

Costs and benefits of apprenticeship: review of available evidence

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Cost - Benefit Analysis

A comprehensive cost-benefit analysis (CBA) entails measuring in monetary values the net benefits of a programme. For apprenticeship it means measuring the cost and returns for apprentices and firms and the costs and benefits for society as a whole.

Hoeckel (2008), drawing on OECD evidence of different approaches to CBA of VET, provides a comprehensive list of these costs and benefits

	COSTS	SHORT TERM BENEFITS	LONG TERM BENEFITS
Individual	Accept lower wages. Opportunity costs (forgone earnings as unskilled worker).	Employment chances. Earning levels. Work satisfaction. Drop out less likely from vocational than general courses.	Flexibility and mobility. Lifelong learning (more likely to receive training and upgrade skills later in life).
Employer	Pay wages (and labour costs) higher than productivity. Mistakes by inexperienced trainees, wasted resources and time of experienced workers. In-house training courses (material, special clothing teacher salary, administration).	Higher productivity from well trained workforce. Saved costs from recruiting external skilled workers (incl. time for integration and risk of hiring a person not known to the company).	Supply benefits (e.g. image improvement). Less turnover (no need for retraining of new workers).
State	Subsidies to training firms. Financial concessions to employers (tax allowances).	Saved expenses for social benefits (unemployment as consequence of failed transition from education to work)	Externalities from productivity gain due to better education. Increase in tax income from higher earnings.

Source: adapted from Hoeckel, K. (2008) "Costs and Benefits in Vocational Education and Training, OECD (pp. 3-4).

Empirical evidence

- **Rigorous CBA studies of apprenticeship are scarce due to lack of adequate data** and difficulties in calculating social costs, externalities, or foregone wages from regular jobs.
- **Heterogeneity in the coverage and features of apprenticeship schemes** in the EU makes the **results of existing studies difficult to generalize.**
- **Limited empirical evidence on CBA for employers.**

Main returns for apprentices

- **Focus on returns** (wages and employment). No estimations of costs and net returns.
- Consensus on the **positive effects of apprenticeships in easing the school-to-work transition**: better job matches (Ryan, 2001); higher wages (McIntosh, 2007); shorter periods of unemployment before finding a first job (Ryan, 1998; Bonnal et al., 2002; Parey, 2009); or longer duration of first job (Bellmann et al., 2000) compared to individuals with low educational attainment or school-based vocational education.
- **Beneficial effect of apprenticeship on wages compared to workers with low education and no apprenticeship**, but not compared to workers having completed full-time vocational education.
- Advantages relative to school based vocational paths **higher at the beginning of the working life** and then decline or even disappear in the long run (Plug and Groot, 1998; Ryan, 1998 and 2001).
- **Gender differences in effectiveness** because of occupational and sector segregation (Ryan, 1998 and 2001).
- **Apprenticeship training transferable across firms**, especially when large training firms and firms investing more in general training.

Costs and returns for companies

- **Direct costs:** apprentice wages, wages of trainers, costs of materials and additional space required for the apprenticeship, administrative costs.
- **Returns during training and post training** depend on the extent to which apprenticeship enhances productivity more than added wage costs, saves on subsequent hiring and training costs, lowers turnover costs. Post-training returns difficult to be measured.
- **Empirical evidence based on employers' surveys.**
 - **Earlier studies:** considered only gross costs of training for employers, tended to overestimate costs of apprenticeship training
 - **Recent studies:** estimation of net benefits based on random large scale samples of employers and/or statistical estimation based on administrative data. Most studies estimate net benefits during and soon after the apprenticeships. Difficult to quantify benefits that accrue to employers for many years after the apprenticeship.
- Large scale surveys on employers in **Germany and Switzerland**. Some evidence also for Austria and the UK. Data for NL mainly cover the cost side.

CBA for training firms: evidence for Germany and Switzerland in the short run

- **Great differences in costs and benefits across countries**
- **Comparison of CBA for training firms in Germany and Switzerland** (Dionisius et al., 2009) shows that:
 - **German firms incur, on average, in net costs during training, while Swiss firms experiment net benefits.** Difference due to higher share of productive tasks allocated to apprentices, lower wages relative to regular employment and lower general training in Switzerland. In recent years decrease in net training costs in DE firms (Schonfeld, 2009; Pfeifer et al. 2009; Jansen et al., 2012)
 - **German firms extract profits later from trained apprentices** due to higher **retention rates** than in Switzerland (stronger unions, higher influence of work councils and higher employment protection in DE (Kriechel, 2013).
- Recent studies show **larger productivity contributions by apprentices than earlier** ones—especially following the apprenticeship period because **their productivity increases very quickly.**
 - In Switzerland: from 37% of a skilled worker's in the first year to 75% in the third (final) year.
 - In Germany from 30% to 68% of a skilled worker's productivity over the apprenticeship period (Muehleemann et al., 2010).

CBA for training firms: evidence for Germany and Switzerland in the long run

- Long run post-program benefits when retaining best apprentices due to:
 - **savings in recruitment and training costs**
 - **Screening and reduced errors in placing employees to tasks,**
 - **performance advantages in favoring internally trained workers** (better understanding of company processes).
 - **positive impact of apprenticeships on innovation** (rarely captured by empirical studies). A study on German establishments found a clear relationship between the extent of in-company training and subsequent innovation (Bauernshuster et al., 2009)
 - **Reputation** facilitating hiring of skilled workers (Backes-Gellner and Tuor, 2010)
- SMEs more difficulties in retaining their apprentices.

CBA for training firms: evidence for Germany and Switzerland

- Costs and benefits vary according to **occupational categories, size and sector of the training firm and institutional setting**
- DE: **positive effects** on gross profits in the short-term **for trade, commercial, craft and construction occupations**; but **net training costs** during the apprenticeship and **gain by the long-term employment of their former apprentices** in **manufacturing occupations** (Mohrenweiser and Zwick, 2009).
- In some industries apprenticeships is a long-term investment, while in others represent a substitute for regular employment. Mohrenweiser et al. (2010).
 - **In Germany less than 20% of training firms adopt a substitution strategy.** Small firms and firms in the service sector are significantly more likely to adopt such a substitution strategy than large or manufacturing firms.

CBA in Germany and Switzerland

- In Switzerland **costs have a significant impact on the training decision but not on the number of apprentices**, once the firm has decided to train.
 - The **net cost of training for non training firms** in Switzerland is significantly higher during the apprenticeship period mainly due to the absence of benefits.
- ➔ Hence subsidies for firms already training apprentices would not boost the number of available training places. (Muhelemann et al., 2007)

Thus:

- Employers hire apprentices at a cost only if:
 - their skills are relatively specific,
 - their retention rate is high and
 - skilled employees are hard to hire.

Evidence from other countries (except UK)

- **Canadian employers** (2006) earn a **positive return** on their apprenticeship investments **during the training period** (average benefit 1.38 times the average cost).
- In the **US**, the majority of employers think their programme involves **net gains** [Lerman et al., 2009]: helping to meet skill demands; raising worker productivity, increasing worker morale, and reducing safety problems. Only one in four regarded “poaching” as a serious problem.
- A study of 60 employers in **Australia** found that **net costs** were nearly 1.4 times the benefits [Dockery ET al., 2001], but **declined sharply over time**: by the fourth year, the benefits exceeded costs.
- In **Italy** the 2003 reform relaxing apprenticeship regulations and extending age limits had a **positive net effect on the productivity of training firms**: added value per worker (+1.5%), sales per worker (+0.9), total factor productivity (+1.6%), reflecting a compositional shift in labour quality.
- In **Austria** Lassnig and Steiner (1997) report net costs on average, however **35% of firms were able to generate a net benefit from training apprentices.**

Institutions and public subsidies

- **Training regulations** (no. of schooling days, specific vs general training and certification, duration of apprenticeship), **market conditions** (labour market and product market competition) **and structure of wages** (apprentices, low skilled and skilled workers) **affect net benefits of apprenticeship.**
- **Government incentives to employers** either as direct subsidies for apprenticeships (e.g. in Austria, Finland and Hungary) and/or tax deductions (e.g. in Austria, France, the Netherlands and Italy) (OECD, 2009) **may cause deadweight losses and result in substitution effects** (Wolter and Ryan, 2011; Brunello, 2009), especially in economic downturns.
- **Limited and controversial empirical evidence on the effectiveness of these subsidies** (Westergaard et al., 1999; Wacker, 2007; Mühlemann et al., 2007):
 - Public subsidies appear to be **effective in encouraging firms to start training**, but **not to increase the demand for apprentices in firms that already train**
 - **If subsidies are uniformly distributed across sectors, distortions are to be expected** : sectors with low training costs expand training, even if the skills involved are not the ones most needed (Wolter and Ryan, 2011) .
 - Westergaard et al. (1999) detected a **significant positive effects** of public subsidies in Danish firms **only in** manufacturing, office and retail trade.
 - Wacker (2007) found instead **very little impact of subsidies in Austria.**
- **Subsidies should be targeted at specific industries and firms which would not otherwise offer apprenticeship positions** (Brunello, 2009; Wolter and Ryan, 2011).

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Thank you for your attention

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