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The case of the Apprenticeship Grant for Employers

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Research Discussion Paper 018

March 2019

CENTRE for ECONOMIC PERFORMANCE

National Institute of Economic and Social Research

LE London Economics

The University Of Sheffield.

This research paper is written in collaboration with the What Works Centre for Local Economic Growth

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Published by:
Centre for Vocational Educational Research
London School of Economics & Political Science
Houghton Street
London WC2A 2AE

Devolving Skills:

The case of the Apprenticeship Grant for Employers

Chiara Cavaglia *, Sandra McNally*[+], Henry Overman ^

Abstract:

One rationale for devolution is that local decision makers may be well placed to adapt national skills' policies to the local context. We test whether such adaptation helps meet programme objectives in the case of the Apprenticeship Grant for Employers. Originally a national programme, aimed at incentivising employers to take on apprentices, reforms a few years in to operation gave some Local Authorities negotiated flexibilities in how the scheme operated. We use a difference-in-differences approach to test whether this led to an increase in the number of apprenticeship starts in devolved areas relative to control groups. We find that the policy had zero effect. There is suggestive evidence that this is because flexibilities were negotiated on the wrong margins

Keywords: Apprenticeships, devolution, employment,

JEL codes: J24, J48, H73,

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1. Introduction

Recent years have seen incremental devolution of responsibilities and powers from UK central to local government. One rationale for this devolution is that local areas may be better able to judge how to adapt national policies to fit the local context. This devolution, at least so far, has not involved a radical transfer of power. For example, the 'city deals' agreed between 2011 and 2014 did not transfer general powers to Local Authorities (LAs). Instead, they provided some cities, working with their Local Enterprise Partnership (LEP), with a small amount of additional funding or powers to be used flexibly.[1] The Apprenticeship Grant for Employers, the focus of this paper, was 'devolved' in this spirit to 40 LAs a few years in to operation. Originally a national programme, introduced in 2012, AGE aimed to incentivise employers to take on apprentices. When the national scheme was reformed a few years after introduction devolved areas negotiated additional flexibilities implemented in different LAs in either 2015 or 2016.

Local decision makers may be better placed to introduce flexibilities that are necessary in their context, providing they have good information and are able to balance competing local interests. However, if such conditions are not met, negotiating flexibilities might prove costly (in terms of time and resources) without producing the hoped-for benefits. This study demonstrates that – in the case of AGE - well-intentioned efforts to negotiate local deals do not appear to have led to better outcomes. Both our own analysis and results reported in the evaluation of the national scheme (BIS, 2013) lead us to believe that this may be partly explained by the fact that devolution flexibilities were negotiated on the wrong margins. The main flexibility ensured eligibility for larger firms whereas the national scheme was predominantly used by very small firms. Compounding this, existing evidence suggests that subsidies are not necessarily very effective for increasing the take up of apprentices. For example, Merrilees (1984) examined a scheme with some similarities in Australia. An effect on apprenticeship starts is found for some trades but not for others. It is suggested that this is because reducing the cost of apprentices may only effect demand where assistant tradespeople are widely used (i.e. apprentices cannot substitute for the work of full tradespeople).

To study the impact of AGE flexibilities, we evaluate the effect of devolving AGE to 40 LAs (in 2015 or 2016) relative to a control group using a difference-in-differences methodology. We use administrative data before and after the policy is introduced in treatment areas relative to the control group to analyse the effect of devolution on the number of apprenticeship starts. Our results are

[1] https://publications.parliament.uk/pa/cm201516/cmselect/cmcomloc/369/36904.htm#_idTextAnchor005

robust to using a matched sample of treatment and control areas and to using a synthetic control method.

We start in Section 2 by explaining AGE in more detail – how the scheme works and how it has evolved. We also provide suggestive evidence on its national impact. In Section 3, we describe the data used for analysis and explain the methodology. We present results in Section 4, before discussing conclusions in Section 5.

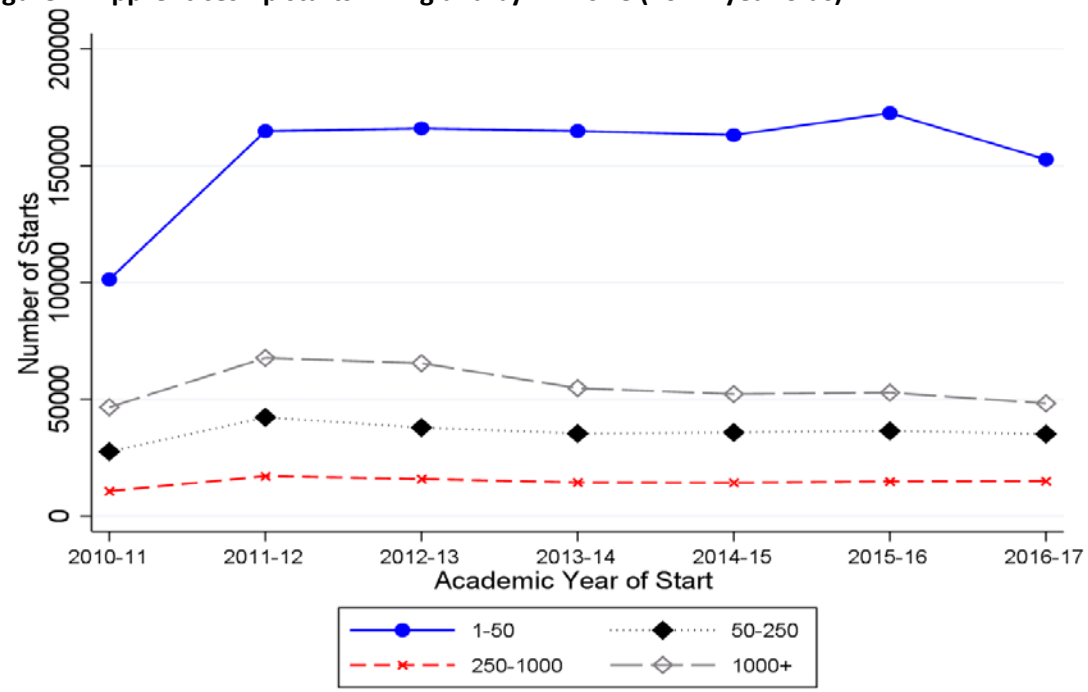
2. The Apprenticeship Grant for Employers

The Apprenticeship Grant for Employers (AGE) was introduced nationally in February 2012, at a time when over a million young people were unemployed (BIS, 2013). The scheme payed an incentive to employers, comprising a £1,500 grant per 16-24 year-old apprentice and a subsidy to the cost of training (100 per cent subsidy for apprentices aged 16-18 and 50% for those aged 19-24). Small and Medium Sized Enterprises (SMEs) with fewer than 250 employees were eligible for the grant so long as they were 'new to apprenticeships'.[2] By the end of the first year of the scheme, eligibility was extended to employers with up to 1000 employees and the maximum number of apprentices which could be taken on was increased from 3 to 10.

An evaluation of the national programme (BIS, 2013) found that most employers making use of AGE were small. The survey of recipients found that 80% employed 25 staff or less. Most of them took on only one apprentice. As the programme was introduced nationally, it is difficult to quantitatively assess whether it increased overall starts. However, it is informative to look at national trends of the number of apprenticeship starts by firm size. Using administrative data (described below), we Figure 1 plots starts (age 16-24) by firm size from the academic year 2010-11 onwards. The figure shows an increase between 2010-11 and 2011-12 for firms of all sizes. In percentage terms, the increase ranges from 45% for firms with over 1,000 employees to 63% for those with fewer than 50 employees.[3]

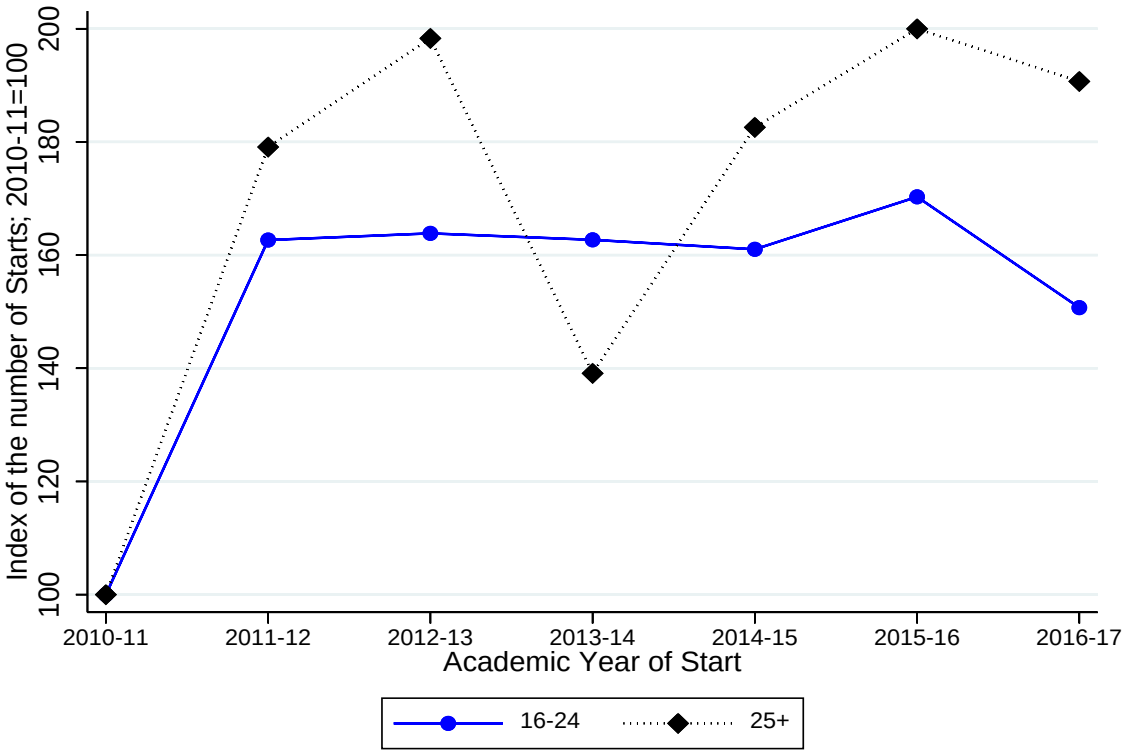
[2] 'New to apprenticeships' was originally defined as never having had an apprentice or having not taken on an apprentice in the last 3 years. At the end of August 2012, this was changed to 'not in the last year'.
[3] For firm sizes of 50-250 and 250-1000, the increases are 53% and 59% respectively between 2010-11 and 2011-12. Notice however that McNally (2018) shows that apprenticeship starts were increasing from the academic year 2008-09 onwards (for those aged over 19). In that context the national increase in the academic year 2011-12 was not exceptional.

Figure 1: Apprenticeship starts in England by firm size (16-24 year olds)



Notes: Author calculations using data from Individualised Learner Record data (matched to the Employer Data Service).The total number of apprenticeships for the year 2017 only includes the first three months of 2017.

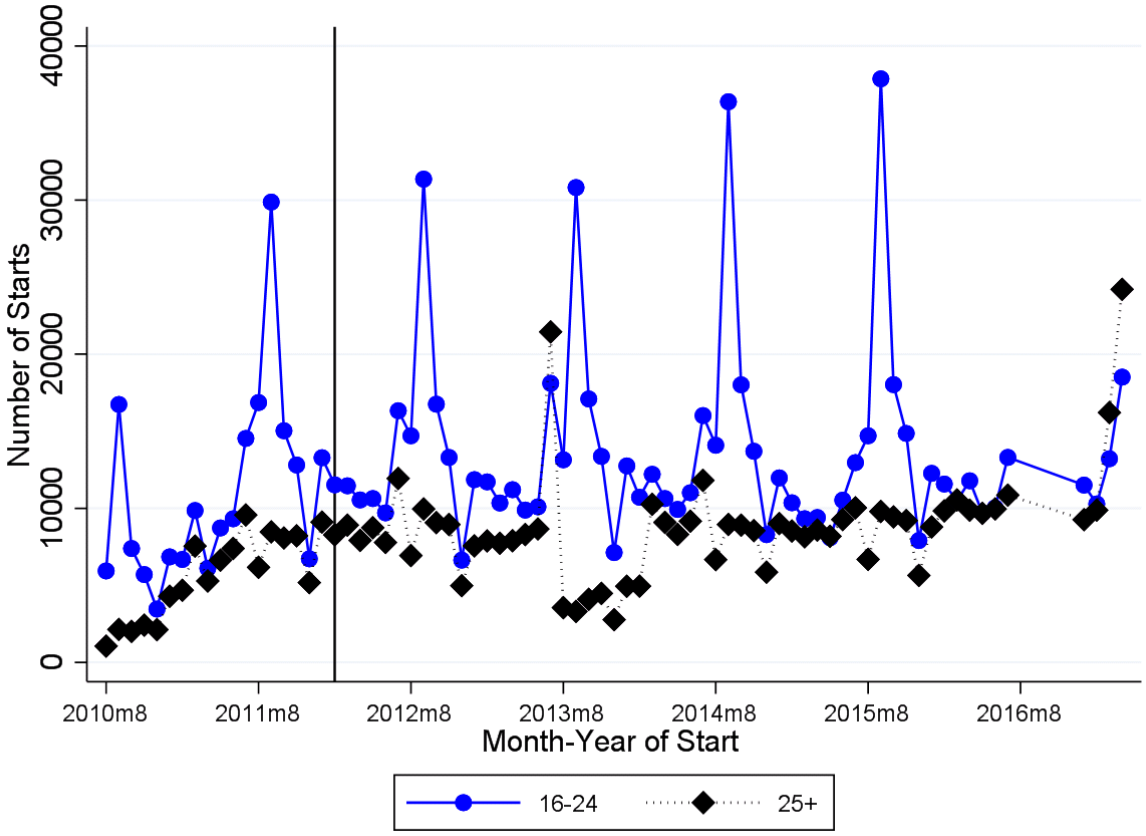
Figure 2: Apprenticeship starts in England in firms with 0-50 employees, by age group



Notes: Author calculations using data from Individualised Learner Record data (matched to the Employer Data Service).The total number of apprenticeships for the year 2017 only includes the first three months of 2017.

At first glance the marked increase for small employers (i.e. with fewer than 50 employees) might suggest that AGE did increase the number of starts for small firms. However when we consider apprenticeship starts by age *within* small firms (Figure 2), the percentage increase in the number of starts for 16-24 year olds is lower than for those over the age of 25 who were not eligible for the AGE subsidy.[4] Furthermore, when we zoom in to look at apprenticeship starts at small firms for 16-24 year olds by month (Figure 3), we see that the main increase in starts is from September 2010 to September 2011, rather than in the months after the introduction of the national policy in February 2012.[5]

Figure 3: Monthly apprenticeship starts in England in firms with 0-50 employees



Notes: Author calculations using data from Individualised Learner Record data (matched to the Employer Data Service).

This description of trends around the time of introduction of the national policy suggests it did not have a large net effect (if any) on the number of apprenticeship starts. Yet, firms claimed subsidies under the programme – for example 30,000 AGE 16-24 apprentices were delivered in the

[4] The absolute number of apprenticeships in small firms is larger for 16-24 year olds than for 24+, even though the change in the latter is more pronounced (as illustrated in Figure 2). The patterns do not change if we further distinguish between 16-18 and 19-24 year-olds.

[5] Figure 3 also shows that the pattern of apprenticeship starts is highly seasonal.

2012-13 financial year (BIS, 2013). This was substantially below the target of 40,000 grants. However, this did not prevent changes reducing the generosity of the national scheme which, in January 2015, was restricted to small firms with less than 50 employees that had hired no apprentices in the previous year.[6] As a result of these changes several local areas negotiated flexibilities as part of devolution deals with central government. The details differ slightly but AGE flexibilities were agreed with groupings of LAs that formed, or were planning to form, Combined Authorities. About 20 LAs gained AGE flexibilities in 2015 (all in Greater Manchester Combined Authority, West Yorkshire Combined Authority and Sheffield City Region) and another 20 gained flexibilities in 2016 (in the West of England, Liverpool City Region, Cambridgeshire and Peterborough and Tees Valley).[7] A full list is provided in Appendix A.

Table 1 provides an overview of the negotiated AGE flexibilities. As is clear from the table, there are aspects of AGE flexibility that are specific to different groups of LAs. Most of them have flexibility in the type of firms that are eligible to claim the subsidy. For example, all but one maintained eligibility for firms with up to 250 employees (at least for a certain number of apprentices; and conditional on not having employed apprentices in the previous year).[8] In contrast the national scheme restricts eligibility in all other LAs to small firms (with up to 50 employees) from January 2015 onwards. In the remaining sections we investigate whether these flexibilities translated into a higher number of apprenticeship starts in devolved areas than might have been expected if they had implemented the revised national scheme.

[6] Firms could now only receive up to 5 grants rather than up to 10 – although in practice very few firms hired more than one apprentice under the scheme.
[7] Suffolk and Norfolk had flexibilities for 4 months only in 2016. They are excluded from the analysis.
[8] In Sheffield, this is up to 100 employees.

Table 1: AGE policy over time and across regions

Time	AGE	Region	Eligible firm (n of employees)	N of apprentices	Grant amount (in GBP)
01/02/2012 – 31/07/2012	AGE 16 to 24	England	up to 250	up to 3	1,500
01/08/2012 – 31/12/2014	AGE 16 to 24	England	up to 1000	up to 10	1,500
01/01/2015 – 31/07/2017	AGE 16 to 24	England	up to 50	up to 5	1,500
01/04/2015 – 31/07/2017	AGE 2015	Greater Manchester Combined Authority	up to 250	up to 3	1,500. Additional 1,000 for higher apprenticeship and/or for providers supporting Trailblazers standards
01/04/2015 – 31/07/2017	AGE 2015	Sheffield City Region (GAP)	up to 100	up to 4	Different amounts depending on sector. Larger grant for strategic sectors for the region
01/08/2015 – 31/07/2017	AGE 2015	West Yorkshire Combined Authority	up to 250	up to 3	1,200. Additional 800 for apprenticeships in specific sectors.
01/08/2016 – 31/07/2017	AGE 2016	The West of England	up to 250	up to 5	1,500. Additional 1,000 for apprenticeships in specific frameworks, for higher level apprenticeships or apprentices from an ethnic minorities.
01/08/2016 – 31/03/2017	AGE 2016	Liverpool City Region	up to 250	up to 5	3,000 for 16-18 year-olds; 2,500 for 19-24 year-olds. Additional 1,000 to SMEs for advanced or higher apprentices
01/08/2016 – 31/03/2017	AGE 2016	Tees Valley (TVAGE)	up to 250	up to 3	1,500. Additional 1,000 for apprenticeships in specific frameworks.
01/08/2016 – 31/07/2017	AGE 2016	Cambridgeshire and Peterborough CA	up to 250	up to 5	2,000 for 16-18 year-olds; 1,500 for 19-24 year-olds.
01/08/2016 – 31/12/2016	AGE 2016	Suffolk and Norfolk	up to 250	up to 5	2,000 for 16-18 year-olds; 1,500 for 19-24 year-olds.

Notes: Based on an AGE Devolution Structures document provided by Manchester Combined Authority and on information from the website of each Combined Authority.

3. Data and methodology

We use Individualised Learner Record (ILR) data - administrative data on all publicly funded apprenticeships in England between 2011 and 2017. This dataset provides information on several characteristics of both the apprentice and the apprenticeship but not a detailed measure of employer size. We use the ILR matched to the Employer Data Service to give us a better estimate of firm size in 2017. Given the relatively short time period, and the broad banding for AGE eligibility, mismeasurement of firm size is unlikely to be a major concern.

We estimate the effect of flexibilities on the number of area-level apprenticeship starts. There are two 'treatment groups' comprised of LAs granted flexibilities in either 2015 (AGE15) or 2016 (AGE16). The control group comprises the other LAs that were never devolved (of which there are 270). In a refinement of this approach, we estimate regressions on a subset of LAs that have 'common support'. This is established by estimating the propensity score for being a treatment area on the basis of observable characteristics in the year prior to the start of the devolution and then trimming the sample such that only treatment and control LAs within the same range are used for the analysis. The procedure is described in Appendix B. Trimming substantially reduces the number of control areas while only reducing the treatment areas by 1 or 2 LAs.

Whether applied to the full or selected sample of LAs, the methodology involves estimating whether apprenticeship starts (age 16-24) increased in devolved areas relative to a control group, in comparison with previous time periods.[9] This 'difference-in-differences' analysis can be specified as follows:

$$\ln(y_{at}) = \alpha + \beta\,(Treat_a \times Post_{at}) + d_t + \mu + \epsilon_{at} \qquad (1)$$

where $\ln(y_{at})$ is the (log + 1) total number of relevant apprenticeship starts in a given area (a) and given time (defined by month and year).[10] $Treat_a$ =1 for all devolved areas. $Post_{at}$ =1 for the treated areas post devolution, and therefore β is the coefficient of interest that captures the effect of treatment. d_t are dummies for each month-year combination. We control for area fixed effects (μ) which removes the influence of time invariant factors that might affect the number of apprentices. ϵ_{at} is the error term.[11] We estimate this regression separately for all firms and firms with 50-250

9 We exclude those aged 25+ because of the possibility of substitution between younger and older apprentices on account of the incentive scheme.

10 Given differences in total number of apprentices across areas, the estimates in logs are easier to interpret (although results when estimating in levels are not very different).

11 Including time-varying characteristics of Local Authorities (e.g. such as those included in Table 2) makes no difference to the coefficients of interest.

employees (i.e. those not eligible for the national scheme) as well as separately for AGE15 and AGE16 areas. We have also estimated an 'event study' such that being in a treatment area is interacted with every time period (defined by month and year). This enables us to check for differential trends in treatment and control areas prior to the flexibilities being introduced.

Standard errors are clustered at the LA level. All the regressions are weighted by the annual population by LA. This is to take into account the differing size of each local authority (although the unweighted results are not very different).

To check the robustness of our results we use the synthetic control method, as developed by Abadie and Gardeazabal (2003) and Abadie et al (2010; 2015). This uses the idea that in some cases a weighted combination of units may be a better comparison group than any unit on its own. It may be particularly useful for AGE15 areas, which are quite different from the other LAs.[12] Table 2 shows that on average they are more populous, are more likely to be rural and have many more small firms than areas in either the AGE16 or never devolved groups. The treatment and control groups look much more similar when the sample is trimmed (shown in Appendix B), as described above. The synthetic control group is created as a weighted average of several untreated units. The weights are defined by 'matching' pre-treatment covariates and outcomes such that the synthetic control is as similar as possible to the treated area before the start of the treatment.[13] The method is further explained in Appendix C.

[12] When estimating the synthetic control method for AGE15 areas, we need to estimate the effect for West Yorkshire separately as this had a slightly different start time from other areas.

[13] We use as covariates the number of firms in each area by size, the total population, the percentage of 16-64 inhabitants, the percentage of the population living in a rural area, the percentage of people with a degree or higher further education (above level 4), the percentage of people who are employed and economically active and the percentage of white population.

Table 2: Local Authority summary statistics by AGE group

Yearly averages	Never Devolved	AGE 2015	Diff AGE15 and Never Devolved	AGE 2016	Diff AGE16 and Never Devolved
Female	51.3	51.1	-0.2*	51	-0.0
Ethnic minority	10.3	11.2	0.9	5	-5.0***
Total population	155,635	328,039	172,404***	195,335	39,700
16-64 population	62.8	63.9	1.1**	64	0.9
Population in rural area	32.0	7.5	-24.5***	23	-9.1
No academic qualification	8.2	11.0	2.8***	10	1.7**
NVQ Level 4 qual. Or more	35.7	30.1	-5.6***	33	-3.2
Economically active	78.8	75.6	-3.2***	77	-2.1**
Unemployment rate	6.1	7.9	1.8***	8	1.4**
Employees receiving work-related training (last month)	10	10	-0.4	10	-0.4
No. micro firms in 2014	5258	7,748	2,490***	4,803	-455
No. firms up to 50 in 2014	549	995	444***	589	40
No. firms up to 250 in 2014	96	184	88***	107	11
No. firms with 250+ in 2014	24	42	18**	25	1
Number of LA	270	20		20	

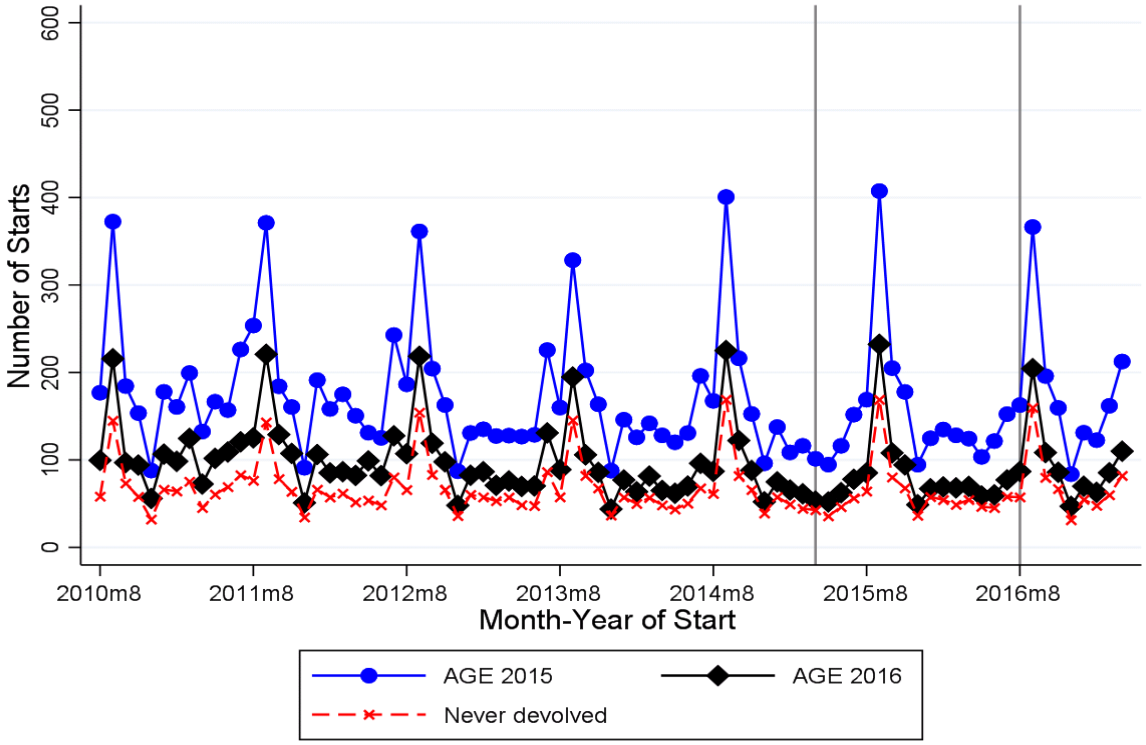
Notes: From Annual Population Survey (NOMIS), 2011-2016. Most statistics are % of the 16-64 year-old population except for total population, and number of firms by firm size, which are in levels and the 16-64 population which is as a % of the total population. ***, **, * indicate significance at 1%, 5% and 10% respectively.

4. Results

Descriptive statistics

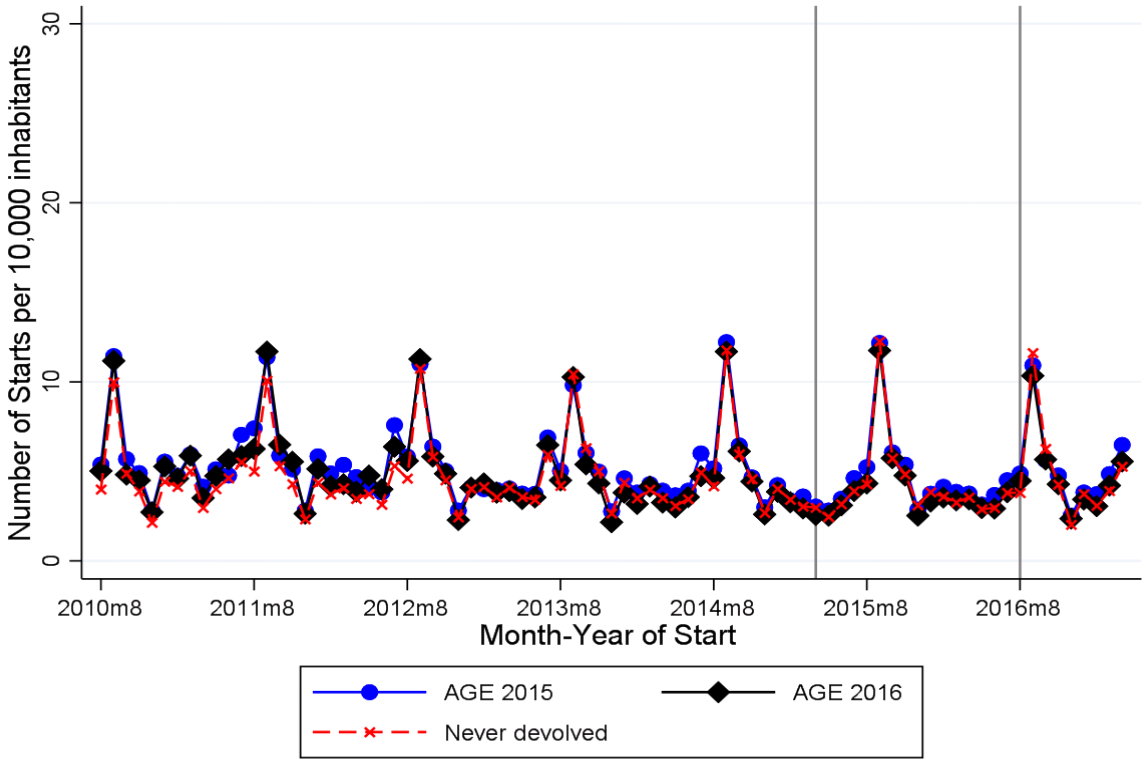
Before reporting regression results, we consider the raw data on the average number of apprenticeship starts for 16-24 year olds in the treatment groups (AGE15 and AGE16) and the control group for the full sample (the never devolved areas). These are plotted in Figure 4, numbers of starts, and Figure 5, starts per 10,000 inhabitants, from January 2011 to January 2017. The vertical lines indicate when flexibilities were introduced in AGE15 and AGE16 areas, respectively. Neither plot shows any obvious change in the number of apprenticeship starts in treatment areas (relative to control areas) coinciding with policy implementation. Of course, it might be that there are small changes that are not picked up by visual inspection but that can be detected in the regression analysis.

Figure 4: Average number of monthly apprenticeship starts per Local Authority, by AGE group



Notes: Author calculations using data from Individualised Learner Record data.

Figure 5: Number of monthly apprenticeship starts per Local Authority (per 10,000 inhabitants), by AGE group



Notes: Author calculations using data from Individualised Learner Record data.

Difference-in-Differences

Table 3 shows results from the difference-in-differences specification (described above), showing the estimate of the coefficient of interest: the effect of introducing flexibilities in treatment areas relative to control areas. Results are estimated separately for AGE15 (columns 1 and 3) and AGE16 areas (columns 2 and 4). They are reported for all firms (columns 1 and 2) and the subgroup of firms with 50-250 employees (columns 3 and 4). The latter are firms eligible to receive the subsidy in all but one of the devolved areas (after the policy was introduced) but not in control areas. Finally, there are two panels: the upper panel shows results for all LAs and the lower panel shows results for LAs that have 'common support'.

Table 3: Difference-in-Difference Results

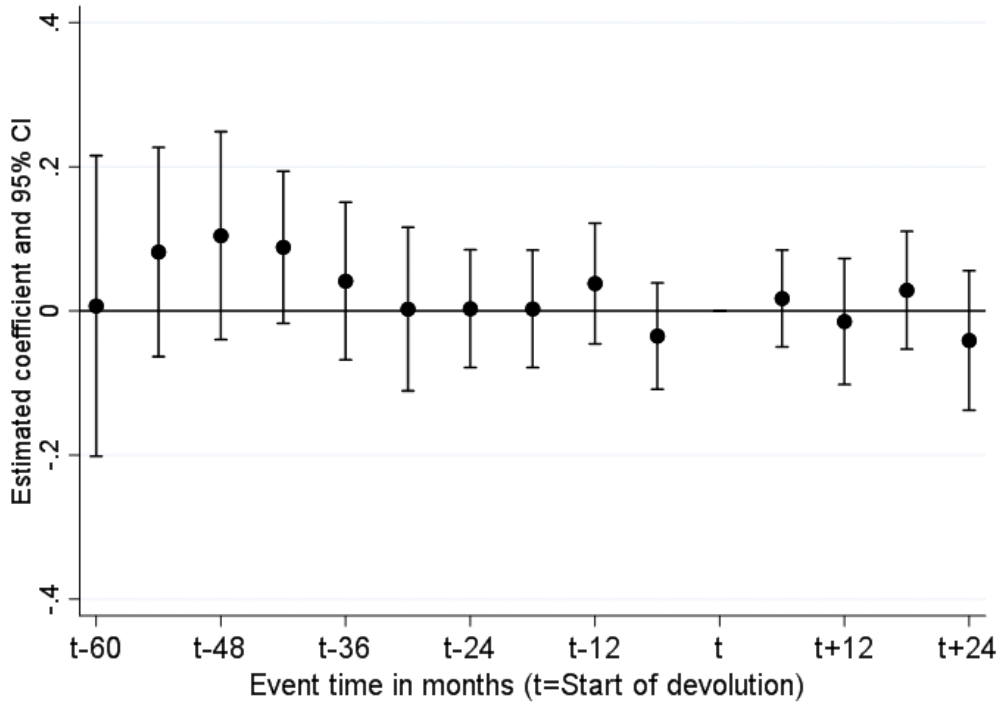
	All Firms		**Firms with 50-250 employees**	
	AGE 15 v ND	**AGE 16 v ND**	**AGE 15 v ND**	**AGE 16 v ND**
	(1)	**(2)**	**(3)**	**(4)**
All Local Authorities				
Treated*Post	-0.025	-0.031	-0.065	-0.099
	(0.017)	(0.032)	(0.048)	(0.073)
N	22040	22040	21736	22040
adj. R-sq	0.901	0.889	0.714	0.690
Local Authorities with Common Support				
Treated*Post	-0.031	-0.059*	0.046	-0.117
	(0.024)	(0.031)	(0.046)	(0.104)
N	4028	11932	3876	11172
adj. R-sq	0.911	0.913	0.651	0.678

Notes: Dependent variable is log (number apprenticeships per month + 1) as discussed in the text. ***, **, * indicate significance at 1%, 5% and 10% respectively. Standard errors clustered at LA level reported in parentheses. The regressions control for LA and month-year dummies. The second panel restricts the analysis to areas with common support on the propensity score.

The pattern of results is the same across all specifications. The treatment effect is small, negative and not statistically different from zero (except for one case where the coefficient is negative and significant at the 10 per cent level).

Figure 6 and 7 show an event study for the trimmed sample for AGE15 and AGE16 areas respectively.[14] The time of policy introduction is denoted by 't' and coefficients for a set of 6 month-period dummies interacted with treatment status are plotted from 60 months before the policy to 24 months afterwards. The coefficients on the interacted dummies are insignificant in all time periods. In other words, devolved areas did not have more apprenticeship starts than non-devolved areas either before or after additional flexibilities were introduced in 2015 and 2016 respectively.[15] The event study for firms with 50-250 employees tells a similar story, though with much wider confidence intervals around estimates (and hence the associated figures are not reported).

Figure 6: Event Study for AGE15 areas (common support sample)

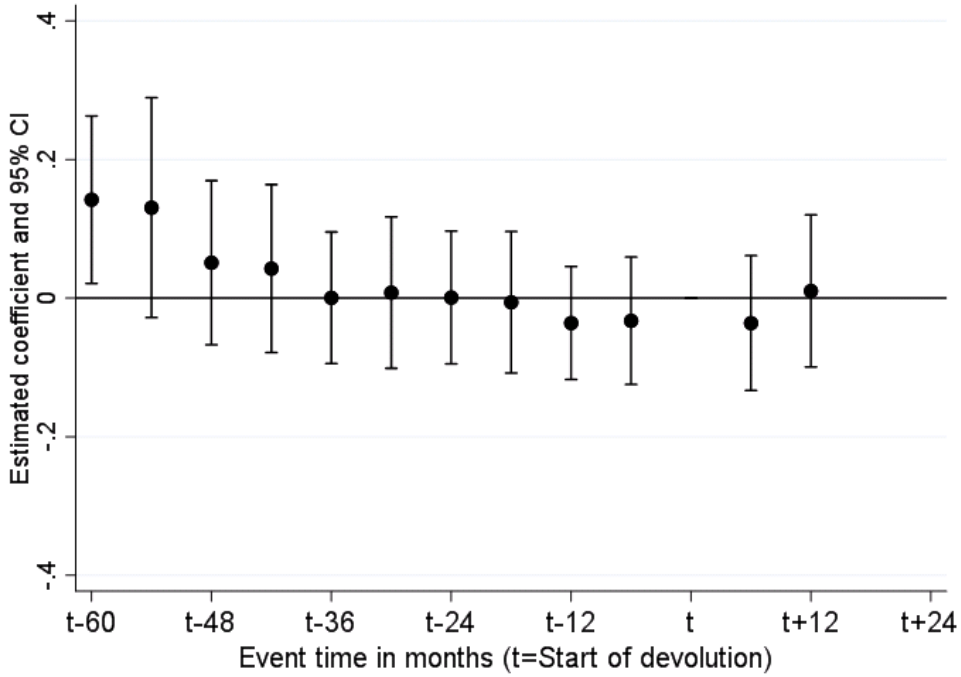


Notes: The figure plots coefficients for a set of 6 month-period dummies interacted with treatment status from 60 months before the policy to 24 months afterwards. Analysis is restricted to areas with common support on the propensity score.

[14] The plot looks very similar for the full sample. However, for the full sample more coefficients are significant in the pre-policy period, suggesting the existence of differential trends in treatment and control areas if we do not restrict the sample to LAs with common support.

[15] There is only one point estimate in the 'pre-policy' period which is statistically different from zero for AGE16 areas. But this a long time before the policy starts in these areas. All other point estimates are not statistically different from zero either before or after the policy is introduced.

Figure 7: Event Study for AGE16 areas (common support sample)



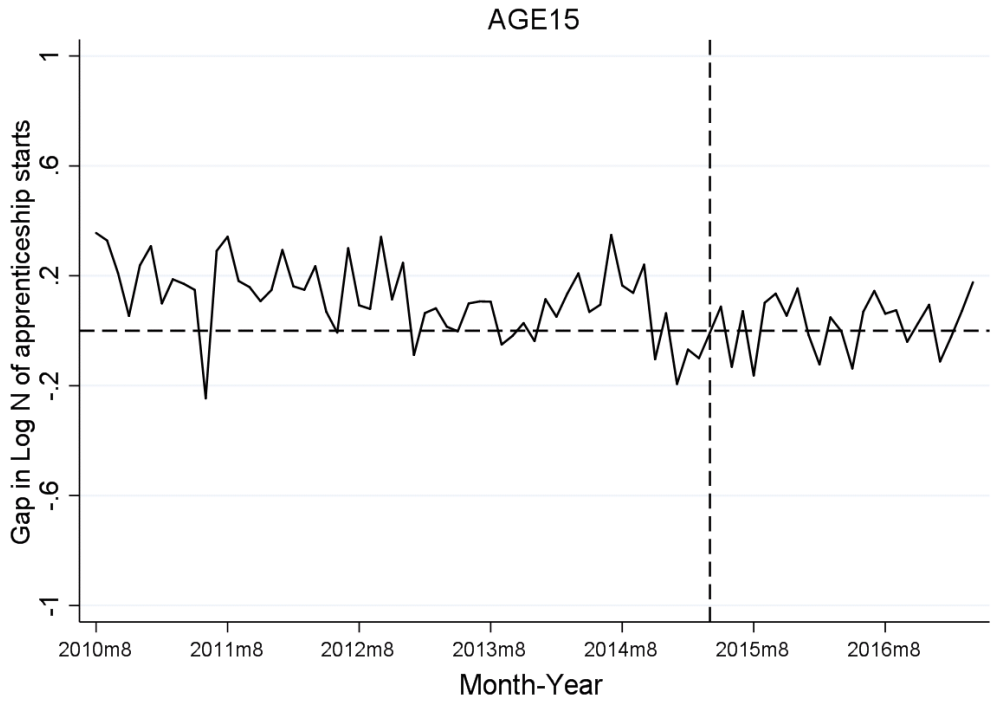
Notes: The figure plots coefficients for a set of 6 month-period dummies interacted with treatment status from 60 months before the policy to 24 months afterwards. Analysis is restricted to areas with common support on the propensity score.

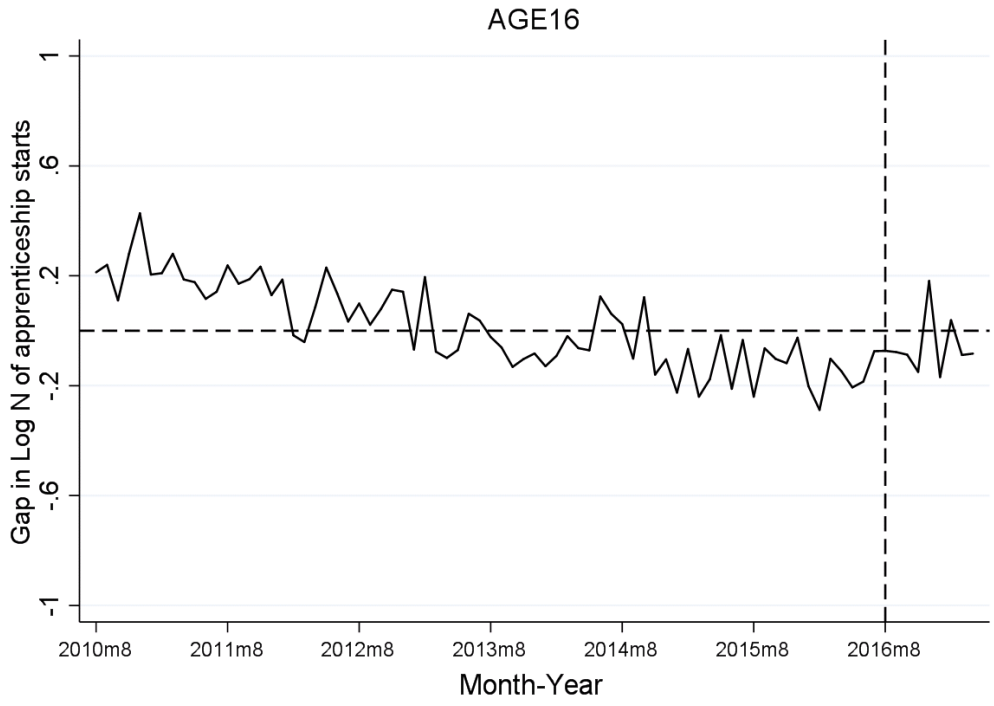
Synthetic Control Method

The results of the synthetic control method are illustrated in Figure 8 for the full sample of firms, with more explanation of results in Appendix C.[16] Figure 8 illustrates the gap in the number of apprenticeship starts between the devolved areas and the synthetic control group for each time period. A horizontal line at zero in the pre-treatment period would indicate that the synthetic control closely matches the treatment group before the introduction of flexibilities. For AGE15 we observe a steady pattern in the pre-treatment period. There is a slight downward-sloping pattern for AGE16, which starts in the pre-treatment period and seems to attenuate in the post-intervention period. Overall, however, it fluctuates around zero both in the pre- and post- treatment period and it is usually contained between -0.2 and 0.2 logs. These results confirm those of our main analysis, suggesting no significant effect of the increased flexibility.

[16] For the synthetic control method West Yorkshire is excluded from the AGE15 areas because they implemented the policy slightly later. Results for West Yorkshire only are very similar to those reported for other AGE15 areas.

Figure 8: Gap in Log Number of Apprenticeship starts between devolved area and the synthetic control group





Notes: Results from synthetic control estimated for the full sample of firms. AGE 16 group excluded from estimation for AGE 15 (and vice-versa).

5. Conclusion

Devolution of skills policy in England started incrementally but is becoming more important. For example, from 2019, about half of the overall Adult Education Budget will be devolved to mayoral Combined Authorities across England. Many of these areas are the same as those that negotiated flexibilities under the Apprenticeship Grant for Employers. In this paper, we show that all the hard work in negotiating flexibilities for the AGE programme made no measurable difference to the number of apprenticeship starts in devolved areas.

A plausible explanation is that flexibilities were negotiated on the wrong margins. The evaluation of the national scheme (BIS, 2013) suggested that take up was much more prevalent among very small firms than in any other group. However, our own analysis of the national scheme suggests that any added value of the scheme in this respect is small, at best. But to the extent that the national scheme was effective for very small firms, it is arguable that more effort should have been made to make the system more generous for those firms, rather than expanding subsidies to larger firms where take up had been poor in the national scheme. This suggests either that those negotiating flexibilities had information constraints (i.e. they did not know about the experience in the national scheme) or that they were influenced by the wrong stakeholders (e.g. larger local employers). It is also possible that the form of devolution on offer was simply too incremental to be useful at the local level. The more general point is that devolution needs to be accompanied by structures to discern carefully how to use resources effectively in the local context. Otherwise there is a danger that devolution multiplies bureaucracy (with associated costs) while doing little or nothing for local economic growth.

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Appendix A: Sample definition

a) All local authorities

LAs that obtained increased flexibility in 2015 (AGE15):

Great Manchester Combined Authority: Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan

West Yorkshire Combined Authority: Kirklees, Calderdale, Bradford, Leeds, Wakefield ,York.

Sheffield City Region: Sheffield, Barnsley, Doncaster, Rotherham.

LAs that obtained increased flexibility in 2016 (AGE16):[17]

West of England Combined Authority: Bath & North East Somerset, City of Bristol and South Gloucestershire.

Liverpool City Region: Halton, Knowsley, Liverpool, Sefton, St Helens, Wirral.

Cambridgeshire and Peterborough Combined Authority: Cambridge, East Cambridgeshire, Fenland, Huntingdonshire, South Cambridgeshire, Peterborough.

Tees Valley Combined Authority: Darlington, Hartlepool, Middlesbrough, Redcar & Cleveland and Stockton-on-Tees,

Control LAs:

The control group include the remaining 270 local authorities.

b) Local Authorities with Common Support

As explained in the main text, and discussed in more detail in Annex B, in an additional exercise we selected control and treated LAs that are more similar to each other (with 'common support') in terms of their propensity to be treated. The treated sample for this exercise is listed below and the control group consists of a total of 173 local authorities (35 for AGE15 and 138 for AGE16 areas).

LAs that obtained increased flexibility in 2015 (AGE15):

All of the above except York and Sheffield.

LAs that obtained increased flexibility in 2016 (AGE16):

All of the above except Peterborough.

[17] Notice that we exclude from our analysis on the effect of the devolution the local authorities that are part of the Combined Authorities of Norfolk and Suffolk. This is because they obtained increased flexibility only from August to December 2016.

Appendix B: Local Authorities with Common Support

To select the sample of LAs with common support, we first estimate a Probit model for the probability that a firm is in the treatment group:

$$Pr(Y=1|X)=\varphi(\beta_0+\beta_1 X)$$

where Y is an indicator that takes value 1 if the LA has AGE flexibilities and φ is the cumulative normal distribution function. X is a vector of pre-determined characteristics measured the year before devolution. A broad range of characteristics are included in the vector X (although results are not very different if this is more restricted). The full set includes:

- labour market characteristics: employment, self-employment unemployment rate and the percentage of employees receiving work-related training;
- demographic characteristics, such as the population, the fraction of population living in rural areas, females and white inhabitants.
- the number of micro, small, medium and large firms.
- the percentages of 16 to 64 year olds with at least a degree or a NVQ qualification higher than level 4 and the percentage of 16 to 64 year olds with no qualifications.
- the log number of apprenticeship starts.

The model is estimated separately for AGE15 and AGE16 LAs. For each of these, we include all non-devolved local authorities. For each local authority, we compute the propensity score - the probability of being an area granted flexibilities. We then use this to construct a subsample of Local Authorities that have 'common support'. In other words, our sample includes only those areas of which the propensity score lies within the distributions of the propensity score of both the non-devolved and devolved areas. The below table gives summary statistics for treatment and control groups with 'common support' (similarly to Table 2 in the text).

Table B1: Summary statistics per local authority for those with 'common support'

Yearly averages per Local Authority	AGE 2015	Counterfactual for AGE15	Diff AGE15 - Coun	AGE 2016	Counterfactual for AGE16	Diff AGE16 - Coun
Female	51.0	51.7	-0.7**	51.4	51.2	0.2
Ethnic minority	11.5	14.4	-2.9	4.8	5.5	-0.7
Total population	321,911	318,783	3,128	195,588	153,380	42,208
16-64 population	63.7	62.4	1.3	63.7	62.6	1.1
Population in rural	7.2	17.9	-10.7	23.5	31.7	-8.2
No academic qualification	11.2	11.4	-0.2	9.8	8.2	1.6*
NVQ Level 4 qual. +	29.2	28.0	1.2	32.9	33.8	-0.9
Economically active	75.4	75.6	-0.2	76.7	79	-2.3**
Unemployment rate	8.1	7.8	0.3	7.6	6	1.6**
Employees receiving work-related training (last month)	9	9	0.5	9.5	10	-0.5
N. micro firms in 2014	7,680	8,308	-628	4,817	4,651	165
N. firms up to 50 in 2014	974	991	-17	589	507	82
N. firms up to 250 in 2014	180	166	14	106	88	18
N firms with 250+ in 2014	41	31	10	24	21	3
N. of LA per area	18	35		19	138	

Notes: From Annual Population Survey (NOMIS), 2011-2016. Most statistics are % of the 16-64 year-old population. Exceptions are the total population and the number of firms by firm size, in levels. The 16-64 population is a % of the total population. ***, **, * indicate significance at 1%, 5% and 10% respectively. Approximated to 3dp

Appendix C: Synthetic Control Method

Following Abadie et al. (2015), let $X_{1m} - X_{0m}W$ be the difference between pre-intervention characteristics and outcomes of the treated (X_1) and the weighted pre-intervention characteristics and outcomes of non-treated units (X_0). The weight matrix W^* is selected to minimize that difference. That is:

$$W^* = \arg min_W \sum_{m=1}^{k} v_m (X_{1m} - X_{0m}W)^2$$

where v_m are a second set of weights given to the pre-treatment characteristics and outcomes.[18] W^* are non-negative and sum to one. The pool of donors and their respective weights are listed in the online appendix.

The effect of the intervention for a given post-treatment period is given by $Y_1 - Y_0W^*$, where Y_1 and Y_0 are the outcome for the treated and the synthetic control units, respectively. Although this method does not allow for traditional statistical inference, following Abadie et al (2010), it is common practice to use falsification tests based on permutation techniques to create a measure for the uncertainty of the estimated effect. To do this we estimate placebo treatment effects for every unit in the pool of donors and we compare these to the estimated effect for the treated unit by computing the ratio of post-treatment Root Mean Square Prediction Error (RMSPE) to pre-treatment RMSPE for each unit. For each unit this is defined as the post-treatment Root Mean Squared Predicted error (RMSPE) $\left((T - T_0)^{-1} \sum_{t=T_0+1}^{T} \left(Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt}\right)^2\right)^{1/2}$, divided by the pre-treatment RMSPE. $\left({T_0}^{-1} \sum_{t=1}^{T_0} \left(Y_{1t} - \sum_{j=2}^{J+1} w_j^* Y_{jt}\right)^2\right)^{1/2}$ where T_0 the number of pre-intervention periods and J+1 the number of donors used to build the synthetic control group. If the ratio of RMSPE for the treated units lies within the distribution of the placebo ratio of RMSPE, it is less certain that the effect is attributable to treatment. A common way to make this statement more precise is to calculate the proportion of placebo that have ratio of RMPSE at least as large as the effect of the treated unit. The larger the proportion, the lower the probability that effects can be attributed to the intervention.

The main text shows graphs that illustrate the results. The Table below reports estimated treatment effects and RMPSE for the whole sample of firms and for firms with 50-250 employees. As discussed

[18] The weights v_m are determined through cross-validation, as in Abadie et al (2015). The authors apply this method to avoid overfitting, but in our case, it allows us to be agnostic a priori about the weight assigned to each variable in the pre-treatment fit, as, to the best of our knowledge, no specific criteria were required to apply for greater flexibilities.

in the text, these results are based on a sample excluding West Yorkshire because this has a different start date to the other AGE2015 areas.

Table C1: Results from synthetic control method

	Treated unit	
	AGE 2015	**AGE 2016**
	(1)	**(2)**
All Firms		
$E(Y_{1post}\text{-}Y_{1pre}) - E(Y_{0post}W - Y_{0pre}W)$	-0.082	-0.065
RMSPE	0.586	0.769
Pr (>RMSPE)	0.972	0.651
Firms with 50-250 employees		
$E(Y_{1post}\text{-}Y_{1pre}) - E(Y_{0post}W - Y_{0pre}W)$	-0.081	-0.043
RMSPE	0.572	0.649
Pr (> RMSPE)	0.994	0.877

Note: Dependent variable is log (number apprenticeships per month + 1) as discussed in the text. The first row of each panel reports the average effect, after accounting for differences in the pre-treatment period (as in a Diff-in-Diff setting). The RMSPE is the ratio between the Post-RMSPE and the Pre-RMSPE, as explained in the text. Pr (> RMSPE) is the proportion of placebo with a larger RMSPE than the treated unit. The synthetic control group is specified based on the following variables: log of monthly apprenticeship starts prior to the start of the devolution and local authority characteristics mentioned in the main text.

The first row reports the average effect, computed as a Difference-in-Difference between the outcomes of the treated and of the synthetic controls in the pre- and post- treatment period. This is slightly negative for both AGE15 and AGE16. Note, however, that the placebo tests, reported in the third row of the table, suggest that this effect is 'insignificant' (in the sense of being small, relative to the underlying uncertainty). The proportion of placebo effects that are at least as large as the effect of the treated unit ranges between 65% (for AGE16) to 97% (for AGE15). This suggests that it is very unlikely that any effect can be attributed to the AGE flexibilities. Similar results are found for the sub-sample of SMEs (reported in the lower part of the table). As a further check, we applied this method to each devolved Combined Authority separately. The pattern of results are similar to those reported above.

Online Appendix only

Synthetic Control Local Authority Weights

Local Authority	Weights for AGE15	Weights for AGE16	Local Authority	Weights for AGE15	Weights for AGE16
Adur	0	0.001	Crawley	0	0.001
Allerdale	0	0.003	Dacorum		0.001
Amber Valley	0	0.003	Dartford	0	0.002
Arun	0	0.001	Daventry	0	0.003
Ashfield	0	0.003	Derby	0.001	0.001
Ashford		0.001	Derbyshire Dales		0.001
Aylesbury Vale		0.001	Dover	0	0.002
Barking and Dagenham	0	0.001	Dudley	0.192	0.001
Barrow-in-Furness	0	0.006	Ealing	0	0.001
Basildon	0	0.001	East Devon		0.001
Basingstoke and Deane		0.001	East Dorset		0.001
Bassetlaw	0	0.002	East Hampshire	0	0.001
Bedford	0	0.001	East Hertfordshire	0	0.001
Bexley	0	0.001	East Lindsey	0	0.002
Birmingham	0.019	0	East Northamptonshire		0.001
Blaby		0.001	East Riding of Yorkshire	0	0.001
Blackburn with Darwen	0.002	0.001	East Staffordshire	0	0.001
Blackpool	0.001	0.002	Eastbourne	0	0.001
Bolsover	0	0.001	Eastleigh		0.001
Boston	0	0.001	Eden		0.001
Bournemouth	0.001	0.001	Elmbridge		0.001
Bracknell Forest		0.001	Enfield	0	0.001
Braintree	0	0.001	Epping Forest	0	0.001
Brentwood		0.001	Erewash	0	0.001
Brighton and Hove	0.001	0.002	Exeter	0.001	0.001
Bromley	0.089	0.001	Fareham	0.004	0.002
Bromsgrove		0.001	Forest of Dean	0	0.002
Broxbourne		0.001	Fylde		0.001
Broxtowe	0.001	0.002	Gateshead	0.001	0.003
Burnley	0	0.002	Gedling	0	0.001
Camden	0.001	0.001	Gloucester	0.064	0.017
Cannock Chase	0	0.002	Gosport	0	0.001
Canterbury	0	0.002	Gravesham	0	0.001
Carlisle	0	0.002	Greenwich	0	0.001
Castle Point	0	0.001	Guildford	0	0.002
Central Bedfordshire		0.001	Hackney	0	0.001
Charnwood	0	0.001	Hambleton		0.001
Chelmsford		0.001	Hammersmith and Fulham	0.001	0.001
Cheltenham	0.001	0.002	Harborough	0	0.002
Cherwell	0	0.001	Haringey	0	0.001
Cheshire East	0.001	0.001	Harlow	0	0.001
Cheshire West and Chester	0.001	0.001	Harrogate		0.002
Chesterfield	0.003	0.027	Hart		0.001
Chichester		0.001	Hastings	0	0.002
Chiltern		0.001	Havant	0	0.001
Chorley	0	0.002	Havering	0	0.001
Christchurch		0.001	Herefordshire, County of	0	0.002
City of London	0.003	0.008	Hertsmere		0.001
Colchester	0	0.001	High Peak	0	0.02
Copeland	0	0.008	Hillingdon		0.001

Corby	0	0.002	Hinckley and Bosworth	0	0.002
Cotswold	0	0.002	Horsham		0.001
County Durham	0	0.001	Hyndburn	0	0.001
Craven		0.001	Islington	0	0.001
Kensington and Chelsea	0.043	0	Rushcliffe		0.07
Kettering	0	0.002	Rushmoor	0	0.001
Kingston upon Hull, City of	0.018	0.041	Rutland		0.001
Lancaster	0	0.002	Ryedale		0.001
Leicester	0.001	0	Sandwell	0.071	0
Lewes		0.001	Scarborough	0	0.001
Lichfield		0.002	Sedgemoor	0	0.002
Lincoln	0	0.021	Selby	0	0.001
Maidstone	0	0.001	Sevenoaks		0.001
Maldon	0	0.002	Shropshire	0	0.002
Malvern Hills		0.001	Solihull		0.001
Mansfield	0	0.006	South Bucks		0.001
Medway	0	0.001	South Derbyshire		0.001
Melton		0.001	South Hams	0	0.001
Mendip	0	0.002	South Holland	0	0.001
Merton	0.001	0.001	South Kesteven	0	0.001
Mid Devon		0.001	South Lakeland	0	0.002
Mid Sussex		0.001	South Northamptonshire		0.001
Mole Valley		0.001	South Oxfordshire		0.001
New Forest	0	0.001	South Ribble	0	0.001
Newark and Sherwood	0	0.003	South Somerset	0	0.001
Newcastle upon Tyne	0.001	0.001	South Staffordshire	0	0.001
Newcastle-under-Lyme	0	0.004	South Tyneside	0	0.102
North Devon	0	0.001	Southampton	0.001	0.001
North Dorset		0.001	Southend-on-Sea	0	0.001
North East Derbyshire	0	0.001	Southwark	0.003	0.001
North East Lincolnshire	0	0.001	Spelthorne	0	0.001
North Hertfordshire	0	0.002	Stafford	0	0.002
North Kesteven	0	0.001	Staffordshire Moorlands	0	0.003
North Lincolnshire	0	0.002	Stevenage	0	0.001
North Somerset		0.001	Stoke-on-Trent	0.001	0
North Tyneside	0.001	0.001	Stratford-on-Avon		0.001
North Warwickshire	0	0.002	Stroud	0	0.001
North West Leicestershire	0	0.002	Sunderland	0.354	0.254
Northampton	0	0.001	Surrey Heath		0.001
Northumberland	0	0.001	Sutton		0.001
Nottingham	0.006	0	Swale	0	0.002
Nuneaton and Bedworth	0	0.001	Swindon		0.001
Oxford	0.005	0.053	Tamworth	0	0.002
Pendle	0	0.001	Tandridge		0.001
Plymouth	0.008	0.001	Taunton Deane		0.001
Poole	0.001	0.001	Teignbridge	0	0.001
Portsmouth	0.001	0.003	Telford and Wrekin	0	0.002
Preston	0.001	0.001	Tendring	0	0.001
Purbeck		0.001	Test Valley		0.001
Reading	0.001	0.001	Tewkesbury		0.001
Redditch	0	0.001	Thanet	0.001	0
Reigate and Banstead		0.001	Three Rivers		0.001
Ribble Valley	0	0.001	Thurrock	0	0.002
Richmondshire	0	0.003	Tonbridge and Malling	0	0.001
Rochford	0	0.001	Torbay	0.001	0.001
Rossendale	0	0.002	Torridge	0	0.009
Rother		0.001	Tower Hamlets	0	0.001

Rugby		0.001	Tunbridge Wells	0	0.001
Runnymede	0	0.001	Uttlesford		0.001
Vale of White Horse		0.001	West Oxfordshire		0.001
Walsall	0.022	0	West Somerset	0	0.001
Waltham Forest	0	0.001	Westminster	0.004	0
Warrington		0.001	Weymouth and Portland	0	0.001
Warwick		0.001	Wiltshire	0.039	0.067
Watford		0.001	Winchester		0.001
Waverley	0	0.002	Windsor and Maidenhead		0.001
Wealden		0.001	Woking		0.001
Wellingborough	0	0.001	Wokingham		0.001
Welwyn Hatfield		0.001	Worcester		0.002
West Berkshire		0.001	Worthing	0.001	0.001
West Devon		0.001	Wychavon	0	0.001
West Dorset		0.001	Wycombe	0	0.001
West Lancashire	0	0.002	Wyre		0.001
West Lindsey	0	0.002	Wyre Forest	0	0.002