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The longer the better? The impact of the 2012 apprenticeship reform in England on achievement and labour market outcomes

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Abstract

We analyse the effects of a 2012 reform, which increased the duration of many service sector apprenticeships, while leaving many other apprenticeships, including some in the service sector, unaffected. Using a Difference-in-Differences approach, we estimate the effect of this reform on apprenticeship starts, achievement, drop-out, employment and earnings. We find evidence for reduced apprenticeship starts, increased drop-out rates and reduced achievement of the qualification, but also significantly increased earnings, especially amongst achievers.

Keywords: Apprenticeship, United Kingdom, returns to education

JEL: I26 (Returns to Education), I28 (Government Policy), C55 (Large Data Sets)

*Corresponding author: Stefan Speckesser, National Institute of Economic and Social Research, 2 Dean Trench Street, London SW1P 3HE, (s.speckesser@niesr.ac.uk). We would like to thank the editor and two reviewers for their comments as well as Sandra McNally and an anonymous reviewer from the London School of Economics for comments on an earlier version. We gratefully acknowledge comments obtained in presentations at the London School of Economics, the 2016 Conference of the Centre for Vocational Education Research (CVER), the Department for Education and the Education Policy Institute (London). We would like to thank Marcus O'Brien and Adrian Jones from the Department for Education, and Andy Cooke from the Skills and Funding Agency for their help with data access. This work has been funded by Department for Education under the CVER programme. Declarations of interest: none.

1 Introduction

Following the rapid expansion of apprenticeships in the late 2000s in the UK, there has been mounting concerns that some of these apprenticeships were of poor quality (Lee 2012). To improve the quality of apprenticeships, the government introduced binding minimum standards for all apprenticeships, known as Specification of Apprenticeship Standards for England (SASE). The SASE came into effect in August 2012 and introduced a minimum duration of one year and learning time of 280 hours for all apprenticeships, regardless of the sector. Following the 2015 General Election¹, the Government announced further reforms of the apprenticeships standards and regulations, as well as the introduction of an “Apprenticeship Levy” to fund for three million new apprenticeships.

Yet little is known about the effectiveness of specific features of apprenticeship programmes, such as duration or learning hours. Increasing apprenticeship duration and learning time may improve the quality of the training, and result in improved educational and labour market outcomes. The education literature suggests that if learning is a cumulative process, then extra teaching time should improve learning outcomes. A number of studies exploit cross-country variation in teaching times (number of days spent at school) to show that teaching time is positively associated with educational outcomes (Wossmann 2003, Rivkin & Schiman 2015, Lavy 2015). In addition, studies using experimental or quasi-experimental variations in teaching time show that longer teaching time improve learning outcomes (Marcotte 2007, Pischke 2007, Meroni & Abbiati 2016).

However, apprenticeships differ from traditional schooling in several ways. First, unlike school, apprenticeships are typically not part of the compulsory schooling system. Increasing the duration of apprenticeships increases the opportunity costs of undertaking them, which could make them less attractive to young people. Second, apprenticeships are a way to gain relevant work experience as much as a way to gain a qualification. If the most valuable part of the apprenticeship is gaining initial work experience, then increasing the duration may have little effects on labour market outcomes.

Finally, apprenticeships involve not only learners and teachers but also employers. Increasing the length of apprenticeships and time dedicated to learning could affect the demand for apprentices. For instance it could adversely affect employers by increasing training costs². Conversely, longer apprenticeship duration could increase demand for apprentices as they may have more time to make a productive contribution to the firm (Malcomson et al. 2003).

In light of these major differences compared to traditional schooling, the effect of increasing the duration of apprenticeships may differ from the effect of increasing length of school year in primary and secondary school.

While there is little evidence on the effect of changing specific features of apprenticeships programmes some studies from Germany suggest that introducing more flexibility and modularisation help increase achievement for people at higher risk of dropping out (Kloas 2001, Hafeli 2004). Therefore, the introduction of binding standards for all apprenticeships, which reduced the flexibility of the apprenticeship system, may improve quality of apprenticeships and but also have an adverse effects on starts and completion, especially among weaker learners.

¹After the general election in 2015, the Chancellor of the Exchequer presented a long-term plan aiming to “create a more prosperous nation”, which emphasised the importance of apprenticeships to improve intermediate-level technical and professional skills throughout the economy and for successful transitions of young people from the education system to employment.

²There is some evidence that employers incur substantial net costs to offer apprenticeships both in the UK (Mcintosh 2007, Hogarth et al. 2012) and Germany (Pfeier et al. 2009).

In this paper, we examine the effect of the introduction of binding standards on starts and achievement of apprenticeships, as well as labour market outcomes of apprentices. Whilst the reform introduced a minimum duration for all sectors, we show that many sectors were virtually unaffected by the reform. In these sectors, the duration already exceeded a year prior to the reform. Duration increased sharply in some service sector apprenticeships, but remained stable in a number of other service sector apprenticeships as well as sectors traditionally offering them like hairdressing, construction, engineering or vehicle maintenance and repair. Therefore, the reform offers a unique quasi-experimental setting to analyse the effect of increasing the duration of vocational programmes on various outcomes. Exploiting this feature, we use a Difference-in-Differences approach to estimate the impact of this reform on number of starts of apprenticeship, achievement rates as well as labour market outcomes. We contribute to the literature on the effect of instruction time on learning outcomes by studying the effect of increasing the duration of apprenticeships whilst the existing literature primarily focus on duration of schooling. To the best of our knowledge, our study is the first to use a quasi-experimental approach to analyse the effect of apprenticeship duration on labour market outcomes.

Our findings show adverse effects on achievement of apprenticeships and increased drop-out from apprenticeships. We also find that the reform increased earnings in the medium run. This improvement is driven by people who achieved the apprenticeship, which indicates that the reform improved the quality of the apprenticeships.

2 Policy background and existing evidence

2.1 Institutional regulation of apprenticeships in England

In the UK, as in most European countries, apprenticeships were historically the traditional route to qualify for a range of occupations in activities such as building, heavy industries, mining and printing. While apprenticeships are still well established in Germany, the Netherlands, or Switzerland, apprenticeships lost importance in the UK in the second half of the 20th century. In the 1960s around 30% of school leavers opted to enter an apprenticeship (Gospel 1995). It fell to 13% in 1994 and has remained stable around 10-15% until today.

While apprenticeships continued to exist in industrial sectors, the introduction of Modern Apprenticeships in 1994 aimed to extend employer-based vocational education to all sectors of the economy, including the expanding service sector. The content was organised in *apprenticeship frameworks*, which described apprenticeships for particular occupations like plumbers, hairdressers or customer service specialists. Until the recent creation of a central regulatory body (the Institute for Apprenticeships), the so-called Sector Skills Councils were looking after them, aiming to keep learning and assessment activity up to date and in line with relevant occupational standards. Successful achievement of apprenticeships included attainment of National Vocational Qualifications (NVQs), English and mathematics and a technical certificate as an optional component (Brockmann et al. 2010).

Following the Apprenticeships, Skills, Children and Learning Bill in 2009, all apprenticeships had to include a “competencies qualification” at Level 2 or 3 of the Regulated Qualification Framework (RQF), a “technical qualification” demonstrating knowledge and understanding of theoretical concepts and “Functional Skills” in English and mathematics for those with low secondary school attainment.

Apprenticeships aiming for Level 2 or Level 3 qualifications differ substantially, both in the qualifications required by employers of new apprentices and the complexity of procedural and theoretical knowledge and skills in the occupational field. Level 2 or *Intermediate Appren-*

ticeships aim to qualify people to be able to deliver clearly defined professional tasks, whereas Level 3 or *Advanced Apprenticeships* aim for people to further acquire knowledge and skills to address non-standard and more complex tasks and wider professional knowledge.

Compared to general qualifications, Intermediate Apprenticeships are equivalent to five good GCSEs passed at grades A*-C³, while Advanced Apprenticeships are equivalent to 2 A-Level passes. Advanced Apprenticeships usually require existing Level 2 qualifications and (in most cases) take longer to complete than Intermediate Apprenticeships, although there is considerable variation by industry and also learning provider.

As can be seen from Figure 1, for the period looked at in this study, the number of apprenticeship starts recorded in official statistics had been increasing. Compared to about 167,700 apprentices in the academic year 2002/03, there have been about half a million apprenticeships in the most recent academic year for which published data exists (2014/15). While apprenticeship starts for the 16-18 year-olds increased by a moderate 29% to 125,900, apprenticeship starts of the 19-24 year-olds more than doubled to 160,100. The most significant growth affected apprenticeships started by people above 25 years of age, which have grown to more than 214,000 within the ten years since 2002/02 and decreased slightly after that.

– Figure 1 about here –

Figure 2 shows that the expansion affected both Intermediate and Advanced Apprenticeships. In the 2007/08 academic year, there were 151,700 starts of Intermediate and 72,900 starts of Advanced Apprenticeships. In 2013/14, starts of Intermediate Apprenticeships grew by 74% to 264,000, while Advanced Apprenticeships starts increased by 89% to 137,600. Starts of Higher Apprenticeships increased to 8,700 from one hundred in 2007/08.

– Figure 2 about here –

Following the expansion of apprenticeships, evidence emerged that some apprenticeships were of poor quality. Lee (2012) summarises a variety of sources with negative perceptions of the limited options resulting from apprenticeships in some sectors and poor practice of employers. The Skills Minister subsequently introduced binding minimum standards for all apprenticeships known as Specification of Apprenticeship Standards for England (SASE). From August 2012 onward, SASE introduced a minimum duration of 12 months, except for learners aged 19 or above with some prior attainment. However, even for them, college funding would be reduced if learners completed apprenticeships in less than 12 months. With a minimum of 37 credits in the Regulated Qualification Framework (RQF), apprentices would have at least 280 Guided Learning Hours (GLH) in the college or workplace, of which at least 100 needed to be off-the-job.

2.2 Research background

The aim of SASE was to increase duration of apprenticeship programmes to a minimum of a year. The rationale was that increasing the programme duration should improve the quality of the training. While little is known about the effect of specific features of apprenticeship programme, such as duration or learning hours, the effect of school and curriculum characteristics on learning outcomes is an important question in the economics of education literature.

³General Certificates of Secondary Education are taken in a variety of subjects and examination takes place in Year 11, the final year of secondary school, when pupils are typically aged 15-16.

Existing evidence suggests that total teaching time within a school year has an effect on educational outcomes. First, there is evidence that cross-country variation in teaching times (number of days spent at school) is associated with educational outcomes (Wossmann 2003, Rivkin & Schiman 2015, Lavy 2015). Second, and more importantly, a growing number of studies exploiting quasi-experimental variations in length of school year find that longer teaching time improve learning outcomes. Using school closure due to snowfall in Maryland, Marcotte (2007) finds that students perform worse in years with more school days lost. Other studies have used changes in laws regulating school years to analyse the effect of instruction time on learning outcomes. Exploiting the variation introduced by the West German short school years in 1966–7, Pischke (2007) finds that shorter school years increased grade repetition in primary school and reduced attendance of higher secondary school track but had no effect on subsequent labour market outcomes. Using a school reform in Indonesia, Parinduri (2014) also finds that longer school year decreased grade repetition, and in addition finds evidence of positive effect on earnings. Evidence that longer duration of school year improves educational attainment has also been found in the US (Sims 2008) and Japan (Kikuchi 2014). There is also evidence that increasing learning intensity (eg number of hours per day) improve learning outcomes (Jensen 2013, Battistin & Meroni 2016, Andersen et al. 2016).

Existing evidence suggest that increasing duration of a learning activity should improve outcomes. However, apprenticeships differ from traditional schooling in several ways. First, unlike primary, and to an extent, secondary school, apprenticeships are not part of the compulsory schooling system. Undertaking an apprenticeship has an opportunity cost which depends on the health of low skill job market. Increasing the duration of apprenticeships increases the opportunity costs of undertaking an apprenticeship, which may make them a less attractive to young people. Second, apprenticeships do not primarily consist of class-based learning, but put the emphasis on work-based learning. They are a way to gain relevant work experience as much as a way to obtain a formal qualification. Increasing the duration implies that the apprenticeships take longer to be completed. If the most valuable part of the apprenticeship is gaining initial work experience (i.e the returns to work experience are diminishing at a high rate), then increasing the duration may have little effects on labour market outcomes.

Furthermore, apprenticeships involve not only learners and teachers but also employers. Increasing the length of apprenticeships could discourage employers to offer apprenticeships. For employers, the duration of apprenticeships and the time dedicated to learning are important elements of the apprenticeship as they affect the time apprentices can make a contribution to the company. There is some evidence that employers incur substantial net costs to offer apprenticeships for the UK (Mcintosh 2007, Hogarth et al. 2012) and Germany (Pfeier et al. 2009). What the apprentice produces is not sufficient to recover the training costs (e.g. time dedicated to train the apprentices, time-release for college, admin costs). If the reform reduces the time spent productively working in the firm (because of increased training time), then it would reduce incentives for employers to create apprenticeships. Conversely, if longer apprenticeship duration leads to more time devoted to productively contribute to the business, then we would expect the reform to increase demand for apprentices, everything else being equal (Malcomson et al. 2003). However, longer duration could also increase the risk of people dropping out of apprenticeships, because they could find better-paid employment elsewhere. This would create adverse incentives for firms as their upfront investment in apprentices could not be recovered. In light of these major differences compared to traditional schooling, the effect of increasing duration of apprenticeships may differ from the effect of increasing length of school year in primary and secondary school.

Most of the existing research on characteristics of apprenticeship programmes and effects

on education and labour market outcomes originate from cross-national comparisons and sector case studies, making use of the dissimilar institutional regulations internationally and comparable attainment and labour market data, see for example Steedman (2005). Key features in the “dual system” countries (Austria, Germany and Switzerland), where good labour market outcomes and attainment are observed, are long duration of apprenticeships and high employer commitment. In contrast, in many other countries, full-time vocational education in colleges prior to labour market entry is the norm for students outside general upper secondary education (Denmark, France, Netherlands and the UK) and apprenticeships are of shorter duration. Brockmann et al. (2010) argue that there are distinct approaches to vocational education and training, and contrast the skill or task-based English system to the occupational model prevalent in the Netherlands, France and Germany. However, apprentices in the UK often already have previous vocational education attainment.

Research evidence on the effectiveness of specific features of apprenticeship from international and inter-sectoral comparisons suggest that improving the quality of apprenticeships requires additional employer investment, such as dedicated staff in firms to look after apprentices, but also accredited qualifications (Bosch & Charest 2008, Fuller & Unwin 2007, Grollmann & Rauner 2007). At the lower level of industries, some evidence exists about the effects of introducing new service sector apprenticeships (e.g. for IT occupations) or modernising/merging some apprenticeships programmes (Bosch & Charest 2008). However, there is a lack of evidence about the specific duration of apprenticeships and learning time required for high-quality apprenticeships.

Some of the literature for Germany found that introducing more flexibility and modularisation would help increase achievement for people at higher risk of dropping out (Kloas 2001, Hafeli 2004), which in particular affects low pay service sector activities where almost half of the apprentices drop out before completion⁴. Similarly, facilitating the transition for low achievers by crediting qualifications obtained in pre-apprenticeship programmes to apprenticeships, has introduced elements of flexibility into the German system (Euler & Severing 2007).

In the light of this findings, the SASE reform of 2012 is likely to increase drop-out rates as requirements for achieving the qualifications have become more rigid. However, the increased drop-out rate may also result in a better match of young people to jobs, if young people decide to drop out from apprenticeship programmes and get a better paid job.

We contribute to the literature on effect of instruction time on learning outcomes by studying the effect of increasing the duration of apprenticeships. The existing literature primarily focus on duration of schooling and to the best of our knowledge, our study is the first to use a quasi-experimental approach to analyse the effect of apprenticeship duration on labour market outcomes.

3 Data

3.1 Description of source data

To analyse the effects of the SASE reform, we use census-level data from the Individualised Learner Records (ILR) for the academic years 2009/10 to 2012/13. We link these data to tax records provided by Her Majesty’s Revenues and Customs (HMRC). As a result can observe both attainment and labour market outcomes for up to three years after the apprenticeships

⁴Bundesministerium für Bildung und Forschung, *Berufsbildungsbericht* 2016 (https://www.bmbf.de/pub/Berufsbildungsbericht_2016.pdf)

started.

Apprenticeships are identified based on ILR data on “learning aims”, which are individual learning components undertaken by apprentices during an academic year. Learning aims include the main vocational learning activity and – depending on existing levels of qualifications – further courses in English, mathematics and/or ICT. ILR data are used for the production of official apprentice statistics, in particular the number of people starting and achieving apprenticeships each year. Since many apprenticeships run over different academic years, we linked the records of all years after 2009/10 to obtain information on individual completion and achievement.

While ILR aims include dates for start and planned end of the apprenticeship, not all apprenticeships have an actual end date. This can be either because the apprenticeship is still ongoing or was terminated but this was not reported in the ILR. This right-censoring affects a substantial percentage of apprenticeships and result in a lower bound estimate on the duration as only apprenticeships that have been completed or withdrawn can be observed for the full duration.⁵ As this censoring would particularly affect programmes of longer duration, we restrict the analysis to Intermediate Apprenticeships. The planned duration of these apprenticeships exceeds a year only in few sectors, and is almost always less than two years.

In addition, many apprenticeships with valid start dates in ILR data are subsequently withdrawn because people decided not to start the programme. To identify the actual number of starters, similar to how these are reported in official statistics, we therefore remove apprenticeships that ended on the same day as they started. We implement further data cleaning procedures as carried out by the Skills Funding Agency for published statistics and remove records where an apprentice has transferred to a different programme or a new provider, as well as frameworks where the apprentice has withdrawn from the learning aim early in the programme (in the so-called “funding qualifying period”) and the learning is not achieved. We further remove a few records with no valid Unique Learner Number as these cannot be linked across multiple years.

To obtain information about employment and earnings, we link ILR data with two databases held by HMRC, P45 and P14.⁶

3.2 Selection of cohorts and outcomes

As mentioned above, we restrict the analysis to Intermediate Apprenticeships (Level 2) as many Advanced Apprenticeships (Level 3) of post-reform cohorts would still be continuing when our data end. For the cohorts starting apprenticeships in the 2009/10, 2010/11, 2012/12 and 2012/13 academic years, we derive a variable indicating whether the apprenticeship is, 24 months after starting, completed and achieved, completed but not achieved, withdrawn or continuing, based on observed start and end dates and completion status of the apprenticeship.

Nearly all Intermediate Apprenticeships are expected to be completed within 24 months. Figure 3 shows the completion status of Intermediate Apprenticeships started in September 2011 and in September 2012 up to 36 months after they started. We can see that most completed

⁵In addition, the data stop at the end of the February 2015, i.e. 24-36 months after the start of the apprenticeship.

⁶P45 contains information about employment spells and P14 about annual earnings until the tax year 2014/15, ending in April 2015. Employers are required to provide P45 forms when an employee joins or leaves “Pay As You Earn” (PAYE) employment, i.e. employment subject to standard labour taxes. Moreover, an annual statement of total earnings subject to taxes and national insurance is issued at the end of each financial year (P14). Since employment and earnings in HMRC data suffer from recording issues, the duration of spells with invalid start or end dates was imputed in a non-parametric way based on the distribution of the duration of valid spells.

apprenticeships are achieved, and therefore in the remainder of this paper we focus only on achievement rather than completion. After 24 months, 68.5% of Intermediate Apprenticeships started in September 2011 were achieved, 1.0% were completed but not achieved, 21.0% had been withdrawn and 9.5% were still continuing. Of Intermediate Apprenticeships started in September 2012, 66.0% were achieved, 1.4% were completed but not achieved, 23.4% had been withdrawn and 9.2% were still continuing. The vast majority of Intermediate Apprenticeships are expected to be completed within 24 months, so the apprenticeships that are still continuing 24 months after starting are likely to be non-completed apprenticeships whose spells have not been yet closed by the provider.

– Figure 3 about here –

The SASE reform introduced a minimum duration of 12 months for all apprenticeships, except for learners aged 19 or above with Level 2 prior attainment⁷. Therefore, we analyse the effects of the reform on three groups defined by age and prior attainment: apprentices aged 16 to 18 and apprentices aged 19 or above with or without Level 2 prior attainment. The sharp increase in the number of apprentices aged 25 or over in the period before the reform (see Figure 1 above) may invalidate using this group in a Difference-in-Differences design. In addition, mature apprentices have different characteristics, specifically in terms of prior attainment, and – compared to young apprentices in the same programme – have lower learning activity and show lower wage returns, see McIntosh & Morris (2018). Therefore, we restrict the analysis to the 19-24 year-olds in the following, providing estimates for the different groups and the combined total.

3.3 The 2012 apprenticeships reform

The introduction of a 12-month minimum duration had a strong effect on both the planned and actual duration of Intermediate Apprenticeships. While all apprenticeships have a planned duration (set at the beginning of the apprenticeship), actual duration is observed only for completed apprenticeships. Therefore, we mainly rely on planned duration in this analysis. Table 1 shows planned and actual duration of apprenticeships started in September 2011 and September 2012 by age and prior attainment of apprentices.

A third (33.1%) of Intermediate Apprenticeships started in September 2011 by 16-18 year old learners had a planned duration of less than 12 months, compared to virtually none (2.9%) for those started in September 2012. The proportion of Intermediate Apprenticeships expected to last for less than 12 months fell from 58.8% to 9.7% for apprentices aged 19-24 with low prior attainment between September 2011 and September 2012. While the 12-month minimum duration did not apply to apprentices aged 19 or above with Level 2 prior attainment, we observe a sharp reduction in the proportion of Intermediate Apprenticeships with a planned duration of less than 12 months (from 62.5% to 15.1%). The reason may be that funding is reduced if the apprenticeship duration is less than 12 months. Therefore, colleges and learning providers may have encouraged learners to sign up for apprenticeships lasting at least 12 months. The right hand-side of Table 1 shows that the reform also had a strong impact on actual duration (of completed apprenticeships), but the proportion of Intermediate Apprenticeships that lasted less than 12 months is larger than expected given the planned duration. The distributions of planned and actual apprenticeship duration are reported in Figure A.1 (Appendix).

⁷Level 2 corresponds to end of high school qualifications

In addition to the changes in the duration, the reform also aimed to increase the number of Guided Learning Hours (GLH) to a minimum of 280 per year, of which at least a 100 needed to be outside the apprentices' firms in colleges. To calculate GLH, we aggregated GLH from various *learning aims* in the raw data, which are associated with Intermediate Apprenticeships, such as knowledge qualification, competence qualification, English, Maths and Information and Communication Technologies and compare how this measure changes over time for the three groups in focus on this study. The results are included in Table 1. As can be expected, GLH are lowest for 19-24 year-olds with prior attainment as they are often exempt from English, Maths and Information and Communication Technologies aims due to having achieved such aims previously. On average, 19-24 year-olds with Level 2 attainment have around 400 GLH when starting Apprenticeships in September 2011, way above the reform's target and higher than a year before. Compared to this, 16-18 year-olds have 180 GLH more per year. As for all other groups, there is relative stability in the GLH associated with apprenticeships over time. The reform did not significantly change learning time, its primary effect was to increase duration.

– Table 1 about here –

Figure 4 shows the average planned duration and proportion of Intermediate Apprenticeships with a planned duration of less than 12 months broken down by month of start. The 12-month minimum duration came into force in August 2012, but the proportion of short-duration apprenticeships was falling from March 2012 onwards, suggesting some anticipatory effects. The right-hand side of the graph shows how the average planned duration has changed for apprenticeships started between September 2011 and August 2013. We can also see from Figure 4 that the planned duration varies by calendar month of start: apprenticeships started in September tend to have a longer planned duration. Sixteen to eighteen year olds, starting Intermediate Apprenticeships at the beginning of the academic year, either from secondary school or leaving further education colleges, show longer planned durations than people starting later in the academic year, even those of the same age.

– Figure 4 about here –

4 Empirical Strategy

4.1 Identifying treatment and control groups

To estimate the effect of the introduction of a minimum duration, we need to identify a treated and a control group. In the treatment group, we want to include apprenticeship frameworks which were genuinely affected by the reform and had a stable duration in the pre-period reform. The control group should include apprenticeship frameworks that were not affected by the reform, because their planned duration exceeded 12 months in the pre-reform period.

To do so, we examined average duration of all apprenticeship frameworks with at least 100 apprenticeships between 2009/10 and 2012/13, which we show in Table B.1 in Appendix B. This table includes observed durations before (September 2009, September 2011) and after the reform (September 2012). Since the duration also varies across the calendar months of start, we apply a symmetric 12-month moving average, with uniform weights⁸.

⁸ We average the first six lagged value, the current value and the first six forward terms of the series, with each term in the average receiving a weight of one.

Using the moving averages, we classify frameworks in four groups, depending whether on their pre-reform duration was over 12 months, whether the duration increased by more than two months between September 2011 and September 2012, and whether their duration was stable between September 2009 and September 2011 (i.e. did not change by more than one month). First, the Treatment group contains frameworks which were affected by the reform (i.e. their duration went up by more than two months) and had a low but stable planned duration before the reform. Second, the control group contains frameworks which had an average duration that exceeded 12 months and did not change either before or after the reform. The third group includes frameworks affected by the reform but which saw planned duration go down by more than one month in the pre-reform period. The fourth group consists of frameworks unaffected by the reform but which saw planned duration go down by more than one month in the pre-reform period. We exclude these apprenticeship frameworks from the treatment and control group because their duration was changing in the pre-reform period, which would threaten the validity of our empirical strategy.

About a third of all apprenticeships started in the pre-reform period are included in the treatment group and 47 percent in the control group (See Table B.2 in Appendix B). The treatment group includes frameworks such as Retail, Hospitality and Catering, Active Leisure and Learning, Customer Service, Contact Centres, Sales and Telesales, IT and Telecoms Professional, Providing Security Services and Logistics Operations. By contrast, the control group includes traditional apprenticeships such as hairdressing, construction, engineering or vehicle maintenance and repair.

Figure 5 shows the observed planned duration of apprenticeships starting in a particular month between September 2009 and August 2013 and the related moving average for these four groups. The vertical line shows the time by which increased durations had to be implemented. For the control group, the average planned duration increases to 12 months in the months preceding the implementation of SASE. From August 2012 onward, the planned duration remains just above the 12-month minimum. Even though we excluded in the treatment group frameworks with changes in duration of more than a month between September 2009 and September 2011, we can nonetheless observe a small drop in duration in 2010, but much less pronounced than for the group of affected frameworks that had a change in duration between September 2009 and September 2011 of more than a month (Bottom left-hand chart). The average duration for the control group remained relatively stable over both the pre- and post-reform period. In contrast, we can see from the two bottom charts that the drop in duration was much more pronounced for the groups that are excluded from the analysis.

– Figure 5 about here –

To further check whether our distinction of “treatment” and “control” groups works, we provide a further description of treatment and control groups in the upper part of Figure 5 by age groups (Figure 6). The graphs show that our assumption of stable duration in the pre-reform period for 16-18 year olds is unlikely to hold because of a much longer duration in September 2009. As with all other groups, we implement placebo tests in the pre-reform period to empirically test this assumption. In Figures A.2 and A.3 in Appendix A we also show how labour market outcomes evolved over the period. The employment rate and earnings two years after start seem to evolve similarly in treated and control frameworks.

– Figure 6 about here –

4.2 Empirical strategy

We analyse the effects of the SASE reform comparing frameworks with stable planned durations in the period before the reform, which were substantially affected by the introduction of a minimum duration, to those on which the reform had no impact (because they already had an expected duration of over 12 months).

We estimate the impact of this treatment for all apprentices as well as separately for each age/attainment group (16-18 year olds, 19-24 year olds with low prior attainment, 19-24 year olds with Level 2 or above prior attainment). Exploiting the fact that some apprenticeship frameworks were not affected by the reform, we use a Difference-in-Differences approach to estimate the impact of the reform.

In order to analyse the effect of the reform on the *number of apprenticeship starts*, we use framework-level data derived from individual level data and estimate the following equation:

$$N_{j,t} = \alpha + \beta D_j \mathbb{1}(t > \text{Aug2012}) + \lambda_j + \delta_t + \varepsilon_{j,t} \quad (1)$$

where $N_{j,t}$ is number of apprenticeships started in framework j at month t . The model includes framework fixed effects (λ_j) and time fixed effects for the month when the apprenticeship started (δ_t).

To estimate the effect of the reform on *individual-level learning and employment outcomes*, we estimate the equation:

$$y_{i,j,t} = \alpha + \beta D_j \mathbb{1}(t > \text{Aug2012}) + \lambda_j + \delta_t + \mathbf{x}_{j,t} \gamma + \varepsilon_{i,j,t} \quad (2)$$

where $y_{i,j,t}$ is the individual level outcome of interest (e.g., achievement or withdrawal until 24 months after the start, employment 30 months after the start or log annual earnings) for individual i enrolled in framework j started at month t . $D_{j,t}$ is a binary variable equal to one if the framework j was affected by the SASE reform⁹. Like the in the framework level model, we includes framework fixed effects (λ_j) and time fixed effects for the month when the apprenticeship started (δ_t). In addition the model includes a vector of individual characteristics (gender, age, disability status, level of prior attainment).

The main identifying assumption is that achievement in affected frameworks would have evolved similarly to achievement in non-affected frameworks. Because the duration of affected frameworks increased in the period ahead of the reform for all the frameworks affected, we focus on apprenticeships started in the first six months of the academic years before and after the introduction of the minimum duration.

4.3 Description of estimation sample

We provide extensive descriptions of the data of individual Intermediate Apprenticeships at framework level in Appendix B. Table B.1 includes all frameworks with more than 100 apprentices and shows the observed planned duration for starters in September in anyone year and the 12-months moving average. The last column shows whether a particular framework has been affected by the reform or not. Table B.2 describes the total number of Intermediate Apprenticeship starts in the three main groups in the period before and after the reform. In

⁹As explained above, a framework is considered as affected by the reform if the average planned duration of apprenticeships started in September 2012 (after the introduction of the 12-month minimum duration) exceed the average planned duration of apprenticeships started in September 2011 by at least two months and duration was well below a year in the previous period.

the 2012-2013 academic year, 129,000 Intermediate apprenticeships were started by the 16-25 year olds. 32% of them are in frameworks affected by the reform (treatment group) and 47% are started in a group unaffected by it (control group). In the period before the reform (2011-12012), the figures are very similar.

Table 2 shows descriptives of the final sample used for the Difference-in-Differences analysis. As discussed above, we are limiting the estimation sample to apprenticeships started in the first six months of the academic years 2011-2012 and 2012-2013. Apprentices in treatment and control groups are about 19 years old. There is a slightly higher share of female apprentices, about 89% of the apprenticeships were started by the British White ethnic group. About half of all starting an apprenticeship have already achieved a qualification at or above the formal level associated with an Intermediate Apprenticeship. About half of all the apprenticeships included in the analysis started in September and October.

The table also gives a brief summary of the outcome variables looked at here: After 24 months, about 64% of all Intermediate Apprenticeships started in the period considered here are achieved, while 27% of the apprenticeships were stopped without attaining the learning outcome. 87% of the apprentices are employed 30 months after they started the apprenticeship and annual earnings observed in the last available year, the 2014-2015 tax year, are on average just below £11,850.

Table 3 displays summary statistics for the outcome variables used in this paper for the treatment and control groups. Attainment is slightly higher in the control group. Depending on the age, between 59% and 67%, achieve their apprenticeship in the control group compared to 56% to 61% in the treatment group. Drop-out rates are lower for control compared to the treatment group, while we find virtually no difference in observed employment rates. Earnings are consistently lower for the treatment groups.¹⁰

5 Results

5.1 Increased duration and apprenticeship starts

Table 4 shows Difference-in-Differences (DiD) estimates of the effect of the reform on apprenticeship starts for all 16-24 year olds but also separately for 16-18 year olds, 19-24 year olds with low prior attainment, and 19-24 year olds with Level 2 or higher prior attainment. These estimates are based on data on the number of apprenticeships started per month between September and February of the academic years before and after the reform for treated and control frameworks. The table provides both the effect of the introduction of the 12-month minimum duration in 2012 and a test for common trends, which uses the time periods one and two years ahead of the reform to estimate the effects of a “placebo reform”.

The results suggest that the introduction of the 12-month minimum duration had a negative and statistically significant effect on the number of apprenticeships starts for all groups. Our weighted results suggest that in the SASE-affected sectors the reform reduced the number of apprenticeships started by 167 per month for 16-18 year olds, by 76 for the 19-24 year olds without Level 2 qualifications and by 190 for 19-24 year olds with Level 2 prior attainment. In total, there are about 447 fewer starts in the frameworks affected by the reform on average per month.

¹⁰Table B.3 in Appendix B provides a full description of the average outcome variables for each of the groups affected or unaffected by the reform. These show achievement for about 50%-60% of apprenticeships within 24 months (depending on the specific group) and generally very high post-apprenticeship employment rates, which are highest for 19-24 year-olds with existing Level 2 qualifications.

Results from column 3 and 4 show that the estimates of a placebo reform taking place one year before the actual reform are not statistically significant. In other words, the common trends assumption is not violated and therefore the Difference-in-Differences approach credibly allow identifying the effect of the reform on the number of apprenticeship starts.

Further results reported in Table C.1 in Appendix C suggest that the reform had a similar impact on learners with high and low prior qualifications. Therefore, the effects observed on individual-level outcomes (presented in the next section) are unlikely to be driven by compositional change in terms of prior qualifications.

– Table 4 about here –

5.2 Increased duration and individual-level outcomes

In this section, we present estimates of the effect of the introduction of the 12-month minimum duration on achievement of apprenticeships two years after start, as well as medium-run labour market outcomes. Table 5 reports estimates of the effect of the reform on treated frameworks for all 16-24 years olds as well as for 16-18 year olds, 19-24 year olds with low prior attainment, and 19-24 year olds with Level 2 or higher prior attainment. As explained above, the sample is restricted to apprenticeships started between September 2012 and February 2013 and September 2011 until February 2012. We exclude the second half of the academic year because duration started to increase in the second half of the 2011/12 academic year, before the new standards came into force.

– Table 5 about here –

Overall, the estimates suggest that the introduction of a minimum duration had an adverse impact on the probability of achieving an Intermediate Apprenticeship.

The introduction of a minimum duration reduced achievement within 24 months by 10.2 percentage points for 16-18 year old learners, 7.3 percentage points for 19-24 year old apprentices with low prior attainment and 4.4 percentage points for 19-24 year old apprentices with Level 2 or higher prior attainment. The effects for the whole group of 16-24 year-olds is -7.7 percentage points. One might argue that the negative impact on duration can simply be explained by the fact that apprenticeships take longer to complete after the introduction of the 12-month minimum duration. However, only 1.3% of apprenticeships in affected frameworks started in September 2012 had a planned duration greater than 24 months, compared to 1.0% for those started in September 2011.¹¹

In column 2, we report estimates of the impact of the reform on the probability of withdrawing from the apprenticeship programme¹². The estimates are slightly below the magnitude of the estimates for achievement for all groups, suggesting that a great proportion of the decrease in achievement within 24 months is driven by the increase in drop-outs.

In column 3 and 4 of Table 5 we report the effect of the reform on labour market outcomes. Overall, we find the reform improved employment rates by 1.9 percentage points and earnings by 9%. The reform had stronger positive effects on the 16-18 apprentices. The longer duration

¹¹In Tables C.2 and C.3 in Appendix C, we estimate the same models based on samples restricted first to those who are observed in HMRC data and secondly to those with positive earnings. The results differ by half a percentage point. Once we condition on positive earnings in HMRC data, the effects on achievement and drop-out become slightly smaller than in the main specification.

¹²As mentioned above, some apprenticeships spells are still labelled as ‘continuing’ in the ILR data, although they started and were not completed within three or four years.

resulted in an 3.9 percentage point increase in their employment rate and 12.7% increase in earnings. The reform did not significantly affect the employment rates of older apprentices, but increased by 6.9% the annual earnings of the 19-24 year-old apprentices with low prior attainment. In order to be able to interpret the effects from the Difference-in-Differences models as to be caused by the reform, we provide again empirical tests of the common trends assumption based on a ‘placebo reform’.

– Table 6 about here –

These tests use treatment and control groups in the two years ahead of the actual reform (2010-2011 and 2011-2012 academic years) and estimate whether any significant differences can be found in outcomes. Results of these common trends tests are reported in Table 6. The estimates of the effect of the 2011 ‘placebo reform’ are close to zero and statistically insignificant for 19-24 year old apprentices of both attainment groups, which suggest that for these two groups, the common trend assumption is likely to hold. Hence, the differences in learning outcomes, employment and earnings presented in Table 5 are likely to represent the true effect of the SASE reform. However, in the pre-reform period, the placebo test shows significant effects for the 16-18 year olds on two of the four outcomes (withdrawal from apprenticeships and the employment status), which suggest that outcomes had not been stable in the pre-reform period. This affects also the estimate of the employment effect for the 16-24 year-olds, and therefore caution is needed when interpreting the effect of the effect of the reform on employment. However, the placebo tests for annual earnings are always insignificant, which suggests that our approach allow to estimate the effect of the reform on earnings for all groups.

5.3 Sensitivity and subgroup effects

To provide sensitivity and to understand potential mechanisms how the reform has affected different groups of apprentices, we carried out a number of subgroup analyses.

First, we restrict the control group to service sector apprenticeships. Most apprenticeship frameworks affected by the reform are in the service sector, but the control group include many apprenticeships from the manufacturing and crafts sectors. Because the trends may be different for service sector and manufacturing apprenticeships we test whether our main results are robust to removing non-service apprenticeships from the control group. Results displayed in Table 7 are consistent with the overall findings presented in 5, although the magnitudes of the effects are slightly smaller. For example, the negative effect on achievement by month 24 decreases from seven percentage points to 5.8 percentage points for 19-24 with low prior attainment, and from 4.4 to 3.8 percentage points for 19-24 with Level 2 or higher prior attainment. Earnings effects are now found to be significant for all the three groups, varying between 3.3% for the 19-24 year-olds with prior Level 2 attainment to 12.19% to 12.1% for the 16-18 year-old apprentices. As before, pre-programme tests suggest that results found for the group of 16-18 year olds are likely not robust as for the other groups.

– Table 7 about here –

Second, we estimated models separately for male and female apprentices, focusing on all 16-24 apprentices as well as the group of 19-24 year-olds, where common trends tests in the main model consistently suggest validity of the Difference-in-Differences approach. The results from these models shown in Table 8 point towards quite a lot of heterogeneity driving

the overall results. 19-24 year-old apprentices with low attainment of both sexes show similar reductions in achievement rates because of the reform (-7 percentage points) and similar increases in drop-outs (4.5 percentage points for female and 5.1 percentage points for male apprentices). While employment rates of any of the groups have not been significantly affected by the reform, a significant earnings effect of the reform was only found for female apprentices with low prior attainment (8.2%).

– Table 8 about here –

Third, we estimated models for different English regions for the 19-24 year-olds with and without prior Level 2 attainment. While the qualitative evidence remains consistent with the overall findings, the differences in effect sizes probably vary because of the differences in the regional economy. As shown in Table 9, there are mainly negative effects on achievement rates across the regions, ranging between 6 percentage point lower achievement rates in the west Midlands to 21.6 percentage points in Yorkshire and the Humber. For apprentices in the East Midlands, an area with a relatively larger manufacturing sector, we found positive and significant effects of the reform, which might have resulted from apprentices orientating towards non-service sectors. The increase in drop-out rates caused by the reform is of similar magnitude across England and positive, again except for the East Midlands. Significant employment and earnings effects have only been found for London and the South East, while the estimated effects are insignificant in other regional areas, possibly because of smaller magnitudes and samples.

– Table 9 about here –

Finally, we estimated models separately by status of apprenticeship achievement. Results are displayed in Table 10. The results point towards wage gains for achievers of 9% for 18-24 year-olds with low initial attainment and 4% for those already holding Level 2 qualifications. In contrast, there are no significant differences in wages for apprentices dropping out. Hence, the positive earnings effect is due to those achieving their apprenticeship earning more as a consequence of the reform.

– Table 10 about here –

5.4 Interpreting the findings

We focus our interpretation of the results on the group the 19-24 year olds, who experienced a genuine increase in apprenticeship duration and for whom the common trend assumption is not violated for any outcome. The reform reduced apprenticeship starts in the affected sectors (between 76 and 191 fewer starts per month depending on the level of qualification), increased drop-out rates (by 3-5 percentage points) and reduced achievement of the qualification (by 4-7 percentage points). The negative impact on the number of starts may be driven by the fact that the increased duration of apprenticeships increased the opportunity costs of undertaking an apprenticeship. This may have made apprenticeship a less attractive choice for young people. In addition, the increase in the length of apprenticeships may have discouraged employers to offer apprenticeship, since it may have increased the cost of providing the training.

One explanation for the reduction of apprenticeship achievements also result from the changed opportunity costs. Apprenticeships do not primarily consist of class-based learning, but put the emphasis on work-based learning. Their explicit aim is that apprentices gain relevant

work experience, which is perhaps more important than obtaining a formal qualification at the end of the programme. Indeed, half of the apprentices already have qualifications at Level 2. In addition, all of the apprenticeships affected by the reform were in service industries without a long-established tradition (and recognition) of apprenticeships. In these sectors, qualifications obtained from the apprenticeship may not be as important for long-term success as in sectors where they are the conventional (and often only) way of starting a successful career, such as in engineering or hairdressing. If however the most valuable part of the apprenticeship is gaining initial work experience, there may be little benefits in staying longer as an apprentice to obtain the qualification. By simply extending the duration, the reform increased the drop-outs.

Our results indicate that the reform increased earnings of apprentices two years after they started their apprenticeship, especially amongst achievers. We find statistically significant increases in earnings (+7% compared to counterfactual for 19-24 year olds without Level 2 qualifications, 9% for the all 16-24) in the apprenticeships affected by the reform. The wage effect could be driven by two mechanisms. First, the reduction in the starts may imply that apprentices in the post-reform period are positively selected. We find no evidence of this, as the reform had a similar impact on learners with high and low prior qualifications (Table C.1 in Appendix C). Second, the reform may have improved the quality of apprenticeships, thereby increasing the earnings of apprentices. If this hypothesis is true, then we would expect that the reform increased the earnings of achievers but not the earnings of those dropped out. This is what we find in Table 10. One could object that the reform increased drop-out rate and may have created additional selectivity. Achievers before the reform may differ from achievers after the reform in unobserved characteristics that are also associated with earnings. If this was the case, then we should also observe that the reform reduced earnings of non-achievers (since non-achievers after and before the reform should also differ in terms of these unobserved characteristics). Because we find no evidence that the reform had a negative impact of the earnings of non-achievers, we can conclude that the earnings effect of the reform on achievers are not driven by selection but rather result from improved quality of apprenticeships caused by the reform.

6 Conclusion

Following the expansion of apprenticeships in the late 2000s, the government introduced binding minimum standards for all apprenticeships, known as Specification of Apprenticeship Standards for England (SASE). The introduction of these standards imposed a minimum duration of 12 months and a minimum number of Guided Learning Hours. Whilst we find no evidence that the SASE reform increased the hours, it did affect the duration of many but not all apprenticeships. Apprenticeships in many occupations (also known as ‘apprenticeship frameworks’) were unaffected by the reform since they already had a duration that exceeded a year.

In this paper, we examine the effect of this apprenticeship reform on starts and achievement of apprenticeships, drop-outs, employment and earnings using a Difference-in-Differences approach. We exploit the fact that some frameworks that had no change in duration in the pre-period reform, while a number of service sector apprenticeships were affected.

We find that the introduction of a 12-month duration reduced the number of starts in the apprenticeships affected. The longer duration increased the opportunity costs of undertaking an apprenticeship, which may make them less attractive to young people. In addition, the increase in the length of apprenticeships may have discouraged employers to offer apprenticeship, since it may have increased the cost of providing the training.

The reform also reduced achievement of apprenticeships. If the most valuable part of the

apprenticeship is gaining initial work experience, there may be little benefits in staying longer as an apprentice to obtain the qualification. Indeed, many apprentices already hold Level 2 qualifications. However, as the duration increases, so does the probability to find another job and drop out of the apprenticeship.

We also find that the reform increased earnings in the medium run. This improvement is driven by people who achieved the apprenticeship, which indicates that the reform improved the quality of the apprenticeships.

By causing reduced starts and achievements, the reform seems to have worked against the Government's 2015 pledge to create three million apprenticeships within five years. However, increasing the duration apprenticeships may ultimately be an important way to improve their quality, although this comes with costs to employers because of increased drop-outs.

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7 Tables

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Table 1: The effect of the introduction of minimum duration on planned duration of apprenticeships

	Sep-10	Sep-11	Sep-12
	<i>16-18</i>		
% with planned duration < 12m	0.135	0.331	0.029
Average planned duration	19.0	15.9	17.4
Average actual duration	17.2	13.7	14.7
Average GLH	550.2	569.4	573.4
	<i>19+, low prior att.</i>		
% with planned duration < 12m	0.422	0.588	0.097
Average planned duration	14.3	12.1	14.1
Average actual duration	9.8	11.4	12.6
Average GLH	477.8	464.0	470.3
	<i>19+, L2+ prior att.</i>		
% with planned duration < 12m	0.568	0.624	0.151
Average planned duration	12.0	11.6	13.1
Average actual duration	9.2	10.7	11.9
Average GLH	337.1	396.4	397.3

Note: Intermediate Apprenticeship only

Source: Individualised Learner Records, 2011/12-2014/15

Table 2: Descriptive statistics of final selection of apprentices

		Mean	Std. Dev.	Min	Max
Age	Age at 31 August	18.9	2.3	15	25
Sex	Female	0.51	0.5	0	1
	Male	0.49	0.5	0	1
Ethnicity	British White	0.89	0.3	0	1
	Other	0.11	0.3	0	1
Disability	No disability	0.88	0.3	0	1
	Disability	0.05	0.2	0	1
	Unknown	0.07	0.3	0	1
Previous qualifications	Other/Unknown	0.13	0.3	0	1
	Below Level 1	0.04	0.2	0	1
	Level 1	0.32	0.5	0	1
	Level 2	0.39	0.5	0	1
	Level 3	0.13	0.3	0	1
	Level 4 and above	0.00	0.0	0	1
Region	North East	0.06	0.2	0	1
	North West	0.16	0.4	0	1
	Yorkshire and the Humber	0.13	0.3	0	1
	East Midlands	0.09	0.3	0	1
	West Midlands	0.11	0.3	0	1
	East	0.10	0.3	0	1
	London	0.09	0.3	0	1
	South East	0.14	0.3	0	1
	South West	0.11	0.3	0	1
	September	0.29	0.5	0	1
Start month	October	0.20	0.4	0	1
	November	0.15	0.4	0	1
	December	0.09	0.3	0	1
	January	0.14	0.4	0	1
Outcomes	February	0.13	0.3	0	1
	Achieved by month 24	0.64	0.5	0	1
	Withdrawn by month 24	0.27	0.4	0	1
	Employed by month 24	0.87	0.3	0	1
	Annual earnings 2015/2014	11,844	6,436	0	127,530
Observations		137,056			

Note: Intermediate Apprenticeship only

Source: Individualised Learner Records, 2011/12-2014/15

Table 3: Descriptive statistics of outcomes for treatment and control groups

	Achievement within 24 m	Withdrawal within 24 m	Employed 30 after start	Annual Earnings 2 y. later	N
A - Treatment group (Pre-reform short/post-reform SASE compliant)					
16-18	56%	36%	87%	10,718	9,296
19-25 Low	52%	37%	89%	12,328	7,432
19-25 L2+	61%	30%	92%	12,953	9,417
All	57%	34%	90%	12,177	26,145
B - Control group (Pre- and post-reform SASE compliant/no duration change)					
16-18	62%	25%	86%	11,296	21,239
19-25 Low	59%	29%	88%	13,053	7,476
19-25 L2+	67%	24%	91%	13,471	10,530
All	63%	25%	88%	12,589	39,245

Note: Intermediate Apprenticeship only

Source: Individualised Learner Records, 2011/12-2014/15

Table 4: Impact of the introduction of the 12 months minimum duration on starts

	Reform		Placebo reform	
	(1)	(2)	(3)	(4)
A - 16-18 Apprentices				
Reform effect	-86.1** (35.8)	-166.9** (49.1)	25 (44.6)	40.4 (61.1)
Observations	551	551	497	497
R2	0.7	0.7	0.7	0.7
Mean outcome	122.3	528.6	136.6	575.4
B - 19-24 Apprentices with low prior att.				
Reform effect	-46.6 (26.6)	-75.6* (41.3)	25.4 (23.6)	-29.8 (28.8)
Observations	502	502	474	474
Pseudo-R2	0.9	0.8	0.9	0.9
Mean outcome	157.1	701.9	135.4	649.6
C - 19-24 Apprentices with L2+ prior att.				
Reform effect	-75.5** (21.4)	-190.5** (32.9)	29.9 (17.6)	-3.5 (22.2)
Observations	520	520	453	453
Pseudo-R2	0.9	0.8	0.9	0.9
Mean outcome	135.7	666.8	124.2	611.4
D - All				
Reform effect	-177.2** (50.5)	-447.4** (56.6)	91 (61.2)	93.9 (67.9)
Observations	604	604	549	549
R2	0.9	0.9	0.9	0.9
Mean outcome	325.4	1589.4	343	1546.1
Month of start	Yes	Yes	Yes	Yes
Framework FE	Yes	Yes	Yes	Yes
Weights	No	Yes	No	Yes

Standard errors in parentheses, *5%/**1% levels of significance. Models include framework fixed effects; Weights are calculated using the total number of starts by framework over the period Sep 2009-Aug 2013; Sep 12-Feb 13 data are used for the actual reform (compared to one year before), Sep 11-Feb 12 for the placebo.

Source: Individualised Learner Records, 2010/11-2012/13

Table 5: Impact of the introduction of the 12-month minimum duration

	(1) Achievement within 24 m	(2) Withdrawal within 24 m	(3) Employed 30 after start	(4) Log Annual Earnings 2 y. later
A - 16-18 Apprentices				
Reform effect	-0.102** (0.009)	0.087** (0.008)	0.039** (0.005)	0.127** (0.021)
Observations	67,034	67,007	61,410	37,265
Pseudo-R2/R2	0.051	0.033	0.043	0.083
Mean outcome	0.631	0.267	0.843	10,212.6
B - 19-24 Apprentices with low prior attainment				
Reform effect	-0.073** (0.012)	0.050** (0.011)	0.005 (0.008)	0.069** (0.023)
Observations	29791	29780	28023	22726
Pseudo-R2/R2	0.035	0.028	0.038	0.067
Mean outcome	0.603	0.300	0.878	12,487.8
C - 19-24 Apprentices with L2+ prior attainment				
Reform effect	-0.044** (0.010)	0.029** (0.009)	0.000 (0.006)	0.029 (0.016)
Observations	39467	39467	37338	33201
Pseudo-R2/R2	0.031	0.019	0.023	0.057
Mean outcome	0.676	0.242	0.915	13,245.5
D - All 16-24 Apprentices				
Reform effect	-0.077** (0.006)	0.061** (0.005)	0.019** (0.004)	0.090** (0.011)
Observations	136,297	136,297	126,932	93,192
Pseudo-R2	0.041	0.027	0.044	0.093
Mean outcome	0.631	0.267	0.843	10213
Socio-demographic	Yes	Yes	Yes	Yes
Framework FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Standard errors in parentheses, *5%/**1% levels of significance. Sample is restricted to apprenticeships started between Sep 2012 and Feb 2013 and the same period a year before. Models include month of start and framework dummies, as well as socio-demographic characteristics (gender, age at start, level of prior attainment and disability status). Robust standard errors in parentheses.

Source: Individualised Learner Records, 2011/12-2012/13

Table 6: Pre-programme tests

	(1) Achievement within 24 m	(2) Withdrawal within 24 m	(3) Employed 30 after start	(4) Annual Earnings 2 y. later
A-16-18 Apprentices				
Reform effect	-0.010 (0.008)	0.023** (0.007)	-0.02** (0.006)	-0.018 (0.019)
Observations	70,958	70,948	69,055	51,669
Pseudo-R2/R2	0.045	0.025	0.041	0.085
Mean outcome	0.657	0.257	0.804	9,405.6
B-19-24 Apprentices with low prior attainment				
Reform effect	0.020 (0.011)	-0.017 (0.011)	0.012 (0.008)	0.040 (0.024)
Observations	29,106	29,087	28,216	22,450
Pseudo-R2/R2	0.016	0.011	0.037	0.072
Mean outcome	0.643	0.276	0.859	12,094.4
C-19-24 Apprentices with L2+ prior attainment				
Reform effect	0.001 (0.010)	0.005 (0.009)	-0.004 (0.006)	0.003 (0.018)
Observations	36,300	36,280	35,342	31,137
Pseudo-R2/R2	0.020	0.012	0.026	0.063
Mean outcome	0.709	0.223	0.901	13,019.7
D-All apprentices 16-24				
Reform effect	0.001 (0.005)	0.008 (0.005)	-0.011** (0.004)	-0.007 (0.011)
Observations	136,385	136,358	132,728	105,256
Pseudo-R2	0.031	0.017	0.048	0.109
Mean outcome	0.657	0.257	0.804	9406
Socio-demographic	Yes	Yes	Yes	Yes
Framework FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Standard errors in parentheses, *5%/**1% levels of significance. Sample is restricted to apprenticeships started between Sep 2011 and Feb 2012 and the same period a year before. Models include month of start and framework dummies, as well as socio-demographic characteristics (gender, age at start, level of prior attainment and disability status). Robust standard errors in parentheses.

Source: Individualised Learner Records, 2010/11-2011/12

Table 7: Impact of the introduction of the 12-month minimum duration (service controls)

	(1) Achievement within 24 m	(2) Withdrawal within 24 m	(3) Employed 30 after start	(4) Log Annual Earnings 2 y. later
A - 16-18 Apprentices				
Reform effect	-0.088** (0.010)	0.077** (0.010)	0.014 (0.007)	0.121** (0.024)
Observations	42,801	42,787	41,111	26,754
Pseudo-R2/R2	0.046	0.043	0.054	0.079
Mean outcome	0.665	0.278	0.854	10511
B - 19-24 Apprentices with low prior attainment				
Reform effect	-0.058** (0.013)	0.037** (0.013)	0.001 (0.008)	0.081** (0.025)
Observations	24,748	24,748	23,611	19,295
Pseudo-R2/R2	0.032	0.028	0.025	0.063
Mean outcome	0.602	0.311	0.892	12408
C - 19-24 Apprentices with L2+ prior attainment				
Reform effect	-0.038** (0.010)	0.022* (0.010)	-0.003 (0.006)	0.033* (0.017)
Observations	35,531	35,531	33,937	30,291
Pseudo-R2/R2	0.03	0.019	0.011	0.047
Mean outcome	0.68	0.247	0.921	13272
D - All 16-24 Apprentices				
Reform effect	-0.064** (0.006)	0.049** (0.006)	0.006** (0.004)	0.094** (0.012)
Observations	103,086	103,086	98,713	76,340
Pseudo-R2	0.037	0.03	0.043	0.083
Mean outcome	0.665	0.278	0.854	10511
Socio-demographic	Yes	Yes	Yes	Yes
Framework FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Standard errors in parentheses, *5%/**1% levels of significance. Sample is restricted to apprenticeships started between Sep 2012 and Feb 2013 and the same period a year before. Control group is restricted to the service sector apprenticeships, eg apprenticeships in Business Administration, Health and Social Care, Management, Driving Goods Vehicle, Road Passenger Transport Support Services in H, Design, IT User, Youth Work, Marketing and Communication, Travel Services, Mail and Package Distribution, International Trade, Providing Financial services Live Events and Promo, Community Arts, Technical Theatre/Light) Models include month of start and framework dummies, as well as socio-demographic characteristics (gender, age at start, level of prior attainment and disability status). Robust standard errors in parentheses.

Source: Individualised Learner Records, 2011/12-2012/13

Table 8: Impact of the introduction of the 12-month minimum duration by gender

	(1) Achievement within 24 m	(2) Withdrawal within 24 m	(3) Employed 30 after start	(4) Log Annual Earnings 2 y. later
A - Female				
19-24 with low prior att.	-0.071** (0.017)	0.045** (0.016)	0.002 (0.011)	0.082** (0.032)
19-24 with L2+ prior att.	-0.036** (0.013)	0.022 (0.012)	-0.007 (0.008)	0.035 (0.021)
All	-0.061** (0.008)	0.054** (0.007)	0.010* (0.005)	0.072** (0.015)
B - Male				
19-24 with low prior att.	-0.073** (0.017)	0.051** (0.016)	0.008 (0.011)	-0.051 (0.033)
19-24 with L2+ prior att.	-0.053** (0.016)	0.040** (0.014)	0.01 (0.009)	0.018 (0.026)
All	-0.095** (0.008)	0.070** (0.008)	0.028** (0.005)	0.099** (0.017)
Socio-demographic	Yes	Yes	Yes	Yes
Framework FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Standard errors in parentheses, *5% **1% levels of significance. Sample is restricted to apprenticeships started between Sep 2012 and Feb 2013 and the same period a year before. Models include month of start and framework dummies, as well as socio-demographic characteristics (gender, age at start, level of prior attainment and disability status). Robust standard errors in parentheses.

Source: Individualised Learner Records, 2011/12-2012/13

Table 9: Impact of the introduction of the 12-month minimum duration by regions

	(1) Achievement within 24 m	(2) Withdrawal within 24 m	(3) Employed 30 after start	(4) Log Annual Earnings 2 y. later
A - North East				
19-24 with low prior att.	-0.057 (0.054)	0.02 (0.049)	-0.035 (0.040)	-0.023 (0.096)
19-24 with L2+ prior att.	-0.059 (0.038)	0.049 (0.035)	-0.021 (0.026)	-0.03 (0.064)
All 16-24	-0.075** (0.023)	0.060** (0.021)	0.015 (0.015)	0.047 (0.044)
B - North West				
19-24 with low prior att.	-0.133** (0.030)	0.087** (0.029)	0.007 (0.019)	0.05 (0.059)
19-24 with L2+ prior att.	-0.053* (0.025)	0.018 (0.023)	-0.023 (0.017)	0.014 (0.041)
All 16-24	-0.118** (0.014)	0.092** (0.014)	0.023* (0.009)	0.085** (0.029)
C - Yorkshire and the Humber				
19-24 with low prior att.	-0.216** (0.036)	0.183** (0.036)	0.003 (0.023)	-0.016 (0.069)
19-24 with L2+ prior att.	-0.088** (0.031)	0.060* (0.028)	-0.026 (0.019)	0.011 (0.049)
All 16-24	-0.157** (0.017)	0.147** (0.016)	-0.006 (0.011)	0.007 (0.034)

D - East Midlands				
19-24 with low prior att.	-0.003 (0.041)	-0.011 (0.037)	0.012 (0.024)	0.24 (0.071)
19-24 with L2+ prior att.	0.086** (0.028)	-0.062** (0.025)	-0.024 (0.019)	-0.018 (0.049)
All 16-24	0.029 (0.017)	-0.006 (0.016)	0.016 (0.010)	0.103** (0.034)
E - West Midlands				
19-24 with low prior att.	-0.096** (0.038)	0.095** (0.037)	-0.004 (0.024)	-0.02 (0.074)
19-24 with L2+ prior att.	-0.066** (0.028)	0.052* (0.026)	0.016 (0.014)	0.07 (0.046)
All 16-24	-0.074** (0.017)	0.068** (0.016)	0.024* (0.010)	0.129** (0.034)
F - East				
19-24 with low prior att.	-0.002 (0.039)	-0.008 (0.036)	-0.004 (0.024)	0.011 (0.074)
19-24 with L2+ prior att.	-0.049 (0.031)	0.043 (0.029)	0.005 (0.016)	0.028 (0.049)
All 16-24	-0.055 (0.018)	0.027 (0.016)	0.009 (0.011)	0.022 (0.034)
G - London				
19-24 with low prior att.	-0.073* (0.035)	0.031 (0.033)	0.054* (0.024)	0.217* (0.095)
19-24 with L2+ prior att.	-0.110** (0.039)	0.074* (0.038)	0.006 (0.026)	0.002 (0.088)
All 16-24	-0.117** (0.019)	0.073** (0.018)	0.026 (0.014)	0.135* (0.051)
H - South East				
19-24 with low prior att.	0.043 (0.029)	-0.051 (0.026)	0.029 (0.016)	0.138** (0.052)
19-24 with L2+ prior att.	-0.033 (0.027)	0.014 (0.024)	0.036** (0.013)	0.051 (0.042)
All 16-24	-0.021 (0.015)	-0.001 (0.013)	0.037** (0.008)	0.148** (0.028)
I - South West				
19-24 with low prior att.	-0.108** (0.035)	0.089** (0.034)	-0.027 (0.023)	-0.006 (0.059)
19-24 with L2+ prior att.	-0.075** (0.030)	0.051 (0.027)	-0.005 (0.016)	-0.027 (0.043)
All 16-24	-0.087** (0.017)	0.070** (0.015)	0.003 (0.010)	-0.018 (0.030)
Socio-demographic	Yes	Yes	Yes	Yes
Framework FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Standard errors in parentheses, *5%/**1% levels of significance. Sample is restricted to apprenticeships started between Sep 2012 and Feb 2013 and the same period a year before. Models include month of start and framework dummies, as well as socio-demographic characteristics (gender, age at start, level of prior attainment and disability status). Robust standard errors in parentheses.

Source: Individualised Learner Records, 2011/12-2012/13

Table 10: Earnings effects for achievers and drop-outs, age group 19-25

	(1) BL2	(2) L2+
A - Achievers		
Reform effect	0.091** (0.025)	0.040* (0.017)
Observations	14180	23096
Pseudo-R2	0.091	0.069
Mean outcome	13291	13704
B - Drop-outs		
Reform effect	0.045 (0.051)	-0.003 (0.042)
Observations	6614	7780
Pseudo-R2	0.060	0.053
Mean outcome	10736	11932
Socio-demographic	Yes	Yes
Framework FE	Yes	Yes
Time FE	Yes	Yes

Standard errors in parentheses, *5%/**1% levels of significance. Sample is restricted to apprenticeships started between Sep 2012 and Feb 2013 and the same period a year before. Models include month of start and framework dummies, as well as socio-demographic characteristics (gender, age at start, level of prior attainment and disability status). Robust standard errors in parentheses.

Source: Individualised Learner Records, 2011/12-2012/13

8 Figures

Figure 1: Apprenticeship starts by age groups

Source: Skills Funding Agency 2016

Figure 2: Apprenticeship starts by levels

Source: Skills Funding Agency 2016

Figure 3: Completion status of Intermediate Apprenticeships

Source: Individualised Learner Records, 2011/12-2014/15

Figure 4: Planned duration by month of start

Source: Individualised Learner Records, 2011/12-2014/15

Figure 5: SASE effect on framework duration

Source: Individualised Learner Records, 2010/12-2012/13

Figure 6: SASE effect on framework duration

Source: Individualised Learner Records, 2009/10-2012/13

A Additional figures

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Figure A.1: Distribution of planned and actual duration

Source: Individualised Learner Records, 2009/10-2012/13

Figure A.2: SASE effect on earnings

Source: Individualised Learner Records, 2009/10-2012/13

Figure A.3: SASE effect on employment

Source: Individualised Learner Records, 2009/10-2012/13

B Additional Tables

B.1 Further tables with descriptive analyses

Table B.1: Average planned duration by Framework

	Observed planned duration			12-months moving averages			Treatment group
	Sep-2009	Sep-2011	Sep-2012	Sep-2009	Sep-2011	Sep-2012	
Agricultural Crops and Livestock	16.8	18.2	18.8	15.6	15.6	16.3	Pre- and post-reform SASE compliant/no duration change
Business Administration	11.9	11.0	12.5	11.5	10.7	12.2	Pre- and post-reform SASE compliant/no duration change
Children's Care Learning and Development	13.4	12.0	13.7	12.8	11.3	12.6	Pre- and post-reform SASE compliant/duration change
Engineering	16.3	18.4	20.0	17.7	14.3	16.9	Pre- and post-reform SASE compliant/duration change
Retail	11.2	9.4	10.1	10.1	9.2	11.3	Pre-reform short/post-reform SASE compliant
Construction	21.5	21.1	22.0	18.9	18.1	19.4	Pre- and post-reform SASE compliant/duration change
Plumbing	22.5	22.9	23.0	20.4	20.1	21.2	Pre- and post-reform SASE compliant/no duration change
Nail Services	11.6	12.8	12.0	11.1	9.4	11.1	Pre- and post-reform SASE compliant/duration change
Accountancy	12.3	10.8	12.6	11.6	10.6	12.5	Pre- and post-reform SASE compliant/duration change
Aviation	12.6	12.5	12.9	13.9	12.3	13.7	Pre- and post-reform SASE compliant/duration change
Cleaning and Support Service Industry	14.0	7.5	13.0	12.0	8.1	11.7	Pre-reform marginal/post-reform exceeding SASE
Electricity Industry	25.0	23.8	23.0	24.5	27.8	25.0	Pre- and post-reform SASE compliant/no duration change
Heating, Ventilation, Air Conditioning and Refrigeration	22.8	22.6	23.8	20.0	21.0	21.7	Pre- and post-reform SASE compliant/no duration change
Property Services	11.0	11.9	12.2	11.6	11.0	12.8	Pre- and post-reform SASE compliant/no duration change
Furniture Industry	22.7	20.0	19.8	19.5	18.6	18.8	Pre- and post-reform SASE compliant/no duration change
Glass Industry	16.6	11.6	12.9	13.2	10.6	11.1	Pre- and post-reform SASE compliant/no duration change
Hairdressing	21.2	21.0	20.7	20.6	18.5	18.5	Pre- and post-reform SASE compliant/no duration change
Hospitality and Catering	11.6	10.5	13.2	10.6	9.8	12.1	Pre-reform short/post-reform SASE compliant
Housing		12.1	15.4		12.2	14.6	Pre- and post-reform SASE compliant/duration change
Printing	19.0	24.2	21.8	19.3	20.7	20.6	Pre- and post-reform SASE compliant/no duration change
Active Leisure and Learning	9.5	7.7	12.4	8.1	7.5	11.5	Pre-reform short/post-reform SASE compliant
Trees and Timber	21.2	18.3	17.5	20.3	17.9	17.3	Pre- and post-reform SASE compliant/no duration change
Marine Industry	13.3	22.0	15.0	21.6	15.1	15.8	Pre- and post-reform SASE compliant/no duration change
Health and Social Care	12.9	11.5	13.0	12.7	11.7	12.6	Pre- and post-reform SASE compliant/duration change
Environmental Conservation	18.0	12.1	17.6	14.2	11.5	13.0	Pre- and post-reform SASE compliant/duration change
Floristry	15.1	17.3	15.9	16.2	16.2	15.5	Pre- and post-reform SASE compliant/no duration change
Equine Industry	15.6	15.5	14.7	15.2	14.3	15.2	Pre- and post-reform SASE compliant/no duration change
Land-based Service Engineering	22.2	25.5	23.2	22.0	23.1	21.2	Pre- and post-reform SASE compliant/no duration change
Management	10.9	9.8	11.7	10.9	10.2	11.7	Pre- and post-reform SASE compliant/no duration change
Animal Care	14.8	15.3	16.0	15.0	15.0	15.1	Pre- and post-reform SASE compliant/no duration change
Customer Service	9.5	9.2	11.6	9.2	9.3	11.7	Pre-reform short/post-reform SASE compliant
Rail Transport Engineering	4.5	12.9	12.1	5.1	10.2	12.5	Pre-reform marginal/post-reform exceeding SASE
Beauty Therapy	11.7	12.7	15.3	13.4	11.8	14.0	Pre-reform marginal/post-reform exceeding SASE
Signmaking		16.6	16.6		16.4	14.8	Pre- and post-reform SASE compliant/no duration change
Optical		12.0	13.5		11.6	13.4	Pre- and post-reform SASE compliant/no duration change
Pharmacy Technicians	11.1	15.2	15.4	11.6	17.1	17.0	Pre- and post-reform SASE compliant/no duration change

Contact Centres	6.9	8.9	12.8	7.3	8.3	12.1	Pre-reform short/post-reform SASE compliant
Driving Goods Vehicles	11.1	10.2	12.5	10.9	10.3	12.1	Pre- and post-reform SASE compliant/no duration change
Payroll	11.2	6.5	14.7	12.4	7.5	12.9	Pre-reform marginal/post-reform exceeding SASE
Rail Transport Operations		25.2	24.0		18.4	21.0	Pre- and post-reform SASE compliant/duration change
Sales and Telesales	8.7	7.6	12.6	8.2	7.9	11.2	Pre-reform short/post-reform SASE compliant
Barbering	13.2	11.9	14.1	11.3	11.9	13.0	Pre- and post-reform SASE compliant/no duration change
Road Passenger Transport - Bus and Coach		12.4	11.8		11.8	13.1	Pre- and post-reform SASE compliant/no duration change
Teaching Assistants	14.3	12.9	13.9	12.9	11.8	13.4	Pre- and post-reform SASE compliant/duration change
Game and Wildlife Management	18.4	19.4	21.3	20.1	17.2	21.0	Pre- and post-reform SASE compliant/duration change
Support Services in Healthcare	10.2	10.9	13.0	11.6	11.4	12.5	Pre- and post-reform SASE compliant/no duration change
Design	11.7	12.3	15.2	13.4	13.0	13.3	Pre- and post-reform SASE compliant/no duration change
IT User	10.3	10.5	12.3	10.6	10.9	12.5	Pre- and post-reform SASE compliant/no duration change
Storage and Warehousing	12.9	11.0	12.5	13.5	11.0	12.3	Pre- and post-reform SASE compliant/duration change
Traffic Office		11.7	12.0		11.7	13.5	Pre- and post-reform SASE compliant/duration change
Vehicle Body and Paint Operations	20.2	20.3	22.4	20.3	20.1	20.0	Pre- and post-reform SASE compliant/no duration change
Vehicle Parts Operations	20.9	18.4	18.0	18.5	19.4	19.7	Pre- and post-reform SASE compliant/no duration change
Youth Work	14.2	14.2	13.0	17.0	11.9	12.2	Pre- and post-reform SASE compliant/no duration change
Food Manufacture	14.7	11.5	13.1	13.6	11.2	12.2	Pre- and post-reform SASE compliant/no duration change
IT and TELECOMS PROFESSIONAL	12.0	11.2	13.4	10.9	10.2	12.5	Pre-reform short/post-reform SASE compliant
Marketing and Communications		13.4	14.1		13.5	14.5	Pre- and post-reform SASE compliant/no duration change
Providing Security Services	12.9	11.2	12.5	9.6	8.8	11.0	Pre-reform short/post-reform SASE compliant
Horticulture	17.7	17.1	18.5	17.0	15.7	17.0	Pre- and post-reform SASE compliant/duration change
Fashion and Textiles	15.1	14.3	14.4	18.1	14.4	14.2	Pre- and post-reform SASE compliant/no duration change
Sustainable Resource Management		11.8	12.1	n.a.	11.3	14.6	Pre-reform marginal/post-reform exceeding SASE
Travel Services	10.3	9.4	12.0	9.1	9.8	11.3	Pre- and post-reform SASE compliant/no duration change
Mail and Package Distribution	n.a.	10.0	9.9	n.a.	11.2	11.3	Pre- and post-reform SASE compliant/no duration change
International Trade and Logistics Operations	n.a.	10.0	10.5	n.a.	13.3	11.3	Pre- and post-reform SASE compliant/no duration change
Process Manufacturing	n.a.	12.4	17.2	n.a.	19.3	20.7	Pre- and post-reform SASE compliant/no duration change
Bus and Coach Engineering and Maintenance	n.a.	20.3	23.4	n.a.	22.7	24.2	Pre- and post-reform SASE compliant/no duration change
Vehicle Maintenance and Repair	21.7	21.5	21.8	20.6	20.4	21.3	Pre- and post-reform SASE compliant/no duration change
Vehicle Fitting	17.8	17.7	21.2	16.2	15.0	19.3	Pre- and post-reform SASE compliant/duration change
Logistics Operations	n.a.	12.5	15.0	n.a.	9.2	13.8	Pre-reform short/post-reform SASE compliant
Providing Financial services	n.a.	12.6	12.4	n.a.	13.0	12.6	Pre- and post-reform SASE compliant/no duration change
Ceramics Manufacturing	n.a.	12.0	15.3	n.a.	12.7	15.5	Pre- and post-reform SASE compliant/duration change
Live Events and Promotion	n.a.	17.5	12.0	n.a.	12.3	12.2	Pre- and post-reform SASE compliant/no duration change
Community Arts	n.a.	11.2	14.4	n.a.	12.5	15.3	Pre- and post-reform SASE compliant/no duration change
Technical Theatre, Lighting, Sound and Stage	n.a.	13.2	12.0	n.a.	14.7	12.8	Pre- and post-reform SASE compliant/no duration change
Improving Operational Performance	n.a.	14.7	15.9	n.a.	11.6	12.9	Pre- and post-reform SASE compliant/duration change
Laboratory and Science Technicians	n.a.	13.0	17.2	n.a.	15.6	15.1	Pre- and post-reform SASE compliant/no duration change
Construction Specialist	n.a.	21.0	21.6	n.a.	20.5	19.7	Pre- and post-reform SASE compliant/no duration change
Construction Civil Engineering	n.a.	21.9	23.0	n.a.	20.0	18.3	Pre- and post-reform SASE compliant/no duration change
HM Forces	n.a.	7.4	13.8	n.a.	9.4	15.6	Pre-reform marginal/post-reform exceeding SASE

Source: Individualised Learner Records, 2009/10-2012/13

Table B.2: Intermediate apprenticeship starts affected by SASE reform and control as percentage of all 16-24 year old apprenticeship starts

	Post-reform (2012-2013)				Pre-reform (2011-2012)			
	16-18	19+, BL2	19+, L2+	Total	16-18	19+, BL2	19+ L2+	Total
Pre- and post-reform SASE compliant/no duration change	21,239	20,067	18,784	60,090	22,619	22,343	18,411	63,373
“Control group” % of all starts	50%	44%	46%	47%	45%	43%	41%	43%
Pre-reform short/post-reform SASE compliant	9,296	16,780	14,966	41,042	14,217	19,665	18,416	52,298
“Treatment group” % of all starts	22%	37%	36%	32%	28%	38%	41%	35%
Pre-reform marginal/post-reform exceeding SASE	842	1,815	936	3,593	1,452	1,672	870	3,994
Pre- and post-reform SASE compliant/duration change	10,812	6,762	6,493	24,067	12,281	8,270	7,111	27,662
Total	42,189	45,424	41,179	128,792	50,569	51,950	44,808	147,327

Source: Individualised Learner Records, 2010/11-2011/12

Table B.3: Descriptives for treatment and control groups

Age range	Time	Outcomes	Obs	Mean	Std. Dev.	Min.	Max.
Pre-reform short/post-reform SASE compliant (Treatment)							
16-18	Pre	After 24 months achieved	14217	0.69	0.46	0	1
		After 24 months withdrawn	14217	0.26	0.44	0	1
		Employed month 30	14025	0.80	0.40	0	1
		Annual earnings	10100	9111	5882	0	46564
	Post	After 24 months achieved	9296	0.56	0.50	0	1
		After 24 months withdrawn	9296	0.36	0.48	0	1
		Employed month 30	8602	0.87	0.33	0	1
		Annual earnings	4812	10718	5775	0	55884
19-24 Low	Pre	After 24 months achieved	7913	0.65	0.48	0	1
		After 24 months withdrawn	7913	0.27	0.45	0	1
		Employed month 30	7798	0.88	0.32	0	1
		Annual earnings	6421	11707	6640	0	127530
	Post	After 24 months achieved	7432	0.52	0.50	0	1
		After 24 months withdrawn	7432	0.37	0.48	0	1
		Employed month 30	7005	0.89	0.31	0	1
		Annual earnings	5767	12328	6542	0	72690
19-24 L2+	Pre	After 24 months achieved	10643	0.70	0.46	0	1
		After 24 months withdrawn	10643	0.23	0.42	0	1
		Employed month 30	10537	0.92	0.28	0	1
		Annual earnings	9546	12911	6288	-2220	69951
	Post	After 24 months achieved	9417	0.61	0.49	0	1
		After 24 months withdrawn	9417	0.30	0.46	0	1
		Employed month 30	8819	0.92	0.27	0	1
		Annual earnings	7909	12953	6203	0	54588
Pre- and post-reform SASE compliant/no duration change ("Control")							
16-18	Pre	After 24 months achieved	22619	0.64	0.48	0	1
		After 24 months withdrawn	22619	0.25	0.43	0	1
		Employed month 30	21980	0.84	0.36	0	1
		Annual earnings	15637	10247	5911	-18207	110704
	Post	After 24 months achieved	21239	0.62	0.49	0	1
		After 24 months withdrawn	21239	0.25	0.43	0	1
		Employed month 30	17126	0.86	0.35	0	1
		Annual earnings	7584	11296	5691	0	46963
19-24 Low	Pre	After 24 months achieved	7210	0.64	0.48	0	1
		After 24 months withdrawn	7210	0.26	0.44	0	1
		Employed month 30	6982	0.87	0.34	0	1
		Annual earnings	5723	12980	7119	0	70943
	Post	After 24 months achieved	7476	0.59	0.49	0	1
		After 24 months withdrawn	7476	0.29	0.46	0	1
		Employed month 30	6492	0.88	0.33	0	1
		Annual earnings	5367	13053	7153	0	87322
19-24 L2+	Pre	After 24 months achieved	9064	0.72	0.45	0	1
		After 24 months withdrawn	9064	0.21	0.40	0	1
		Employed month 30	8838	0.91	0.29	0	1
		Annual earnings	7890	13709	6427	0	71942
	Post	After 24 months achieved	10530	0.67	0.47	0	1
		After 24 months withdrawn	10530	0.24	0.43	0	1
		Employed month 30	9445	0.91	0.28	0	1
		Annual earnings	8302	13471	6250	0	72815
Pre-reform marginal/post-reform exceeding SASE (Dropped)							
16-18	Pre	After 24 months achieved	1452	0.69	0.46	0	1
		After 24 months withdrawn	1452	0.26	0.44	0	1
		Employed month 30	1451	0.70	0.46	0	1
		Annual earnings	952	7944	6965	-1018	43900
	Post	After 24 months achieved	842	0.64	0.48	0	1
		After 24 months withdrawn	842	0.23	0.42	0	1
		Employed month 30	783	0.82	0.38	0	1
		Annual earnings	431	12971	7445	0	35651
19-24 Low	Pre	After 24 months achieved	545	0.70	0.46	0	1
		After 24 months withdrawn	545	0.22	0.41	0	1
		Employed month 30	539	0.76	0.43	0	1
		Annual earnings	411	10123	7632	0	32617

19-24 L2+	Post	After 24 months achieved	757	0.52	0.50	0	1
		After 24 months withdrawn	757	0.24	0.43	0	1
		Employed month 30	641	0.85	0.36	0	1
		Annual earnings	530	13644	8260	0	53097
	Pre	After 24 months achieved	461	0.79	0.41	0	1
		After 24 months withdrawn	461	0.16	0.37	0	1
		Employed month 30	458	0.85	0.36	0	1
		Annual earnings	380	13842	8089	0	41900
	Post	After 24 months achieved	683	0.75	0.43	0	1
		After 24 months withdrawn	683	0.17	0.37	0	1
		Employed month 30	650	0.87	0.34	0	1
		Annual earnings	550	15712	7598	0	45038

Pre- and post-reform SASE compliant/duration change (excluded)

16-18	Pre	After 24 months achieved	12281	0.67	0.47	0	1
		After 24 months withdrawn	12281	0.24	0.43	0	1
		Employed month 30	12014	0.82	0.39	0	1
		Annual earnings	8654	10053	5922	-15264	55628
	Post	After 24 months achieved	10812	0.64	0.48	0	1
		After 24 months withdrawn	10812	0.24	0.43	0	1
		Employed month 30	8660	0.85	0.35	0	1
		Annual earnings	3793	11435	5891	0	45842
19-24 Low	Pre	After 24 months achieved	3414	0.66	0.47	0	1
		After 24 months withdrawn	3414	0.24	0.43	0	1
		Employed month 30	3307	0.84	0.36	0	1
		Annual earnings	2618	13685	7692	0	50955
	Post	After 24 months achieved	3101	0.58	0.49	0	1
		After 24 months withdrawn	3101	0.28	0.45	0	1
		Employed month 30	2557	0.86	0.35	0	1
		Annual earnings	2016	12947	7358	0	43561
19-24 L2+	Pre	After 24 months achieved	3638	0.78	0.42	0	1
		After 24 months withdrawn	3638	0.15	0.36	0	1
		Employed month 30	3563	0.90	0.30	0	1
		Annual earnings	3189	15701	7480	0	63121
	Post	After 24 months achieved	3774	0.73	0.44	0	1
		After 24 months withdrawn	3774	0.17	0.38	0	1
		Employed month 30	3159	0.92	0.27	0	1
		Annual earnings	2798	15181	7197	0	58727

Source: Individualised Learner Records, 2009/10-2012/13

C Results on restricted samples

Table C.1: Impact of the introduction of the 12 months minimum duration on apprenticeship starts by level of pre-existing qualifications

	Reform		Placebo reform	
	(1)	(2)	(3)	(4)
BL2 qualifications				
Reform effect	-105.0** (37.6)	-166.0** (46.2)	59 (42.2)	88.4 (51.1)
Observations	557	557	507	507
R2	0.8	0.8	0.8	0.8
Mean outcome	206.3	810	203.5	802.1
L2+ qualifications				
Reform effect	-100.2** (27.9)	-256.4** (36.3)	28.8 (25.3)	-20.1 (29.1)
Observations	579	579	516	516
Pseudo-R2	0.9	0.8	0.9	0.9
Mean outcome	175.96718	861.07041	165.00775	818.37185
Month of start	Yes	Yes	Yes	Yes
Framework FE	Yes	Yes	Yes	Yes
Weights	No	Yes	No	Yes

Standard errors in parentheses. *5%/**1% levels of significance. Models include framework fixed effects; Weights are calculated using the total number of starts by framework over the period Sep 2009-Aug 2013; Sep 12-Feb 13 data are used for the actual reform (compared to one year before), Sep 11-Feb 12 for the placebo.
Source: Individualised Learner Records, 2010/11-2012/13

Table C.2: Impact of the introduction of the 12-month minimum duration, conditional on being observed in HMRC data

	(1) Achievement within 24 m	(2) Withdrawal within 24 m	(3) Employed 30 after start	(4) Log Annual Earnings 2 y. later
A - 16-18 Apprentices				
Reform effect	-0.107** (0.009)	0.048** (0.008)	0.039** (0.005)	0.127** (0.021)
Observations	61429	61407	61410	37265
Pseudo-R2	0.050	0.038	0.043	0.083
Mean outcome	0.642	0.283	0.843	10212.6
B - 19-24 Apprentices with low prior attainment				
Reform effect	-0.075** (0.012)	0.029** (0.011)	0.005 (0.008)	0.069** (0.023)
Observations	28053	28044	28023	22726
Pseudo-R2	0.035	0.031	0.038	0.067
Mean outcome	0.607	0.308	0.878	12487.8
C - 19-24 Apprentices with L2+ prior attainment				
Reform effect	-0.047** (0.010)	0.023** (0.009)	0.000 (0.006)	0.029 (0.016)
Observations	37462	37462	37338	33201
Pseudo-R2	0.031	0.020	0.023	0.057
Mean outcome	0.680	0.248	0.915	13245.5
D - All 16-24 Apprentices				
Reform effect	-0.080** (0.006)	0.033** (0.005)	0.019** (0.004)	0.090** (0.011)
Observations	126952	126952	126932	93192
Pseudo-R2	0.040	0.030	0.044	0.093
Mean outcome	0.642	0.282	0.843	10212.551
Socio-demographic	Yes	Yes	Yes	Yes
Framework FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Standard errors in parentheses, *5%/**1% levels of significance. Sample is restricted to apprenticeships started between Sep 2012 and Feb 2013 and the same period a year before, and to those observed in HMRC data. Models include month of start and framework dummies, as well as socio-demographic characteristics (gender, age at start, level of prior attainment and disability status). Robust standard errors in parentheses. Source: Individualised Learner Records, 2011/12-2012/13

Table C.3: Impact of the introduction of the 12-month minimum duration, conditional on having positive earnings

	(1) Achievement within 24 m	(2) Withdrawal within 24 m	(3) Employed 30 after start	(4) Log Annual Earnings 2 y. later
A - 16-18 Apprentices				
Reform effect	-0.089** (0.012)	0.044** (0.010)	0.016** (0.005)	0.127** (0.021)
Observations	37264	37245	37145	37265
Pseudo-R2	0.048	0.034	0.022	0.083
Mean outcome	0.677	0.248	0.929	10403.6
B - 19-24 Apprentices with low prior attainment				
Reform effect	-0.070** (0.014)	0.025** (0.013)	0.009 (0.006)	0.069** (0.0228)
Observations	22718	22713	22623	22726
Pseudo-R2	0.035	0.030	0.020	0.0670
Mean outcome	0.624	0.291	0.939	12694.4
C - 19-24 Apprentices with L2+ prior attainment				
Reform effect	-0.042** (0.011)	0.017 (0.010)	0.004 (0.005)	0.029 (0.016)
Observations	33201	33201	33041	33201
Pseudo-R2	0.031	0.020	0.015	0.057
Mean outcome	0.696	0.234	0.952	13362.5
D - All 16-24 Apprentices				
Reform effect	-0.066** (0.007)	0.027** (0.006)	0.010** (0.003)	0.090** (0.011)
Observations	93190	93190	93108	93192
Pseudo-R2	0.038	0.027	0.019	0.093
Mean outcome	0.677	0.248	0.930	10404
Socio-demographic	Yes	Yes	Yes	Yes
Framework FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes

Standard errors in parentheses, *5%/**1% levels of significance. Sample is restricted to apprenticeships started between Sep 2012 and Feb 2013 and the same period a year before, and to those observed in HMRC data and who have positive earnings. Models include month of start and framework dummies, as well as socio-demographic characteristics (gender, age at start, level of prior attainment and disability status). Robust standard errors in parentheses.

Source: Individualised Learner Records, 2011/12-2012/13