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# Firms' motivation for training apprentices: an Australian–German comparison

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INFORMING POLICY AND PRACTICE
IN AUSTRALIA'S TRAINING SYSTEM

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# About the research

## *Firms' motivation for training apprentices: an Australian–German comparison*

Harald Pfeifer, Federal Institute for Vocational Education and Training (BIBB)

Apprenticeships are a well-established pathway to employment across many countries, with a particularly long and enduring history in Germany and Australia. Apprenticeships are characterised by a tripartite relationship between employer, apprentice and training organisation.

The available international literature suggests that the institutional framework for training in a country is an important determinant of a firm's motivation to provide training, and it influences their willingness to bear (at least part) of the training costs.

This study investigates how firms in Germany and Australia compare when dealing with the institutional arrangements for apprenticeship training in their countries, with particular attention given to factors which may impact on their training motivation.

## Key messages

- Employers of trades' apprentices in both Germany and Australia appear to bear substantial costs for training their apprentices.
- Institutional frameworks in Germany foster an investment model, a model which emphasises the benefits of employing apprentices after training, while in Australia some firms adopt more of a production (that is, substitution for 'regular' workers) model of apprenticeship training, although there is a relatively strong investment motivation for trade firms in Australia.
- For firms focused on the short-term costs and benefits of training, the withdrawal of some national government incentive payments in Australia has led to a weaker commitment to training, most evident in non-trade trainee places being offered.
- By contrast, firms training in trade occupations appear to be more investment-oriented and are more inclined to continue training, or employ an apprentice after training, even with the withdrawal of incentives.

This paper does not directly address the relationship between firms' motivation for training, the quality of the training provided and resultant completions. The author points to further needed inquiry into the existence and/or withdrawal of incentive payments on training quality and subsequent labour market outcomes for apprentices.

Dr Craig Fowler
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# Introduction

Apprenticeship training is an important post-secondary education pathway in several industrialised countries. In German-speaking countries in particular, apprenticeship training systems are crucial for the successful integration of youth into the labour market. Among the Anglo-Saxon countries, Australia stands out as a country with a relatively strong vocational education and training (VET) sector, reporting shares of apprentices (as a percentage of all employees) similar to those of Germany (Steedman 2010).

Apprenticeships require the active involvement of firms and the aggregate numbers suggest that firms in the two countries are equally committed to providing training (see figure A1 in the appendix). However, the aggregates do not reveal anything about the firms' *motivation* for training. This information is important for policy-makers aiming to increase the amount of training opportunities for non-university-bound youth.

A large body of theoretical and empirical literature has developed and tested various hypotheses about firms' motivation for providing training. In many of the studies, the costs and benefits of training are central factors in a firm's decision-making process. Lindley (1975) discusses a production (or substitution) motivation for firms to provide training. In his model, firms mainly train apprentices because they are inexpensive substitutes for 'regular' workers. Merrilees (1983), by contrast, discusses an investment model of training, which assumes firms are primarily interested in employing their apprentices long-term. Because the returns on investment are realised over the total expected employment period, firms are willing to bear the costs of training during the apprenticeship period. It is along these lines that Stevens (1994) argues that the main motivation for firms to finance training is the benefit gained by screening apprentices over a period and choosing the best to keep as skilled workers.

Further studies focus on factors explaining the training investment behaviour of firms. Acemoglu and Pischke (1999) and Pischke (1998) argue that wage-setting arrangements, such as collective bargaining agreements or minimum wages, increase training incentives for firms, because they depress wages and thus increase the returns of the training investment. Muehlemann et al. (2010) show in a Swiss—German comparison that extensive employment-protection legislation may increase investment in training, because hiring and firing becomes more costly for the firm and apprenticeship training can be used as a device for screening future employees. Further, Kriechel et al. (2014) show that employee representation at the workplace increases firms' training investment, because works councils assume a monitoring function and ensure a high level of training quality. Finally, Dustmann and Schönberg (2007) highlight the importance of legal and institutional frameworks, which lead to a stronger commitment from firms in training.

These and other studies suggest that the institutional environment in a country is an important determinant of a firm's motivation to provide training and thus their willingness to bear (at least part) of the training costs. Complementing the literature, this paper compares the training behaviour of Australian and German firms. It first

describes differences in the apprenticeship training systems and then develops hypotheses about the motivation of firms in both countries to provide training. It then compares data on training costs in the trade sector. Finally, it analyses the firms' response to a withdrawal of government incentive payments in Australia. The assumption is that the firms who react strongly to changes in government subsidies follow a more production-oriented training strategy, because the payments significantly affect the underlying cost—benefit structure for these firms. Conversely, firms following an investment model of training, motivated by medium- to long-term employment factors, are expected to be less affected by changes, because their cost—benefit structure also takes into consideration returns on the investment for the time beyond the training period.

The results of the analysis support the view that the majority of training firms in Germany are investment-oriented. In Australia, firms in the non-trade sector of training in particular react strongly to changes in incentive payments, supporting the view of a strong production orientation in this training segment. However, the results also suggest a relatively strong investment motivation for trade firms in this country.

The following section briefly describes and compares the Australian and German systems of apprenticeship training, the aim being to understand the contexts in which this training takes place. The following section provides the empirical analysis. The paper presents some concluding remarks.

# The systems of apprenticeship training: a brief review

## Australia

In its initial phase, the Australian apprenticeship system was closely related to the English system, with a supporting legislative framework developed during the nineteenth and twentieth centuries (Gospel 1994; Smith & Brennan-Kemmis 2013). The system changed considerably during the 1980s, when, in addition to 'traditional' apprenticeships, traineeships were introduced in several non-trade industries as a reaction to high levels of unemployment (Karmel, Blomberg & Vnuk 2010). From the mid-1990s, both traditional apprenticeships and traineeships were subsumed under the term 'New Apprenticeships'. More recently, there has been a tendency by researchers and commentators to speak about apprenticeships and traineeships as separate entities. However, the national data collections collect information on contracts of training, which are common to both apprenticeships and traineeships.

The main differences between these two types of training programs are the duration of study, the level of qualifications aimed at and the industry in which the training firms operate. 'Traditional' apprenticeships are developed for a three- to four-year training period, are usually aimed at a level III qualification of the Australian Qualifications Framework (AQF) and are mainly found in firms operating in the industry areas of building and construction, electrotechnology, manufacturing, automotive engineering and hospitality. Traineeships by contrast, usually take between one and two years, are aimed at qualification levels II or III and are provided mainly in the services and business sectors of the economy.

With respect to training curricula, training packages replaced the training course and module curricula from 1997 onwards (Knight 2012). Training packages contain and define the competencies to be obtained over the training period — known as a 'competency-based' approach to training. The role of the specific industry skills councils was to constantly review and modernise the training packages in their fields and to supply guidelines for the assessment of those competencies.

Another important change that occurred at the end of the 1990s was the widening of apprenticeships and traineeships to include currently employed and older workers. From there on, apprenticeships could also be undertaken on a part-time basis. Both of these changes broadened the potential supply of apprentices, who until that time had been almost exclusively young school leavers with little labour market experience (Knight 2012).

The current Australian apprenticeship system is characterised by a user choice approach, which offers individuals several pathways to obtaining vocational qualifications at levels II, III or IV of the qualifications framework. One of the main components of this approach is that apprentices and trainees may obtain off-the-job-knowledge and practical components not only at TAFE (technical and further education) institutes (which are mostly publicly financed), but at any registered training organisation (RTO) with the

relevant courses on its scope of registration. RTOs may include large private companies, as well as small not-for-profit organisations. Furthermore, individual parts of an apprenticeship or traineeship can be undertaken in high school under the school-based apprenticeship model. The perception among stakeholders is that the multitude of pathways has increased the options for individuals, but has also reduced the comprehensibility of the system for potential trainees and training firms.

With respect to the funding of vocational education and training, the Australian Government and state governments finance a large part of the off-the-job training component, which often takes place at TAFE institutes. Furthermore, the government provides for various employer incentive payments (Knight 2012), which have been subject to various changes over time. Overall, government spending on VET has increased in recent years, but not at the same pace as expenditure for schooling and higher education (Noonan et al. 2011; Burke 2013).

Information about direct investment by employers is scarce. Studies providing empirical evidence on training costs include works by Dockery et al. (1997), Dockery, Stromback et al. (2001) and Nechvoglod, Karmel and Saunders (2009), with the authors of these various studies finding significant investment in training. Smith and Billett (2005) discuss results from the *Employer Training Expenditure and Practices, Australia* survey and *Training Practices and Expenditure Survey* (TEPS) of 2001—02, finding relatively high investment in training in Australia (as a percentage of wages) in all VET activities compared with other countries, including Germany. Hence, existing empirical evidence points towards significant net investment by Australian training firms, at least in the traditional trade sector of the economy.

## Germany

In Germany, the apprenticeship system traditionally plays an important role in providing formal qualifications to non-college-bound youth. Although critics have argued that structural change away from traditional trades and industries towards a service-oriented economy can be expected to have weakened the VET sector (Bowman 1993; Baethge, Solga & Wieck 2006), around 60% of school leavers still enrol in an apprenticeship (BIBB 2013).

Although training occupations with a standard studying duration of two years were introduced in 2004, the duration of training for the vast majority of occupations is between three and three-and-a-half years. Currently, training for 330 occupations in all economic sectors is provided in the 'dual system', which combines in-company training of about three days with off-the-job vocational training of two days in a working week. The content of in-company training is defined in a training regulation (*Ausbildungsordnung*), which is legally binding in Germany for every company involved in training apprentices.

Part of the continuing success of the system has been ongoing modernisation and the introduction of new occupations over time. Through the Federal Institute for Vocational Education and Training (BIBB), the tripartite governing board of BIBB has initiated the modernisation of 120 training occupations and the introduction of another 20 new occupations since 2007 (BIBB 2015b). The process of modernising occupations involves

the active participation of both employer representatives and unions in defining standards and skill requirements. The high priority given to the role of the social partners, such as employers' organisations and trade unions, creates a balance of interests between industry skill requirements, as well as high-quality and transferable training.

Despite ongoing modernisation and institutional stability, the German training market has experienced changes in supply and demand over time. At the beginning of the 1990s, the relationship between vacancies and applicants was very much in the applicants' favour; however, this changed dramatically in the mid-1990s, when a shortage of apprenticeship vacancies led to an excess supply of applicants (BIBB 2009). A similar situation emerged between 2002 and 2007. Recent developments, however, point towards a turnaround in the training market, with open vacancies increasing due to demographic changes in German society (Maier, Troltsch & Walden 2011). Additionally, a series of ministerial meetings and agreements between European countries called the *Bologna Process* has exerted pressure on the German training market by introducing bachelor degrees for the first time. This is because better-qualified school graduates, in particular, are increasingly choosing an academic career over an apprenticeship.

With respect to the financing of the apprenticeship training system, the vocational training element of an apprenticeship is wholly provided by state-owned schools (*Berufsschule*), which in their organisational set-up and the employment conditions for their personnel, operate similarly to secondary schools. The average public spending on apprentices was measured to be around €2700 per apprentice in 2012, an increase in recent years from €2300 in 2007 (Statistisches Bundesamt (DESTATIS) 2015).

Companies in Germany contribute significantly to the financing of training, investing an average of €5400 per apprentice and per training year in 2012 (Jansen et al. 2015). These calculations take into account the gross costs of training (wages, costs for trainers and training infrastructure) of €17 900 and, partly offsetting these costs, returns in terms of apprentices' productivity at the workplace, of €12 500. Over time, firms' net investment dropped from €7730 in the year 2000, to €3600 in 2007, before increasing again by €1800 per apprentice and per year up until 2012 (Wenzelmann et al 2009; Schönfeld et al 2016). All in all, a series of surveys conducted by BIBB confirm firms' willingness to contribute to financing the German apprenticeship system.

## Similarities and differences in the Australian and German apprenticeship training systems

A number of similarities and differences can be observed when comparing these two apprenticeship training systems. This section first takes a brief look at the role of the social partners and the legal frameworks in both countries. It then addresses content and quality issues. Finally, flexibility and outcome-related factors, such as certification, completion and post-training employment, are discussed.

### Industrial relations

Both systems rely on the involvement of stakeholders with a vested interest in maintaining and improving the VET sector. The respective legislative and procedural

frameworks assign specific rights and duties to industrial relations institutions (Deissinger, Smith & Pickersgill 2006). However, significant differences become obvious when taking a closer look at employees' formal participation rights and employer representation.

In Germany, the tripartite concept governing the apprenticeship system has remained largely unchanged since the Vocational Training Act (BBiG) in 1969. Unions and employer associations form an equally important part of the tripartite bodies that develop competency and examination standards in all occupational curricula. Additionally, they send representatives to examination boards, who participate (based on a parity principle) in the testing procedures during the final exam of apprentices (BBiG, section 40).

Furthermore, training-related topics are often part of agreements reached via collective bargaining. Unions in particular take up training-related topics and implement them as part of agreement packages. One recent example of this involvement is the 2012 outcome of a state-level collective bargaining agreement in the metal industry, obliging employers to offer any former apprentice a permanent working contract after training.[1] In addition to unions, works councils (who represent workers) are legally entitled to enforce the delivery of training components, as outlined in the respective training curricula and described in the Works Constitution Act of 1972 (or Betriebsverfassungsgesetz, 1972).

Union participation and co-determination rights in the Australian VET sector are less formalised and have undergone significant changes in recent decades. Depending on the government in charge, the scope for unions to 'promote access to VET via collective bargaining or via the industrial tribunal' has been severely limited (Kenchington-Evans, Blaker & Colman 2013, p.11). Most recently, the Liberal Government repealed the previously existing industry skills councils (ISCs), which usually included union representatives, stressing that industry (employers) are the dominant player in 'driving the training package process' (Australian Government 2015b). Cully (2006) describes the Australian VET system as 'a quasi-market for the delivery of training services', which is 'primarily geared towards meeting employer needs' (p.12).

## Legal frameworks

Similarities and differences also exist with respect to the legal framework regulating the relationship between companies, training providers (in German vocational schools) and apprentices.[2] On the one hand, contractual arrangements in both countries define in-company training conditions and working/training timeframes. The contract between company and apprentice includes a probation period, during which each contract partner may withdraw from the contract. After the probation period, the contract can only be cancelled if specific economic or behavioural conditions apply. In both frameworks, an off-the-job training component is part of the training plan and is usually chosen by the company (sometimes in conjunction with the apprentice).

[1] The contract allows companies to deviate from this obligation in case of economic difficulties. In these cases, a 12-month contract has to be offered to the apprentice.

[2] For Australia, the reference framework is the *Apprenticeship and Traineeship Act 2001*. For Germany, the Vocational Training Act (version 2005) applies.

In Germany, off-the-job training is provided by publicly financed vocational schools located near the training company. The setting is often similar to secondary school, with a range of general but also occupation-specific subjects being taught. In Australia, the RTOs are either publicly financed or private institutions. TAFE institutes remain a major player in providing off-the-job training to apprentices. One difference in contractual arrangements is that, in the German framework, apprentice wages paid by the employer are fixed in the contract for the entire training period. The wages must either be at — or no more than 20% below — the industry or occupation-specific collectively bargained wage. In Australia, apprentices' wages are regulated via the awards system and thus are not explicitly fixed in the training contract.

## Training contents

In German firms, training content is formally regulated in the *Ausbildungsordnungen* (training regulations), which contain the knowledge and skills to be gained during the apprenticeship. Furthermore, they contain a timeframe and the requirements for the final exam. The training regulations are occupation-specific and are developed by tripartite working parties, who communicate the results of their work to either the Ministry of Trade and Commerce or the Ministry for Education and Research, which formally approves the regulation. The training regulations apply to all companies training apprentices in an occupation in Germany.

In Australia, accredited training is organised around training packages, which define the competency standards, qualifications and assessment guidelines for qualifications. Training packages are not specific to individual occupations, but rather describe the competencies and skills needed in work roles or even in a specific (usually large) company. They are relevant for both the training company[3] and the off-the-job training organisation (RTO). In theory, all of the parties (employer, employee and RTO) involved develop a training plan, in which the competency and skill development, as well as the intended outcome, are determined. Until recently, training packages were developed and updated through the industry skills councils. Recently, however, a new governance structure was introduced for the development and review of training packages.

The change to a competency-based training model and the introduction of training packages as a way of standardising competencies have triggered some criticism in the VET research community. The general argument being put forward is that competency-based training is a mechanism 'through which the working class is denied access to powerful knowledge represented by the academic disciplines' (Wheelahan 2007, p.637). Misko (2006) further emphasises that giving employers the flexibility of choosing the competencies they require from training packages may come 'at the expense of an in-depth preparation for the occupation as a whole' (p.34). Misko (2006) also highlights the risk of employers not choosing the right training packages if they are unaware of all training package options. On the other side, Simons et al. (2003) stress the potential for improvement by new and flexible approaches to training and assessment by defining 'endpoints for learning but not how to get there' (p.7). Smith (2002) provides a review of critical literature on training packages.

[3] In Australia, the training company is generally referred to as the employer (of the apprentice).

## Quality assurance

In Australia, regulation of training has undergone a series of reforms and changes and over time more emphasis has been placed on the skills outcomes of training as well as issues such as consumer protection. In 2011, a national regulator for VET was established, the Australian Skills Quality Authority (ASQA). This body has as part of its mandate regulation of VET providers, including accredited VET course providers dealing with courses for overseas students.

Additionally, in 2011, the VET Quality Framework was introduced (with similar intent to the preceding Australian Quality Training Framework [AQTF]). This framework underpins quality in the system and comprises the standards for national VET registered training organisations. It aims to achieve national consistency in the way by which providers are registered and monitored, and quality standards are applied and enforced. The framework addresses issues of probity including: the Fit and Proper Person Requirements; the Financial Viability Risk Assessment Requirements; the Data Provision Requirements; and the Australian Qualifications Framework. If providers want to be registered with the Australian Skills Quality Authority, they will need to identify how they are or will: be responsive to industry needs; address quality assurance issues; ensure that information they hold is secure and accurate; ensure that information about the services they provide is accessible; and how learners will be informed and protected (Misko 2016).

Victoria and Western Australia, whose training organisations are not covered by the Australian Skills Quality Authority (except where they provide courses interstate or overseas), continue to address the standards of the 2010 Australian Quality Training Framework and the 2007 Standards for Registering and Accrediting Bodies. The AQTF standards implemented in these two states cover very similar issues as those covered by the national VET regulator, the Australian Skills Quality Authority.

In 2015 new arrangements were put in place for the development of training products, aimed at giving industry a greater voice in VET policy-making. To this end, the Australian Industry and Skills Committee (AISC) was created and comprises chief executive officers of major enterprises and industry peak bodies. The role of the committee is, among other things, to advise government on quality standards, endorse qualifications, provide industry input into the direction for VET research, and industry input into the ministerial council (Misko 2016). In addition, industry reference committees (IRCs) were appointed by the Australian Industry and Skills Committee to represent the needs of particular industry sub-sectors, while service skills organisations (SSOs) were formed to assist the IRCs.

In Germany, the chambers of commerce and trade and the chambers for the trades have at least two important functions in training quality assurance. First, the chambers are mandated by the Vocational Training Act (BBiG) to foster and monitor the quality of the training provided by companies. Second, they function as the recognised authority for both registering apprentices and organising the assessment and examination of their skills by the tripartite examination committee. Finally, they are important for accrediting a firm's training capability. In order to train apprentices, every company has to nominate a person who has obtained the *Ausbildungseignung* (trainer qualification),

which proves both pedagogical and professional capability for training apprentices. This process is steered by the appropriate chamber.

The strong role of the chambers has been criticised, especially by the unions, as they represent their members' (firms') interests, as well as being assigned to monitor training quality on behalf of apprentices (Deutscher Gewerkschaftsbund (DGB) 2015).

In the German apprenticeship system, works councils, in addition to the chambers, play an important role in quality assurance. Works councils can be established by employees in any company employing more than five workers, with the likelihood of having a council increasing as the size of the firm increases. Although only around 10% of all companies have a works council, more than 40% of all employees are working in a company with one (Ellguth & Kohaut 2014). The Works Constitution Act is the legal framework defining the rights and duties of works councils, and explicitly describes their role as a one of quality assurance. In a recent study, Kriechel et al. (2014) found that companies with a works council invest more resources in training apprentices and employ a larger share of training graduates on a long-term basis. With respect to off-the-job training, quality assurance is undertaken by the respective state departments responsible for that area of vocational training.

## Flexibility of the system

The Australian and German systems of apprenticeships differ greatly in terms of their flexible pathways to qualifications. In Australia, apprenticeship training is characterised by RTOs providing off-the-job training in direct competition with each other, due to the introduction of user choice in the 1990s (Hellwig 2008). This approach essentially grants employers the freedom to choose among several providers of off-the-job training. As described above, the provider may be a local TAFE institute, but it may also be a private commercial training provider or even an RTO established within a larger company. As well as the flexibility arising for employers from this 'freedom of choice', individuals may also choose from several pathways leading to a formal qualification within the AQF. For example, apprentices may start an apprenticeship during their regular secondary school enrolment as part of the VET in Schools program. They may sign up with a company directly, or opt to go with a group training organisation, which then places apprentices on an ongoing basis with other enterprises as their 'host employers' for their on-the-job training (Buchanan & Evesson 2004).

Another form of flexibility arises from the fact that apprenticeships have been open to 'adult' apprentices since the late 1990s. Therefore, apprenticeships in Australia are not necessarily restricted to school graduates, but offer an effective model for certifying skills learned over a longer period in the labour market. Taken as a whole, the VET reforms undertaken in the last two decades in Australia have significantly increased the options for individuals to gain VET qualifications, including apprenticeships.

In Germany, the apprenticeship system remains relatively static and inflexible when compared with the current Australian framework. Apprenticeships are still predominantly aimed at providing young school graduates with an upper-secondary qualification and facilitating the transition of youth from education to the labour market. Furthermore, the combination of general education (the off-the-job training

component) and on-the-job training has remained unchanged since the post-war period. For individuals, options for changing pathway during a training program are limited, because occupational curricula are not developed on a modular basis. Firms often complain about the lack of flexibility in the off-the-job training components, in that apprentices need to attend vocational schools at predetermined times and this leaves little room for the work demands of the training company.

## Completion and certification

In Australia, an apprenticeship is completed when the formal qualification has been issued by the RTO and the employer considers the apprentice or trainee competent to industry standard (NSW Department of Education and Communities 2011). If both of these requirements have been met, the state/territory training authority will certify the successful completion of the contract, after being provided with necessary evidence. Apprentices may then apply for a licence for their trade, which is mandatory for working in some industries (NSW Department of Education and Communities 2011).[4]

In recent years, completion rates for trade apprenticeships have been between 46% and 48%, with projections for 2014 dropping to around 41%. For traineeship contracts, the completion rate is somewhat higher, at around 52%, and dropping to 50% for 2014. When considering individual completion rates, which are calculated at the personal level rather than at the contract level, completion rates reached between 56% and 58% in trade and non-trade occupations in 2010, the last year for which figures are available (NCVER 2015). Extensive studies have been undertaken to analyse the reasons for non-completion in the Australian apprenticeship system. In a recent assessment, Bednarz (2014) finds employment-related problems such as conflicts with the employer or co-workers or dislike of the type of work to be performed to be important reasons for young people not completing a contract. Notably, however, personal reasons (such as career changes) or being made redundant are the causes of every second non-completed contract (Bednarz 2014, p.13). With respect to determinants for completion, Mlotkowski and Karmel (2011) indicate that, among other factors, the completion rate depends on the difference between wages in alternative employment and training wages.

In Germany, the employer notifies the chamber responsible that the apprentice is ready for the final examination. According to the Vocational Training Act, the employer is responsible for preparing the apprentice for the final examination. The examination is standardised at a national level and, if they pass, the apprentice receives a certificate issued by the chamber and the vocational school. Although generally lower than in Australia, non-completion is also an inherent problem in the German apprenticeship system. About 20% to 25% of apprenticeship contracts are terminated, while the individual drop-out rate is lower, with a maximum of 16% (Uhly 2015).[5]

## Post-training employment of apprentices

[4] Stanwick (2011) points out that there is only a loose relationship between obtaining licences and apprenticeships and traineeships, even for those occupations which do require a licence.

[5] Reference year is 2012. Due to data restrictions, a true drop-out rate cannot be calculated. However, because an unknown share of individuals may return to apprenticeships later in their career, the drop-out rate is likely to be below the maximum of 16% (see Uhly 2015).

Apart from direct information about training costs, the post-training employment of apprentices in their training firm can serve as an important indicator of firms' motivation for training. For example, Mohrenweiser and Backes-Gellner (2010) use data on the retention of apprentices to argue that a larger share of German firms apply an investment strategy for training, one that focuses on medium- to long-term employment returns, rather than a short-term strategy, relying on returns through employment during the training period alone. Comparing the share of apprentices remaining employed after training in Australia and Germany, some differences emerge from the data. In Australia about 43% of apprentices continue to be employed in the training firm, but German firms retain about 60% of their apprentices.[6]

The two systems of apprenticeship training have gone down different roads since the 1990s. In Germany, the institutional framework, with its strong cooperative elements, has remained largely unchanged, while Australia has introduced several important reforms which have increased competition among training providers and offered greater choice to individuals and firms. The introduction of competency-based training packages has meant a 'decomposition' of the traditional occupations and introduced more flexibility into the system. With respect to the topic of this paper (and assuming all things remain constant), the motivation for firms to be involved in training should remain relatively persistent in Germany due to the high degree of standardisation and consistency. For Australia, far-reaching reforms over the last two decades have made it more difficult for firms to plan long-term. One could therefore expect Australian firms to be less inclined to invest in training apprentices. The relatively low retention rate suggests that a training investment strategy plays a less important role for Australian firms than for German firms. However, whether this is indeed the case is assessed empirically in the next sections.

[6] The data source for Australia is the Apprenticeship Destination Survey of 2011. For Germany, the data comes from the IAB Establishment Panel 2010.

# Data analysis

## Direct evidence on employer investment in apprenticeships

The following section presents evidence of employers' training investment, available from surveys and case studies in both countries. The numbers presented in table 1 are aggregates from firm-level interviews conducted using detailed questionnaires on employers' expenditure on, and direct returns from, apprenticeship training. For Germany, a large-scale survey of training firms collected information about training costs for about 3000 firms. The Australian 'case-study' data presented by Dockery et al. (1997) focus on certain trades only, so for this comparison the German averages shown in table 1 correspond to 1155 firms training in the same trades analysed in the Australian case studies.

**Table 1 Net costs of apprenticeship training (€s)**

| | Germany (year 2000) | | Australia (year 1996) | | |
|---|---|---|---|---|---|
| Occupation | Net costs | Cases | Net costs | Cases | Difference |
| Metals | 26 874 | 304 | 23 047 | 14 | 3827 |
| Electrical | 30 894 | 253 | 36 392 | 7 | -5498 |
| Building | 16 330 | 172 | 31 763 | 6 | -15 433 |
| Printing | 32 915 | 95 | 25 223 | 7 | 7692 |
| Vehicle | 28 585 | 41 | 24 648 | 5 | 3937 |
| Food | 11 911 | 210 | 1668 | 6 | 10 243 |
| Horticulture | 10 102 | 41 | 27 592 | 6 | -17 490 |
| Hairdressing | 12 915 | 39 | 15 213 | 7 | -2298 |
| **All trades** | **24 058** | **1155** | **23 273** | **58** | **785** |

Sources: The values for Australia are taken from Dockery et al (1997), the values for Germany calculated from the BIBB Cost-Benefit Survey 2000. Adjustments of consumer prices based on 2015 release of consumer price index from Statistisches Bundesamt (DESTATIS) of Germany and Australian Bureau of Statistics. Exchange rate as of 1st September 2000 (European Central Bank).

Calculations of net costs include the same components in both countries. The main components on the costs side are the apprentices' wages and the costs for full- or part-time trainers. The latter costs use calculations for the time the trainers spent on training and values this time at the wage usually paid to the person providing training. Costs for infrastructure, machinery and training materials are also included in the cost calculations. With respect to the benefits of training, the cost—benefit model uses a substitution approach to calculate the value of work the apprentices provide during their training period. It first determines the apprentices' work volume and attaches this work volume to a wage usually paid to unskilled/skilled workers. The difference between the costs and benefits as described above are the net costs.

Table 1 illustrates that, at the time these costs and benefits were calculated, the net costs for training apprentices were, on average, similar in the two countries. Furthermore, in the metals, hairdressing, vehicle and electrical sectors, there are noticeable differences, although they are not overly large. However, in the horticulture,

food or building sectors, the differences in net training costs are very large and in some cases lower in Germany, while in other cases lower in Australia.

However, there are several reasons why the above comparison must be interpreted carefully. Firstly, the calculations are snapshots at different points in time in the two countries and therefore do not take into account differences in economic and institutional circumstances. Secondly, the Australian data are based on only 58 cases, which is a too small a sample to draw conclusions about the entire group of training firms. Thirdly, the data are relatively old and, considering the above discussion, they could be outdated, especially in the case of Australia, where the apprenticeship system has undergone significant changes since the late 1990s. The numbers of traineeships had just increased due to these changes and later calculations show these programs to involve lower costs than traditional apprenticeships (see Dockery, Stromback et al. 2001).

Despite these shortcomings, the data suggest that, at that time, employers in both countries were willing to invest significant resources into training apprentices. For Germany, more recent data confirm that training firms are investment-oriented. Figure A2 in the appendix depicts the distribution of net costs as calculated for the training year 2012—13. The majority of firms train with positive net costs, which average about €5600 per apprentice and per training year. Newer data for Australia are not available, so the next section applies an indirect approach to determine the training motivation of firms in this country.

## Indirect evidence: the withdrawal of public incentive payments to employers

### Employer incentive payments

The Australian Government introduced incentive payments in the mid-1990s to reduce the costs of apprenticeships and traineeships and to encourage employers' involvement in training (Knight 2012). An incentive payment was paid to employers when an apprenticeship commenced and another upon completion of the apprenticeship. Although the incentive payments had undergone several changes by the year 2012 (and were supplemented by other financial support measures targeted at certain groups of the population and/or regions), major policy reform was introduced in the years 2012 and 2013. This reform saw the abolition of incentive payments for workers in occupations that were not listed on the National Skills Needs List (NSNL).[7] In July 2012, the commencement payment of A$1500 was withdrawn for apprentices in non-NSNL occupations, and the completion payment of A$2000 was withdrawn in 2013.

In the absence of up-to-date direct evidence on training investment by Australian firms, this section analyses the consequences of a withdrawal of public subsidies for employing apprentices and trainees in Australia, the rationale being that companies that train apprentices for production purposes have little interest in the long-term (employment)

[7] The National Skills Needs List 'identifies traditional trades that are identified as experiencing a national skills shortage. This list is based on detailed labour market research and analysis'; see Australian Government (2015a).

gains from training, but rather focus on maximising short-term benefits. Short-term benefits arise if the cost of training apprentices (for example, the wages of apprentices and trainers) is lower than their productivity. Since public incentive payments are a premium for employing apprentices, they increase the short-term benefits for production-oriented companies, while they are of less importance for companies interested in employing the apprentice long-term (that is, beyond the training phase).

This section makes use of this argument by analysing the impact of withdrawing government incentive payments on companies' demand for training. The hypothesis is that production-oriented training companies will reduce their demand for apprentices (or cease their training activity completely) due to the withdrawal of public incentive payments. By contrast, companies with an employment motive remain in the training market due to their long-term calculation of costs and benefits, which are less affected on average by the withdrawal of incentive payments. The following analysis takes this argument to the level of training systems and 'tests' for the training motivation of the average training firm in Australia.

## Data

To analyse the impact of incentive changes on the demand for apprenticeships, this section uses administrative micro data relating to the number of apprenticeship contracts commenced during the relevant reference periods. The data are collected by the state training authorities, where all apprenticeship and traineeship contracts (that lead to a nationally recognised qualification) are registered. The data are directly transferred to NCVER, which undertakes plausibility and quality checks. These records contain a great deal of information on individuals, such as gender, nationality, highest educational level, age or duration of the contract. Furthermore, each record provides information about the employer and where the on-the-job training component of the apprenticeship takes place. This includes employer type (private or public), industry and region.

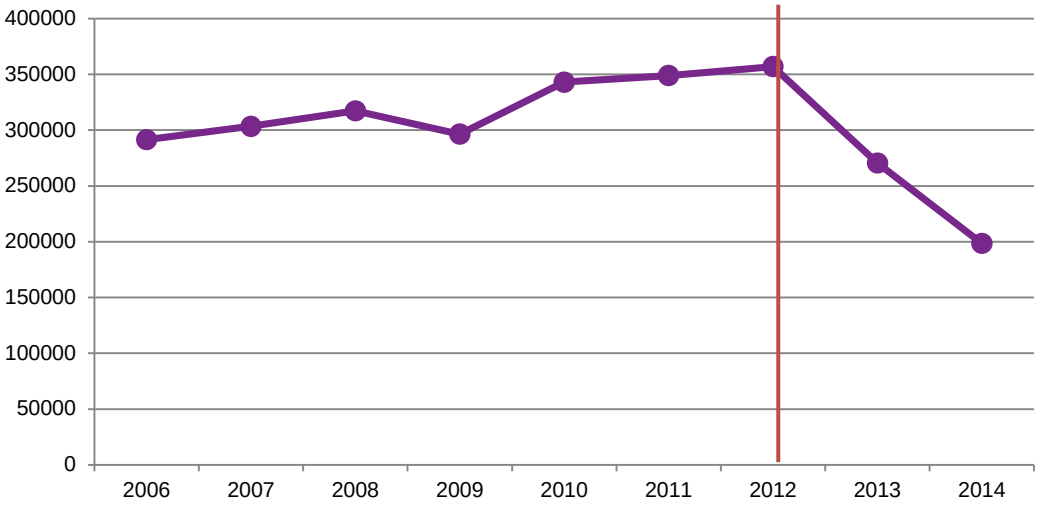
For the purpose of this paper, the reference years 2006 to 2014 are used, providing information on 2 723 549 individual apprenticeships or traineeships. For the regression analysis, the number of contracts is aggregated at an occupational level (ANZSCO 6-digit level).[8] Of the 663 training occupations, those occupations that had registered fewer than ten contracts over the reference period are removed from the panel. The reason for this data reduction is to exclude occupations from the analysis for which training is very rarely provided in Australia and therefore could be considered as less marketable across the country. Furthermore, these occupations may differ in their unobservable characteristics, which could bias the regression results. In total, 454 occupations remain for the regression analysis presented below.

[8] The Australian and New Zealand Standard Classification of Occupations; there are various levels in ANZSCO, ranging from Major Group (1-digit level) through to its most detailed level, Occupation (6-digit level).

## Description

Figure 1 provides an overview of the annual number of newly commenced apprenticeships and traineeships during the years 2006 to 2014. From 2006 to 2012, the number of new contracts increased steadily, whereas 2009 represents an exception. The lower number of new contracts could be attributed to the aftermath of the Global Financial Crisis, which led to a slowdown in gross domestic product (GDP) growth (ABS 2016). Following 2012, the number of new apprenticeship contracts dropped sharply, from over 350 000 in 2012, to about 200 000 in 2014, a decrease of about 43%.

**Figure 1 Number of new contracts for Australian apprenticeships, 2006–14**




Source: NCVER Apprenticeship and Traineeship Collection 2006-14.

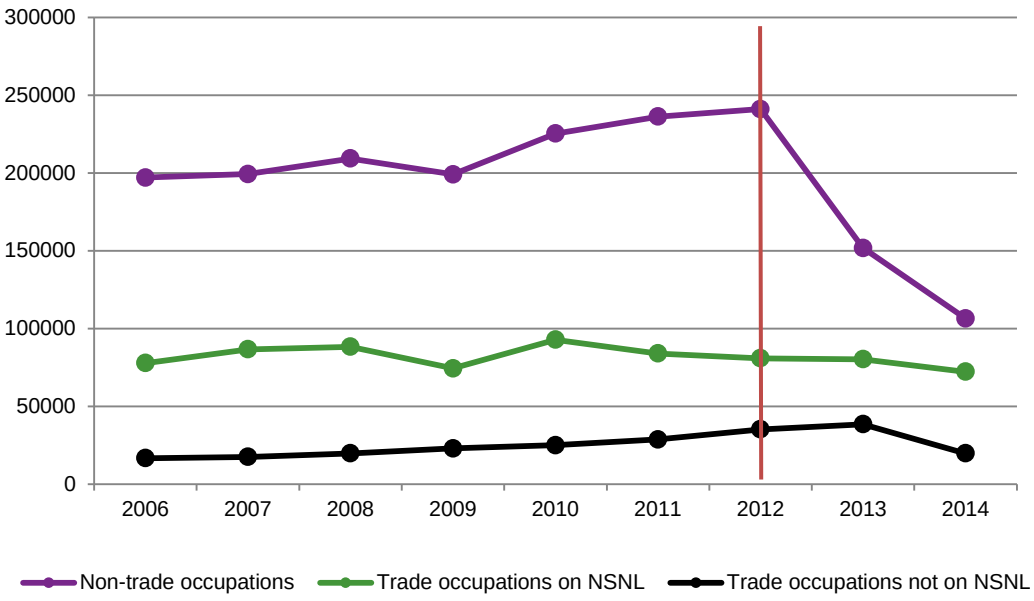
Figure 2 takes a closer look at commencements for the occupations listed or not listed on the NSNL. The figure suggests that the sharp drop in apprenticeship commencements almost entirely concerned those occupations not listed on the National Skills Needs List. Commencements in NSNL occupations remained relatively stable up until and following the policy reforms in 2012 and 2013.

**Figure 2 Number of new apprenticeship contracts in occupations on the National Skill Needs List and others, 2006–14**


Source: NCVER Apprenticeship and Traineeship Collection 2006 -14.

Finally, figure 3 shows the trends for commencements in trade and non-trade occupations. Bearing in mind the previous comparison of direct data on the net costs of apprenticeship training (see table 1), this figure distinguishes between occupations within the trade sector that were or were not on the NSNL.

**Figure 3 Number of new apprenticeship contracts in trade and non-trade occupations, 2006–14**




Source: NCVER Apprenticeship and Traineeship Collection 2006 -14

This figure shows that, in the aftermath of the policy changes, new enrolments in the trades remained relatively stable. While enrolments in trade occupations actually increased in the year following the withdrawal of the commencement incentive, in 2013, a drop occurs in the number of enrolments in 2014, as the figure shows.

Overall, this graphic and a purely descriptive analysis of new apprenticeship contracts over time suggest that the main impact of the incentive withdrawal took place in occupations that were in the non-trade sector of training. However, the descriptive analysis does not take into account structural changes over time. To accommodate this, the subsequent section uses difference-in-difference regression techniques to identify the size and significance of the impact of the withdrawal of the incentive.

## Regression analysis

The econometric approach to estimating the impact of withdrawing the incentive is based on a standard difference-in-difference approach, frequently used in the literature to analyse effects of policy changes on certain outcome variables. The idea of a difference-in-difference approach is to compare an outcome for a group (usually individuals or firms) that have been subject to a 'treatment' (like a specific policy measure) with the outcome of a group that has not been subject to this treatment. However, because differences in the outcomes after the treatment may have been caused by factors other than the treatment itself, it is important to also control for the group differences that were already present before the treatment. Thus, in order to implement a difference-in-difference estimation strategy, information for the outcome needs to be available before and after the treatment, for both groups of subjects.

Applied to the topic of this paper, the strategy is to compare the number of newly signed training contracts[9] (the outcome) across two groups of occupations. The first group consists of occupations for which firms received incentive payments upon signing a new training contract, before and after the policy reform. The second group consists of occupations for which firms received incentive payments only prior to the policy reform (up until 2012).

A simple implementation for a difference-in-difference approach is an Ordinary Least Squares (OLS) regression model, which includes a variable indicating whether the occupation has been on the National Skills Needs List (and receives incentive payments after the policy reform) or not. Another variable accounts for when the contract is signed. This variable is dichotomous, indicating whether the contract was signed before or after the policy reform. However, the variable of interest is the interaction of both variables, which can be interpreted as the treatment effect of the policy reform on the number of newly signed apprenticeship contracts. Descriptive information on the sample is provided in table A1 in the appendix.

Due to the richness of the data, the model can take into account a number of factors that could confound the policy effect of removing the incentives for certain occupations. Firstly, a number of individual-level variables, such as gender, age and educational level, can be controlled for. These apprentice-level characteristics may be important determinants of the outcome of new contracts. Secondly, contract-specific variables, such as contract duration or contract type, can also be included in the regression model. Because the data also contain firm-level information, the models can also control for firm size. Finally, time-specific trends in occupations may play an important role in the

[9] Referred to in Australia as commencements.

number of signed contracts and are therefore controlled for in the regression framework.

The regression equation takes the following form:

$$y_{it} = \beta_0 + \beta_1 \text{NSNL}_i + \beta_2 \text{AFTER}_t + \beta_3 \text{NSNL}_i * \text{AFTER}_t + \beta_4 X_{it} + u_{it},$$

where $y_{it}$ is the (log) number of newly signed apprenticeship contracts in occupation *i* in year *t*. $NSNL$ is the dummy variable for occupation *i* being on the list of occupations still receiving incentive payments and $AFTER$ is the indicator of signing a contract after the policy reform (that is, at *t*). $NSNL_i * AFTER_t$ is the interaction term of interest, whereas $X_{it}$ is a vector of control variables, as discussed above.

Table 2 provides results for three different regression models. Model 1 includes only those variables identifying the impact of the policy change on newly signed training contracts (that is, whether the occupation is on the NSNL, when the contract was signed and their interaction). Model 2 also includes variables on the duration of the training contract, the (average) age of the apprentices and the share of male apprentices in an occupation. Finally, model 3 includes the full set of structural characteristics discussed above.

**Table 2 OLS regression analysis of the impact of incentive withdrawal on new training contracts**

| | Model 1 | Model 2 | Model 3 |
|---|---|---|---|
| Dependent variable: number of new training contracts (log) | | | |
| Occupation ***not*** on NSNL | -1.42*** | -1.81*** | -1.97*** |
| | (-0.14) | (-0.15) | (-0.16) |
| Contract signed ***after*** incentive withdrawal | 0.23 | 0.32 | 0.002 |
| | (-0.26) | (-0.25) | (-0.16) |
| **Interaction '*Not* on NSNL' and '*after* withdrawal'** | **-0.53*** | **-0.56**** | **-0.37**** |
| | (-0.28) | (-0.27) | (-0.16) |
| Duration of training contract (occupation mean) | | -0.0005*** | -0.0001 |
| | | (-0.0002) | (-0.0001) |
| Age of apprentice (occupation mean) | | 0.0297*** | 0.0079 |
| | | (-0.0057) | (-0.0060) |
| Gender: male (occupation mean) | | -0.87*** | -0.61*** |
| | | (-0.13) | (-0.14) |
| Controls for educational level (11 categories) | No | No | Yes |
| Controls for firm size (9 categories) | No | No | Yes |
| Controls for region (8 states) | No | No | Yes |
| Controls for contract type (7 categories) | No | No | Yes |
| Occupational trends | No | No | Yes |
| Year dummies | No | No | Yes |
| Observations | 3065 | 3065 | 2961 |
| R-squared | 0.06 | 0.12 | 0.75 |

Note: Data aggregated at occupational level. Robust standard errors are given in parenthesis. Significance levels: * p-value < 0.1, ** p-value < 0.05 and *** p-value < 0.01.

Source: NCVER Apprentice and Trainee Collection 2006–14.

Of primary interest in the regression table is the interaction term of 'occupations not on the NSNL' and the indicator of whether the contract was signed before or after the policy reform. In all three models, the interaction term is negative and significant, suggesting that withdrawal of the incentive payments has had a negative effect on the number of new contracts in occupations not on the NSNL. Although the size of the coefficient decreases from Model 1 to Model 3, the effect is substantial, even when controlling for a large set of controls in the regression model.

Table 3 concentrates on the subset of trade occupations. The models shown in the regression output thus shed light on the question of whether the withdrawal of the incentive payment also had a negative effect within this specific group of occupations.

**Table 3 OLS regression analysis of the impact of incentive withdrawal on new training contracts in trade occupations only**

| | **Model 4** | **Model 5** | **Model 6** |
|---|---|---|---|
| Dependent variable: number of new training contracts in trades (log) | | | |
| Occupation ***not*** on NSNL | -1.88*** | -1.67*** | -1.68*** |
| | (-0.15) | (-0.17) | (-0.17) |
| Contract signed ***after*** incentive withdrawal | 0.23 | 0.13 | 0.16 |
| | (-0.25) | (-0.25) | (-0.16) |
| **Interaction '*Not* on NSNL' and '*after* withdrawal'** | **-0.30** | **-0.20** | **-0.23** |
| | (-0.31) | (-0.31) | (-0.17) |
| Duration of training contract (occupation mean in days) | | 0.0006** | 0.0008*** |
| | | (-0.0002) | (-0.0002) |
| Age of apprentice (occupation mean) | | 0.0093 | -0.0078 |
| | | (-0.0109) | (-0.0112) |
| Gender: male (occupation mean) | | -0.17 | -0.55** |
| | | (-0.25) | (-0.232) |
| Controls for educational level (11 categories) | No | No | Yes |
| Controls for firm size (9 categories) | No | No | Yes |
| Controls for region (8 states) | No | No | Yes |
| Controls for contract type (7 categories) | No | No | Yes |
| Occupational trends | No | No | Yes |
| Year dummies | No | No | Yes |
| Observations | 1085 | 1085 | 1054 |
| R-squared | 0.17 | 0.20 | 0.82 |

Note: Data aggregated at occupational level. Robust standard errors are given in parenthesis. Significance levels: * p-value < 0.1, ** p-value < 0.05 and *** p-value < 0.01.

Source: NCVER Apprentice and Trainee Collection 2006 –14.

Table 3 suggests that also in the trade occupations the policy reform reduced the number of new contracts. However, the coefficient is not statistically significant in any of the three models (Model 4 to Model 6).

Despite the extensive information provided by the data, the regression results need to be interpreted with care. First, the econometric strategy does not fully take into account the possibility of an announcement effect. Firms can anticipate the policy reform (and daily enrolment figures indeed provide evidence for such behaviour) and increase their training activity prior to the reform. This would lead to an increase in the number of newly enrolled apprentices shortly before the policy reform and a steep drop afterwards. This paper has used yearly enrolment data and includes several years prior

to the reform to address this issue. However, with the simple difference-in-difference approach, it cannot be claimed that possible announcement effects have been fully controlled for.

# Conclusion

The main purpose of this paper was to shed light on the motivation for Australian and German firms to become involved in apprenticeship training. The paper first took a closer look at the apprenticeship training systems in Australia and Germany. As measured by participation rates, the apprenticeship training systems of the two countries are of similar importance for training workers, but there are great differences in their respective institutional frameworks. Particularly over the last two decades, the Australian system has been subject to numerous changes intended to increase: competition among providers; flexibility for (potential) apprentices; and incentives for training companies to become involved in training. In contrast to the relatively dynamic policy-driven development in the Australian apprenticeship system, the German system has remained stable in the context of its main institutional features.

This paper then addressed the question of whether firms in the two countries follow a production-oriented training strategy — one that emphasised short-term profit maximisation — or whether they follow an investment-oriented training strategy, a strategy characterised by short-term training investment and medium- to long-term returns generated by their employees' improved skills. Therefore, the paper analysed direct data on firms' training costs in order to make inferences about firms' training motivation. Although this comparison is based on relatively old data, which apply to trade occupations only, and in the case of Australia only involves case studies, the net training costs in both countries are quite similar. In both countries, firms appear to bear substantial costs for training their trade apprentices.

To further investigate Australian firms' training motivation, this paper applied an indirect approach. It used a recent withdrawal of government incentive payments for a subset of occupations to analyse firms' reaction to this withdrawal. The proposition was that investment-oriented training firms would not react as strongly to a withdrawal of an incentive payment, since for these firms the medium- to long-term benefits of training should even out the short-term costs arising from the withdrawal of the incentive payment. For firms focusing on the short-term costs and benefits of training, withdrawal of incentive payments could be expected to lead to a weaker commitment to training and, in turn, fewer apprenticeship places being offered. The results of a difference-in-difference regression analysis imply that firms in the non-trade sector of training in particular have reduced their training engagement significantly, due to the withdrawal of incentives. By contrast, firms training in trade occupations show a less strong adjustment following this withdrawal.

With respect to the purpose of this paper, the analysis suggests that the majority of German firms still train with an investment motive, emphasising the benefits of employing trained workers after training. Recent data on net training costs and retention rates confirm that two-thirds to three-quarters of training firms take initial costs into account, which then have to be offset by the benefits arising from the continued employment of former apprentices. In Australia, in the context of an incentive payment to employers, the non-trade sector of training in particular has been strongly shaped by firms that followed a short-term training and employment strategy

prior to withdrawal of the incentive. However, the trades appear to be more investment-oriented, showing significant training investment and a less severe reaction to its withdrawal.

While the results presented above are interesting for both the research community and policy-makers, some important issues are beyond the scope of this paper and could be addressed in future research. Firstly, this paper does not address the relationship between a firm's motivation for training and the quality of the training provided in the system. As the case of Switzerland shows, low-cost training (from the firm's perspective) does not necessarily imply low-quality outcomes for apprentices (Wolter & Ryan 2011). However, concerns about the deterioration of quality due to deregulation and government subsidies have been raised (Snell & Hart 2007). The question arises: what consequences does the withdrawal of incentive payments have (apart from a quantitative reduction of training) on the quality of training in a system? Secondly, and related to the above issue, is the issue of how training costs are related to labour market outcomes for apprentices. Recent research shows a significant relationship between training costs and post-training wages in Germany (Dietrich, Pfeifer & Wenzelmann 2016). Although labour market returns from trainees have also been discussed in the Australian context (Dockery, Koshy & Stromback 2005), it would be beneficial to use the recent policy changes to obtain more up-to-date insights on this issue.

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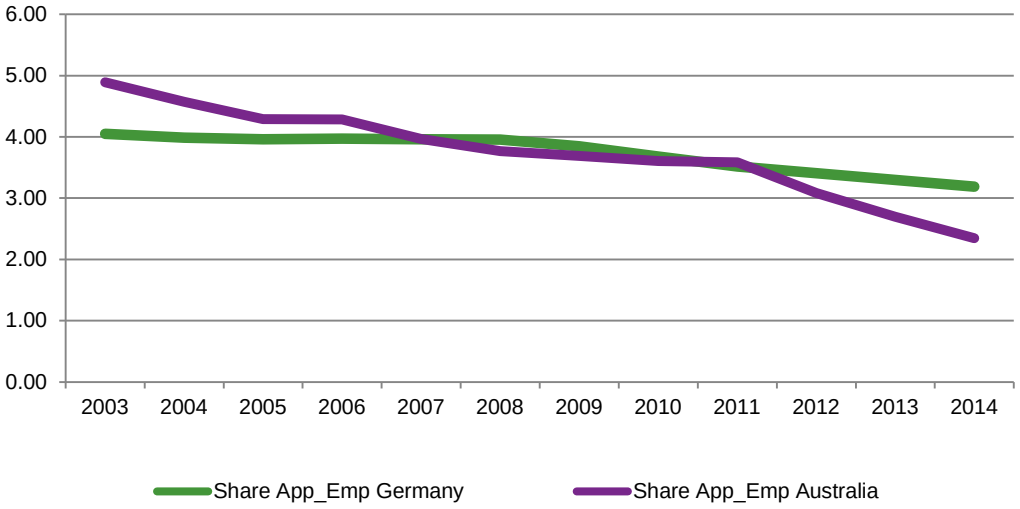
# Appendix

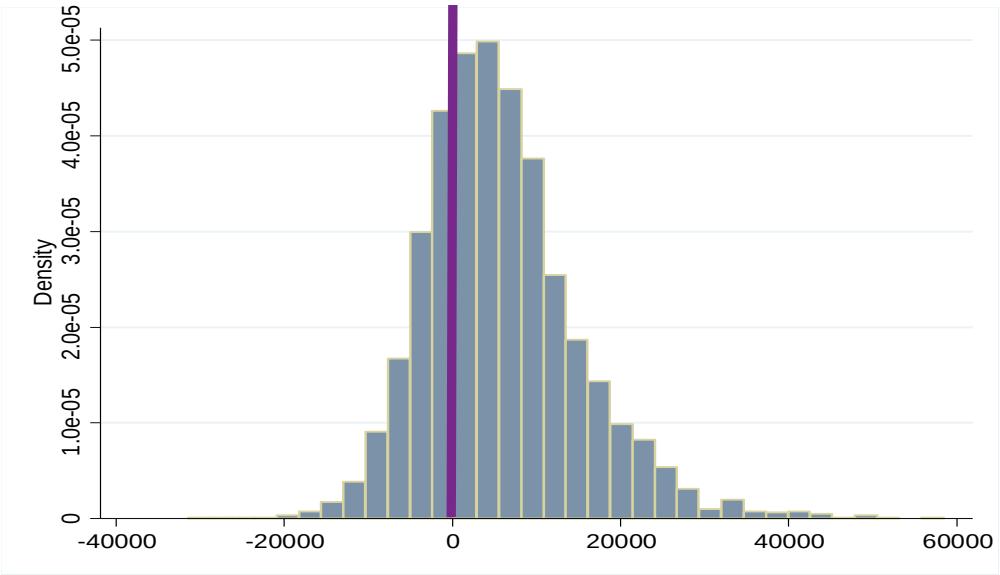
## Figures and tables

**Figure A1 Share of apprentices among all employees (Share App_Emp) in a given year (%)**




Sources: DESTATIS 2003–13; ABS Labour Force, Australia, Detailed, cat. No 6291.0.55.001; NCVER Apprentice and Trainee Collection 2003–15.

**Figure A2 Distribution of net training costs (€s) across firms in 2012–13**




Source: BIBB Cost-Benefit Survey (CBS) 2012–13.

**Table A1 Descriptive information relating to the Australian data used for regression analysis**

| Variable | Mean | Std. dev. |
|---|---|---|
| Age of apprentices < 16 | 0.12 | 0.32 |
| Age of apprentices 16 to 19 | 0.26 | 0.44 |
| Age of apprentices 20 to 24 | 0.19 | 0.40 |
| Age of apprentices 25 to 34 | 0.18 | 0.38 |
| Age of apprentices >34 | 0.25 | 0.43 |
| Male apprentices | 0.59 | 0.49 |
| Average duration of training | 1.82 | 1.26 |
| In full-time training | 0.74 | 0.44 |
| Did not attend school | 0.00 | 0.02 |
| Year 8 or below | 0.01 | 0.10 |
| Year 9 or equivalent | 0.06 | 0.24 |
| Completed Year 10 | 0.28 | 0.45 |
| Completed Year 11 | 0.16 | 0.36 |
| Completed Year 12 | 0.49 | 0.50 |
| New South Wales | 0.31 | 0.46 |
| Victoria | 0.27 | 0.44 |
| Queensland | 0.21 | 0.41 |
| South Australia | 0.07 | 0.25 |
| Western Australia | 0.09 | 0.29 |
| Tasmania | 0.03 | 0.16 |
| Northern Territory | 0.01 | 0.10 |
| Cases | 2 830 605 | |

Source: NCVER Apprentice and Trainee Collection 2006–14.

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