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Work, train, win: work-based learning design and management for productivity gains

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Work, train, win: work-based learning design and management for productivity gains

Education Working Paper No. 135

This working paper has been authorised by Andreas Schleicher, Director of the Directorate for Education and Skills, OECD.

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Abstract

Realising the potential of work-based learning schemes as a driver of productivity requires careful design and support. The length of work-based learning schemes should be adapted to the profile of productivity gains. A scheme that is too long for a given skill set might be unattractive for learners and waste public resources, but a scheme that is too short will fail to attract employer interest. Ensuring that the design of work-based learning schemes balances the interests of both employer and trainee is key to successful implementation. Carefully organising what trainees do while in the workplace and integrating learning into productive work can yield higher benefits for firms, while maintaining the quality of learning. Strengthening capacity within firms to effectively manage work-based learning can help achieve this. Enhancing that capacity, for example through training for trainee supervisors can help employers reap more benefits from work-based learning schemes while meeting quality requirements.

Résumé

Les programmes d'apprentissage en milieu professionnel doivent être conçus avec soin et mis en œuvre de façon appropriée si l'on veut exploiter pleinement les possibilités qu'ils offrent en tant que moteurs de la productivité. La durée de ces programmes devrait être adaptée au profil des gains de productivité. Un programme qui est trop long pour acquérir un ensemble donné de compétences risque de ne pas attirer les apprentis et de gaspiller les ressources publiques, tandis qu'un programme trop court ne suscitera pas l'intérêt des employeurs. Il est donc essentiel à la bonne mise en œuvre des programmes d'apprentissage en milieu professionnel qu'ils soient conçus de façon à répondre aux besoins à la fois des employeurs et des stagiaires. Le fait d'organiser avec soin les tâches des stagiaires sur le lieu de travail et d'intégrer l'apprentissage dans un travail productif peut procurer aux entreprises des avantages accrus, tout en maintenant la qualité de l'apprentissage. La capacité des entreprises à gérer l'apprentissage efficacement en interne contribue à atteindre ces objectifs. Renforcer cette capacité, par exemple en offrant une formation aux maîtres de stage, peut aider les employeurs à tirer davantage profit des programmes d'apprentissage en milieu professionnel tout en répondant à des exigences de qualité.

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INTRODUCTION

Work-based learning is often seen as a powerful driver of workplace skills and productivity. Realising the potential of work-based learning requires firms and trainees to engage in work-based learning that effectively increases productivity. Understanding the dynamics of the costs and benefits of work-based learning (work-based learning) and ensuring that those are reflected in the design of work-based learning schemes is essential to ensure that firms provide high-quality work-based learning and trainees perceive work-based learning as an attractive learning opportunity.

This policy paper is one of a series of reports on work-based learning, prepared as part of a broader OECD project (see Box 1). The series includes in-depth analyses of specific topics (modules) leading to a set of policy pointers backed by analysis. This paper contributes to the module on work-based learning and productivity funded by the UK Commission for Employment and Skills.

Box 1: Work-based Learning in Vocational Education and Training – the broader OECD project

The OECD launched a study in 2015 on work-based learning in vocational education and training (VET) that aims to deliver policy messages about how to use work-based learning to achieve better economic and social outcomes. The work focuses on six topics:

- *the costs and benefits of apprenticeships*
- *work-based learning: incentives and implementation*
- *work-based learning and school-to-work transition for at-risk youth*
- *work-based learning and productivity*
- *recognising skills acquired through work-based learning*
- *work-based learning and career advice and information.*

The study will be initially desk-based, yielding discussion papers for each module that will provide a foundation for country participation in a sequence of module-specific workshops. Workshops will take place between February and September 2016. During the workshops countries will be invited to share policy experience and research evidence on issues specific to each module. Policy reports on each module will then be prepared to integrate analysis from the technical reports and outcomes for workshops in order to distil policy messages. Finally, a synthesis report will bring together the conclusions and policy messages from all the modules.

Australia, Canada, Germany, Norway, Scotland, Switzerland, the United Kingdom, the United States and the European Commission are providing voluntary contributions towards the work, either through sponsoring specific modules or contributing to the project as a whole.

The purpose of this paper

This paper aims to inform policy makers and practitioners, including firms delivering work-based learning and education and training institutions, about how to design and manage effective work-based learning. It explores the issues linking work-based learning and productivity through analysis of the underlying factors driving the use of work-based learning, and setting out a framework that identifies policy pointers. It draws on various strands of the literature, in particular the economics of apprenticeships and empirical research exploring how productivity evolves during training and apprenticeships. It looks at three questions:

- How does productivity evolve during structured work-based learning schemes (e.g. apprenticeships, traineeships)?
- How does the design of work-based learning schemes affect different stakeholders? How can the process for designing work-based learning schemes ensure that stakeholders' interests are balanced and work-based learning effectively increases productivity?
- How can firms' capacity to use work activities as a vehicle for learning be effectively developed?

Following this introduction, section 1 explores how productivity gains evolve in the course of structured work-based learning schemes and discusses implications for the design of schemes. Section 2 focuses on how the time spent by trainees in workplaces may be best organised to serve both learning and productive goals. The last section discusses how firms' capacity to effectively manage trainees affects the benefits it can reap from trainee productivity and how such capacity may be developed.

Scope and definitions

Productivity: competence in a job and productive contribution to a firm

During work-based learning trainees become better at performing skilled tasks in a particular occupation and their productivity increases (at least to the extent that the work-based learning scheme concerned is effective at developing skills). Productivity increases are achieved in both absolute and relative terms, as explained in Box 2. The aim of a work-based learning scheme targeted on a specific occupation is to ensure that by the end of the scheme the trainee is competent in that occupation – this means increasing the trainee's productivity relative to a fully skilled worker to a high level – approaching but not quite 100%, recognising that a freshly qualified apprentice will continue to learn and it will take more time to be as productive as more experienced skilled workers. As trainees become better at doing their job (i.e. their relative productivity increases), their productivity also increases in absolute terms – they produce more output for an hour worked. To what extent this is achieved also depends on what trainees do while in the workplace – this question is examined in detail in section 2. In addition, work-based learning can be a vehicle for productivity gains when a person progresses to a higher level job – for example an experienced "plasterer" may engage in further training to become a "plasterer and drywall practitioner", reaching a higher level of productivity. Work-based learning can thus equip people with skills not only for a particular job, but may support progression into more jobs requiring higher level skills.

Box 2: Relative and absolute productivity

Relative productivity

This reflects how productive a trainee is in skilled tasks compared to an experienced skilled worker in the same occupation. This may reflect time it takes to complete a task or the quality of what is produced – a trainee cook might need more time to clean and cut fish, or might do it less neatly than an experienced cook. Sometimes the term "competence" in an occupation may be used.

Absolute productivity

This reflects the trainee's productive contribution to the firm. It may be captured, for example, by output per hour spent by the trainee in the workplace. It results from the combination of different factors, such as:

- *the trainee's relative productivity (i.e. how fast and how well the trainee can do skilled tasks);*
- *how trainee's time in the workplace is spent (the mix of productive and non-productive activities);*
- *other factors like production technology and the business cycle.*

In this paper the word productivity will be used to refer to absolute productivity, otherwise the term "relative productivity" will be used.

Box 3: Definitions – types of work-based learning

Work-based learning (core definition)*: Learning that takes place through some combination of observing, undertaking, and reflecting on productive work in real workplaces. It may be paid or unpaid and includes a diversity of arrangements as described below.*

- **Structured** *work-based learning* **schemes***: Forms of work-based learning that combine on-the-job and off-the-job components, with equal importance, and typically lead to a formal qualification. Duration, learning outcomes, funding and compensation arrangements are determined through a regulatory framework and there is typically a contract between the learner and the firm. Apprenticeships or dual programmes are a classical example of such schemes, but other terms are also used across countries to refer to such schemes.*
- **Work placements***: Forms of work-based learningthat usually complement formal education and training programmes, are shorter and less regulated than formal structured work-based learning schemes. Examples include internships, work shadowing opportunities and other work placements used as part of school-based VET programmes.*
- **Informal and non-formal** *work-based learning: Forms of work-based learning that do not lead to a qualification and typically lack explicit targeted learning outcomes. This includes, for example, learning-by-doing or learning from managers or co-workers.*

This paper looks at structured work-based learning schemes like apprenticeships

This paper focuses on *structured* work-based learning schemes – defined by a particular set of skills to be acquired over a fixed duration with specific funding arrangements and leading to a recognised qualification (see Box 3 on different types of work-based learning). In most countries such schemes are called apprenticeships or dual vocational education and training, but other terms (e.g. traineeships) are also used sometimes. There has been strong policy interest across many OECD countries in promoting structured work-based learning schemes. In many countries youth face a challenging labour market, with high youth unemployment rates, a succession of fixed-term jobs or informal jobs (OECD, 2015). Combined on and off-the-job programmes are seen by many as an effective tool to smooth school-to-work

transition, equipping young people with labour market relevant skills and engaging those less interested in academic forms of learning. Many countries have been promoting apprenticeships with substantial investment of public resources – for example England recently announced that government spending on apprenticeships will double by 2019-20 compared to its level in 2010-11. The United States announced in late 2015 the award of USD 175 million to expand apprenticeships in new, high-growth fields (www.dol.gov). To make the most of public investment and ensure strong outcomes for young people, structured work-based learning schemes must be carefully designed and implemented.

The design of structured work-based learning is associated with specific policy questions…

Structured work-based learning schemes, unlike informal and non-formal work-based learning, are provided as a package with regulations regarding duration, content, requirements regarding firms (or other establishments providing work-based learning) and supervisors, monitoring schemes etc. Designing structured work-based learning schemes requires policy choices to be made – and only well-designed schemes can yield the expected benefits. The potential consequences of poorly designed work-based learning schemes include insufficient provision of work-based learning opportunities by firms, low take-up rates by learners, poor learning experiences and limited productivity increases for learners and wasteful use of public resources. For many young people enrolling in structured work-based learning schemes, like apprenticeships, these programmes are a key stepping stone into the labour market. Upon completing a qualification, first experiences in the labour market can have long lasting consequences (e.g. Bell and Blanchflower, 2010; Gregg and Tominey, 2005; Nordström Skans, 2004). The potential benefits of work-based learning schemes that smooth transition into good jobs are therefore large, and to fully reap those benefits work-based learning schemes must be carefully designed to ensure that learners acquire the targeted skills and increase their productivity.

The issues surrounding other less structured forms of work-based learning are different. Shorter work placements linked to formal education and training programmes rarely have productivity increases as their main objective, at least in the short run. Informal and non-formal work-based learning (e.g. learning from colleagues, internal seminars) is not provided within the sort regulatory framework (e.g. industry-wide agreement on skill standards and the design of the scheme) that is typical in structured work-based learning schemes, so the policy choices required to define that framework do not arise.

…and the link between productivity and informal and non-formal work-based learning is less clear due to methodological challenges

While there has been some research interest in different forms of work-based learning and its effect on productivity, limited data and methodological challenges mean that solid evidence on productivity effects remains limited. In structured work-based learning schemes, at least when they are well-designed (this will be discussed throughout the paper), the targeted skills are clearly defined and assessed at the end of the scheme, ensuring that productivity gains are achieved. In the case of informal and non-formal work-based learning for employees, measuring productivity and obtaining unbiased estimates creates major methodological challenges (see Box 4). The availability of data on these forms of work-based learning is also limited, as large-scale national surveys of employees or employers tend to focus on formal training (Bassanini et al., 2005). Existing analyses drawing on large-scale datasets (e.g. employer surveys) often use imprecise measures of work-based learning and suffer from potential sources of bias. For example, using a large panel dataset of establishments in Germany, Zwick (2005) found that most types of on-the-job training had a negative impact on productivity. But these results might simply reflect methodological challenges rather than ineffective work-based learning. For example firms that undergo restructuring might increase their use of work-based learning and also suffer lower productivity. But as such restructuring is not measured, data might show that work-based learning is associated with lower productivity in those firms (Zwick, 2005). Some studies use more precise measures of work-based learning in particular niches

of the economy, but their findings are of limited relevance for work-based learning in other sectors, occupations or skill levels. For example small-scale studies of telephone operators in the United States (Liu and Batt, 2007) or call centre workers in the Netherlands (De Grip and Sauermann, 2012) did not suffer from methodological challenges similar to large-scale studies and identified a positive effect of work-based learning on productivity – but given their limited scope, their findings cannot be easily applied to broader contexts.

Box 4: Work-based learning for employees and productivity: The challenges of measurement

Good measures of productivity are hard to obtain. Much of the literature uses workers' wages as a measure of productivity, typically drawing on workforce surveys. But wages may underestimate improvements in productivity, because they only reflect the share of the return that goes to workers and fail to capture improvements in productivity that go to the employer. Therefore other studies use representative establishment surveys that use productivity indicators such as sales or value-added. Indeed, evidence from the UK (Dearden, Reed, and Van Reenen, 2006) and from Belgium (Konings and Vanormelingen, 2010) suggests that wages capture only part of the productivity gain. Finally, a third strand of the literature uses direct measures of productivity (e.g. in a call centre the time needed to handle customer calls). But these measures have the disadvantage of not being available across jobs and sectors (De Grip and Sauermann, 2013).

Obtaining unbiased estimates of the effect of work-based learning on productivity is another challenge. Omitted variables are a common source of bias – this occurs when participation in or provision of work-based learning and productivity are both affected variables that are not observed in the dataset (see Zwick, 2005 for a detailed discussion and overview of evidence). One potential source of such bias is that firms that choose to offer work-based learning may be different from firms that do not offer work-based learning (unobserved heterogeneity among firms). For example, if well-managed firms offer more work-based learning, the effect of work-based learning on productivity may be overestimated. Another potential source of bias is that a firm may choose to offer training one year but not to do so another year for reasons that are not observed (endogenous training decisions). For example firms might be more willing to train in times of productivity disadvantage, when it is cheap to allocate workers to non-productive tasks. This would lead to a negative bias in the estimated effect on productivity (see for example Zwick, 2005).

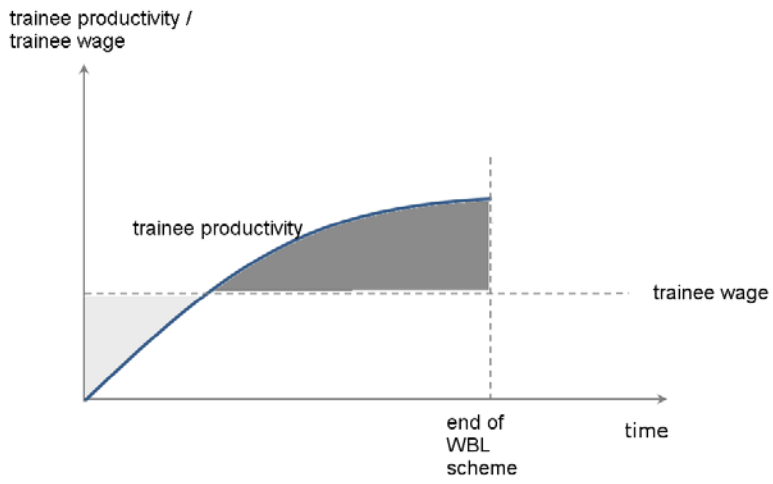
1. FINDING THE OPTIMAL LENGTH OF WORK-BASED LEARNING SCHEMES

The issue and analysis

Firms tend to bear net costs at the beginning of work-based learning schemes but reap net benefits at the later stages

In a structured work-based learning programme, trainees are initially low-skilled and have low productivity. Their productivity gradually increases over the period of training as they develop their skills. Figure 1 depicts how trainees' marginal product and wages evolve over the period of work-based learning, assuming for simplicity that trainee wages remain constant throughout the period. Initially, trainees receive higher wages than their marginal product, creating net costs for the firm (light grey area). With trainee productivity increasing over time, at the final stages trainees' marginal product exceeds their wage, resulting in a net benefit for the firm (dark grey area). Some complications to this story are that work-based learning schemes involve costs other than wages, benefits that firms reap when they retain trainees upon completion[1], firms might receive subsidies or benefit from tax credits, or some trainees have wages that rise through the period of the work-based learning scheme. But they do not alter the fundamental story.

Figure 1: A stylised model of trainee productivity



A longer on-the-job component allows more benefits to firms…

Firms start reaping benefits at the point where the trainee's productivity line crosses the wage line. From that point on trainee productivity is higher than the trainee wage, as the trainee works more and more like a skilled employee but receives a trainee wage (lower than skilled employee wages). The longer the work-based learning scheme lasts after this point, the more benefits the firm can reap. Once the work-based learning scheme is finished, there is some uncertainty about further benefits – if the trainee leaves the firm at that point, those benefits will not be captured by the firm. So firms typically prefer a longer work-based learning scheme with a longer on-the-job component. Conversely, trainees once they have acquired the targeted skills would prefer to obtain a qualification immediately and receive a skilled employee wage rather than continuing to work as a trainee and receive a trainee wage. Finding the balance is a key policy challenge.

…but only if the trainee wage and the achieved productivity gains allow room for benefits

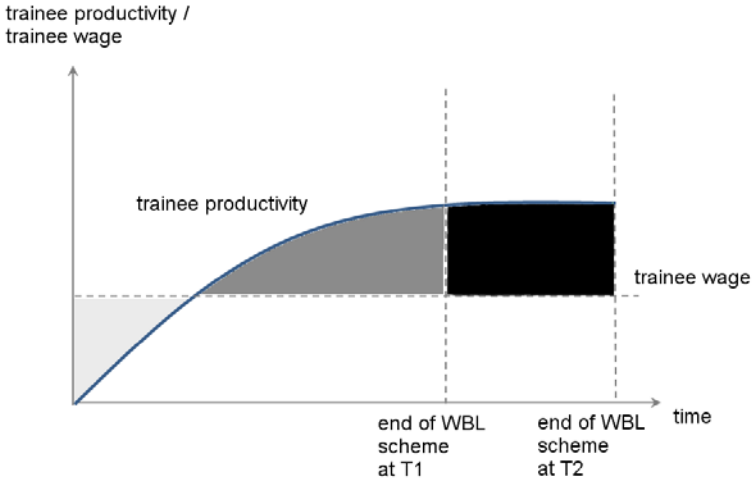
This story only holds if there is room for the dark grey area in Figure 1. The level of trainee wages and the shape of trainee productivity curve affect the size of this area (for simplicity other factors like non-wage costs and subsidies are not considered here). If the trainee wage is set high, there is limited skill development during the scheme or the trainee does little productive work in the workplace as part of the work-based learning scheme, firms have little room to reap benefits. If a work-based learning scheme combines high trainee wages with paid off-the-job training, then firms might even have an interest in reducing the duration of the work-based learning scheme. In practice how high apprentice wages are varies considerably across countries,[2] with wages typically higher for adult apprentices.

A work-based learning scheme that is too long might become unattractive for learners and waste public resources

Figure 2 shows a case where the firm would reap benefits from providing work-based learning already if the scheme ends at T1 – the dark grey area representing benefits is larger than the light grey area, representing costs. If the work-based learning scheme were to last longer and end at T2, there would be a longer period during which the firm continues to reap benefits. Highly skilled trainees would work for an extended period with the productivity of skilled workers while receiving trainee wages that are below their productivity. At the same time, trainees would lose out, as during the additional period of the work-based

learning programme they would continue to earn trainee wages rather than higher, skilled worker wages, but they would not have further learning opportunities.

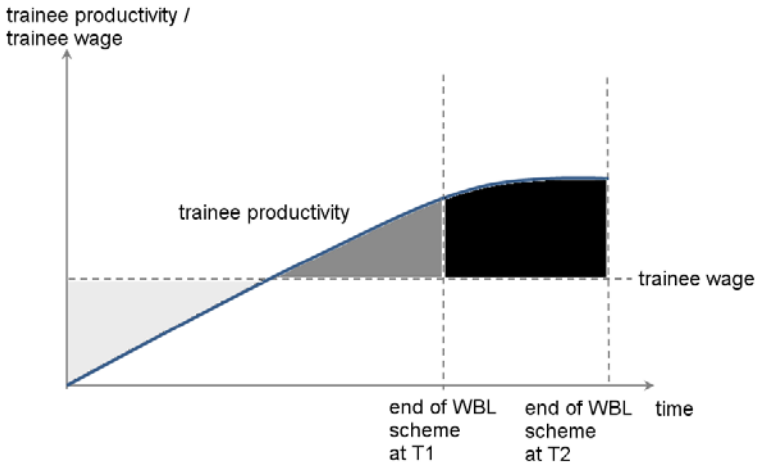
Figure 2: The scheme ending at T2 goes on too long, with few learning opportunities over a long period



Work-based learning that is too short will fail to attract employer interest

Figure 3 shows a case where with a shorter duration (end of scheme at T1) the costs involved (light grey area) were higher than the benefits (dark grey area) for the firm. The work-based learning scheme is too short relative to its content. But extending the duration of the scheme shifts the cost-benefit balance. A longer duration (end of scheme at T2) allows firms to reap more benefits (black area), as highly skilled trainees work while receiving a trainee wage. This allows the firm to reap net benefits from the work-based learning scheme overall and encourages it to offer work-based learning opportunities. Trainees who otherwise would not have received a work-based learning place benefit, as the extended duration allows them to obtain a work-based learning place. One implication of this is that extending duration may lead to increased provision in cases where the productivity curve does not rise fast enough to compensate for the initial costs – for example firms that are less efficient in training (e.g. SMEs, firms with little experience of work-based learning provision); sectors or occupations where the complexity of the skilled required means that trainees need a long period of training before they can perform skilled tasks; or trainees with lower ability whose productivity increases more slowly.

Figure 3: The scheme ending at T1 is too short to yield short-term benefits to firms



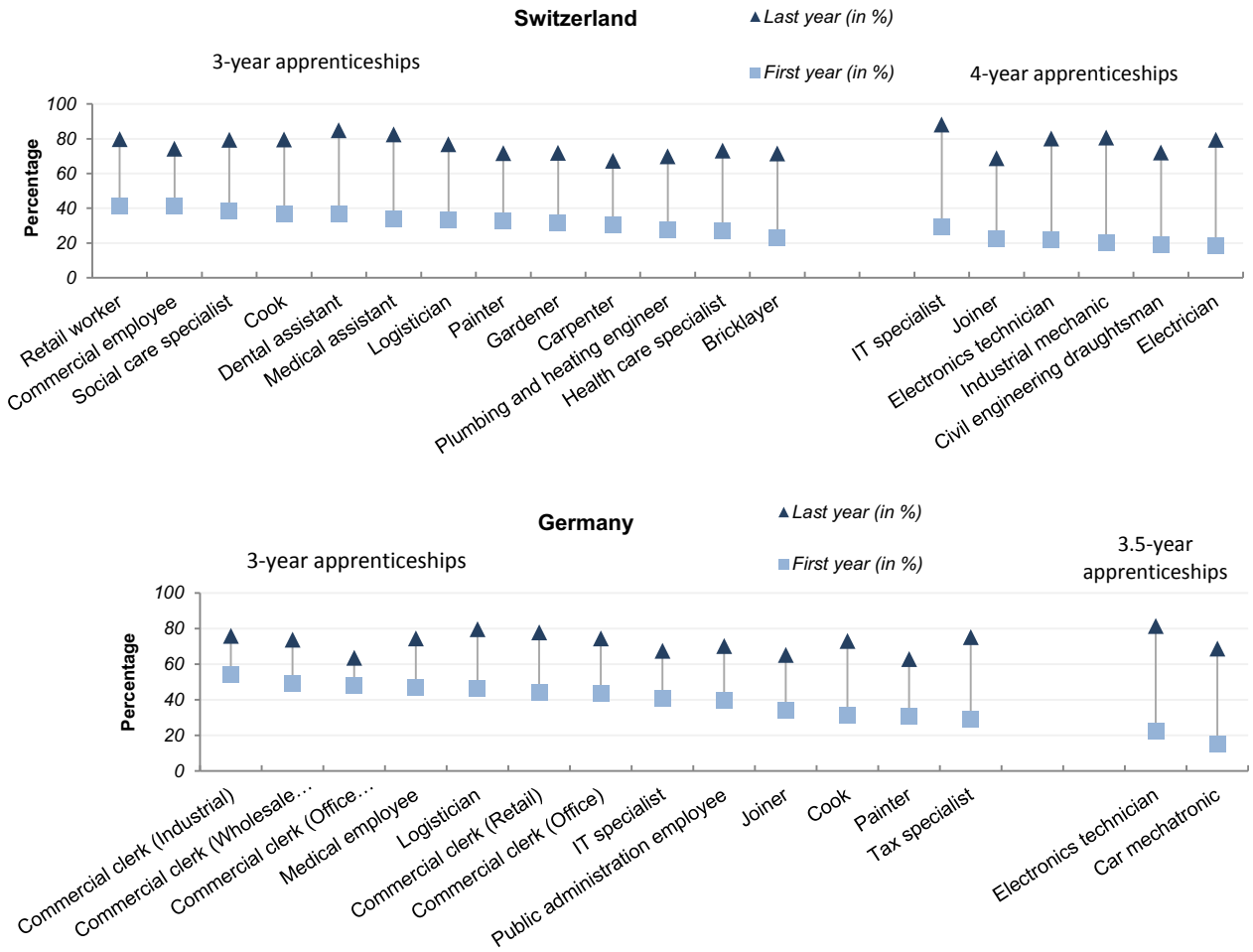
How fast productivity gains are achieved during work-based learning varies across occupations

The time needed for a trainee to become competent (i.e. reach a high level of relative productivity) varies across occupations and probably also across firms and trainees. Defining the duration of a work-based learning scheme in a way that reflects this can help ensure that the scheme is suited to the needs of employers as well as trainees. In occupations where relative productivity increases faster, shorter work-based learning schemes tend to be more suitable. Conversely in occupations where relative productivity is low initially, for example because substantial training is needed before trainees can do skilled tasks, a longer period of work-based learning is more appropriate.

As trainees progress through a work-based learning scheme, they get better at their job. Their productivity gradually approaches the productivity of more experienced workers (their relative productivity increases). The time needed for a trainee to get close to the productivity of experienced employees depends on factors like the complexity of the skills involved, how good the firm is at training and the ability of the trainee. One way of capturing this empirically is to ask employers about their perception of how well and how fast trainees can carry out skilled tasks in comparison to skilled employees. These questions have been part of employer surveys in Germany and Switzerland (see Box 5). The results show substantial variation across occupations (Figure 4).

Figure 4: How does apprentices' relative productivity evolve in different occupations?

Apprentices' relative productivity in skilled tasks in the first and last year of apprenticeship by occupation



Notes: Reference year 2009 for Switzerland, 2012/13 for Germany. Relative productivity is defined in comparison to the productivity of a skilled worker in the firm performing the same skilled tasks. Data are provided in Table 1 and 2 in Annex.

Source: Calculations by Muehlemann (forthcoming) based on data from the 2009 Cost-benefit survey in Switzerland and 2012 Cost-benefit survey in Germany.

Box 5: How apprentices' relative productivity is assessed

Question from the firm-level questionnaire in Switzerland

Regarding skilled tasks (i.e. productive tasks normally performed by a qualified skilled worker) performed in the workplace, what is your estimate of the average productivity of apprentices for the academic year? Please consider tasks that apprentices actually performed during the year. The productivity of a skilled worker that performs the same task corresponds to 100%. The relative productivity of the apprentice refers to both working speed and the quality of the work performed.

Source: Balzer and Fuhrer (2009), Evaluation Pilot Informatikpraktiker/in EBA, Abschlussbericht, EHB http://www.ehb-schweiz.ch/Documents/2009-0831FINAL-balzer-fuhrer_endbericht-evaluation-informatikpraktiker.pdf

Question from the firm-level questionnaire in Germany

The following question refers to skilled productive tasks performed at the workplace in the training occupation, i.e. harder tasks that normally need to be performed by a skilled worker. What is your estimate of the average productivity of apprentices in these skilled productive tasks? As a benchmark for your assessment please consider the productivity of a skilled worker in the apprenticeship occupation or, if necessary, in a comparable occupation in your firm and consider the productivity of this skilled worker as 100%.

Source: BIBB (2007), Kosten und Nutzen der betrieblichen Berufsausbildung Fragebogen, Kurzfassung der CAPI-Version https://metadaten.bibb.de/download/677 .

Apprenticeships tend to be longer in occupations where skills are acquired slowly

Empirical evidence in Figure 4 shows a picture that is consistent with the idea that in occupations where productivity gains are achieved more slowly, a longer duration is more suitable. In Switzerland apprenticeships last three years in occupations where apprentices' relative productivity in the first year of apprenticeship is highest. In occupations where apprentices' have the lowest relative productivity in the first year of apprenticeship, the apprenticeship lasts four years. For Germany data are available for fewer occupations, but the results show a similar picture to Switzerland, with apprenticeships lasting longer in occupations where the relative productivity of apprentices is lower at the early stages of apprenticeship.

Regulation of structured work-based learning schemes to ensure appropriate length for a given content is often desirable

Policy measures to ensure that during a work-based learning scheme trainees acquire new skills and thus achieve productivity gains as intended are important for at least two reasons. First, from the perspective of the state, a structured work-based learning scheme with excessive duration for its content is suboptimal. Many structured work-based learning schemes receive public support in one form or another (e.g. subsidies, tax breaks). A scheme that is too long would mean that public resources are used to increase benefits to firms, while trainees lose out.

Second, individuals who choose to enrol in a structured work-based learning scheme do so because they expect to learn a given set of skills and obtain a qualification useful for the labour market. Ensuring that work-based learning schemes do indeed develop those skills protects young people as consumers (e.g. of apprenticeships, traineeships). A work-based learning scheme that develop few skills in comparison to its length would be a less attractive choice for young people, who might be willing to accept lower trainee

wages but only in exchange for learning opportunities. A less attractive scheme means fewer candidates, with the brightest students choosing other learning opportunities. Firms then, faced with a pool of candidates of lower quality would end up providing fewer work-based learning opportunities. This can lead to a vicious cycle of work-based learning perceived as a less attractive option and firms providing fewer work-based learning opportunities. Also a work-based learning scheme that is too long may increase the incentive for dropout from the programme. In a deregulated labour market trainees towards the end of their work placement will be highly skilled, and might therefore find a job with the wage of a skilled worker even without completing the programme and obtaining the qualification.

Data on the productivity profile of trainees are scarce, but the design of schemes can draw on implicit knowledge among industry representatives

One question is what should be the information base for determining the appropriate duration for a given work-based learning scheme? Many factors need to be taken into account, such as the complexity of the skills involved, the initial skill set and other characteristics of trainees and how good the firm is at training. Typically, a well-designed scheme that develops a relatively limited skill set will be of shorter duration. Well-designed schemes with longer durations will typically have to develop a larger set of skills. While relevant data are patchy (e.g. data on how the relative productivity of apprentices evolves are not widely available across countries) and hard to collect. But there is much relevant implicit knowledge among employers, workers and VET schools. An electrician or a trainer will know how long it takes approximately for an 18-year-old to become sufficiently competent to work as a qualified electrician. The active involvement of employers (or industry representatives more broadly) can bring this implicit knowledge into the design of work-based learning schemes. Employers are also well-placed to define what skills are needed in different occupations and how those skills might be tested. It is widely accepted the engagement of employers in the design of work-based learning schemes is key to successful implementation. Active participation of employers in the design of schemes also fosters trust in the system. Employer organisations (e.g. chambers of commerce) can use links to local firms and encourage them to provide training (Wolter and Ryan, 2011).

The design of work-based learning schemes needs to balance the interests of employers with the interests of trainees

To make work-based learning an attractive option for both employers and trainees, regulations regarding the content, length and structure of work-based learning schemes need to allow firms to reap sufficient benefits to encourage them to provide enough work-based learning places, while also ensuring trainees develop sufficient skills and are not used as cheaper substitutes for skilled employees for an extended period. Putting control of the design of work-based learning scheme and quality control solely in the hands of employers without balancing it with expressions of employee and trainee interests is not desirable. For example employers could benefit from poorly designed schemes that achieve limited productivity gains. Structured work-based learning schemes are provided as a “package” with pre-defined conditions (e.g. content, duration, funding arrangements), including trainee wages which are often lower than that of regular skilled (or even unskilled) employees. This means that there may be room for firms to reap benefits from taking on trainees as part of a structured scheme despite limited skills development. Illustrating an extreme case, simulations drawing on data from Switzerland show that firms could gain around EUR 22 000 if, instead of training apprentices as they currently do, they simply used apprentices as unskilled workers (Wolter and Ryan, 2011). Less extreme cases could include lengthy work-based learning schemes with limited productivity increases combined with not very demanding quality regulations and enforcement.

Working with the social partners to agree the shape of work-based learning is key to well-designed schemes

In many countries that have apprenticeships are a widely used pathway to jobs, the driving seat has been shared with both employer and employee representatives strongly engaged in the design and implementation of work-based learning schemes (see Box 7).

Box 6: How apprenticeships are designed in partnership

Norway

National authorities define the content and duration of apprenticeships with advice from the social partners. Both the length and the content of the training are laid down in law (regulations to The Education Act). According to the Education Act, the social partners have the majority of the representatives in the advisory bodies at national level for upper secondary VET. The National Council for Vocational Education and Training (Samarbeidsrådet for yrkesopplæring) which gives advice on an overarching level. Each of the nine upper secondary VET programmes are closely monitored by the nine trade-specific Vocational Training Councils (Faglige råd). This includes the need to revise the length and content of the training.

When the social partners have identified a need to revise the content, the Directorate for Education and Training appoints teams for curriculum development consisting of professionals (typically proposed by the employer and employee organisations) and VET teachers. Within three months, the team sends a draft version of the curriculum to the Directorate. The draft is sent out for a three-month consultation process to the sector and their feedback is subsequently incorporated in the draft curriculum. With support from external representatives from the sector, the quality of the curriculum is assured by the Directorate. Depending on the subject, the curriculum is finally set by the Ministry or the Directorate.

Source: Norwegian Directorate for Education, personal communication 14 March 2016.

Switzerland

The legal basis for each apprenticeship programme is defined in VET ordinances (Berufsbildungsverordnungen) prepared jointly by the three key actors in the apprenticeship system: the Confederation, the cantons and professional associations (employers, trade unions and trade associations). They are then issued by the Federal Office for Professional Education and Technology (OPET). The ordinances define both content and duration – training plans set out the skills to be acquired, the content to be covered at school and in a company and how the acquired skills are assessed.

All VET ordinances provide for the creation of a Commission for Quality and Development for the given occupation or occupational group. Each Commission for Career Development and Quality is composed of members representing all of the VET partners (Confederation, cantons and professional organisations). Their role is to adapt training plans for specific VET programmes to the current needs of the labour market. If necessary, they submit a request to OPET to have changes made to the VET ordinance.

Source: Hoeckel,K., S. Field and W. Grubb (2009), OECD Reviews of Vocational Education and Training: A Learning for Jobs Review of Switzerland 2009, OECD Reviews of Vocational Education and Training, OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264113985-en.

Duration may be adapted in different ways

Another question is how to adapt duration in practice. Adjustments and flexibility may be introduced in various ways and to different extents. In some countries (e.g. Germany, Switzerland) duration is defined collectively by stakeholders and varies across occupations, but for a given occupation there is one standard duration. This allows to take into account how long it takes to develop the mix of skills required for different occupations. In other countries work-based learning schemes targeting a given occupation can

have different lengths, with variations for example between training providers (e.g. schools, colleges, firms). In England and the United States, for example, duration is not defined collectively at national or state level for each occupation, leaving room for variation across training providers.

Box 7: How much room for variation in apprenticeship duration?

A standard duration for each occupation or room for variation?

In some apprenticeship schemes (e.g. United Kingdom, United States) a standard duration is not defined collectively for each occupation at national or state level and there is room for some variation in how long an apprenticeship lasts for a given occupation. There is a minimum duration requirement of one year in both countries (12 months in the United Kingdom, 2000 hours for registered apprenticeships in the United States). (www.doleta.gov/oa/apprentices.cfm, www.gov.uk). In various countries duration is defined through collective agreement for each occupation. For example:

Germany: Apprenticeships last two, three or three and a half years, depending on the occupation. The majority of occupations are targeted by a three-year programme (www.bibb.de/de/berufeinfo).

Ireland: Almost all apprenticeships take a minimum of four years to complete, with minimum three years only for one occupation out of the 27 occupations covered by apprenticeships (www.fas.ie).

Norway: Most apprenticeships take four years to complete, with four and a half year schemes in some occupations.

Switzerland: The duration of an apprenticeship varies across occupations. Two-year apprenticeships (covering 53 occupations) lead to a federal VET certificate. Three- or four-year apprenticeships (covering over 200 occupations) lead to a federal VET diploma. Those who have completed a two-year apprenticeship may progress to a three- or four-year apprenticeship within the same field, entering the second year of the programme (www.berufsberatung.ch/).

Time-based vs. competence-based completion

The most common route to apprenticeship is time-based so that apprentices must participate in training over a certain period of time and can take a qualifying examination at the end of that period. Some countries have introduced the possibility of competence-based completion (or progression), which allows apprentices to complete their qualification once they have reached the targeted competences, rather than upon completion of a fixed time of on-the-job and off-the-job training.

In Australia a nominal term is agreed for each apprenticeship or traineeship, but that may be reduced – apprentices may progress from one stage of apprenticeship to the next based on their competences rather than time served (www.australianapprenticeships.gov.au/employers).

In the United States registered apprenticeship programmes range from one to six years depending on the complexity of the occupation, with the majority of programmes taking four years. Some of the programmes are competency-based or hybrid (others are time-based). In competency-based schemes apprentices may complete faster or take extra time to develop the required competences, though these schemes still have to comply with certain requirements regarding time spent on each major process. Hybrid apprenticeship programmes combine time-based and competency-based elements. (www.doleta.gov/oa/apprentices.cfm).

Some work-based learning schemes allow for competence-based completion, but that may not work for employers

Competence-based progression or completion is another way of introducing flexibility in the duration of work-based learning schemes. This allows in principle for a trainee to progress through a work-based learning scheme or complete it faster or slower than the usual length, based on the competences acquired and not on time spent. Yet competence-based completion in apprenticeships has been more often praised

than practised. Research from Australia (Clayton et al. 2015) found that lack of employer support was a major barrier to the implementation of competence-based completion. Money seemed to be a major issue – faster progression through the scheme means faster wage rises and early completion means paying skilled worker wages instead of apprentice wages. Competence-based completion removes or reduces the period when apprentices are highly productive but receive an apprentice wage. But that period is essential for employers, as the benefits of this period compensate for the costs incurred at the beginning, when apprentices were mostly learning and producing little (see Figure 1). The fundamental dynamics of the costs and benefits of work-based learning schemes mean that firms have few incentives to make use of the possibility of early completion based on competences.

Policy pointers

1. Adapt the duration of work-based learning schemes to reflect the profile of productivity gains, thereby ensuring that schemes are long enough to be attractive for employers while not so long that they become unattractive to learners and waste public resources. Typically schemes would be longer when productivity gains are achieved more slowly

2. Involve employers in the design of work-based learning schemes but balance their interests with the interests of trainees.

2. ORGANISING WORK-BASED LEARNING TO ENHANCE PRODUCTIVITY

The issue and analysis

Trainees may do productive or non-productive activities while in a workplace – and learning may be part of one or the other

When hiring a trainee as part of a structured work-based learning scheme, a firm commits to develop, through the work-based learning, a particular set of skills in the trainee over a specific period. This needs to be achieved in a way that makes work-based learning worthwhile for the firm in terms of costs and benefits. A key question is how to allocate the time spent by trainees in the workplace between different activities – some of which bring benefits to the firm, others incur costs and some imply both costs and benefits. Trainees may spend time doing three broad categories of tasks:

- **Non-productive activities**, i.e. activities with no direct productive value to the firm. This includes non-productive time dedicated to learning (e.g. doing exercises and simulations or listening to an instructor's explanations), as well as other non-productive activities like time spent in transport to visit a client. Non-productive activities that involve learning are of no direct value to the firm, but they bring indirect benefits through improved skills and higher trainee productivity.

- **Productive skilled activities**, i.e. tasks that are normally performed by a skilled worker. This category includes activities designed to support learning and activities that do not involve learning. An example of productive skilled work involving learning is a trainee practicing a particular technique while doing real work, rather than by simulation. Productive skilled tasks

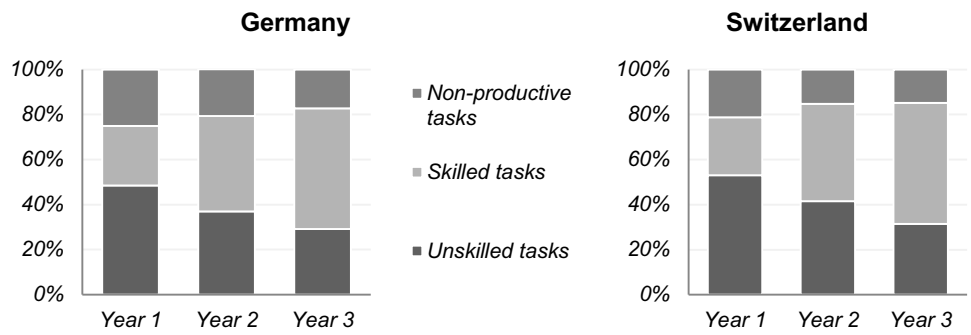
without further learning cover skilled tasks performed by the trainee, using techniques and skills that they already master.

- **Productive unskilled activities**. This category includes tasks that are of benefit to the firm and can be done by an unskilled worker (e.g. cleaning a workshop). Performing such tasks does not develop technical skills, but it may develop soft skills like ability to work in a team or time management.

The mix of tasks changes as trainees progress through the work-based learning scheme

The mix of tasks carried out by trainees in the workplace is likely to change over the duration of the scheme. On day one trainees can do unskilled productive work and participate in training (through productive or non-productive activities). As they progress and become more and more skilled, firms can gradually alter the mix and include more skilled productive activities. Some empirical data are available from Germany and Switzerland, where firms offering apprenticeships are regularly surveyed about the allocation of apprentices' time to different types of tasks. These data show that in both countries as apprentices progress, they do more and more skilled work and less and less unskilled work or non-productive activities (see Figure 5).

Figure 5: Different activities performed by apprentices in the workplace



Note: Reference year 2007 for Germany, 2009 for Switzerland.

Source: Jansen, A. et al. (2015), "Labour Market Deregulation and Apprenticeship Training: A Comparison of German and Swiss Employers", European Journal of Industrial Relations, Vol.21/4, http://ejd.sagepub.com/content/21/4/353.abstract.

Firms immediately benefit from productive work, non-productive learning activities yield benefits later

From the firm's perspective productive activities (whether skilled and unskilled) are needed to ensure that work-based learning brings benefits while it lasts. The more productive activities the trainee performs, the higher the benefits for the firm. For non-productive activities the situation is less clear-cut. Those that involve no learning (e.g. time spent in transport to reach a client) are clearly of no benefit to the firm. But non-productive time that involves learning (e.g. exercises, simulations or instructor explaining theory to trainees) affects firms to two opposing ways. On the one hand, it reduces time available for productive activities. On the other hand, it develops trainees' skills and thereby enhances their productivity. If subsequently the trainee performs skilled tasks, then non-productive time dedicated to training brings benefits to the firm indirectly.

Trainees benefit from learning, which can be part of either productive or non-productive activities

From a trainee's perspective the key element is learning – which can happen either through non-productive activities or integrated into productive time. Some types of learning need to be disconnected from productive work, for example for safety reasons. But many types of learning can happen either through non-productive activities or integrated into productive work. For example, after observing their supervisor and receiving instruction, a trainee might practice the targeted skills through simulations (e.g. in a workshop) or by doing real work. Either way the trainee gets a chance to practice the task in order to master the skill. But while during simulations or other exercises trainees do not produce anything, in a real work environment they can be productive while learning. Trainees will need more time to complete a given task than an experienced worker and the result might be of lower quality, but they still generate benefits for the firm. Integrating some elements of training in productive activities is therefore, in principle, beneficial from the point of view of firms and neutral from the point of view of trainees.

With care, learning can be integrated into productive work yielding higher benefits for firms, while maintaining learning quality

Skill development can take place integrated into productive work or outside real work. Integrating learning into productive work has the potential of yielding immediate productive benefits to firms – and thereby encourage them to offer further learning opportunities – while maintaining the quality of learning for apprentices. To achieve this, tasks need to be carefully organised. Experience from Germany suggests that setting up productive activities in a way that they develop trainee skills can yield benefits to firms, without damaging learning outcomes for trainees. Research (Jansen et al., 2015) has found that German firms that employed apprentices reduced the share of non-productive activities by half between 2000 and 2007, and increased the share of productive work. If in doing firms had reduced training activities, the change would have harmed learning outcomes for apprentices. But data suggest that this did not happen. The changes in time allocation did not lead to changes in apprentices' relative productivity compared to skilled workers and time spent by apprentices with instructors remained the same, as did overall spending on apprenticeship. In summary, careful organisation of the time spent in the workplace allowed firms to increase the benefits reaped during the apprenticeship scheme itself, without having an adverse effect on skills development among apprentices.

The scope for learning through productive work varies across occupations

The scope for integrating learning into productive work depends on various factors. In some occupations it may be more easily done than others – in highly technical occupations where expensive equipment is used, substantial training is often needed before trainees can start productive work. In others health and safety considerations mean that simulations, theoretical instruction and other non-productive training activities are necessary before a trainee can start working. Trusting productive activities to trainees typically requires careful management, as there is always an element of risk when partially skilled trainees work with valuable equipment or interact with valued clients. Examples of initiatives that support firms in providing high-quality work-based learning and enhance their management capacity (e.g. through training for apprentice supervisors) are provided in Section 3.

Quality assurance is needed to ensure that learning is integrated into productive work and not reduced

Carefully organising trainees' time spent in the workplace can be an effective way of ensuring that that firms benefit from the productive contribution of trainees and that trainees develop skills as intended in the work-based learning scheme. This is more easily said than done – it requires careful organisation of productive tasks and strong quality assurance. Without quality assurance, there is a risk that non-productive learning activities, like simulations, are simply replaced by productive work and learning

quality suffers. To avoid this, quality assurance must ensure that learning is genuinely integrated into productive work. One way of ensuring that the desired learning outcomes were achieved – regardless of how – is to define at the outset the skills to be acquired and ensure that trainee skills are assessed by impartial assessors at the end of the scheme (issues of assessment of skills acquired through work-based learning will be the discussed by another module of the broader OECD project, entitled "Recognising skills acquired through work-based learning).

What is expected of firms during a work-based learning scheme depends on how the scheme is organised

The design features of work-based learning schemes are important contextual features and affect what can reasonably be expected from firms in terms of skill development. One such factor is the weight carried by the on-the-job component in the overall work-based learning scheme. When the scheme includes longer time spent in the workplace and less school-based (or other training centre-based) training, it usually makes sense to expect more training delivered by firms. Another important factor is timing – when work placements take place as part of the scheme. If the work-based learning scheme is designed in a way that trainees spend time in workplaces after having gone through extensive off-the-job training, trainees are not unskilled on day one – they already have some occupation-specific skills that they can apply and further develop.

There is much variation across countries in how work-based learning schemes are organised. This remains true even when they target similar levels like apprenticeships at upper secondary level. For example, in Norway apprentices spend half of their time in a school: typically two years school-based training is followed by two years in a firm, including one year doing training and one year doing productive work. In Belgium, Germany and Switzerland apprentices spend most of their time in a firm. German apprentices alternate one or two days at school with three or four days in a firm. In Belgium apprentices spend one day at school and four days in a company, while in Switzerland they can alternate one day at school with four days in a firm or weeks of on-the-job and off-the-job periods.

Policy pointers

3. Ensure that productive work is organised in a way that maximises productivity gains, carefully integrating learning into productive work whenever there is scope for such an approach.

4. Use quality assurance to ensure that work-based learning schemes are effective in developing skills.

3. RAISING FIRMS' CAPACITY TO SUPPORT EFFECTIVE WORK-BASED LEARNING

The issue and analysis

The capacity to effectively manage work-based learning within the firm affects trainee productivity

Even within a particular occupation there will be variation as between trainees and firms in how trainee productivity evolves over time. Trainee productivity is results from a combination of different factors, including:

- How good trainees are at their job: This depends on how good the firm is at training and trainee characteristics – higher ability trainees will learn faster and do skilled tasks faster and better than lower ability trainees.

- What they do while in the workplace: This requires careful organisation of time spent by trainees in the workplace (see Section 2), ensuring time for learning (otherwise trainees will not be able to do skilled tasks) and for productive activities (to put the skills acquired to productive use).

- Other factors like the technology used by the firm.

Empirical evidence is scarce on the effect of different factors on productivity gains during structured work-based learning. Data on apprentices from Germany and Switzerland suggest that apprentices are likely to have higher levels of productivity (in absolute terms) in larger firms than in smaller firms. Although apprentices' relative productivity in the first and last year of apprenticeship is not very different across firms of different sizes, apprentices' productivity in absolute terms is probably higher in larger firms than in smaller firms. This is because employees tend to earn higher wages in larger firms, so to the extent that wages reflect employee productivity, the data suggest that apprentices have higher levels of productivity in larger than in smaller firms (Muehlemann, forthcoming). But these results do not reveal causes. Stronger training capacity is one potential cause, others include apprentices of higher ability, or more advanced technology in larger firms.

Firms' management capacity can be subject to policy influence

While the exact effect of different factors that affect trainee productivity may not be known, what is clear is that increased capacity in firms to effectively manage work-based learning can be directly targeted by policies. Such capacity affects the first two factors mentioned above: how good trainees are at their job and what they do while in the workplace. If a firm is good at managing work-based learning, the quality of learning will be better and trainees will develop their competences faster. Strong capacity to manage work-based learning can also help the firm better allocate trainees' time to different activities, as discussed in Section 2 so that providing work-based learning allows the firm to meet both learning and production goals.

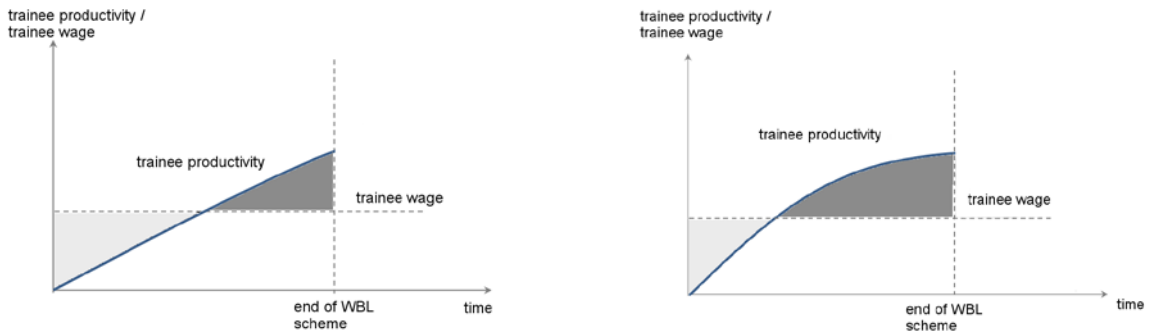
Enhancing firms' capacity to manage work-based learning can help balance the twin goals of expanding work-based learning and ensuring its quality

Enhanced capacity in firms to manage work-based learning can be an effective way of balancing the goal of promoting structured work-based learning opportunities with employers and enhancing their quality. There is some inherent tension between those two goals. Good structured work-based learning schemes are built on quality standards, setting out what is to be learned and checking whether targeted learning goals have been reached by the end of the scheme. Such requirements make the provision of a structured work-based learning scheme demanding for employers. As minimum quality standards are imposed or increased, some firms might find that they no longer reap sufficient benefits from providing a structured work-based learning programme. In some cases this might be desirable – for example to eliminate apprenticeships that do not develop a large enough set of skills to be called an "apprenticeship". In other cases policies might aim to maintain provision – one way of doing this is to help companies become better at training. This would allow firms achieve faster productivity gains and reap more benefits from the work-based learning scheme, without damaging learning quality.

Greater management capacity can help employers reap benefits from offering a work-based learning scheme, while meeting demanding quality standards

With careful management, trainees can develop their skills faster and those skills can be put into use through productive work, so that trainees' productivity increases faster. The faster the productivity of trainees increases during the work-based learning scheme, the more benefits the firm is able to reap, while maintaining the same learning outcomes for trainees. The left hand side of Figure 6 shows a slower increase in productivity – for example a firm that has weaker training capacity and/or a firm that dedicates limited time to productive tasks. On the right hand side the targeted level of productivity is reached faster – for example a firm with stronger training capacity and/or a better organisation of tasks performed by the trainee.

Figure 6: Faster productivity gains – greater benefits for firms

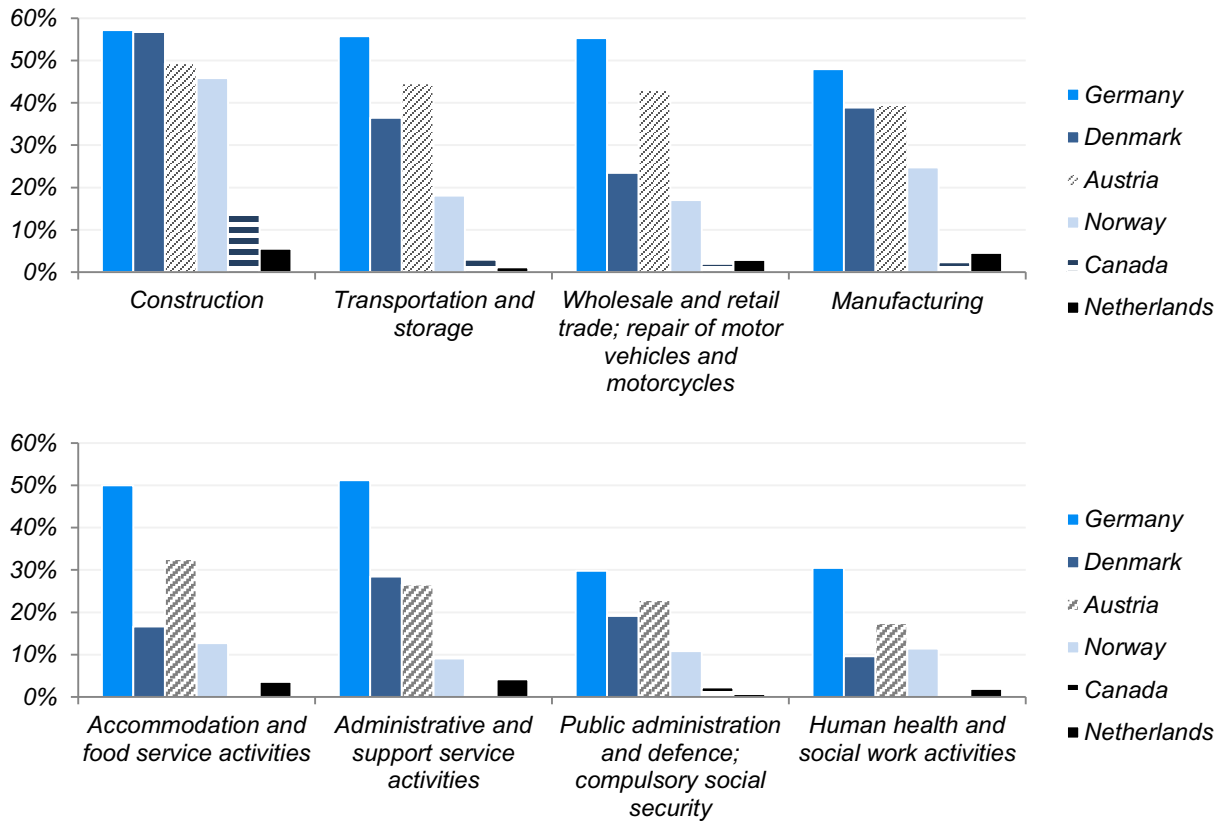


The infrastructure that supports management capacity varies across countries and sectors, developing it can help promote work-based learning

As argued in Section 2, one way of achieving productivity gains without compromising learning is to integrate learning into productive work, but doing this effectively requires management capacity in firms – capacity to use partially skilled trainees in productive activities, ensuring that at the same time trainees have a chance to acquire all the skills targeted by the scheme. How well-developed and widespread such capacity is likely to vary across countries and sectors. For example in countries and sectors where apprenticeships have traditionally been an important pathway to occupational skills, much of that knowledge is implicitly present in firms and their workers, many of whom were trained as apprentices themselves (Figure 7 gives a flavour of the variation in this respect across countries and sectors). In "traditional" apprenticeship sectors tools supporting effective work-based learning are also more likely to exist already, like learning plans and targeted training for apprentice supervisors. Conversely, in countries and sectors where there is little tradition of using structured work-based learning schemes, there may be more limited capacity to effectively manage trainees. This may create challenges in implementing high-quality schemes in those sectors, but developing tools that help firms to manage work-based learning may help introduce, improve or expand work-based learning schemes.

Figure 7: The share of the labour force holding an apprenticeship qualification in selected countries

Percentage of the labour force aged 16-40 whose highest qualification is an apprenticeship at ISCED 3 level



Notes: These figures may underestimate the share of the labour force with an apprenticeship qualification, as those who progressed to a higher level qualification upon completing an apprenticeship will not have apprenticeship as their highest qualification.

These figures refer to the sector of the person's current or last job, which may be different from the sector where the apprenticeship was completed.

Source: Calculations based on data from the OECD Survey of Adult Skills (2012).

Different tools can support firms to manage work-based learning

A range of tools are used across OECD countries to help firms develop their capacity to manage work-based learning. Many of these initiatives are developed and implemented with active industry involvement. Box 8 describes targeted training initiatives for employees who supervise apprentices – such training is optional in some countries and mandatory in others. Box 9 provides other examples of initiatives that support work-based learning in firms – some focusing on apprenticeships, others with a broader focus.

Box 8: Country examples of training for apprentice supervisors

Germany

The requirement for apprenticeship supervisors to hold a trainer qualification was reintroduced for all regulated occupations in 2009 after a six-year suspension (BIBB, 2009a). Holders of an upper-secondary qualification have to pass the trainer aptitude exam, while those with an advanced VET qualification (e.g. master craftsperson) already fulfil the requirements (BIBB, 2009b).

In the trainer aptitude exam (Ausbildereignungsprüfung), candidates demonstrate their ability to assess educational needs, plan and prepare training, assist in the recruitment of apprentices, deliver training and prepare the apprentice to complete their training. The exam consists of a written three-hour section and a 45-minute practical part, during which the candidate presents a typical training situation and is interviewed by a group of experts. It is provided by the chambers of industry, commerce and crafts (BIBB, 2009a).

To prepare for the exam, candidates typically attend "Training for trainer" courses (Ausbildung für Ausbilder). These preparatory courses are provided by the chambers, normally last for 115 hours and take place either on a full-day, week-end or evening basis (BIBB, 2009a). Average costs are EUR 180 for the trainer aptitude exam and up to EUR 420 for the preparatory course. Candidates may be supported by their employers and can seek financial support from the State through schemes such as the training credit (Bildungsprämie) (TA Bildungszentrum, 2015).

Sources: BIBB (2009a), "Empfehlungen des Hauptausschusses des Bundesinstituts für Berufsbildung vom 25.06.2009: Rahmenplan für die Ausbildung der Ausbilder und Ausbilderinnen", https://www.bibb.de/dokumente/pdf/HA135.pdf (accessed 11 April 2016); BIBB (2009b), Ausbilder-Eignungsverordnung Vom 21 Januar 2009, Bundesgesetzblatt Jahrgang 2009 Teil I Nr. 5, https://www.bibb.de/dokumente/pdf/ausbilder_eignungsverordnung.pdf; TA Bildungszentrum (2015), "Ausbildungseignungsprüfung IHK (AEVO)", www.ta.de/ausbildereignungspruefung-ihk-aevo.html (accessed 11 April 2016).

Norway

Optional training is offered to employees involved in supervising apprentices. Some counties provide the training themselves, others ask schools or training offices (which are owned by companies collectively) to ensure its provision. The courses are free to participants, since counties provide for the course, learning material, subsistence and travel expenses. However, the firm is responsible for the supervisor's pay during the course.

Typically the duration of the training is two days (or four half days) per year. Often there is a time interval between each training session, so that supervisors may practice what they have learnt and prepare a report, which is then presented at the next session. National guidelines, developed in cooperation with VET teacher training institutions, are available on the Internet and can be adapted to local needs. The form of training typically includes role-play and practice. Supervisors learn to cover the curriculum, complete evaluation procedures and administrative forms, prepare a training plan for apprentices and follow through the plan.

Source: Norwegian Directorate for Education and Training, personal communication, 22 January 2009.

Switzerland

Apprentice supervisors are required to complete a targeted training programme, in addition to having a vocational qualification (VET certificate or VET diploma) and at least two years of relevant work experience. Cantons are in charge of training, either by offering courses themselves or by delegating them to accredited training providers. They also subsidise these courses. Two types of training are offered:

A 40-hour course leads to a federally recognised cantonal course certificate. The curriculum includes three modules covering the framework conditions of the Swiss VET system, pedagogy and potential problems with young people like drugs, alcohol etc. The average cost of taking the course and obtaining the certificate is SFR 600.

A 100- hour course leads to a federal diploma. Its curriculum deepens the knowledge of pedagogy, VET legislation, and handling of young people and may bring additional advantages on the labour market. Completion typically takes at least seven months (ABB, 2016). For the qualification procedure, candidates need to submit a dossier and give a presentation. The assessment of the candidate's skills can be done either without the candidate being present or include an interview with the candidate either in the workplace or elsewhere (Berufsbildung.ch, 2016). The average cost of the training course and diploma is SFR 2 300.

Sources: ABB (Amt für Berufsbildung und Berufsberatung) (2016), "Lehraufsicht", Amt für Berufsbildung und Berufsberatung, Thurgau, www.abb.tg.ch/xml_63/internet/de/application/d10079/d9739/f9309.cfm (accessed 26 February 2016); Berufsbildner.ch (2016), "Berufsbildner/in werden – Das Wichtigste in Kürze",www.berufsbildner.ch/allg-infos-berufsbildner (accessed 26 February 2016); Berufsbildung.ch (2016), "Bildung von Berufsbildner/innen in Lehrbetrieben", Das Portal zur Berufsbildung, www.formationprof.ch/dyn/10975.aspx (accessed 26 February 2016); SBFI (Staatssekretariat für Bildung, Forschung und Innovation), "Berufsbildungsverantwortliche", www.sbfi.admin.ch/berufsbildung/02383/index.html?lang=de (accessed 26 February 2016).

Box 9: Tools supporting firms that provide apprenticeships

A website with free resources for apprentice supervisors – Norway

The Norwegian Directorate for Education offers a website with a wide range of free resources for apprentice supervisors. Resources cover eight broad topics, including "Being a training establishment – roles and responsibilities", "Instruction and guidance", "Assessment and documentation".

Apprentice supervisors can access booklets and practical tools, like "reminder cards" which summarise key points on each of the eight topics. Those interested can also watch 15-minute videos, which explore key issues and show relevant examples on a variety of topics, such as "Guidance and assessment during apprenticeship", "Good conversation: the art of asking open questions", "School-company interaction" or "The first 14 days – getting to know each other".

Source: http://www.udir.no/Utvikling/Etterutdanningsmateriell_FY/ (accessed 29 March 2016).

QualiCarte – Switzerland

This tool was developed with the social partners and can be used by firms on a voluntary basis. It provides a checklist of 28 quality criteria, which may be used by the firm for self-assessment. The criteria describe key aspects of work-based learning within four broad categories:

- *Hiring: The receiving company/institution establishes the conditions of hiring. An example of criteria: "Taster apprenticeships" (short periods allowing potential apprentices to learn about the job) are organised."*
- *Starting the training: A special programme is prepared for the initial period spent in the company/institution. An example of criteria: Information is provided on the activities of the company/institution and the relevant industrial field."*
- *Training: The company/institution helps the apprentice acquire competences required in the labour market and takes the time to provide training and progressively transmit their knowledge and skills. (An example of criteria: "The different working methods and procedures are planned, demonstrated and explained.")*
- *Responsibility of the training company/institution: The company/institution is engaged and collaborates with all those involved in the training. An example of criteria: "If the apprentice has difficulties, the supervisor contacts his/her parents, school or relevant VET office."*

Source: www.qbb.berufsbildung.ch/ (accessed 29 March 2016).

Investors in People – United Kingdom

Investors in People (IiP) is a standard for better people management. It was developed in the UK in 1991 and over 14 000 businesses across 75 countries have IiP accreditation. The Standard defines what it takes to lead, support and manage people well for sustainable results and is based on a tried and tested methodology of leading practice and a rigorous process of assessment. Achievement of the Standard signals a high performing culture and high quality products and services.

The IiP Standard explores practices and outcomes within an organisation under three performance headings: leading, supporting and improving. Under each heading, there are identified three key indicators.

The first stage of the accreditation process is an online self-assessment. At Stage 2 the views of employee's are sought and data is collected. Stage 3 involves exploring key themes from the online assessment through face to face meetings and observations. Finally, at Stage 4 businesses receive an accreditation report which outlines their award level and benchmarks performance.

Source: Investors in People, www.investorsinpeople.com (accessed 29 March 2016).

The ability to manage work-based learning is part of broader management capacity with potentially wider benefits to firms

Developing management capacity in firm needed to organise effective work-based learning is demanding, but it is also part of broader management capacity – given that very often employees, particularly in the context of technological change and innovation, will have limited experience and skills in relation to a changing set of work tasks. The implication is that while increased management capacity may be necessary to make effective use of trainees in the workplace, that capacity will have many wider benefits – particularly in terms of the ability of firms to make the most effective use of their employees, innovate and adapt to changing work contexts.

The capacity to manage learning as part of productive work activities is potentially beneficial to all firms and in particular to small and medium sized enterprises (SMEs), which might rely more on informal learning than formal training. Some of the common ways of learning in small companies identified by an ILO study of learning and training in SMEs (Ashton et al., 2008) are indeed similar to methods that might be used in apprenticeships and structured work-based learning programmes – such as working alongside a skilled employee, going for advice to an employee or rotating between jobs. Integrating learning into everyday work life was highlighted by a cross-national study of SME learning practices as one of the key success factors for small firms that were "learning organisations" (The Conference Board of Canada 2009).

Policy pointer

5: Support firms' capacity to provide high-quality work-based learning, for example by encouraging targeted training for supervisors of trainees and offering tools and resources that help firms effectively manage work-based learning.

Box 10: Summary of policy pointers

1. *Adapt the duration of work-based learning to the profile of productivity gains, , ensuring that schemes are long enough to be attractive for employers but not too long to avoid being unattractive to learners and wasting public resources. Typically schemes might be longer when productivity gains are achieved more slowly.*

2. *Involve employers in the design of work-based learning schemes but balance their interests with the interests of trainees.*

3. *Ensure that work-based learning is organised in a way that maximises productivity gains, integrating learning into productive work with care whenever there is scope for such an approach.*

4. *Ensure through quality assurance that work-based learning schemes are effective in developing skills.*

5. *Support firms' capacity to offer high-quality work-based learning, for example by encouraging targeted training for supervisors of trainees and offering tools and resources that help firms effectively manage work-based learning.*

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NOTES

1. When upon completion former trainees are hired by the firm as employees, employers reap further benefits for example by paying wages below marginal product. This is possible because the firm hiring the trainee knows the skills of the trainee, but those skills are not fully visible to other potential employers (Acemoglu and Pischke, 1996; Acemoglu and Pischke, 1999). Employers may also benefit from reduced recruitment costs (as it is cheaper to hire a person trained in the company through a structured work-based learning scheme than an external recruit) (for empirical evidence see Blatter, Muehlemann, and Schenker, 2012). These potential benefits are somewhat reduced if the trainee already worked for the same firm before engaging in the work-based learning scheme (e.g. apprentices who were employed by the same firm before starting the apprenticeship). In that case the firm still benefits from knowing the skills (including those newly developed) of the person, while those skills are not fully visible to other employers. But the firm no longer obtains the benefit of getting to know the abilities of the person.

2 A study of the metalworking industry (where training standards are similar and apprenticeships are a key route to intermediate jobs) found that apprentice wages in comparison to skilled worker wages were highest in Britain, lower in Germany and the lowest in Switzerland (Ryan et al., 2013). The characteristics of apprentices are important part of the context, as in some countries (e.g. Germany, Switzerland) apprentices are typically teenagers and young adults, many of whom live with their parents, while in others (e.g. United Kingdom, United States) apprentices tend to be older, self-supporting adults who are often employed before starting an apprenticeship.

ANNEX

Table 1: Relative productivity of apprentices in Germany

	First year (in %)		Last year (in %)		Apprenticeship duration (years)
	Relative productivity in skilled tasks	*Number of observations*	*Relative productivity in skilled tasks*	*Number of observations*	
Retail worker	*41,3*	*57*	*79,7*	*55*	*3*
Commercial employee	*41,1*	*450*	*74,3*	*429*	*3*
Social care specialist	*38,5*	*82*	*79,2*	*81*	*3*
Cook	*36,9*	*76*	*79,5*	*69*	*3*
Dental assistant	*36,8*	*25*	*84,8*	*16*	*3*
Medical assistant	*33,8*	*28*	*82,5*	*31*	*3*
Logistician	*33,4*	*40*	*76,7*	*35*	*3*
Painter	*32,5*	*32*	*71,7*	*26*	*3*
Gardener	*31,6*	*19*	*71,9*	*18*	*3*
Carpenter	*30,5*	*26*	*67,3*	*26*	*3*
IT specialist	*29,3*	*37*	*88,1*	*44*	*4*
Plumbing and heating engineer	*27,6*	*15*	*69,8*	*21*	*3*
Health care specialist	*26,6*	*115*	*73,1*	*102*	*3*
Bricklayer	*23,3*	*55*	*71,5*	*54*	*3*
Joiner	*22,7*	*28*	*68,7*	*35*	*4*
Electronics technician	*21,9*	*16*	*80,0*	*19*	*4*
Industrial mechanic	*20,0*	*58*	*80,6*	*91*	*4*
Civil engineering draughtsman	*18,8*	*31*	*72,0*	*23*	*4*
Electrician	*18,6*	*75*	*79,2*	*63*	*4*

Note: Reference year 2012/13.

Source: Calculations by Muehlemann (forthcoming) based on data from the 2012 Cost-benefit survey - Jansen, A., H. Pfeifer, G. Schönfeld, F. Wenzelmann (2015). Apprenticeship training in Germany remains investment-focused – results.

Table 2: Relative productivity of apprentices in Switzerland

	First year (in %)		Last year (in %)		Apprenticeship duration (years)
	Relative productivity in skilled tasks	*Number of observations*	*Relative productivity in skilled tasks*	*Number of observations*	
Commercial clerk (Industrial)	*54,1*	*49*	*75,8*	*50*	*3*
Commercial clerk (Wholesale and export)	*48,8*	*54*	*73,6*	*56*	*3*
Commercial clerk (Office communications)	*48,2*	*48*	*63,5*	*50*	*3*
Medical employee	*47,1*	*31*	*74,4*	*35*	*3*
Logistician	*46,2*	*35*	*79,6*	*32*	*3*
Commercial clerk (Retail)	*44,1*	*85*	*77,8*	*87*	*3*
Commercial clerk (Office)	*43,7*	*82*	*74,3*	*80*	*3*
IT specialist	*40,4*	*39*	*67,4*	*37*	*3*
Public administration employee	*39,5*	*29*	*70,1*	*32*	*3*
Joiner	*33,8*	*18*	*65,1*	*31*	*3*
Cook	*30,9*	*47*	*72,9*	*41*	*3*
Painter	*30,9*	*16*	*62,7*	*20*	*3*
Tax specialist	*29,0*	*21*	*75,1*	*26*	*3*
Electronics technician	*22,3*	*15*	*81,2*	*16*	*3,5*
Car mechatronic	*15,3*	*46*	*68,6*	*31*	*3,5*

Note: Reference year 2009.

Source: Calculations by Muehlemann (forthcoming) based on data from the 2009 Cost-benefit survey - Strupler, M. & S.C. Wolter (2012). Die duale Lehre eine Erfolgsgeschichte - auch für Betriebe. Ergebnisse der dritten Kosten-Nutzen-Erhebung der Lehrlingsausbildung aus der Sicht der Betriebe, Glarus/Chur: Rüegger Verlag.