusively on the benefits of this special form of VET. Fersterer et al. (2008) have investigated the monetary returns to apprenticeship training in Austria, using the data of failed firms. The background of this study is that apprenticeship training differs from school-based and HE-based forms of education in major points and thus influences the estimation of returns. The quality of apprenticeship training is very heterogeneous, because it strongly depends on the training company's specialisation, its size and the available infrastructure. In addition, training companies select their future apprentices depending on the strength of demand from applicants. Heterogeneity very much depends on the company's size and the level of wages that can be obtained by people with an apprenticeship diploma increases significantly with the training company's size. Therefore the authors presume that these selection mechanisms lead to a substantial distortion of OLS estimations in the field of apprenticeship training. Fersterer et al. (2008) now want to overcome the selection bias by applying an instrument variable approach (IV estimation) that refers to an external event: their sample only consists of apprentices of small companies who had to discontinue or stop their apprenticeship training due to their training provider's failure. The authors demonstrate that many apprentices who had to stop their training due to company closure did not acquire an apprenticeship certificate (i.e. not at another company either), although it can be assumed they would have completed their training if their training company had not gone bankrupt. As the apprentices in the sample are in different stages of their training at the time their company closed, the authors use the time span between the apprentice's entry to this company until its closure as the instrument variable. As a result, the authors find relatively low wage effects for apprenticeship training: depending on the method, one additional year of apprenticeship training is associated with an increased wage of approximately 1.5% to 2.7% (OLS variants) or some 2.6% to 4.1% (IV variants), with the IV estimates not differing significantly from OLS estimations, though they tend to be slightly higher. These estimates are comparatively low against the above presented returns to

apprenticeship training of around 15%. It must be noted, however, that these estimations only take the school-based part of apprenticeship training into account, thus an average duration of one school year was generally assumed for apprenticeship training.[5] Fersterer et al. (2008) list additional reasons for the relatively low return estimates: as the focus is put on companies that were shut down, the sample used is not representative of all apprentices or apprenticeship graduates, because failed firms are more likely to be small and possibly lower-quality training providers, particularly in the final stage before closure. In addition, returns of some unfinished apprenticeship periods were estimated, which constitutes a significant difference to estimates on the basis of apprenticeship qualifications. The authors see the main result of their study in that OLS and IV estimates do not represent a major difference in relation to their data and conclude that selection in the dropout behaviour of apprentices is not particularly important and apprenticeship training does not differ in this respect from the full-time school-based VET sector (BMS, BHS).

In a periodically appearing publication about the status of apprenticeship training in Austria (most recently Schneeberger and Nowak, 2008), within the framework of demographic and labour market indicators, reference is also made to the output of dual training with labour market impact. In this context, descriptive representations about the apprenticeship graduate retention and performance on the labour market are made. Both the unemployment rate and the duration of unemployment is on average clearly lower for apprenticeship graduates than for people without any qualification and lower than for people with other upper secondary qualifications (BMS, AHS). The relationship between vacancies (as published in the print media and by AMS [Public Employment Service]) and registered unemployed people over the year can be rated as more favourable for apprenticeship graduates than for graduates of VET school (BMS), VET college (BHS), secondary school (AHS) and university-related institutions.

2.3. CET returns

Steiner et al. (2007) also estimated individual returns to different CET forms on the basis of the 2003 Labour Force Survey ad hoc module on lifelong learning. Where people in the twelve month observation period took part in at least one CVET measure, net hourly wage is 6% (men) and 8% (women) higher compared to those not active in CVET who otherwise had the same formal education level and professional experience. These values seem to be very high compared to the effect of an additional year in formal initial education (around 7%), because - as was shown by Lassnigg et al. (2006, p. 28) in their analyses of the same dataset - one CVET measure lasts for an average of only 72 course hours. The existing positive correlation between CVET participation and wages cannot be interpreted causally, because those active in CVET differ in principle from those not active, independent from their CVET participation. Most of these differences (individual traits such as general skills, motivation, ambition, etc.) cannot be checked in the model because the data basis does not include any relevant information. Where panel data are available, it is frequently attempted to counter this problem by applying fixed-effects estimates.[6] Two international comparative research

[5]) If the calculation was based on an average duration of three apprenticeship years (thus part-time vocational school and in-company training), returns would be around 5%, which is no longer so clearly above the estimates of Fersterer et al. (2008).

[6]) This method considers the unobserved personal traits as time-invariant, enabling the comparison of individual wage increases with and without CET. This procedure requires at least two measurement points in time.

projects also conducted fixed-effects estimates for Austria on the basis of the ECHP data (European Community Household Panel), and no significant wage effect of CVET could be proven in Austria (OECD 2004, Bassanini et al. 2005). But also by using fixed-effects estimates on the basis of ECHP data it is very difficult to interpret CVET effects causally and the estimated returns seem to be – at least for Austria – underestimated. Reasons include overcorrection due to individual fixed effects, different steep wage profiles, short time series and small sample sizes combined with panel mortality.

Little is known not only about the wage effects of CVET overall, but also the knowledge level about non-monetary effects is – according to Lassnigg et al. – poor (2006). The results of the 2003 microcensus special programme reflect the subjective perception of the effects of CVET, with mainly one contribution to improving the professional situation being seen, partly in combination with securing employment. About one fifth of those active in CVET perceived few or no effects at all, for 3% of the respondents it was easier to find a job. According to the authors, the identification of effects is not very specific and informative, for which reason results can be interpreted only with difficulty. Regarding an assessment of educational matching[7] Lassnigg et al. (2008) investigated the impact of under- and overqualification on CVET behaviour. They were able to prove that underqualified people – i.e. people whose formal education level is lower than their occupation's typical qualification requirement – show an increased CVET participation. This result corresponds with the assumption that the required professional competences need to be acquired in other ways and that actually CVET partly serves to compensate a lack of formal education (p.45). By analogy, overqualified people show a significantly lower participation in CET than adequately qualified people. However, the pronounced positive connection between formal initial education and CET remains predominant: although underqualified people, on average, show a higher CET participation than people with the same formal education level in occupations with lower qualification requirements, they participate less than people with a higher formal education level in these jobs.

Schmid (2008) conducted a survey among people who took part in company-external courses of WIFI (a provider for VET and CET of the Austrian Economic Chamber) in the winter semester 2006/07. He found very large jumps in income: following course participation, graduates had on average an 11% higher income than before. For the control group who was CET inactive in the last five years, the author indicates a rise in income of around 4% p.a. That would equal a net return of some 7%. It is not known, however, if the control group corresponds with the group taking part in the measures in structural terms (education, professional experience, etc.). Around one fifth of respondents indicated that the course had a direct effect on their income improvement. For this group, income after course attendance was an average of 23% higher than before. Those who did not indicate any direct wage effect of the measure experienced an increase in income of an average 9%. The comparatively high wage increases are certainly associated with the special role of the course provider, which is closely connected with the companies, as well as the fact that only external courses were examined. Thus, interviewees differ in several respects from the entirety of those active in

[7]) "Qualification-related matching refers to the extent of conformity of completed training and qualification requirements on the job (according to Oe-ISCO classification of Statistics Austria). A model to assess training adequacy is applied that includes both the specialisations of training programmes (broken down into 8 education levels) and the Oe-ISCO occupational groups at 2-digit level." (Lassnigg et al., 2008, p. 45)

CVET in Austria. In the three years before the survey, respondents had taken part in an average of four courses. Around three quarters attended the course exclusively in their leisure time and more than half paid the course fees in full themselves.[8] In addition, CET is frequently accompanied with promotion or company change, which is associated with a boost in salary. Furthermore, the calculation of rises in income only included people who had also completed the course. The results of the study provide a very good insight into individual motives, consequences and labour market effects of WIFI courses, whereas comparability with the results of other research projects or conclusions to general CET effects are only possible with major restrictions.

Another study deals with the effects of CET on the companies' productivity. Böheim and Schneeweis (2007) analysed the connection between enterprise CET and the productivity of companies in the manufacturing and service sectors in Austria. The data basis comprises a combination of two waves of the European Continuing Vocational Training Survey (CVTS2 and CVTS3) of 1999 and 2005 with the Structural Business Statistics of the same years, which provides information about the productivity of the observed companies. It studied the connection between the companies' productivity and their staff's CET activity as well as the companies' CET expenses. The authors find short- and medium-term positive correlations of corporate CET measures and corporate productivity. Companies that double their investment in training boast an average of some 4% more productivity. The results also show that companies with higher CET expenses also pay higher wages. It is not possible to interpret these connections causally, because of (unobserved) selection effects, which influence the companies' CET decisions as well as their productivity, and due to the problem of reverse causality. Therefore, panel models were also estimated with fixed effects. Due to the low number of observations, the estimated coefficients are not statistically significant. Longitudinal analyses however also indicate that higher CET intensity is associated with higher productivity. When investigating how productivity and the specialisation of completed courses are connected, the data reveal a slightly surprising picture: highest elasticities can be found in courses to enhance personal skills and those in administration, relatively low values are observed in EDP and marketing courses. In between there are language courses, technology and other courses.

2.4. Anticipation, matching, skills

In a keynote study, against the background of increased efforts and initiatives on quality assurance in VET[9] Lassnigg and Markowitsch (2005) dealt with the interaction of training and employment (matching) and existing approaches and methods to anticipate qualification requirements. This study also lays down the principles for quality indicators to identify supply and demand structures in Austrian VET that focus particularly on measuring performance on the labour market (matching, skills gaps, see also Lassnigg, 2008) and suggests developing a differentiated VET classification based on a combination of education level and the

[8]) By comparison, a projected 70% of all those active in CET in Austria stated that they did not have to pay any fees themselves and 60% that the course was held exclusively or largely during their paid working hours (cf. Lassnigg et al. 2006).

[9]) The VET Quality Initiative (QIBB, www.qibb.at) was launched by the Federal Ministry for Education, Arts and Culture (BMUKK) with the aim of introducing a comprehensive quality management system in the Austrian VET sector. In 2007 the Austrian Reference Point for Quality Assurance in VET (ARQA-VET, www.arqa-vet.at) was set up as a general point of contact and service to support the implementation of QIBB as well as national and European activities of ENQA-VET.

programme's ISCED specialisation. This classification system for VET provision was subsequently developed and, on this basis, a monitoring system of the relationship of VET programme and the labour market proposed (Lassnigg and Vogtenhuber 2007). The monitoring system aims at regular reporting, which represents a uniform information basis for involved institutions, ministries, social partners and research institutions. Some of the indicators that were suggested (employment and unemployment rate, monetary effects as described above) were published for the first time in the national report on education by using the developed classification as education-statistical performance indicators. Thus people who boast an apprenticeship diploma or have completed a VET college always have higher activity rates than individuals who have no upper secondary qualification or have completed an AHS. Regarding unemployment, VET qualifications – above all apprenticeship diplomas – reveal a heterogeneous picture. Although it is true that gainfully employed who have only completed compulsory schooling are most strongly affected by unemployment, some area specialisations of apprenticeships, BMS and BHS also show above-average unemployment rates. In the apprenticeship system this applies particularly to training paths in the services sector (cf. Lassnigg and Vogtenhuber, 2009).

3. Conclusions and implications for further research projects

Individual returns that are connected with an investment in formal education in Austria are well documented for the main general and vocational school qualifications, with the development of private returns available in the time series - since the early 1980s until 2005. In addition, in a cross-sectional analysis for the year 2005, return estimates for the main vocational specialisations broken down by education levels are available. The process of decision-making in the field of educational policy was not directly influenced by these outcomes, but recent estimates in particular were acknowledged with interest by various stakeholders (ministries, social partners). This interest was not least due to the fact that in the annual publication of OECD indicators until the issue "Education at a Glance 2008" (OECD 2008) no educational returns had been reported for Austria.[10] This was also one reason why the study by Steiner et al. 2007 was commissioned by the Federal Ministry for Education, the Arts and Culture, although this study had focused on the national time-series comparison and not on the international comparison of results.

The social returns of VET and its returns for society as a whole, however, have only been explored in part by the available research projects. Here further research is needed that contrasts the entire public *and* private expenses for VET to the various short-, medium- and long-term benefit aspects for society as a whole. In this connection it needs to be borne in mind that the benefit - apart from monetarily quantifiable individual and social effects (e.g. income, productivity, economic growth, tax revenues, costs for unemployment and health, crime, etc.) – also comprises non-monetary effects (e.g. social participation, satisfied lifestyle, wellbeing, security, etc.).

[10]) The 2009 issue marked the first time that net present values of an educational investment in Austria were specified (cf. OECD 2009, Indicator A8: "What are the incentives to invest in education?").

As well as the contribution of VET and CVET to economic growth, its effect on the companies' performance regarding continuity, productivity, profitability and degree of innovation has hardly been explored in Austria, nor has the long-term economic and social returns of these forms of education.

Compared to the benefit of formal initial education, the effects of CVET have hardly been explored. The main reason is data availability, which only partly supplies aspects related to effects and benefits and barely enables any analyses of these aspects to be conducted. In addition, however, the possibilities offered by various data bases have to date not yet been explored. This mainly applies to the rigorous and comparative analyses of data of the third wave of the Continuing Vocational Training Survey (CVTS, reference year 2005), as well as the data of the Adult Education Survey (AES). Moreover, the dataset used by Steiner et al. (2007), which is based on a linking of microcensus and wage tax data and is created regularly for the annual income report, could also be used for in-depth analyses of the returns to education and training. In general, the setting up of well-designed panel data would clearly boost relevant research.

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List of acronyms

Abbreviation	German term	English term/explanation
abf-austria	Arbeitsgemeinschaft Berufsbildungsforschung	Austrian Working Group on VET Research
AHS	allgemeinbildende höhere Schule	Secondary academic school (higher general education school) – junior cycle and senior cycle
ALE	Erwachsenenbildung	adult learning
AMS	Arbeitsmarktservice Österreich	Public Employment Service Austria
ARQA-VET	Österreichische Referenzstelle für Qualität in der Berufsbildung	Austrian Reference Point for Quality Assurance in Vocational Education and Training
BAG	Berufsausbildungsgesetz	Vocational Training Act
BBAB	Bundesberufsausbildungsbeirat	Federal Advisory Board on Apprenticeship
BFI	Berufsförderungsinstitut	Vocational Training Institute
BHS	Berufsbildende höhere Schule	VET college
BIC	Berufsinformationscomputer	database containing career information, job descriptions etc.
bifie	Bundesinstitut für Bildungsforschung, Innovation und Entwicklung des Bildungswesens	Federal Institute of Educational Research, Innovation and Development of the Education System
BildokG	Bildungsdokumentationsgesetz	Education Documentation Act
BIZ	Berufsinformationszentrum	Career guidance centre
BMF	Bundesministerium für Finanzen	Federal Ministry of Finance
BMG	Bundesministerium für Gesundheit	Federal Ministry for Health
BMHS	Berufsbildende mittlere und höhere Schulen	VET schools and colleges
BMLFUW	Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft	Federal Ministry for Agriculture, Forestry, Environment and Water Management
BMS	Berufsbildende mittlere Schule	VET school
BMASK	Bundesministerium für Arbeit, Soziales und Konsumentenschutz	Federal Ministry of Labour, Social Affairs and Consumer Protection

BMUKK	Bundesministerium für Unterricht, Kunst und Kultur	Federal Ministry of Education, Arts and Culture
BMWFJ	Bundesministerium für Wirtschaft, Familie und Jugend	Federal Ministry of Economy, Family and Youth
BRP	Berufsreifeprüfung	examination providing access to higher education for skilled workers and graduates of three- and four-year full-time VET schools
CET	Weiterbildung	continuing education and training
CVET	berufliche Weiterbildung	continuing vocational education and training
CVTS	Continuing Vocational Training Survey	Continuing Vocational Training Survey
ECHP	European Community Household Panel	European Community Household Panel
ECVET	Europäisches Lernkreditsystem	European Credit System for Vocational Education and Training
EQR / EQF	Europäischer Qualifikationsrahmen	European Qualifications Framework
ESF	Europäischer Sozialfonds	European Social Fund
EU-SILC	Gemeinschaftsstatistiken über Einkommen und Lebensbedingungen	Community Statistics on Income and Living Conditions
FH	Fachhochschule	university level study programmes of at least three years' duration with vocational-technical orientation
FHR	Fachhochschulrat	Fachhochschule Council
FHStG	Fachhochschul-Studiengesetz	Fachhochschule Studies Act
GE	Allgemeinbildung	general education
GewO	Gewerbeordnung	Trade, Commerce and Industry Regulation Act
HE	Hochschulbildung	higher education
IHS	Institut für Höhere Studien	Institute for Advanced Studies
IBA	Integrative Berufsausbildung	integrative vocational education and training, integrative VET
ibw	Institut für Bildungsforschung der Wirtschaft	Institute for Research on Qualifications and Training of the Austrian Economy
ISCED	International Standard Classification of Education	International Standard Classification of Education
IVET	berufliche Erstausbildung	initial vocational education and training

JASG	Jugendausbildungssicherungsgesetz	Youth Training Guarantee Act
KEBÖ	Konferenz der Erwachsenenbildung Österreichs	Austrian Conference of Adult Education Institutions
LAP	Lehrabschlussprüfung	apprenticeship-leave examination
LBAB	Landesberufsausbildungsbeirat	Regional Advisory Board on Apprenticeship
LFI	Ländliches Fortbildungsinstitut	Institute for further education in rural areas
LFS	Labour Force Survey	Labour Force Survey
LLG	Lifelong Guidance	Lifelong guidance
LLL	Lebenslanges Lernen	Lifelong learning
MZ	Mikrozensus	microcensus
NEC	Nationales Europass Zentrum	National Europass Centre
NQR / NQF	Nationaler Qualifikationsrahmen	National Qualifications Framework
OECD	Organisation für wirtschaftliche Ko-operation und Entwicklung	Organisation for Economic Cooperation and Development
ÖGB	Österreichischer Gewerkschaftsbund	Austrian Trade Union Federation
öibf	Österreichisches Institut für Berufsbildungsforschung	Austrian Institute for Research on Vocational Training
PTS	Polytechnische Schule	prevocational school
SBP	Studienberechtigungsprüfung	higher education entrance examination
SchOG	Schulorganisationsgesetz	School Organisation Act
SchUG	Schulunterrichtsgesetz	School Education Act
VET	Berufsbildung	vocational education and training
WB	(berufliche) Weiterbildung	continuing (vocational) education and training