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Incentives for apprenticeship

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INCENTIVES FOR APPRENTICESHIP

OECD Education Working Paper No. 152

By Małgorzata Kuczera, OECD

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ABSTRACT

While an apprenticeship is potentially very beneficial to students, employers and economies, many countries face difficulties in encouraging companies to provide apprenticeship places, and individuals to enter apprenticeship programmes. To encourage companies to provide apprenticeships, the government, and sometimes social partners, promote apprenticeships through a wide range of incentives, including financial incentives, such as subsidies and tax breaks, and non-financial incentives, such as adjustments in apprenticeship design to make it more attractive to employers. While financial incentives are common, their effect is often modest and depends on the amount of financial support and allocation criteria. Schemes that target specific sectors and are supported by social partners tend to be more successful. However, non-financial measures, which are often less costly than financial incentives, can also be helpful in increasing the provision of apprenticeships and merit further consideration.

RÉSUMÉ

Malgré tous les avantages que la formation en alternance peut procurer aux étudiants, aux employeurs et à l'économie, beaucoup de pays ont du mal à convaincre les jeunes et les entreprises d'y recourir. Pour inciter ces dernières à prendre des apprentis, les autorités, parfois soutenues par les partenaires sociaux, disposent d'un vaste arsenal de mesures financières, comme les subventions et les allègements fiscaux, et non financières, pour rehausser l'attrait de l'apprentissage pour les employeurs. Les incitations financières sont très répandues même si, en règle générale, leur impact est limité et dépend du montant et des critères d'attribution de l'aide. Les programmes qui visent un secteur donné et sont financés par les partenaires sociaux rencontrent habituellement un plus grand succès. Cela dit, les mesures non financières, souvent moins onéreuses à mettre en place, peuvent elles aussi contribuer à accroître le nombre des places de formation en alternance et méritent à ce titre d'être étudiées de plus près.

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INTRODUCTION

Issues discussed in the paper

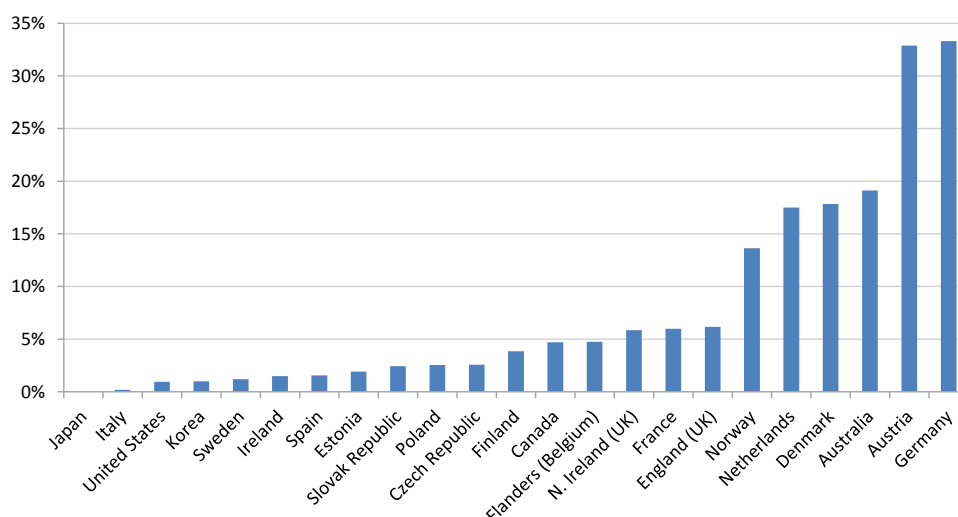
This paper looks at the incentives for employers to offer apprenticeships, and considers the rationale for governments to intervene and provide incentives to employers for offering apprenticeships. It discusses when incentives can be effectively introduced, drawing on cost and benefit analysis. It also discusses the challenges of developing apprenticeships in small companies and sectors with limited provision of apprenticeships. Finally, this paper focuses on financial and non-financial incentives, and considers some of the pitfalls of incentive programmes.

Apprenticeships are widely appreciated, but hard to sustain and develop

Apprenticeships are widely praised and appreciated as an effective means of training young people and transitioning them from school to work. At the same time, they are sometimes insufficiently supported by employers, and not attractive enough to potential apprentices. As a result, many countries are grappling with the problem of how to encourage apprenticeships – either increasing the quality and scale of established schemes, or developing apprenticeship systems from scratch (see Figure 1 for differences in the use of apprenticeships across countries).

Figure 1. There are large differences in the use of apprenticeships

Current apprentices in programmes leading to upper-secondary or shorter post-secondary qualifications, as a share of all students enrolled in upper-secondary and shorter post-secondary education (ISCED 3 and ISCED 4C), 16-25 year-olds (2012)



Notes: In Ireland, Italy, Japan, Korea, Spain, Sweden and the United States, the estimated share of current apprentices is not significantly different from zero.

ISCED: International Standard Classification of Education, www.uis.unesco.org/Education/Documents/isced-2011-en.pdf.

For the definition of current apprentices see Box 1.

Source: OECD (2016), *Survey of Adult Skills (PIAAC)* (Database 2012, 2015), www.oecd.org/skills/piaac/publicdataandanalysis/.

Box 1. Apprentices and apprenticeship graduates in the Survey of Adult Skills (PIAAC)

Current apprentices

Current apprentices are defined as currently studying in upper-secondary education or short post-secondary programmes (at ISCED level 3 longer than 2 years, or ISCED 4C) and defining themselves as apprentices or holding an apprentice contract. See Table A1 in Annex A for the distribution of apprentices between upper-secondary and post-secondary levels.

Variables C_Q07 and D_Q09 from the background questionnaire for the Survey of Adult Skills were used to identify current apprentices (see Box A1 in Annex A for the full text of the questions). As these variables do not distinguish between internships and apprenticeships, apprenticeships have been limited to programmes leading to upper-secondary and short post-secondary programmes only, with the assumption that internships are more common in long post-secondary programmes than at lower levels of education and training.

Apprenticeship graduates

In Austria, Canada and Germany, individuals were classified as apprenticeship graduates if they identified “apprenticeship” as their highest qualification (question B_Q01aAT in Austria, B_Q01aCA6 in Canada, and B_Q01aDE2_REC in Germany in the national background questionnaires for the Survey of Adults Skills).

In Norway an apprenticeship graduate is a person whose highest qualification is ISCED 3C (lasting for 2 years or more) (question B_Q01a in the background questionnaire for the Survey of Adult Skills).

In Denmark, an apprenticeship graduate is a person whose highest qualification is at upper-secondary level (ISCED 3, of 2 years or more) and the qualification was obtained in one of the following areas of study: social science, business and law, science, mathematics and computing, teacher training and education science, engineering, manufacturing and construction (questions B_Q01a and B_Q01b in the background questionnaire for the Survey of Adult Skills).

All variables used to define “apprenticeship graduates” are described in Box A1 in Annex A.

Sources: OECD (2013), “The background questionnaire”, in *The Survey of Adult Skills: Reader's Companion*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264204027-5-en>; and National background questionnaires in “*The Survey of Adult Skills*” (unpublished).

Apprenticeships are a structured mix of work and training

Apprenticeships typically involve a structured mix of: 1) work placement during which apprentices develop new skills and perform productive work; and 2) off-the-job education and training that involves no or limited productive work and is typically funded and managed primarily by public authorities (e.g. education and training provided in vocational schools, colleges, recognised educational and training providers). Apprenticeships lead to a formal qualification.

Apprenticeships contribute to a broader OECD project on work-based learning

This paper is designed to support the implementation and incentives of an apprenticeship module that is part of a wider OECD project on work-based learning (see Box 2), financed by Norway. This paper looks at the incentives for employers to offer apprenticeships, places this analysis alongside examples of policy and practice from countries, and identifies key policy messages. The present paper draws on an analysis of costs and benefits of apprenticeships carried out for the OECD by an external expert (Mühlemann, 2016). It also draws on OECD work on the costs and benefits of apprenticeships, sponsored by the European Commission and Germany. Within the framework of the wider OECD project on work-based learning, the present paper argues that the balance of costs and benefits can help to establish whether

incentives for apprenticeships are required, which helps to design an effective incentives scheme. The paper, therefore, underpins other strands of work in the wider project on work-based learning, including the module (reflected in separate papers) on engaging at-risk youth in work-based learning.

Box 2. Work-based learning in vocational education and training: The broader OECD project

The OECD launched this study in 2015 with the aim of delivering policy messages about how to use work-based learning in vocational education and training (VET) to achieve better economic and social outcomes. It builds on in-depth analytical work on six topics and a series of workshops held in 2016. Six reports will be published:

- The cost and benefits of work-based learning
- Incentives for apprenticeship
- Work, train, win: Work-based learning design and management for productivity gains
- Work-based learning for youth at risk: Getting employers on board
- Recognising skills acquired through work-based learning
- Work-based learning and career guidance.

A synthesis report drawing together all six modules will be published in 2017. All reports will be published on the following website as they become available: www.oecd.org/edu/skills-beyond-school/work-based-learning.htm.

The rationale for apprenticeship incentives

Apprenticeships yield benefits to the government and society

Governments normally contribute to apprenticeships by funding off-the-job education and training. In many countries, they also co-finance work placements for apprentices with employers. Governments support apprenticeships for many of the same reasons they support other forms of education and training: they provide benefits to individuals and society, and without public support, the provision of education and training would be inadequate. As with other types of education and training, apprenticeships contribute to the development of stronger basic skills, and are associated with factors such as higher wages, better jobs and career opportunities, better health, lower criminality. Apprenticeships also have some distinctive features.

Apprenticeships facilitate transition to the labour market

In comparison to other educational paths, apprenticeships are distinctive in that they equip young people with generic and job relevant skills by combining learning and work, which facilitates the transition of young people from school to work. There is some evidence that upon graduation, apprentices have better labour market chances, in terms of duration of search, unemployment spells and wages, in comparison to those who choose another type of upper-secondary education (Bratberg and Nilsen, 1998; van der Klaauw, van Vuuren and Berkhout, 2004; European Commission, 2013). Overall, countries with a high share of youth in apprenticeships have lower rates of disconnected youth and youth experiencing a difficult transition to employment (Quintini and Manfredi, 2009).¹ This is an important finding, as

1. This study compares the labour market situation of young people across various countries and at various points of time.

evidence shows that first labour market experiences have lasting consequences, and that unemployment leaves young workers with long-term scars that impose costs on individuals and society (Bell and Blanchflower, 2011; Nilsen and Reiso, 2011).

Apprenticeships may reduce undesirable social outcomes

The combination of school and work may be better suited for students who dislike more academic forms of learning, and who otherwise would have dropped out of school. By reducing dropout and improving school to work transition, apprenticeships can prevent undesirable social outcomes (e.g. criminal behaviour, drug abuse or teenage pregnancy).

Apprenticeships provide a path to higher levels of education and training

While apprenticeship programmes are primarily designed for labour market entry, in many countries, they also provide a route into higher levels of education. The effectiveness of such routes depends on the wage premium associated with higher level qualifications, and on pathways in the system that allow apprenticeship graduates to continue in education and training. For example, in Germany, around 10% of apprenticeship graduates continue to post-secondary level. Apprenticeship graduates represent around 13% of students in all post-secondary programmes, and between 20-40% in post-secondary professional programmes, such as Training at Fachschule, Meister, Berufsakademie, Fachakademie, Bachelor at Fachhochschule (classified at ISCED 5B and 5A level) (OECD, 2016). Apprenticeships that provide genuine opportunities to continue at higher levels of education and training are also more attractive to students, and are more likely to attract good candidates.

Sometimes support for apprenticeships is a matter of fairness

Apprenticeships for young people that lead to upper-secondary qualifications are typically provided without tuition fees, as many countries see upper-secondary education as an educational minimum and aim for universal attainment at this level. If other alternative education and training pathways, such as academic upper-secondary or university education, receive state funding, public support for apprenticeships is a matter of fairness, especially if students from socio-economically disadvantaged families are over-represented in apprenticeship programmes.

SUMMARY OF POLICY LESSONS

Incentives for employers to provide apprenticeships

Financial incentives for apprenticeships are likely to have modest effects, and will usually involve substantial deadweight. There are also risks of unintended effects, such as encouraging the engagement of employers who are more interested in subsidies than skills development. At the same time, through quality youth apprenticeships, employers may be shouldering the burden of training and guiding young people through to employment – a task that, in other contexts, may fall to the government and the public purse. Financial incentives should be carefully monitored and evaluated, as evaluation evidence is relatively thin.

Some of the most promising non-financial incentives make apprenticeships more attractive and beneficial to employers, and aim to support employers in getting the best out of apprentices. The cost-benefit balance of apprenticeships is not always fixed in stone: better apprentice supervisors and trainers could make apprenticeships profitable for an employer. Support institutions can help individual employers successfully work with apprentices. Very often, the apprenticeship “culture” is in fact a set of management capacities within employer organisations that allow them to make effective use of apprentices. Management capacity can be learnt, and this resonates with the long-term aim of many countries to build apprenticeship capacity.

Policy pointers

1. Financial incentives for employers to take apprentices are likely to yield substantial deadweight losses, i.e. they subsidise apprenticeships that would have been provided anyway. Therefore, such incentives should be used with caution and their impact should be evaluated carefully, including displacement effects.
2. Introduce high quality standards for apprenticeships to ensure that incentives do not lead to apprenticeships in low-skilled jobs.
3. When providing financial incentives for apprenticeships, ensure that small employers also receive support with accessing and processing available funding.
4. Cost sharing by employers at the sectoral level can be promoted in specific sectors where: the cost of apprenticeship training is high, the labour market is tight and it is difficult to find skilled employees on the external market, and when employers face a high risk that their fully trained employees will be poached by other employers.
5. Financial incentives should take into account the wider public policy context, as well as the relative attractiveness of alternative learning pathways (including tertiary education) and the level of public support offered for such pathways.
6. Explore options for enhancing non-financial incentives for employers, including measures that increase the training capacity of employers.
7. Review the design of apprenticeship schemes (e.g. apprentice wages, duration of the apprenticeship, on-the-job practices) to ensure that they are both beneficial to employers and attractive to apprentices.

Apprenticeships in small companies

The evidence shows that small employers often make effective use of apprentices. This may be because small employers themselves learned their trade as apprentices and understand and appreciate the apprenticeship route. Circumstances may be different in countries with a weaker overall apprenticeship culture, and where individual small employers may not fully understand how to realise the potential benefits. Small employers will often benefit from supporting and co-ordinating institutions that help small employers in different ways to work together to manage apprentices. Some smaller employers will benefit from targeted training and assistance to develop their capacity to use apprentices.

Policy pointers

1. Smaller employers can benefit greatly from apprentices. Governments and social partners can support smaller employers by:
 - Encouraging employers to find ways to share the responsibilities and risks associated with the provision of apprenticeships.
 - Promoting bodies that work with groups of small employers to co-ordinate training.
 - Supporting small employers with the administration and provision of apprenticeships.
2. Special financial incentives for smaller employers to take on apprentices should be used cautiously and carefully evaluated.

Apprenticeships across sectors

In some sectors, apprenticeships are an obvious tool for recruiting and training, while in others, they are virtually unknown. Building apprenticeships from scratch can be challenging. In sectors with no previous experience of apprenticeships, employers have to build up expertise in how to run a successful apprenticeship, and importantly, they often need to be convinced that apprenticeships are a worthwhile investment.

Policy pointers

1. When expanding apprenticeships into new sectors, ensure that:
 - Employers and trade unions support and are involved in the design of apprenticeships.
 - Ensure that skills developed during apprenticeships correspond to skills required in the sector so that apprenticeship graduates can effectively compete for jobs with other graduates.
2. Help employers to establish apprenticeships by:
 - Building institutions and infrastructure that support the provision of apprenticeships within a sector.
 - Provide support measures that assist individual employers with setting up their apprenticeships.

1. FRAMEWORK FOR THE ANALYSIS

Introduction

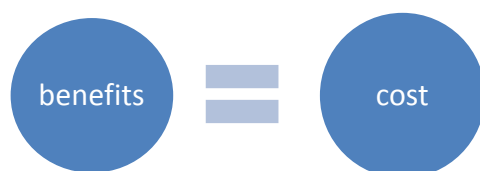
An economic perspective on the costs and benefits of apprenticeships provides a conceptual framework for the analysis of employers' behaviour, and enables consideration about the conditions under which employers provide apprenticeships, and policy options that encourage the provision of apprenticeships by employers.

The balance between costs and benefits

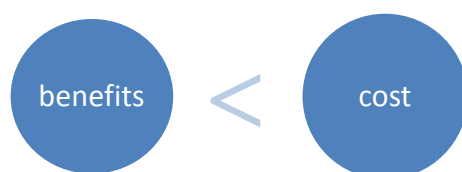
Costs incurred by companies providing apprenticeships include apprentice wages and the cost of training provision (training equipment, time devoted by skilled workers to training of apprentices, etc.). However, apprenticeships also generate benefits to companies, both during and after apprenticeship training. The contribution of apprentices to the firm's productive work yields benefits during the apprenticeship period, while retention of the most productive apprentice graduates as valued employees generates benefits after the end of that period.

Employers offer apprenticeships:

- When benefits outweigh or are at least equal to the costs.



- They choose not to provide apprenticeships when costs exceed the benefits.



The mix of long and short-term benefits

Some employers are much less likely to achieve the long-term benefits from recruiting apprentices. Companies that are uncertain about long-term benefits will not offer apprenticeship training unless they can recoup the costs by the end of apprenticeship. The mix of short and long-term benefits, and therefore the mix of incentives for employers to take on apprentices, varies across countries and occupations. In Germany, fewer companies realise net benefits by the end of the apprenticeship period than in Switzerland. In Germany, about 30% of apprenticeships result in net benefits by the end of apprenticeship, compared to 71% in Switzerland. German companies are also more likely to retain apprentices as skilled workers after

the end of the programme, and thus to realise long-term benefits. The retention rate of apprentices at the firm level is 60% in Germany and 35% in Switzerland (Mühlemann, 2016).

Many employers provide apprenticeships to reach long-term benefits

Companies that can hire apprenticeship graduates reach long-term benefits after the end of the apprenticeship. These companies are more likely to accept an upward investment in apprentice skills, even if it exceeds the short-term benefits. For example, in Switzerland, apprenticeship training in occupations such as industrial mechanics or electronics technicians is very costly. Apprentices in these occupations spend a relatively large amount of time in training facilities, and a relatively small amount in productive work. Companies make a net investment during the apprenticeship period that is offset later on through the recruitment of fully trained apprentices, as the retention rate of apprentices in these occupations is high.

How long does it take to recoup the cost?

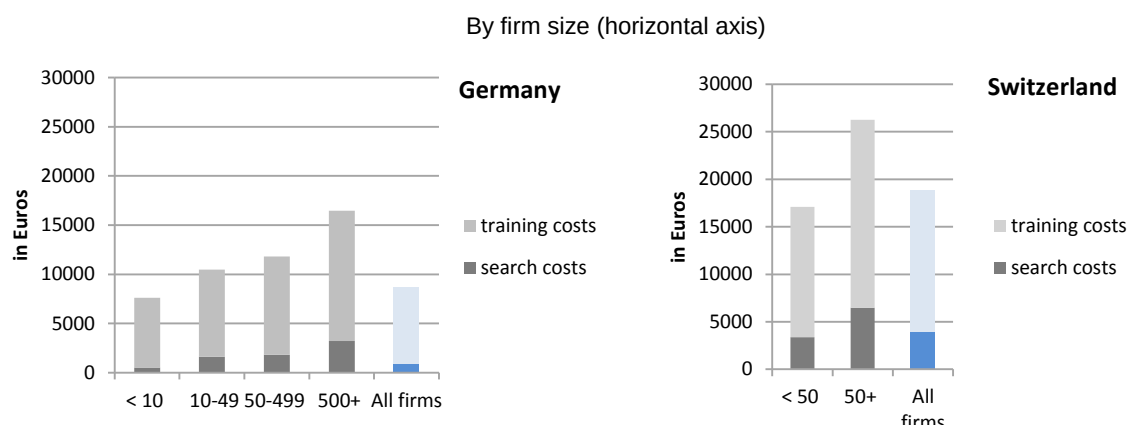
The benefits yielded by the recruitment of the most able apprenticeship graduates depend on how long apprentice graduates stay with the employer after the end of the apprenticeship programme. One English study estimates that companies in the construction sector are able to recoup their investment in apprenticeships if the apprentice stays with the employer for at least two years after the completion of the programme (Hogarth and Gambin, 2014). The time necessary to recoup the cost of investment in apprenticeship varies across companies, depending on factors such as the company's initial investment in the apprentice, the wage structure, and the ability of apprenticeship graduates.

Wages and long-term benefits

Recruitment benefits also depend on whether employers can pay a wage below the employee's productivity. In "perfect" labour markets, fully informed employers could buy exactly the skills they want instantly and without any transaction costs. However, in the real world, employers with privileged knowledge of the productivity of their apprentice graduates can pay a wage below their productivity. Labour markets are imperfect for multiple reasons: when information is "asymmetric" (whereby the actual productivity of employees is not visible to all potential employers); because of labour market institutions that compress wages (rather than allowing them to reflect individual productivity variations); and because the company is the only employer in the specific occupation in the region (monopsony). These market imperfections can allow employers to yield substantial post-training benefits.

The higher the cost of recruitment in external markets, the higher the long-term benefits

Recruitment costs include: expenditure on job advertisements and interview costs; formal and informal training expenditure, including costs of the lower productivity of regular employees who instruct new recruits; and the costs associated with initially low productivity of any new employee during the adaptation period (until the worker reaches full productivity). An additional part of the cost of recruitment is the risk of mistaken recruitment, followed by the need to fire recruits. Firing expenditure includes: administrative costs; morale effects, including the costs of lower productivity among workers during the notice period; and the costs of unfilled vacancies. These costs can be substantial, as shown by Figure 2. Apprenticeships not only save on the training costs of future workers hired externally, but also allow employers to better match individuals with responsibilities and tasks on the job. Apprenticeship training is an important screening tool for employers as it allows them to uncover the true ability and motivation of an individual apprentice, a process that can take a few years following external recruitment (Lange, 2007). One key advantage of apprenticeship training is that the employer can evaluate more accurately whether a particular individual is a good match for the specific position, which reduces information asymmetries between the training firm and the apprentices (Mühlemann et al., 2010).

Figure 2. Average hiring costs for a skilled worker in Germany and Switzerland (EUR), 2012/13

Notes: CHF/EUR exchange rate of 1.10 on 11 September 2015. Hiring cost - average cost to successfully fill a vacancy.

Source: Mühlemann, S. (2016), "The cost and benefits of work-based learning", *OECD Education Working Papers*, No. 143, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5j1pl4s6g0zv-en>.

Some employers are more likely to reach long-term benefits than others

Employers realise long-term benefits only if they are able to attract and retain the most able apprentices. Typically, employers offering higher starting wages, better career prospects, and more job security are more likely to recruit apprenticeship graduates. Large companies, often seen as more attractive to work for, are more likely to attract and retain the most able apprentices than small firms. Small firms may therefore be losing the competition with big companies for the “best” apprentices.

Tight labour markets make the recruitment of apprenticeship graduates more difficult

Retention rates of apprenticeship graduates depend on the tightness of the local labour market. When the labour market is tight, i.e. there are many vacancies and few workers available; the competition for apprenticeship graduates is high. In such a context, employers that use apprenticeships primarily as a recruitment tool may prefer not to invest in apprenticeship training through a fear that their fully trained apprentices will be poached by another employer.

Conclusions and policy implications

When additional incentives are not required

When employers can reach positive net benefits that take into account short and long-term benefits, in principle, no additional incentives are required. It is therefore important to estimate the costs and benefits of apprenticeships to employers when designing incentive schemes.



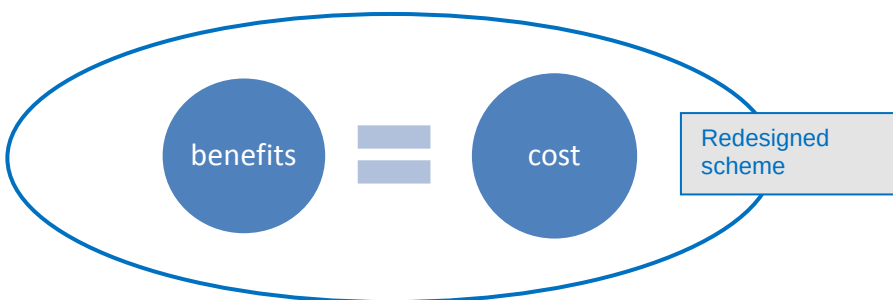
When incentives can be envisaged

When the existing apprenticeship scheme yields limited benefits to employers and few companies provide apprenticeships, the government, and sometimes social partners, may want to promote apprenticeships through a range of incentives. Incentives are typically designed to allow companies to at least break even by the end of the apprenticeship period. There are:

Financial incentives that may include either direct subsidies or tax benefits.



Non-financial incentives that include a wide range of measures, such as a redesign of the apprenticeship scheme and measures to improve the training capacity of employers. These measures increase the benefits or diminish the costs of offering apprenticeship, meaning that the overall benefits are at least equal to the costs. Other non-financial incentives include regulatory measures that require employers to take on apprentices (or penalise them if they do not), and image enhancement measures designed to attract employers and students to the apprenticeship brand.



2. INCENTIVES FOR EMPLOYERS TO PROVIDE APPRENTICESHIPS

Introduction

Given the evidence that apprenticeships represent a cost-effective way of developing workforce skills and transitioning young people smoothly from school to work, there are good policy reasons for governments to encourage and support the provision of apprenticeships. Where apprenticeship offers are limited, the government and social partners may want to promote apprenticeships through a range of incentives. This paper distinguishes two types of incentive:

- Financial incentives that may include either direct subsidies or tax benefits.
- Non-financial incentives that include measures such as assisting employers in providing apprenticeships, preferential treatment for companies with apprentices in the public procurement process, and image campaigns.

For apprenticeships to be attractive to employers, they need also to be attractive to students so that well-qualified young people will compete to be apprentices, and training employers will be able reap the benefits of their abilities. This means that the level of public support for the learning pathways that compete with apprenticeships, such as different forms of post-secondary education, is important. If such pathways receive higher public funding than apprenticeships and are high status, for example, if university fees are zero, young people may avoid apprenticeships because of the more attractive well-funded alternative. Employers may then be reluctant to recruit apprentices from a group of school leavers with weak school attainment that prevented them from entering other forms of post-secondary education. In short, if the broader educational context provides appealing alternatives to apprenticeships, filling apprenticeship places will be harder.

Financial incentives for employers

The effect of financial incentives depends on how the money is collected, and how it is spent

The effect of financial incentives provided by government for apprenticeships depends on how the money is spent, for example in terms of tax breaks or specific subsidies. However, it also depends on how the money is collected, in particular whether it is collected through some form of levy that may or may not be targeted on particular industrial sectors, or through general taxation.

Financial incentives funded with general public expenditure

The cost of apprenticeships is shared across all taxpayers based on the assumption that apprenticeships lead to positive externalities. Externalities are created when apprenticeships yield benefits to employers other than the employer who provided the apprenticeship (e.g. by improving skills of potential recruits) and to the whole society (by increasing the overall level of human capital). To create positive externalities, apprenticeships should convey skills other than firm-specific skills. These include skills that are transferable across employers within the sector and more generic cognitive and non-cognitive skills. These incentives are introduced when the expected externalities from apprenticeships are large and the provision of apprenticeships is low.

The cost of financial incentives for apprenticeships can come out of general public expenditure, and therefore from taxpayers in general, as: 1) a reduction in the tax base or tax due by companies providing apprenticeships; and 2) a subsidy to firms with apprentices. Some examples include:

- In Austria, tax incentives were abolished in 2008 and replaced by direct subsidies for apprenticeships. The Ministry of Economics and Labour concluded that the tax incentive scheme failed to target companies that would benefit most from additional support for apprenticeships (CEDEFOP, 2011). Tax incentives have been replaced by a grant based system. The amount of grant received by the employer depends on the year of apprenticeship, with the subsidy decreasing with each year of apprenticeship (in the first year of apprenticeship the employer receives the equivalent of three gross apprentice wages per apprentice, in the second year the equivalent of two gross apprentice wages, and in the third year the equivalent of one gross apprentice wage). Extra support is also available to employers offering apprenticeships for the provision of additional training to apprentices and training of instructors, to employers whose apprentices excel on final assessment, and to employers whose apprentices face learning difficulties. In addition, grants are available for apprenticeships that support equal access of men and women to traditionally non-male and non-female professions (Federal Ministry of Science, Research and Economy, 2014).
- In France, all enterprises (including public establishments) employing apprentices for at least one month can benefit from a tax credit. Employers receive EUR 1 600 per apprentice per year, or EUR 2 200 for disabled and low qualified apprentices. Small and medium-sized enterprises (SMEs) offering apprenticeships are fully exempted from employer social contributions (CEDEFOP, 2011).
- In the Netherlands, tax deductions were abolished in 2014 and replaced with subsidies (Casey, 2013).

Financial incentives funded by employers

The costs of financial incentives can also fall on employers, with either all employers or some employers contributing, typically through a levy on a percentage of turnover or payroll. Funds from this contribution may be used to support training in general and apprenticeships in particular. For example, in Denmark and France, all employers share the cost of apprenticeships. In Austria, Germany and Switzerland, levies are collected by sectors; while in England (United Kingdom), only large employers contribute. Further details on incentive schemes are set out in Table 1.

Table 1. Financial incentives to companies

	Tax incentives*	Subsidy	Levy scheme
Australia	Tax incentives depend on the qualifications the programme leads to.	Subsidy in specific cases, e.g. person being trained has a disability.	No
Austria	Tax incentives abolished in 2008 and replaced by targeted subsidies.	From 2008 targeted subsidies are available per apprentice (the amount depends on the year of apprenticeship), for additional training, for training of instructors, for apprentices excelling on final assessment, for measures supporting apprentices with learning difficulties, to measures supporting equal access of men and women to apprenticeships in.	A levy fund in the construction sector covering all regions and a levy fund in the electro-metallic industry of one province (Vorarlberg). It is negotiated by Employers and Trade Union.
Belgium (Flemish Community)	Payroll tax deduction.	Direct subsidy depending on the number of apprentices and programme duration.	No
Denmark	No	No	All companies – including in the public sector – pay a contribution to the Employer Reimbursement Fund (AER) based on the number of full-time employees. The amount is DKR 492.50/ full-time employee four times a year. Enterprises with apprentices get their expenses for trainees refunded when they are at VET college (i.e. salary, transportation). AER also pays grants to motivate employers who establish extra training places.
England (UK)	No	Contributions from employers who pay the levy are topped up with a 10% contribution from the government. Grants to companies and education and training institutions offering apprenticeship to 16-18 year-olds.	Universal levy set at the rate of 0.5% of payroll, applying to the proportion of payroll above GBP 3 million.
Germany	No	No	In the building sector. They are negotiated by employers and trade unions.
Netherlands	Tax exemptions (abolished in 2014).	Subsidy from 2014 to employers providing apprenticeships of maximum EUR 2 700 per student per year (depending on the duration of the apprenticeship and the number of training companies asking for subsidy).	No

Table 1. Financial incentives to companies (*continued*)

	Tax incentives*	Subsidy	Levy scheme
Norway	No	Direct subsidy per apprentice depending on apprentice characteristics (such as age, disability, school performance, migration status, gender, previous education) and sector characteristics.	No
Switzerland	No	No	All companies within a given economic sector are required to contribute to a corresponding vocational and professional education and training (VPET) fund (e.g. to develop training programmes, organise courses and qualifications procedures, promote specific occupations). The Confederation may declare some VPET funds to be of general interest and therefore mandatory for all companies within a given economic sector.

Notes: * Tax incentives reduce either the tax base or the tax due. They include: 1) tax allowances (deducted from the gross income to arrive at the taxable income); 2) tax exemptions (some particular income is exempted from the tax base); 3) tax credits (sums deducted from the tax due); 4) tax relief (some classes of taxpayers or activities benefit from lower rates); and 5) tax deferrals (postponement of tax payments).

Sources: The OECD International Survey of VET Systems, 2007 – countries' responses (unpublished); CEDEFOP (2011), Using Tax Incentives to Promote Education and Training: Cedefop Panorama Series 2009, Cedefop Panorama Series 2009, Dictus Publishing, Saarbrücken, www.cedefop.europa.eu/fr/publications-and-resources/publications/5180; Federal Ministry of Science, Research and Economy (2014), Apprenticeship: Dual Vocational Education and Training in Austria Modern Training with a Future, www.bmwf.gv.at/Berufsausbildung/LehrlingsUndBerufsausbildung/Documents/Die_Lehre_HP_engl.pdf.

Special case: Levies

What are the effects of levies?

Levy schemes normally have distributional effects, making some employers winners and others losers. The winners are those who pay little into the levy scheme but take extensive advantage of it, for example by having numerous apprentices supported by levy funding. The aim of levy schemes is to reward employers that create apprenticeship places and make those who benefit indirectly by poaching employees trained by other companies contribute to the cost of training. Other effects may be unintended. For example, some industrial sectors make little use of apprentices, perhaps because the skills involved are evolving too rapidly to be formalised in an apprenticeship qualification, but they may still have to invest heavily in skills development and at the same time pay into a levy.

Many incentive effects arise from how levy funds are spent, as with incentives funded out of general taxation. However, some may arise from how levies are collected. For example, in Singapore, because the levy falls only on employers paying low wages, it may encourage an increase in wages and skills to justify the higher wages, and/or it may raise the unemployment risk of low-skilled employees, by increasing the cost of their employment.

Some effects are not strictly economic. Levy schemes that require employers to be directly involved in managing the training fund and identifying training priorities aim to give employers a sense of ownership of, and involvement in, training.

Few countries have levy systems specifically designed to support apprenticeships. Three countries that do have such systems are Denmark, England (United Kingdom) and France (see Box 3).

Box 3. Employer levies to support apprenticeships in Denmark, England and France

Denmark maintains a dual apprenticeship system supported by an employer levy system. All employers, public and private, contribute to the Employers' Reimbursement Fund by a fixed amount for each employee (in 2016 it was around EUR 370 per year). Levy funds are used primarily to pay apprentice salaries while they are pursuing off the job training. Apprentice wages are set at the sector level through collective agreements, and typically reach 40% to 50% of the minimum wage. (This model compares with Ireland, where the government carries this cost, paying an allowance to apprentices during their off the job training). Reimbursements are relatively generous and may exceed the wage in some cases. There are bonuses for youth who find a paid apprenticeship without assistance.

Apprenticeships in **England** have been undergoing reform to raise their quality and status, and a target of 3 million apprenticeship starts by 2020 has been set, backed by a new proposal that a minimum of 2.3% of the workforce of larger (250+ employees) public sector employers should be apprentices. A new funding arrangement, based on an employer levy, will be introduced in 2017. While the requirement for employers to pay the levy is UK-wide, spending the proceeds involves devolved responsibilities, so the apprenticeship funding arrangements described here apply only to England. The levy will be collected at the rate of 0.5% of all payroll over GBP 3 million, so that smaller employers with less than GBP 3 million in payroll will be exempted. Levy-paying employers will be given a digital training account where they can see "their" levy contributions accumulating in a fund that is topped up by a 10% contribution from the government. They can use this account to pay registered providers to provide training (and other bodies to provide assessment) for apprentices in their workforce. Funds entering the account must be used within 24 months (Department of Education, 2016). Employers who cannot call on these funds (either because they are small employers who pay nothing or little into the levy, or because they have exhausted the training account) must pay 10% of the training and assessment costs of their apprentices, with the levy funding the remaining 90% (Department of Education, 2016).

France maintains a complex mix of incentives that encourage employers to offer apprenticeships. A training levy in the form of an apprenticeship tax is set at 0.5% of the wage bill, plus an additional 0.18% tax contribution to a separate "apprenticeship development" fund. Large employers with 250 employees or more provide a further contribution that varies with the percentage of their employees in work-based vocational training (apprenticeships and some other schemes). Most funds from these taxes are funnelled through intermediary bodies and the regions to offer employers a tax credit of EUR 1 600 per apprentice and an allowance of at least EUR 1 000 per apprentice. Employers are also largely exempt from social security contributions for their apprentices (a substantial benefit in France). Employers may opt for some of their contributions to the apprentice tax to go directly to the local training institutions that they designate, including higher education institutions, independently of the apprenticeship training role of these institutions. However, following recent reforms, only around 23% of the apprenticeship tax is now allocated in this way.

Sources: AUB (2016), Webpage for: AUB Employers' Reimbursement System, <https://indberet.virk.dk/arbejdsgivernes-uddannelsesbidrag-english/arbejdsgivernes-uddannelsesbidrag-aub> (accessed December 2016); Department of Education (2016), Webpage for: Apprenticeship Funding: How it will work (updated 25 October 2016), UK Government, London, www.gov.uk/government/publications/apprenticeship-levy-how-it-will-work/apprenticeship-levy-how-it-will-work (accessed December 2016); Conseil d'Analyse Economique (2014) L'apprentissage au service de l'emploi Les notes du conseil d'analyse économique, no. 19, December 2014, www.cae-eco.fr/IMG/pdf/cae-note019-env2.pdf; OECD (2014), *OECD Economic Surveys: Denmark 2013*, OECD Publishing, Paris, http://dx.doi.org/10.1787/eco_surveys-dnk-2013-en.

Who bears the cost of levies?

Levies imply an extra cost for companies that may be absorbed by employers, passed on to customers through higher prices, or shifted on to workers and apprentices through lower wages. If there are many skilled workers willing to work for the company, even at a lower wage, the employer can shift the cost onto the workers. However, if companies struggle to find qualified labour, they may not be able to lower salaries.

How to build employer support for levies

Employers in an industry sector may see apprenticeships as being in their collective interest, even when individual (often small) employers may be reluctant to invest in apprentices who could leave to work for another employer. In these circumstances, employers may opt to work together to support training through a levy. Employer commitment to sectoral training levies is normally high, such schemes can be found in Germany, Austria and Switzerland.

Employers have particular incentives to set up a sectoral levy fund when the cost of apprenticeship training is high, the labour market is tight and it is difficult to find skilled employees on the external market, and when employers face a high risk that their fully trained employees will be poached by other employers. Employers tend to be more sceptical of universal levy schemes, often perceived by employers as a tax, and when companies have little control over how the money is used and spent (Müller and Behringer, 2012).

How the money is spent*Subsidies can be earmarked according to various criteria*

- Number of apprentices: A number of countries offer a fixed sum per apprentice to employers that provide apprenticeship places. In Norway, the government provides companies a subsidy per apprentice (with a right to upper-secondary education) of around EUR 14 800² for two years of work placement with the company, including one year of productive work and one year of training (Norwegian Directorate for Education and Training, 2016). The grant amount is set at the level slightly below the cost of a one year full time school education.
- New apprenticeship places: Sometimes subsidies aim to encourage companies to create new apprenticeship positions. In Austria and Australia, there is a subsidy for employers providing new apprenticeship places (Federal Ministry of Science, Research and Economy, 2014). The Australian government offers an AUS 1 500 (EUR 1 000)³ incentive for an employer who commences an Australian apprentice in a certificate III or IV level qualification (New South Wales Department of Industry, 2016).
- Specific occupation: Some countries promote apprenticeships in specific industries and occupations. In Australia, there is an extra subsidy for employers providing apprenticeships that lead to an occupation from the National Skills Needs List. In Norway, higher grants are allocated to employers in small crafts, such as shoemaker, pottery art and silversmith art, which are “protected” for historic or social reasons.
- Progression through the programme: The subsidy can depend on how successful apprentices are in progressing through and completing the programme. The Australian government provides AUS 2500 (EUR 1 700)⁴ for employers whose apprentices successfully complete the apprenticeship programme (New South Wales Department of Industry, 2016).
- Characteristics of the apprentice: Financial incentives available to companies can also depend on the characteristics of apprentices. Certain schemes aim to increase the provision of work

2. Based on currency NOR/EUR exchange rate, 5 April 2016.

3. Based on currency AUS/EUR exchange rate, 5 April 2016

4. Based on currency AUS/EUR exchange rate, 5 April 2016.

placements to individuals with particular characteristics, such as age, disability, school performance, migration status, gender, and previous education. In Norway, a company receives a maximum subsidy if the apprentice is entitled to three years of upper-secondary education. Companies offering apprenticeships to a person over 21 years and/or who has already attained a qualification at the upper-secondary level receive a subsidy of around a third of the full subsidy. In addition, the company can apply for an extra subsidy if the person has special needs and is under the age of 25 (Norwegian Directorate for Education and Training, 2016). In Australia, there are a wide range of targeted incentive payments for particular circumstances and groups, including for apprentices in a set of “equity” groups and apprentices in rural areas (Australian Government, Department of Education, 2015).

Choice between a lump sum and an earmarked grant

A lump sum that is offered to employers who decide to take on apprentices, but independent of apprentice numbers, creates financial incentives for companies that have not provided apprenticeships previously, but does not affect the decision of a firm with apprenticeship arrangements in place to take an additional apprentice. A lump sum can be used to build training capacity (including, for example, investment in trainers/instructors, training equipment, assessment capacity) in a company or sector. A subsidy based on the number of apprentices is more likely to have an impact on a firm’s decision to create additional apprenticeship places.

Challenges associated with financial incentives

The effect of direct financial subsidies for apprenticeships is probably modest

Work on the costs and benefits of apprenticeships in Switzerland and Germany shows that the net benefits to employers are extremely variable from sector to sector and employer to employer. This means that only a relatively small proportion of employers will increase the provision of apprenticeships in response to financial incentives.

This theoretical perspective is borne out by empirical evidence. Westergaard and Rasmussen (1999) found a significant positive effect of public subsidies in Danish firms, but only in manufacturing, office and retailing. In Austria, subsidies appear to have had a limited impact (Wacker, 2007). In Switzerland (where there are no subsidies of this type), a simulation exercise suggested that subsidies would have an impact on firms that are not involved in apprenticeships, but would have no effect on the supply of apprenticeship training in firms that train already (Mühlemann, 2016). An evaluation of the Australian scheme shows that the subsidy had only a small impact on the decision of employers to train. This was mainly because the subsidy covered only a small part of the company costs involved (Deloitte, 2012). Another Australian study evaluates the impact of the withdrawal of an apprenticeship subsidy to employers (Pfeifer, 2016), and found no effect on employers using apprenticeships as a recruitment tool. However, the withdrawal of the subsidy led to a decline in apprenticeship provision in sectors where employers could not count on the long-term benefits from apprenticeships. These employers were not able to break even by the end of the programme without the subsidy. Mühlemann (2016) argues that the reduction in apprenticeships was particularly strong in the service sector, where the quality of apprenticeship provided was often low (as measured by graduation rates and employment outcomes). The subsidy might therefore have been promoting an apprenticeship that was of limited value to individuals. The overall implication is that financial subsidies will typically involve a significant amount of “deadweight”, i.e. apprenticeships that employers would have funded regardless of the relevant incentive. Some element of deadweight is inevitable; usually the objective is to minimise its scale, so that incentives increase the volume of apprenticeships.

A further risk is that financial incentives may succeed in engaging employers who are primarily interested in the subsidy, rather than training the apprentices. This is a potential problem because the effectiveness of apprenticeships as an institution depends very much on employers seeking to reap the benefits of developing well-trained and highly productive employees, and who are therefore committed to quality on-the-job training because they see it as being in their own interests.

Regulations ensure incentives do not promote apprenticeships in very low-skilled jobs

Where apprenticeship regulations make significant demands on the employer in terms of their capacity to train the apprentice, some employers may lack the relevant capacity to take on apprentices; either because their production processes are highly specialised and do not allow apprentices to develop a range of skills required by the qualifications, or because they lack experienced staff able and willing to guide the learning of apprentices. This bottleneck in capacity means that such employers cannot take on apprentices, at least in the short term, although in the longer term, they may be encouraged by incentives to invest in their own training capacity. However, it is important that this type of regulation exists, as otherwise incentives may encourage employers to offer apprenticeships without providing the required training.

Companies relying on high-level skills might be indifferent to incentives

Companies relying on highly skilled employees may be unwilling to take on apprentices if the skills required and developed during apprenticeships are defined at a much lower level than those the company is looking for. For example, companies may be more likely to hire and train university graduates from specific fields, rather than to offer a work placement to apprentices if apprenticeship programmes are at a much lower level.

Incentives targeted at the support of vulnerable groups may experience deadweight problems

The German experience with training bonuses for companies offering work placements to disadvantaged apprentices (with learning difficulties or from disadvantaged backgrounds) shows some of the challenges in such schemes. Mühlemann (2016) argues that the bonus for disadvantaged apprentices was too low to allow companies to recoup their investment by the end of the apprenticeship. Companies were therefore offering work placements to individuals they intended to hire after the end of apprenticeship in order to realise long-term benefits. These individuals would have been offered an apprenticeship place in any case, even without the subsidy. (See Kis, 2016 for more information on work-based learning programmes for disadvantaged youth).

Displacement takes place when subsidies increase one type of training at the expense of others

Displacement is often intended, since funding criteria are designed to set priorities, but the global effect, as with deadweight, is to reduce the impact of an incentive on training volume. Well-intended measures sometimes result in unwanted displacement effects, for example, in the Netherlands, a 1998 tax law allowed firms to claim 120% of their training expenditure as a tax deduction for workers under 40, and 140% for those over 40, with the objective of encouraging the training of older workers. However, the effect was that training was redistributed from workers slightly below the age of 40 to those just over 40. The overall volume of training was little changed (Leuven and Oosterbeek, 2004).

Measures to reduce deadweight sometimes focus on additionality

Attempts are occasionally made to avoid deadweight by limiting subsidies for additional apprenticeships. In Austria and Australia, there is a subsidy for employers providing new apprenticeship places (Federal Ministry of Science, Research and Economy 2014). For example, there is an AUS 1 500

(EUR 1 000)⁵ incentive for an employer who starts, for the first time, an Australian apprentice in a certificate III or IV level qualification (New South Wales Department of Industry, 2016). A tax allowance for training introduced in Belgium (Flemish Community) as limited to companies that could show they were increasing overall training (Muller and Behringer, 2012). However, additionality tests can be hard to enforce, as an expanding company may qualify simply because it is expanding. It may also be seen as unfair if funding does not go to employers with a stable and longstanding commitment to apprenticeships.

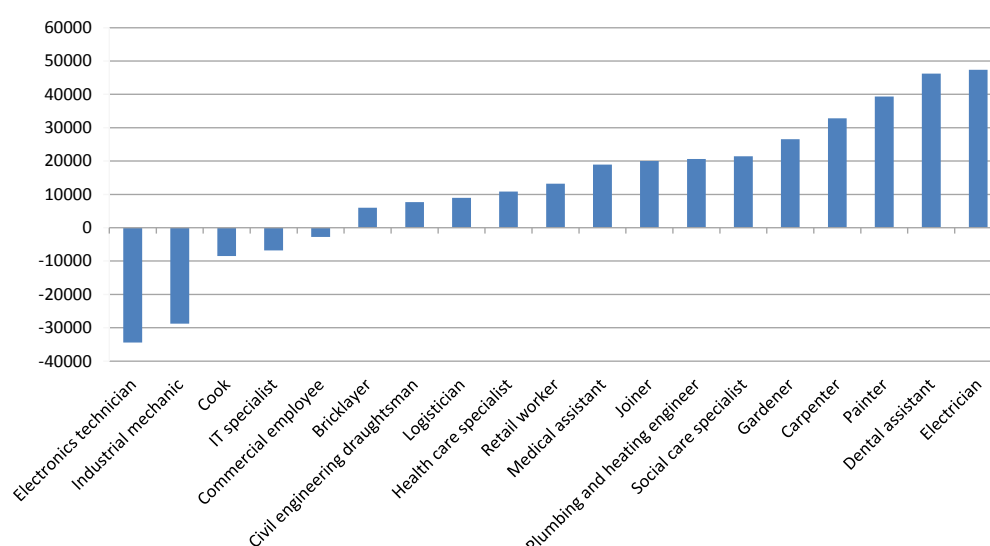
Sectoral and national schemes have different attractions

Universal schemes with a simple structure (e.g. with one tax credit or subsidy rate for training companies) are easier to understand and handle by employers. They are also cheaper in terms of administrative costs. However, they do not take into account the large differences in costs and benefits incurred by companies, and as a result can lead to either deadweight effects or the under-provision of apprenticeships.

In Germany, the net costs per apprentice (costs less benefits gained during the apprenticeship period) by sectors ranges from EUR 1 200 to EUR 8 000 (Mühlemann, 2016). In Switzerland, this difference is even larger, with many companies making financial gains from apprenticeships by the end of the apprenticeship (see Figure 3). In Austria, while employer net benefits are, on average, negative by the end of the apprenticeship, despite the subsidy, the cost-benefit ratio is positive in some typically female dominated occupations (e.g. office clerk, hairdresser, pharmacy assistant). Schlögl and Mayerl (2016) argue that government subsidies may contribute to the oversupply of apprenticeships in these occupations. Given large differences in the costs and benefits structure across different firms, a single subsidy level will only encourage more apprenticeships in a relatively small proportion of “marginal” cases, while substantial deadweight is inevitable.

Figure 3. The net benefits of apprenticeships in Switzerland

Net benefits (in EUR) reached by the end of the apprenticeship period. Long-term benefits, such as benefits flowing from the recruitment of apprentice graduates, are not included



Source: Mühlemann, S. (2016), "The Cost and Benefits of Work-based Learning", *OECD Education Working Papers*, No. 143, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5j1pl4s6g0zv-en>.

5. Based on currency AUS/EUR exchange rate, 5 April 2016.

Large employers are better at accessing financial support

Large employers tend to benefit disproportionately from financial incentives (Müller and Behringer, 2012). For employers to benefit from the subsidy, they need to be informed about the scheme, e.g. on the existence of the measures, the criteria of eligibility, and procedures of application. Access to accurate and timely information may be easier for bigger employers that often have training departments and staff dedicated to training issues. Provision of apprenticeships and the use of subsidies also involve costs, which may be less significant for bigger enterprises, relative to their overall training costs. Small enterprises may lack the capacity to determine training needs, plan accordingly and file applications for cost reimbursement or grants. It is therefore important to assist small companies with access to and processing of available funding, in parallel to providing financial incentives for apprenticeships. Some of these measures are discussed in section 4.

Non-financial incentives for employers

Non-financial incentives take four main forms:

- Redesign of apprenticeship scheme: makes the costs and benefits balance more favourable to employers.
- Capacity building: designed to help employers make a better use of apprentices.
- Regulatory measures: require employers to take on apprentices (or penalise them if they do not).
- Image enhancement measures: designed to attract employers and students to the apprenticeship brand.

Redesign of apprenticeships

The design of apprenticeship systems must balance the needs of companies and apprentices

Apprenticeship design needs to build in features that will make the institution attractive to employers, but without losing sight of the fact that it must also attract good students. The attractiveness of apprenticeships to employers and individuals depends on the duration of apprenticeship programmes, how the duration is articulated with apprentice wages and productivity, and the content and organisation of the work placement. Public authorities can support an effective apprenticeship system by helping companies to become better at training, which makes apprentices more productive during the programme.

Wage levels need to make apprenticeships attractive for both employers and apprentices

If the apprentice wage is too high, few companies will offer work placements to apprentices. Lower apprentice wages are not necessarily desirable for employers, particularly when they are seeking the high ability recruits that will be most valuable to them over the medium and longer term. For example, in Switzerland, companies reward students who receive good grades in school with higher wages (Mühlemann, 2016). The wage at which employers are willing to take on an apprentice depends on many factors, including unemployment rates and characteristics of the apprentice, such as ability and age. For example, younger apprentices are more likely to accept lower wages than older apprentices, particularly during periods of high youth unemployment.

Since company net benefits depend on apprentice wages, the mechanisms of wage setting play an important role in providing incentives for companies to train apprentices. In Norway, apprentice wages are

determined for each sector through negotiations between trade unions and employers associations at the national level; in Austria and Germany, the apprentice wage is based on collective wage agreements in occupations with collective bargaining agreements; and in Switzerland, it is up to individual companies, but with employer associations providing guidance on salary levels (see Ryan et al. (2013) for a discussion on wage setting in England (United Kingdom), Germany and Switzerland). Table 2 provides additional information on wage arrangements across countries.

Table 2. How apprentice wages and social security contributions differ across countries

	Do apprentices receive wage during on-the-job period?	Do apprentices receive wage during off-the-job period?	What is the apprentice wage compared to the skilled worker's wage?	Who defines the minimum apprentice wage?	Do employers pay social security contributions for an apprentice?
Australia	Yes	No	Missing	Depending on the programme the wage is defined by sectors at national and regional levels. In some cases it is up to individual companies.	Missing
Austria	Yes	Yes	On average 50% of the skilled worker wage.	Sectors at regional level.	Yes, but the state covers parts of the insurance costs.
Denmark	Yes	Yes	30-70% of the skilled worker wage, depending on the year of the programme.	Sectors	No
England (UK)	Yes	Yes	On average 63% of the skilled worker wage (metalworking industry).	Individual company according to the national regulations.	No (for apprentices under the age of 25).
Germany	Yes	Yes	25-33% of the skilled worker wage, depending on the year of the programme.	Sectors at regional level.	Yes
Netherlands	Yes	Yes	Missing	Sectors	Yes
Norway	Yes	No	30-80% of the skilled worker wage, depending on the year of the programme.	Sectors at national level.	Yes

Table 2. How apprentice wages and social security contributions differ across countries (*continued*)

	Do apprentices receive wage during on-the-job period?	Do apprentices receive wage during off-the-job period?	What is the apprentice wage compared to the skilled worker's wage?	Who defines the minimum apprentice wage?	Do employers pay social security contributions for an apprentice?
Sweden	No	No	-	-	-
Switzerland	Yes	Yes	On average 20% of the skilled worker wage, depending on the year of the programme.	Individual company but employer/professional associations provide recommendations. As a result apprentice wage varies by sector.	Yes

Note: Apprentice wages can vary largely across sectors and tend to increase over the duration of apprenticeship programme.

Sources: Ryan, P., U. Backes-Gellner, S. Teuber, and K. Wagner (2013), "Apprentice Pay in Britain, Germany and Switzerland: Institutions, Market Forces and Market Power", *European Journal of Industrial Relations*, Vol.19/3, pp. 201–20; Schönfeld, G., A. Jansen, F. Wenzelmann, and H. Pfeifer (2016) "Kosten Und Nutzen Der Dualen Ausbildung Aus Sicht Der Betriebe." BIBB. www.bibb.de/veroeffentlichungen/de/publication/show/id/8034; Sweden – e-mail exchange; The OECD International Survey of VET Systems, 2007 – countries' responses (unpublished); Swiss Federal Statistical Office (2016), "What's New? Income from Employment 2015. Gross Income from Employment per Year from Employed Persons according to Economic Activity Status, Group of Occupation, Workweek Percentage and Gender - Median in Franc", www.bfs.admin.ch/bfs/en/home/statistics/work-income/wages-income-employment-labour-costs.assetdetail.276590.html (accessed December 2016).

Apprenticeship length needs to balance interests of employers and apprentices

Work placements of longer duration help the company to recoup its investment as apprentices spend more time in productive work. At the beginning of an apprenticeship, apprentices often cost more than their value in terms of their productive work, while at the end of the apprenticeship, they cost less than their value in productive work, which is often similar in value to the productive work performed by a skilled worker. This at least is true for youth apprenticeships under the dual system (combines work placements in a company and education and training at a vocational school). The situation is very different for adult apprentices who are incumbent workers; whose wages may vary little over the course of the apprenticeship.

Capacity building

Apprenticeships can be promoted by making companies better at training

Some employers may not feel able to train apprentices, and some are better than others at conducting on-the-job training. Better training can yield higher gains, as apprentices can be used in productive skilled tasks earlier on in their apprentice career. Training capacity depends on the quality of trainers, training methods and training equipment, and is typically less well developed in small companies without dedicated training arrangements. Small companies may therefore benefit particularly from measures designed to enhance training capacity, such as training for trainers or assistance with administrative work.

The capacity to train and develop apprentices is very similar to general management capacity. All workers are partially rather than fully skilled, particularly in the context of innovation, where everyone is trying out new approaches and tasks. The job of managers is to guide and support staff and ensure that key tasks are performed, while at the same time developing the skills of staff through feedback of different

types. This is a very challenging task, similar to that of someone supervising apprentices. The implication is that measures that develop employer capacity to manage apprentices will also assist their capacity to manage other staff.

Governments can enhance the training capacity of firms through a wide range of tools, including providing training for apprentice instructors, offering support materials to firms to help develop their training skills, or facilitating networking among employers to share knowledge and experience on how best to support, develop and make use of apprentices. For example, the Norwegian Directorate for Education offers free resources for apprentice instructors on their website, including short movies showing how instruction can be carried out in practice (Norwegian Directorate for Education and Training, 2011).

In some countries, special bodies facilitate the provision of apprenticeships

In some countries, special bodies aim to match employers to students looking for workplace training. They also take care of the administrative duties involved in apprenticeship training, employ apprentices and hire them out to host employers (see Box 4). These bodies can be run and managed by employers themselves or by a third party.

Box 4. External bodies involved in apprenticeship training

Australia: Group training organisations (GTOs) are not-for-profit organisations supported by public authorities, with some charges to host employers. GTOs employ apprentices and hire them out to host employers, sometimes focusing on a particular industry or region. Their tasks include selecting apprentices adapted to the needs of employers; arranging and monitoring training both on- and off-the job; taking care of administrative duties; and ensuring that apprentices receive a broad range of training experience, sometimes by rotating them to different firms.

For research papers on GTOs see www.ncver.edu.au/publications/bytheme.html.

Austria: Training Alliances support companies that cannot provide a full range of skills to apprentices required for the specific occupation. They can involve: an exchange of apprentices between two or more companies; unilateral sending of apprentices to another or several other companies or to their training workshop (usually against payment); and attendance of courses or programmes at training institutions against a fee. Some provinces provide additional support to training alliances by providing information and support to companies about possible partner enterprises and educational institutions, and co-ordinating different training alliances activities (Federal Ministry of Science, Research and Economy, 2014).

Norway: Apprenticeship Training Agencies (ATA) (*opplæringskontor*) are owned by companies and aim to establish new apprenticeship places, supervise companies with apprentices, train staff involved in the instruction of apprentices and organise the administrative tasks related to being a training company. Many ATAs organise the theoretical part of apprentices' training. While county authorities must approve each individual company with apprentices, ATAs often sign the apprenticeship contracts on behalf of enterprises providing apprenticeship, thereby becoming accountable for completion of the apprenticeship and its results. About 70-80% of companies with apprentices are associated with ATAs. These bodies are funded through the state grant. Typically, companies pay half of the amount received from the state for apprenticeship training to ATAs. The prices of ATA services are set in an agreement between ATAs and the member companies.

A recent research report (Høst et al., 2014) found that the ATAs often carried out the county authorities' tasks and worked actively in assuring the quality of the apprenticeship training. ATAs have the formal status of training enterprises, however they operate somewhere between the county authorities and the individual company with apprentices, making their legal status unclear. Research shows that the institutional support given by the ATAs is important for the apprenticeship scheme to work (Høst, Skålholt and Nyen, 2012).

Box 4. External bodies involved in apprenticeship training (*continued*)

Switzerland: Autonomous training centres provide basic practical training to apprentices on behalf of companies. Training can be of varying duration, and typically precedes training in a company. It aims to facilitate the transition to training in companies by providing apprentices with theoretical and practical knowledge relevant to the occupation. It ends with a theoretical examination. Training in the training centres does not replace education and training provided by vocational schools. In addition to the provision of training, some training centres also take responsibility for the recruitment of apprentices for companies. The centres are non-profit organisations, with their expenses covered by the member companies. Member company fees vary depending on the occupation. Companies outsource part of the training to training centres, rather than providing it themselves, as it is more effective and less risky.

- Training centres reach economies of scale by increasing the number of apprentices while maintaining the cost.
- As training is the principal activity of training centres, they have greater capacity to focus on the quality of training than individual companies. Some companies, and in particular SMEs, do not have the capacity to deliver good quality apprenticeship training on their own. Apprenticeship training typically takes two years and represents a long-term commitment for companies.
- By outsourcing training to training companies, which take the entire responsibility for apprentices during this period, companies also outsource part of the risk. The risk can be related to changing business environment, economic shocks and other factors.

Based on an empirical evaluation, the model of training centres is a viable alternative to part of in-company training.

Sources: The OECD International Survey of VET Systems, 2007 – Norway (unpublished); personal e-mail exchange with Norway; Walther B., J.Schweri and S.Wolter (2015), "Shall I train your apprentice? An Empirical Investigation of Outsourcing of Apprenticeship Training in Switzerland", *Education+Training*, Vol. 47 Iss4/5 pp. 251-269; Høst, H., A. Skålholt, A. and A. Nyen, (2012). Om potensialet for å få bedriftene til å ta inn flere lærlinger: En kartlegging av norske bedrifters vurdering av lærlingordningen. ISSN: 1894-8200. Nordisk institutt for studier av innovasjon, forskning og utdanning. Sider: 94.; Høst, H.(2014). Kvalitet i fag og yrkesopplæringen. Arena for kvalitet – Opplæringskonferanse, Utdanningsdirektoratet.

Regulatory measures

The simplest type of regulatory measure is a workforce requirement. For example, a new proposal in England is that larger (more than 250 employees) public sector providers should have at least 2.3% of their workforce as apprentices. Some measures may be linked to public procurement: companies providing apprenticeships may sometimes receive preferential treatment in the award of public contracts. Strupler Leiser and Wolter (2014) evaluated this policy in Switzerland, and found that the policy increased apprenticeship provision among small firms with fewer than 50 employees, and among firms in sectors where public procurement represents a large share of the business. The policy had little effect on training quality (such as instruction time).

While preferential treatment in the award of public contracts looks promising given its relatively low cost and the positive impact on provision, there are also some potential drawbacks: 1) some highly specialised firms have niche skilled jobs that will not correspond to any widely recognised apprentice qualification, and they may be discriminated against in the public procurement process; 2) there may be discrimination against small firms when a limited pool of qualified applicants for apprenticeships are scooped up by larger firms; and 3) the policy may lead to too many apprenticeships in certain industries or occupations (such as construction) where public procurement is widespread (Strupler Leiser and Wolter,

2014; Mühlemann, 2016). Preferential treatment to companies with apprenticeships in public procurement contracts may also be against World Trade Organisation guidelines (Mühlemann, 2016).

The Norwegian government may introduce new rules for apprenticeship requirements in public procurement.⁶ For contracts worth a minimum of NOK 1.5 million, the government must buy goods and services from companies that are an approved apprenticeship provider. These regulations will mainly apply to the building, construction and information and communications technology (ICT) sectors. These stricter rules are part of the follow-up to the new Social Contract to ensure that every VET student in search of an apprenticeship shall find one. Lack of apprenticeship places is a serious challenge in Norway: in 2015, 9 000 would-be apprentices could not find an apprenticeship place.

Image enhancement measures

Companies that offer apprenticeships can enhance their reputation as companies investing in people. This may indirectly increase the profits of the company, if companies seen as socially responsible are more likely to sell their products and services. In a recent campaign in Norway, a set of companies received a brand as “approved learning enterprises”. The purpose of this initiative is to encourage more enterprises to join the apprenticeship scheme. If consumers make it clear that they prefer to buy goods and services from approved learning enterprises, firms that offer apprenticeships will have a competitive advantage. The government has launched a public relations campaign to encourage people to look for the brand, with advertisements in a national newspaper and on online marketplaces. The brand also has a Facebook page. While such branding initiatives may be promising, evidence of their effectiveness is scarce, and good quality evaluation remains to be undertaken.

Conclusions and policy implications

On the evidence presented here, financial incentives for apprenticeships are likely to have modest effects, and will usually involve substantial deadweight. There are also risks of unintended effects, such as encouraging the engagement of employers who are more interested in subsidies than skills development. At the same time, through quality youth apprenticeships, employers may be shouldering the burden of training and guiding young people through to employment – a task that, in other contexts, may fall to the government and the public purse. In recognition of this role, Norwegian employers, for example, receive a sum for each apprenticeship that is nearly as high as what it would cost for the apprentice to complete their school education without an apprenticeship. With this, there are some issues of burden sharing between the government and employers that go beyond the narrow issue of incentives and their effectiveness. Financial incentives should be carefully monitored and evaluated, as evaluation evidence is relatively thin.

Some of the most promising non-financial incentives make apprenticeships more attractive and beneficial to employers, and aim to support employers in getting the best out of apprentices. The cost-benefit balance of apprenticeships is not always fixed in stone: better apprentice supervisors and trainers could make apprenticeships profitable for an employer. Support institutions can help individual employers successfully work with apprentices. Very often, the apprenticeship “culture” is in fact a set of management capacities within employer organisations that allow them to make effective use of apprentices. Management capacity can be learnt, and this resonates with the long-term aim of many countries to build apprenticeship capacity.

6. These are suggested requirements from the current government, as described in recent public hearing, that have not been adopted yet.

Policy pointers

1. Financial incentives for employers to take apprentices are likely to yield substantial deadweight losses, i.e. they subsidise apprenticeships that would have been provided anyway. Therefore, such incentives should be used with caution and their impact should be evaluated carefully, including displacement effects.
2. Introduce high quality standards for apprenticeships to ensure that incentives do not lead to apprenticeships in low-skilled jobs.
3. When providing financial incentives for apprenticeships, ensure that small employers also receive support with accessing and processing available funding.
4. Cost sharing by employers at the sectoral level can be promoted in specific sectors where: the cost of apprenticeship training is high, the labour market is tight and it is difficult to find skilled employees on the external market, and when employers face a high risk that their fully trained employees will be poached by other employers.
5. Financial incentives should take into account the wider public policy context, as well as the relative attractiveness of alternative learning pathways (including tertiary education) and the level of public support offered for such pathways.
6. Explore options for enhancing non-financial incentives for employers, including measures that increase the training capacity of employers.
7. Review the design of apprenticeship schemes (e.g. apprentice wages, duration of the apprenticeship, on-the-job practices) to ensure that they are both beneficial to employers and attractive to apprentices.

3. APPRENTICESHIPS IN SMALL COMPANIES

Introduction

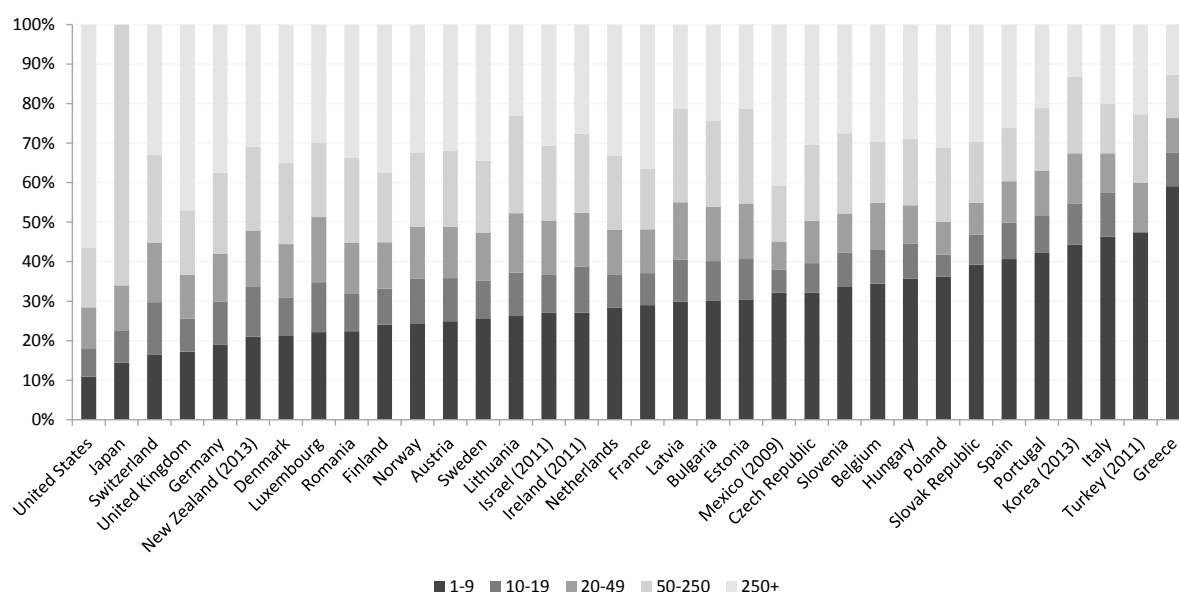
Many countries are concerned that smaller employers may be reluctant to offer apprenticeships. It has been argued that funds from training levies are often exploited by larger employers (Johanson, 2009; Dar and Whitehead, 2003; CEDEFOP, 2011; Müller and Behringer, 2012), and that smaller employers may perceive few benefits from training if trained employees are “poached” by larger employers with more promotion opportunities. Smaller companies may also lack the capacity to plan and determine training needs.

Apprenticeships in small companies

Many economies rely on micro and small companies

In Southern European countries and Korea, 40% or more of all employees work for micro companies employing fewer than 10 people (see Figure 4). These micro companies represent between 70% and 95% of all companies across OECD countries (OECD, 2015). In the majority of countries, small companies with fewer than 50 persons employed account for at least 40% of total employment. On average in OECD countries, 40% of value added is created by small enterprises (with fewer than 50 employees), with the relative share of small firms in total value added ranging from 23% in Mexico to more than 60% in Luxembourg. The contribution of small companies to the economy varies across sectors, but they are the backbone of the services sector in nearly all countries. In contrast, large firms provide a substantive contribution to value added in manufacturing (OECD, 2016).

Figure 4. Persons employed, by company size (2012 or latest available year)

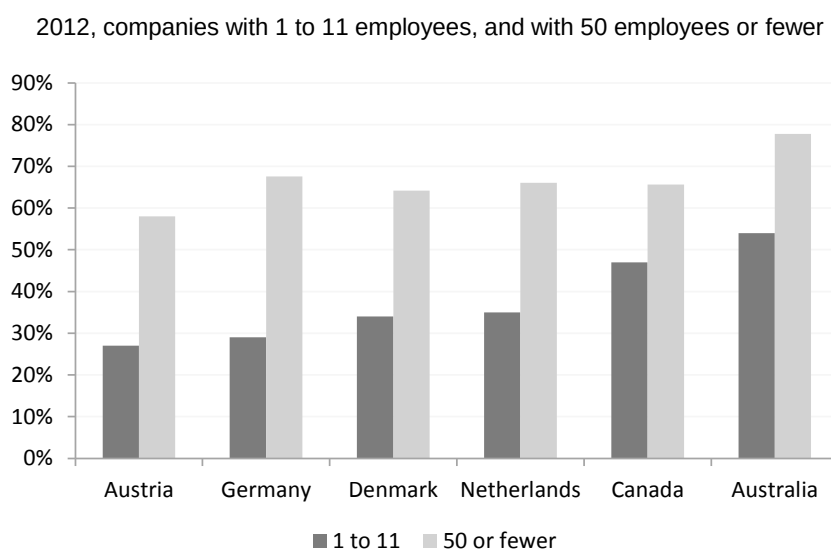


Source: OECD. (2015), *Entrepreneurship at a Glance 2015*, Table 2.2, OECD Publishing, Paris, <http://dx.doi.org/10.1787/entrepreneur-aag-2015-en>.

Small companies are a major provider of apprenticeships

Small companies provide a large share of apprenticeships. In countries with available data, more than half of all apprentices work in companies with 50 employees or fewer (see Figure 4). Some small companies therefore find apprenticeships beneficial. Small and very small employers, including family firms, may find that apprenticeships are an effective way of recruiting and training up key individuals. This is in a context where personal connections and loyalties may play an important role and cannot be reproduced through ordinary recruitment channels.

Figure 5. A large share of apprentices (16-65 year-olds) work in small and micro companies



Source: OECD (2016), *Survey of Adult Skills (PIAAC)* (Database 2012, 2015), www.oecd.org/skills/piaac/publicdataandanalysis/.

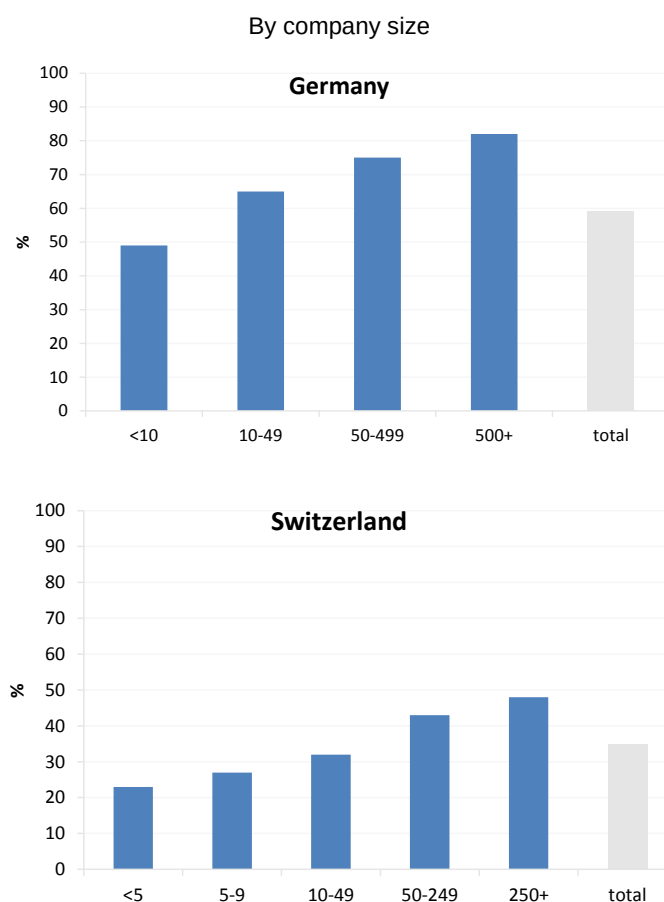
Barriers to apprenticeships in small employers

Establishing apprenticeships in small companies is more challenging

While small firms are a major provider of apprenticeships, they are less likely to provide apprenticeships than large employers. In Switzerland, around 25% of companies with fewer than 10 employees provide apprenticeships, compared to 80% of large firms employing 100 people or more (Mühlemann, 2016). This statistic provides no indication of whether the ratio of apprentices to ordinary employees is greater or smaller in larger firms, but there are a number of ways in which small companies may find the provision of apprenticeships more challenging.

Small companies are less likely to recruit apprentice graduates

Big companies are more likely to realise long-term benefits from apprenticeships by retaining the most able graduate apprentices than small employers. Evidence from Germany and Switzerland shows that retention rates for apprentices increase with firm size, as shown by Figure 6. Higher retention rates among larger employers may reflect graduate preferences, as big companies are often seen as more attractive to work for (in terms of salary, benefits packages and long-term career opportunities).

Figure 6. Company retention rates of apprentices

Source: Mühlemann, S. (2016), "The Cost and Benefits of Work-based Learning", *OECD Education Working Papers*, No. 143, OECD Publishing, Paris, <http://dx.doi.org/10.1787/5f1pl4s6g0zv-en>.

Small companies are less likely to attract the best apprentices

There is some evidence (Germany and the Netherlands) that apprentices with stronger basic skills are more likely to be found in big firms (see Table A2 in Annex A). This may be because higher ability students choose apprenticeships in larger firms, or because large employers are more effective in developing the skills of apprentices, or both. Evidence shows that large firms invest more in training and in the development of general skills than small companies, which tend to provide more company specific training (European Commission, 2013). If would-be apprentices with strong skills prefer larger employers with good career opportunities, smaller employers may decide to opt out altogether from apprentice recruitment.

Small companies may find the provision of apprenticeships more expensive and disruptive

Small companies are less able to benefit from the economies of scale that can reduce the unit cost of apprenticeship training. Such economies are realised when, for example, a trained instructor provides training to a few apprentices at the same time, or the company bears the fixed cost of understanding the administrative and other requirements associated with apprenticeship. Small companies may also be unable to train for the full range of skills required by a particular apprenticeship qualification.

Incentives and support for small employers

Incentives for small employers to offer apprenticeships

One of the main potential market failures is that small companies are more likely to have their fully trained apprentices poached by another employer. As a result, they might not provide apprenticeships unless they can recoup their training investment by the end of apprenticeship through the additional productivity of the partly trained apprentice, without taking into account the long-term benefits of retaining a skilled worker. Governments can help to tackle this market failure, either through financial incentives targeted at small firms, or by supporting mechanisms that allow smaller employers to work together to gain some economies of scale in apprenticeship provision.

Shared responsibility for the provision of apprenticeships

Some small companies are not able to comply with all the requirements for the on-the-job part of apprenticeships (e.g. in terms of skills that apprentices should develop, and trainers' qualifications). To support employers that on their own would not be able to provide apprenticeships, many countries have arrangements that allow employers to share responsibility for apprenticeships. For example, in Denmark, small companies can jointly provide part or all of an apprenticeship (Poulsen and Eberhardt, 2016). In Germany "apprenticeship sharing" includes the following models (Poulsen and Eberhardt, 2016):

- Lead enterprise with partner enterprise model: the lead enterprise bears the overall responsibility for training, but parts of the training are conducted in various partner enterprises.
- "Training to order" model: some periods of training take place outside the regular enterprise, perhaps in a nearby large enterprise with a training workshop, on the basis of an order and against reimbursement of costs.
- "Training consortium" model: several small enterprises work together and take on apprentices.
- "Training association" model: the individual enterprises establish an organisation for the purpose of the training that takes over the organisational tasks (contracts, etc.), while the master enterprises offer the training. The organs of the association are the general meeting and the honorary committee. A statute regulates rights and obligations of the members.

In Austria, companies that cannot fulfil certain standards (for instance because they are too small or too specialised to provide their apprentices with required training) may form training alliances (*Ausbildungsverbünde*) to share apprentices. Alliances of training firms are supervised at the state level by the Apprenticeship Offices (*Lehrlingsstellen*) appointed by Economic Chambers. The Economic Chambers help to find partners for firms willing to create new training alliances. Lachmayr and Dornmayr (2008) show that training alliances help to improve the quality of apprenticeship provision. In 2008, at least 5 000 training firms, or 15 000 apprentices, were organised in training alliances (estimation in Lachmayr and Dornmayr, 2008 based on Hoeckel, 2010).

Shared responsibility for apprenticeships among commercial partners

In specific occupations in England, such as occupations related to engineering and technology, large companies may provide part of the apprenticeship training to apprentices recruited by small companies in their supply chains. By providing part of the training on behalf of the small companies, large employers ensure they receive better quality products and services from their suppliers and prevent skills shortages in their supply chains (Lewis, 2014). Many small companies would not be able to provide apprenticeships

without “outsourcing” part of their apprenticeship, as they often lack the training infrastructure. Apprenticeships provided jointly with a large and well-known company also raises the status of provided apprenticeships and allows small firms to attract better candidates (Lewis, 2014).

Measures to improve training capacity among small companies

Training capacity is typically less well developed in small companies that do not have dedicated training arrangements and staff. Small companies may therefore particularly benefit from measures to improve training efficiency, such as training for trainers and assistance with administrative work. This can include a range of tools. For example, in Austria, qualified trainers from vocational schools can also work with small companies and support them in the provision of apprenticeship training (CEDEFOP, 2015).

In many countries, there are external bodies helping companies with different aspects of apprenticeship provision (see Box 3 for country examples). While they are not specifically designed to serve small employers, they can facilitate the provision of apprenticeships in smaller employers.

Conclusions and policy implications

The evidence shows that small employers often make effective use of apprentices. This may be because small employers themselves learned their trade as apprentices and understand and appreciate the apprenticeship route. Circumstances may be different in countries with a weaker overall apprenticeship culture, and where individual small employers may not fully understand how to realise the potential benefits. Small employers will often benefit from supporting and co-ordinating institutions that help small employers in different ways to work together to manage apprentices. Some smaller employers will benefit from targeted training and assistance to develop their capacity to use apprentices.

Policy pointers

1. Smaller employers can benefit greatly from apprentices. Governments and social partners can support smaller employers by:
 - Encouraging employers to find ways to share the responsibility and risks associated with the provision of apprenticeships.
 - Promoting bodies that work with groups of small employers to co-ordinate training.
 - Supporting small employers with the administration and provision of apprenticeships.
2. Special financial incentives for smaller employers to take on apprentices should be used cautiously and carefully evaluated.

4. APPRENTICESHIPS ACROSS SECTORS

Introduction

In some workplaces, it is common to see young apprentices working hand in hand with experienced employees, many of whom used to be apprentices themselves. For some employers, apprenticeships are part of the work landscape and work culture. However, familiarity with apprenticeships varies across sectors.

Cross-sectoral differences across countries

The Survey of Adult Skills (PIAAC) shows big differences in the employment of recent apprenticeship graduates (those who graduated after 2002) across sectors and countries (see Table 3). Assuming apprentices work in occupations they were trained for after graduation, these data show how the provision of apprenticeships differs across sectors. In the majority of countries for which data are available, apprenticeships are common in sectors such as manufacturing, construction, wholesale and retail, accommodation and food service activities. Apprenticeships are less common in sectors such as agriculture and education.

In Canada, apprenticeships are mainly concentrated in construction, whereas in Germany, they cover the majority of sectors. Germany has also been successful in expanding apprenticeships to sectors that were traditionally not associated with apprenticeship, such as finance and insurance, information and communication.

Table 3. Share of apprenticeship graduates (who graduated after 2002) in total employment, by sector
16-64 year-olds, 2012

	Austria	Canada	Denmark	Germany	Norway
Agriculture, forestry and fishing	4%	0%	0%	0%	5%
Mining and quarrying	0%	4%	0%	0%	10%
Manufacturing	10%	1%	9%	11%	5%
Construction	14%	8%	17%	13%	13%
Wholesale and retail trade; repair of motor vehicles and motorcycles	12%	1%	8%	12%	7%
Transportation and storage	8%	0%	9%	14%	4%
Accommodation and food service activities	10%	0%	6%	15%	9%
Information and communication	0%	0%	4%	8%	0%
Education	0%	0%	2%	3%	2%
Financial and insurance activities	5%	0%	0%	14%	0%
Professional, scientific and technical activities	0%	0%	3%	7%	0%
Administrative and support service activities	0%	0%	0%	9%	0%
Public administration and defence	2%	0%	4%	8%	4%
Human health and social work activities	3%	0%	4%	8%	5%
Other service activities	7%	1%	7%	8%	0%

Note: How to read the table: For example, in Norway, 10% of people employed in mining and quarrying sector hold an apprenticeship qualification (obtained after 2002).

For the definition of apprenticeship graduates see Box 1. Sectors are classified following the International Standard Industrial Classification of All Economic Activities (ISIC). For more information on the ISIC classification please see (United Nations 2008, part two).

Source: OECD (2016), *Survey of Adult Skills (PIAAC)* (Database 2012, 2015), www.oecd.org/skills/piaac/publicdataandanalysis/.

Firm and sector characteristics

Some areas, such as non-financial services (e.g. hairdressing, repair of personal and household goods), may be dominated by small, family run companies, while in others, such as aerospace and car industries, there are many big employers (see for example Eurostat, 2011 Table 1.4; list of occupations in each category can be found at http://ec.europa.eu/competition/mergers/cases/index/nace_all.html). Since small employers are generally less likely to provide apprenticeships, sectors with many small firms may also have less apprenticeship training.

Barriers to provision of apprenticeships in some sectors

Apprenticeships are more common in sectors with “training tradition” and where employers and trade unions are well organised

Companies from sectors/occupations that have a well-established training tradition have access to training know-how and institutional support that makes apprenticeship provision less expensive. This is not available to companies from other sectors and occupations. Training know-how refers, for example, to training methods and practices applied by peer companies that can be easily emulated by others, and institutional support including training centres, sectoral levy funds available to companies from a specific sector/occupation. Expansion of apprenticeships into new sectors is easier if social partners in these sectors are well organised and actively involved in the development of new apprenticeships, both at a national level (e.g. by designing qualifications) and local level (by providing on-the-job training).

In the early 1990s, Norway created an apprenticeship in health and social care that was meant to upgrade and improve working conditions in this traditionally female dominated area. However, hospitals, one of the main employers in this area, were reluctant to hire health and care professionals from apprenticeships, and favoured employees with post-secondary qualifications (Høst, Seland and Skålholt, 2015). This may be because of differences in skills and knowledge between apprenticeships and post-secondary graduates, the stronger signalling value of post-secondary qualifications, or the lack of engagement and support from employers for apprenticeships.

Provision of apprenticeships depends on the capacity of apprenticeships to meet the skills requirements of the occupation

Differences between sectors in apprenticeship provision can also be attributed to varying work and production methods. Some occupations and companies may rely mainly on low skills. If there are apprenticeship regulations in place preventing the provision of low quality apprenticeships (with limited opportunities for skills development and leading to poor labour markets), these companies will not offer apprenticeships because of their inability or unwillingness to provide relevant higher level skills, rather than because of insufficient net benefits. At the other end of the spectrum, some occupations and companies rely on highly skilled employees. These companies may also be unwilling to take on apprentices if the skills required and developed during apprenticeships are defined at a much lower level than those the company needs. Companies may be more likely to hire and train university graduates from specific fields rather than to offer a work placement to an apprentice if the apprenticeship programme is defined at a much lower level.

Apprenticeships are more common in sectors where an apprenticeship qualification is required to start the job

In some countries, an apprenticeship qualification is a prerequisite for entering a profession. For example, in Austria, apprenticeships are the only formal route leading to occupations such as hairdresser, plumber and car mechanic. Mandatory apprenticeship qualifications may result in a higher provision of

apprenticeships by employers, and a higher demand for apprenticeships from young people in corresponding occupations. In other professions, there are no formal entry requirements, and apprenticeship graduates compete for jobs with graduates from other paths.

Incentives and support for sectors with a low provision of apprenticeships

To promote the development of apprenticeships in sectors with a traditionally low provision of apprenticeships, particular attention could be given to:

- **Helping employers build training capacity:** This involves building institutions and infrastructure that support the provision of apprenticeships within a sector. This includes defining qualifications that are supported and regularly updated by social partners, and setting up reliable assessments that ensure the quality and transferability of skills developed in apprenticeships. Support measures may also target specific employers and help them to organise on-the-job training, prepare their staff for the role of apprentice supervisor, and integrate training into their production process. Some of these measures have already been discussed in section 2.
- **Involving employers and trade unions in the design of apprenticeship:** Apprenticeships imposed on employers have very low chances of success. Few employers would see such an apprenticeship as a worthwhile investment, and few would be keen on hiring apprenticeship graduates. Apprenticeships that lead to poor labour market outcomes are also not attractive to individuals. Instead of choosing an apprenticeship, students would rather opt for other paths that prepare them for the profession and that have a better labour market record.
- **Creating higher level apprenticeships:** Apprenticeships have traditionally been provided in blue collar male dominated occupations. However, some countries have successfully expanded their apprenticeships into areas that rely on high-level skills, such as banking and engineering. In Germany, 14 % of employees in the financial and insurance sector completed apprenticeship (see Table 3). In England, there are plans to develop high-level apprenticeships (e.g. in nursing, teaching, engineering) that should be equivalent to university qualifications in the relevant fields.

Conclusions and policy implications

In some sectors, apprenticeships are an obvious tool for recruiting and training, while in others, they are virtually unknown. Building apprenticeships from scratch can be challenging. In sectors with no previous experience of apprenticeships, employers have to build up expertise in how to run a successful apprenticeship, and importantly, they often need to be convinced that apprenticeships are a worthwhile investment.

Policy pointers

1. When expanding apprenticeships into new sectors, ensure that employers and trade unions support and are involved in the design of apprenticeships, and ensure that skills developed during apprenticeships correspond to skills required in the sector so that apprenticeship graduates can effectively compete for jobs with other graduates.
2. Help employers to establish apprenticeships by:
 - Building institutions and infrastructure that support the provision of apprenticeships within a sector.
 - Provide support measures that assist individual employers with setting up their apprenticeships.

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ANNEX A

Box A1. Variables used to identify current apprentices and apprenticeship graduates**International background questionnaire****C_Q07**

Please look at this card and tell me which ONE of the statements best describes your current situation. If more than one statement applies to you, please indicate the statement that best describes how you see yourself.

- 1 Full-time employed (self-employed, employee)
- 2 Part-time employed (self-employed, employee)
- 3 Unemployed
- 4 Pupil, student
- 5 Apprentice, internship
- 6 In retirement or early retirement
- 7 Permanently disabled
- 8 In compulsory military or community service
- 9 Fulfilling domestic tasks or looking after children/family
- 10 Other
- DK

D_Q09

What kind of employment contract do you have? Is that ... *[Only salaried employee]*

- 1 An indefinite contract (go to D_Q10)
- 2 A fixed term contract (go to D_Q10)
- 3 A temporary employment agency contract (go to D_Q10)
- 4 An apprenticeship or other training scheme (go to D_Q10)
- 5 No contract (go to D_Q10)
- 6 Other

Box A1. Variables used to identify current apprentices and apprenticeship graduates (*continued*)

BQ_01a

Which of the qualifications on this card is the highest you have obtained?

- 1 No formal qualification or below ISCED 1 (Go to B_Q02a)
- 2 ISCED 1 (Go to B_Q01c1)
- 3 ISCED 2 (Go to B_Q01c1)
- 4 ISCED 3C shorter than 2 years (Go to B_Q01b)
- 5 ISCED 3C 2 years or more (Go to B_Q01b)
- 6 ISCED 3A-B (Go to B_Q01b)
- 7 ISCED 3 (without distinction A-B-C, 2y+) (Go to B_Q01b)
- 8 ISCED 4C (Go to B_Q01b)
- 9 ISCED 4A-B (Go to B_Q01b)
- 10 ISCED 4 (without distinction A-B-C) (Go to B_Q01b)
- 11 ISCED 5B (Go to B_Q01b)
- 12 ISCED 5A, bachelor degree (Go to B_Q01b)
- 13 ISCED 5A, master degree (Go to B_Q01b)
- 14 ISCED 6 (Go to B_Q01b)
- 15 Foreign qualification

B_Q01b

What was the area of study, emphasis or major for your highest level of qualification? If there was more than one, please choose the one you consider most important.

- 1 General programmes
- 2 Teacher training and education science
- 3 Humanities, languages and arts
- 4 Social sciences, business and law
- 5 Science, mathematics and computing
- 6 Engineering, manufacturing and construction
- 7 Agriculture and veterinary
- 8 Health and welfare
- 9 Services

Box A1. Variables used to identify current apprentices and apprenticeship graduates (*continued*)**National background questionnaire - Austria****B_Q01aAT**

Which of the qualifications on this card is the highest you have obtained?

- 1 = "No compulsory school"
- 10 = "Post-secondary courses"
- 11 = "Post-secondary colleges"
- 12 = "University courses"
- 13 = "University-Bachelor"
- 14 = "University-Master"
- 15 = "Post-graduate courses"
- 16 = "Doctoral Programme"
- 17 = "Foreign qualification"
- 2 = "Compulsory school"
- 3 = "Apprenticeship"
- 4 = "Vocational School (< 2 Years)"
- 5 = "Vocational School (2 Years and longer)"
- 6 = "Nursing"
- 7 = "Master craftsman's certificate"
- 8 = "Academic Secondary School"
- 9 = "Vocational college"
- .V = "Valid skip"
- .D = "Don't know"
- .R = "Refused"
- .N = "Not stated or inferred"

National background questionnaire - Germany**B_Q01aDE2_REC**

Which of the qualifications on this card is the highest you have obtained?

- 1 = "No professional qualification (yet)"
- 10 = "Doctorate"
- 11 = "Foreign professional qualification"
- 12 = "Another professional qualification"

Box A1. Variables used to identify current apprentices and apprenticeship graduates (*continued*)

- 2 = "Apprenticeship (Lehre)"
- 3 = "Basic vocational training (beruflich-schulische Ausbildung)"
- 4 = "Training at Fachschule, Meister"
- 5 = "Berufsakademie, Fachakademie"
- 6 = "Bachelor at Fachhochschule"
- 7 = "Master/Diplom at Fachhochschule"
- 8 = "Bachelor at university"
- 9 = "Master/Diplom at university"
- .V = "Valid skip"
- .D = "Don't know"
- .R = "Refused"
- .N = "Not stated or inferred"

National background questionnaire - Canada

B_Q01aca6

Which of the qualifications on this card is the highest you have obtained?

- 1 = "No formal education"
- 10 = "Bachelor's degree"
- 11 = "University certificate above the bachelor's"
- 12 = "First professional degree (medical, veterinary medicine, den"
- 13 = "Master's"
- 14 = "Ph.D."
- 15 = "Education not definable by level"
- 2 = "Less than high school diploma"
- 3 = "High school diploma or equivalent"
- 4 = "Trade/vocational certificate (includes an attestation of voc"
- 5 = "Apprenticeship certificate"
- 6 = "CEGEP diploma or certificate"
- 7 = "Non-university certificate or diploma from a college, school"
- 8 = "University transfer program"
- 9 = "University certificate or diploma below bachelor's degree"
- .V = "Valid skip"
- .D = "Don't know"
- .R = "Refused"
- .N = "Not stated or inferred"

Sources: OECD (2013), "The background questionnaire", in *The Survey of Adult Skills: Reader's Companion*, OECD Publishing, Paris, <http://dx.doi.org/10.1787/9789264204027-5-en>; and National background questionnaires in "The Survey of Adult Skills" (unpublished).

Table A1. Distribution of current apprentices (16-65 year-olds) by level of education and training, in %

	Upper-secondary	Short post-secondary	Number of observations
Australia*	83	17	58
Austria	100	0	87
Canada	8	92	63
Denmark	97	0	95
Germany	100	0	116
Netherlands	100	0	75
Norway*	79	21	51

Note: * Results for Australia and Norway are not reliable due to the sample size.

Source: OECD (2016), *Survey of Adult Skills (PIAAC)* (Database 2012, 2015), www.oecd.org/skills/piaac/publicdataandanalysis/.

Table A2. Firm size and literacy skills

Reference group is firms employing more than 50 people. "Firms 50" is firms with 50 or fewer employees

Country	Parameter	Estimate_m	SE	prob_T
Austria	Intercept	256.0622	7.05279	0
Canada	Intercept	287.6763	10.98371	0
Denmark	Intercept	269.1184	7.507157	0
Germany	Intercept	279.6391	6.286906	0
Netherlands	Intercept	288.4626	6.366924	0
Norway	Intercept	244.4325	10.09737	0
Austria	firms50	-4.88844	8.564001	0.569747
Canada	firms50	-21.6098	14.59736	0.142747
Denmark	firms50	-10.7112	8.521074	0.212448
Germany	firms50	-15.9068	8.968389	0.079975
Netherlands	firms50	-14.1289	7.643442	0.068272
Norway	firms50	10.81464	12.2796	0.381152

Source: OECD (2016), *Survey of Adult Skills (PIAAC)* (Database 2012, 2015), www.oecd.org/skills/piaac/publicdataandanalysis/.