LSC South East
Projections of postcompulsory education learner numbers in the South East of England.

May 2008

A report to the Learning and Skills Council (South East), for the Regional Infrastructure Group (Capital Bids)

Learning Planning \& Performance Team

# Report prepared for the Learning and Skills Council by Michael Barrow, Department of Economics, University of Sussex <br> Researchers: Ray Bachan, Annelle Bellony, Alvaro Monge Zegarra, University of Sussex. 

For more information, please contact:
Jan Jackson
Learning and Skills Council
Price House
53 Queens Road
Brighton
BN1 3XB
Jan.jackson@lsc.gov.uk

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## 1. Introduction

We were commissioned by the LSC (South East) in March 2008 to develop a model to project forward participation in post-compulsory education, building on some existing work within the LSC (see the Literature Review section below). The brief asked for projections of population, participation rates and learner numbers to 2020, with a system of warnings where the forecasts were thought to carry a great deal of uncertainty. The purpose of the report is to provide a framework within which to make judgements about capital bids coming forward from schools and colleges in the coming years. This is pertinent because of the recent announcement of the raising of the compulsory participation age to 17 in 2013 and to 18 in 2015. Subject to trends in the age cohort, this will increase the demand on schools and colleges for education post-16. This raising of the school-leaving age is the main factor driving our forecasts of demand for post-16 education though, as we will show, this is moderated by anticipated changes in the population age cohort.

We have constructed a spreadsheet model to calculate projections of learner numbers at the level of district and unitary local authorities, and allow different assumptions or scenarios to be tested. This report explains the workings of the model and provides forecasts on the basis of different scenarios. One is a central or baseline forecast, examining the anticipated effect of raising the compulsory participation age (where we still assume a small element of non-participation, i.e. truancy). One alternative then examines a different assumption about the growth of work-based learning and its effect upon the forecast values. This alternative is a realistic one but part of the purpose of including it is to show how the model can be used to look at different scenarios. We also (in an appendix) present a third scenario, which assumes 100\% participation everywhere and thus illustrates the (estimated) maximum possible effect of the government's policy changes.

It is important to be aware of the purpose of the model and also of its limitations. It is intended to provide a consistent framework for evaluating capital bids and therefore applies the same methodology to all districts in the South East, using the same data sources for all. It is quite possible therefore that our projections may differ from others produced by (e.g.) local councils or colleges, where different assumptions have been made and/or different data sources used. (The LSC is fully aware that in some areas of the South East, some local authorities are in discussions with central government about the reliability (or validity) of ONS data for their particular circumstances.) However, it should then be possible to explore the reasons for any differences and gain a better appreciation of likely future outcomes. For example, it is possible that several colleges in a district are all independently projecting an increase in market share and hence growth in learner numbers. However, aggregating these would result in an unattainable overall outcome, and this should be observable by comparison with forecasts given by our model.

Another limitation is the quality and consistency of the data. Where different data sources are used there is always a danger that differences in definitions, etc. will cause inconsistencies between different sets of figures. Even within a single data source there can be shortcomings; for example, the DCSF tables for participation rates report that "due to rounding error" the participation rates for Wokingham and Reading in 2005 amounted to over 100\%. Given that the figures for both 2004 and 2006 record participation rates of $91 \%$ or less, this is some rounding error. We have endeavoured to ensure the use of consistent data and methods and we do know that the results are at least internally consistent within our model, something which may not occur if projections are being made by a number of different parties.

Another point to note is that our forecasts apply to 16 and 17 year olds in the year in question. Many of the 17 year olds will reach 18 during the year and, even after the raising of the compulsory participation age, will then be entitled to leave school or college. Hence we will have some attrition of these students during their final year. We do not model this effect, on the grounds that provision would have to be made for their participation at the start of the year and this determines the required capacity of schools and colleges.

In addition to the model, we have done a range of other research into the background of post-compulsory education, which will be useful in interpreting the output of the model. For example, part of this work illustrates the flows of students across local authority boundaries (including into and out of the South East as a whole), demonstrating that it is not sufficient only to forecast the growth of resident learners. Some of this is possibly as valuable as the model itself, and it reveals that although a statistical model can produce forecasts, there is still an important element of judgement that is required when deciding upon the implications for a particular district.

The structure of our report is as follows.

- Section 2 provides a review of relevant economics literature, identifying some of the factors that have been found to influence the decision to stay on beyond the compulsory school leaving age.
- Section 3 provides a brief account of our main data sources.
- Section 4 then explores a range of contextual issues using a variety of information sources. This provides useful background material for interpreting the output of the model.
- Section 5 then explains the methodology we have used in our model and how we have used the model to generate forecasts.
- Section 6 reveals the results of our modelling exercise and, importantly, shows how these may be interpreted in the light of the contextual information reported in section 4 above.
- Section 7 provides a conclusion.
- Section 8 provides some appendices, with references and fuller versions of some of the tables in the text.

A separate Executive Briefing document provides a shorter version of this report, focussing on the contextual background, methodology and results.

## 2. Literature Review

There is a large body of UK empirical research that examines the factors that influence the decision to participate in post-compulsory education between the ages of 16-18. Most of these studies, often carried out by educationalists, psychologists and economists, using different data and methodologies, find some agreement on the factors that influence this decision (Appendix A1 provides the list of references to the studies reported in this section. Appendix A2 provides a summary of data and methodologies used in selected studies reviewed below). It is important to note that there is almost universal agreement in the studies reviewed here, inter alia, that educational attainment at 16, measured by either $O$ level or GCSE grades, provide an important indicator of an individual's academic skills and aptitude for post-compulsory education and is found to be a significant determinant of participation rates. For ease of exposition we review the literature under four headings that convey the general influences on the decision to participate in post-compulsory education commonly found. These are: expected future earnings, family background characteristics, school effects, and the effect of government policy changes.

### 2.1 Expected Future Earnings

The theory of human capital is often used as a framework of analysis in many empirical studies (see Becker, 1993). Post-compulsory education is assumed to be an investment good and the returns to such investment, as measured by the future or lifetime discounted earnings stream associated with post-compulsory qualifications, is assumed, a priori, to be an important determinant of participation in education beyond the school leaving age. Researchers using labour market information from a variety of data sources (see Appendix A2), have constructed variables that proxy pupils' expected lifetime earnings streams. These include: the future discounted earnings associated with graduate study; the future discounted earnings associated with different occupations; and the future discounted earnings received by different ethnic groups (see, for example, Leslie and Drinkwater, 1991; Andrews and Bradley, 1997; Rice, 1999). The results from this literature support the view that a pupil's expected future earnings are significant in determining the decision to participate in post-compulsory education. Against this, studies using time series data over various periods since the 1950s, have suggested that higher levels of present and future youth and adult unemployment are associated with greater uncertainty regarding future earning streams and thereby discourage participation (see, for example, Pissarides, 1981; Whitfield and Wilson 1991; Rice, 1999; McVicar and Rice, 2001; Clark, 2002). However, Micklewright et al (1988) found no evidence of an association between participation rates and unemployment in the period 1974-78.

### 2.2 Family Background Characteristics

A consistent finding in cross-sectional studies is that the parental and socioeconomic background of a student has an important effect on the probability of participating in post-compulsory education. Such influences can be transmitted through parents' ability to finance, encourage, and support their children in further
education. For instance, there is evidence that children from middle class families are more likely to stay on than their lower working class counterparts. Halsey et al (1980) suggests that there are two channels of influence. First, a direct route by which professional families encourage or coerce their children to stay on. Second, there is an indirect channel by which high ability children, who tend to be middle class, have a greater propensity to stay on. Access to capital markets may also be an important influence on participation with less wealthy families being constrained in this respect. Thus socio-economic factors can indeed influence participation and these influences may also differ according to household structure and size (e.g. single parent household and the number of siblings), household income, ethnicity, parental occupation and education (post-compulsory). Researchers have also used various measures of deprivation such as local income levels, health status and the receipt of means tested benefits, as further indicators of the socioeconomic status of the household. Rice (1987), Micklewright (1989), Leslie and Drinkwater (1991), Gray et al (1993), Andrews and Bradley (1997), Dearden et al (2006) and Gorard and Smith, 2007 provide evidence on these issues. Similar evidence is found in the time series studies cited above. Foskett and Hesketh (1997) found evidence that children from working class backgrounds who stayed on opted for vocational rather than academic programmes. However, it is interesting to note that Thomas et al (2003) found that local income levels had no significant affect on participation.

### 2.3 School Effects

The type of school attended (private, grant maintained comprehensive, special and single sex), the size of the year 11 cohort, the quality of current school/college provision (e.g. position in school 'league tables'), and the academic reputation of the recipient institution are often cited as key influences on the decision to participate in post-compulsory education. These influences can manifest themselves in the degree of support and information that that teachers give to their pupils regarding post-compulsory education pathways or 'trajectories'. The available evidence also suggests that pupils from public/grant maintained schools and single sex schools (particularly for girls) are more likely to stay on than their counterparts without such attributes. Micklewright (1989), Cheng (1995), Andrews and Bradley (1997), Foskett and Hesketh (1997), Rice (1999) and Clark (2002), provide empirical evidence on these issues. Several studies have focused on peer group effects and find a significant influence on the desire to continue (see, Thomas and Webber 2001; Thomas et al 2003). Mangan et al (2001) found evidence that the nature of the curriculum offered by post-compulsory providers and the cost of transport to the nearest provider are significant in determining whether the student remains in the same school, or switches to a new provider.

### 2.4 Government Policy

Participation in post-compulsory education has increased in the UK in the post war period. The abolition of fees for state secondary education by the Education Act 1944 was a key influence on the increase in participation in post-compulsory education in the early post WWII period. Successive changes in education policy have been acknowledged as driving up participation rates in post-compulsory education and training. These policy initiatives include: the increase in the school
leaving age from 14 to 15 in 1946 and from 15 to 16 in 1972 (Micklewright, 1989); the provision of youth training schemes (Whitfield and Wilson 1991; Andrews and Bradley, 1997); the introduction of GCSEs in England and Wales in 1986 and the introduction of the national curriculum in 1988 under the Education Reform Act 1988. For instance, the introduction of the GCSEs was geared towards raising educational achievement at 16 and improving participation in post-compulsory education (Ashford et al. 1993; Gray et al. 1993). National targets for education and training were also reinforced in the Dearing Report (1996) which provided further impetus for the increase in participation in the early 2000s.

The expansion of the Higher Education sector has resulted in lower entry requirements for higher education programmes and 'role model' effects across successive cohorts have been cited as significant influences on post-compulsory staying on rates (see, for example, McVicar and Rice, 2001; Gorand and Smith, 2007). More recently the introduction of Curriculum 2000 in England and Wales, that gives students more choice and flexibility regarding their A level choice may have also contributed to the recent rise in participation.

Finally, the introduction of the educational maintenance allowance (EMA) nationally in England and Wales in 2004, for economically disadvantaged students or for students experiencing some degree of social deprivation, has had a positive impact on the participation rates of students with low socio-economic status (Dearden, 2006), but may have impacted unfavourably on other learning 'trajectories' such as youth training (Maguire and Thompson, 2006). These benefits are means tested and payable weekly, during school term only (for 2 years or 3 for people with special education needs). There is also a retention/achievement 'bonus' payable to those who are good attendees and meet agreed learning targets.

### 2.5 Other analyses of learner numbers in the South East

We are aware of other analyses of learner numbers that have been made by or on behalf of the LSC. Simon Winkworth for Hampshire LSC has produced a similar analysis to ours, but differing in some details (e.g. it includes 18 year olds whereas we include only 16 and 17 year olds) and not investigating such a wide range of scenarios.

Sussex LSC has also commissioned work which is complementary to ours, calculating numbers from a 'bottom up' approach. This is a model which is used by Sussex LSC and individual colleges to forecast learner numbers, by using assumptions about participation rates, progression rates, numbers of new learners and market share. The tool allows different scenarios to be modelled using historical evidence on specific patterns of participation in a local area and travel to learn patterns. It includes data from FE Colleges, schools and work based learning providers. In principle, if these were aggregated for all colleges, the answers ought to be similar to ours. The model is not in use by all colleges so cannot at this stage be used as a consistency check across all colleges in the region.

## 3. Data sources

We use four main sources of data in our research, which we briefly describe here. Other sources are noted in the text, as appropriate. The four sources are:

1. Population figures and projections. We use the ONS sub-national population projections (SNPP) as our baseline data. See http://www.statistics.gov.uk/statbase/Product.asp?vInk=997 for details of these data. This provides a consistent set of data across the South East although it may not take account of developments contained in local plans, etc. We discuss the implications of these omissions in section 4.2. These data are available at county, unitary authority and district level, annually through to 2020 and beyond. Only broad age groups are given, the relevant one for our purposes being the 15-19 age group. We have relied on LSC calculations of the breakdown of this broad age group into individual year cohorts, in particular, 16 and 17 year olds.
2. Participation rates. Again we rely on official figures, specifically those published by the Department for Children, Schools and Families in their Statistical First Release series. These give participation rates (by different types of provider: schools, colleges, etc) by local education authority (LEA, i.e. the counties and unitary authorities) for the years up to 2006, which we take as our base year. Participation rates are not provided at district level.
3. The Individual Learning Record (ILR). We use this data source to obtain data about the numbers of learners (in colleges) within each district and hence to estimate district level participation rates. As the database contains both the district of the learner and of the education provider, we can also use this source to examine movement across district borders, where a student resident in one district attends school in another.
4. The Pupil Level Annual School Census (PLASC) serves a similar role as the $I L R$, but for schools. Again, we can estimate participation rates and crossborder flows.

In most of our analyses we focus attention on the 16 and 17 year old age groups though in places we include 18 year olds where this is relevant or unavoidable. Supplementary data sources are described when encountered.

## 4. Contextual information relevant to the forecasts

### 4.1 Population

The population projections from the ONS suggest that overall there will be a modest reduction in the population between now and 2013, continuing to decline thereafter to 2020. The trend for 16 and 17 year olds is shown in Figure 1:

Figure 1: Trend in the 16 and 17 year old population in South East England (000s).


## Source: ONS and LSC

Thus it can be seen that 2008 is expected be a peak in terms of population for this age group with a more or less continuous decline through to 2020. The population declines by $4.7 \%$ between 2006 (our baseline year) and 2013 when it is expected that the school leaving age will be raised to 17. By 2015, the population will have declined by $6.1 \%$ and by 2020 the decline is $7.7 \%$.

Thus even if the participation rate rises substantially, the increase in student numbers may be modest. For example, supposing that the 16 year old participation rate rises from $86 \%$ in 2006 to $98 \%$ in 2013 , the number of students should rise by only 98 _ $(1-0.047)-86 \_1=7.4 \%$. If the $98 \%$ participation rate holds true through to $2 \mathbf{0} 20$, the number of 16 year olds in the system will only be $6.0 \%$ above the level in 2006. Individual authorities will, of course, vary around this average.

The dispersion of population trends by counties is shown in Figure 2 below, where it is evident that the trends are similar across all the counties of the SE but differ from the experience of unitary authorities.

Figure 2: Trends in 16 and 17 year old population in SE Counties (000s).


Up until the year 2013, the population of 16 and 17 year olds in counties declines gently by an average of $3.5 \%$, the range being from West Sussex, with a roughly constant population, to Oxfordshire, with an expected fall of $6.1 \%$. From there through to 2020 the population is expected to decline with all being below their 2006 level of population. Concentrating on the change in population suggests a greater degree of disparity than suggested by the graph, which focuses on the levels of population, and hence all counties tend to look similar.

Figure 3: Trends in 16 and 17 year old population in SE unitary authorities (000s).


For the unitary authorities (Figure 3) we see a different picture, with consistent falls in population. By 2013 the population (16-17) of the unitaries is expected to drop by $8.1 \%$ on average, with falls as large as $16.6 \%$ in Reading and $13.8 \%$ in

Portsmouth. Subsequently, the fall is generally more modest, of the order of an additional 3\% points on average.

On the basis of this evidence therefore, we would expect growth in student numbers to occur more outside the unitary authorities.

Once we look at the district level we might expect greater divergences (by the law of large numbers), and this is true to some extent. Line charts such as those above cannot adequately show the large number of district authorities, so we present the population growth rates for districts in the form of bar charts. Figure 4 below shows the histograms of the growth rates for 2013 and 2020 (both relative to 2006).

Figure 4: Trends in 16 and 17 year old population in SE districts and unitary authorities.
(a) to 2013

(b) to 2020


In Figure 5 below we show a map of the South East district and unitary authorities ${ }^{1}$, coloured according to the absolute growth in population of 16 and 17 year olds over the period 2006 to 2013. The map reveals that there are a few more authorities with decreases (38) than with increases (25).

[^0]Figure 5: Growth in numbers of 16 and 17 year olds, 2006-2013


Table 1 below lists the authorities with the highest absolute growths of population.
Table 1: Authorities with the largest predicted increase in the 16 and 17 year old population, 2006-2013

| Authority | 2006 | Growth | $\%$ <br> growth |
| :--- | ---: | ---: | ---: |
| Ashford | 2843 | 266 | $9 \%$ |
| Chichester | 2365 | 136 | $6 \%$ |
| Elmbridge | 3033 | 156 | $5 \%$ |
| Horsham | 3331 | 128 | $4 \%$ |
| Basingstoke and |  |  |  |
| Deane | 3810 | 103 | $3 \%$ |
| Isle of Wight | 3494 | 92 | $3 \%$ |
| Thanet | 3461 | 86 | $2 \%$ |
| Rother | 2070 | 48 | $2 \%$ |
| Dartford | 2360 | 54 | $2 \%$ |
| Runnymede | 1656 | 33 | $2 \%$ |
| Chiltern | 2373 | 29 | $1 \%$ |
| South Bucks | 1618 | 11 | $1 \%$ |
| Arun | 3408 | -5 | $0 \%$ |
| Eastbourne | 2296 | -6 | $0 \%$ |
| Surrey Heath | 2079 | -8 | $0 \%$ |

The full table is given in Appendix 3 as Table A3.1.
As well as individual authorities, it is useful to look at broader areas of increase since, as we discuss later, there is much travelling across boundaries to go to school or college. For example, Ashford and Rother are neighbouring authorities which appear in the above table, as do Chiltern and South Buckinghamshire. It should be noted however, that the absolute sizes of the increases are not very large in most cases, only five districts have numbers increasing by more than 100.

In addition, we note that some of these areas are ones identified by SEEDA in its regional plan as 'growth diamonds'. Although this does not necessarily imply increased population but rather areas with potential for investment and economic growth, this may in turn draw in people from other areas. Relevant to the above list in this context are the growth diamonds in Basingstoke, and Gatwick/Crawley. We say more about the growth diamonds and related issues later on.

It is also interesting to note that many of the areas on (but within) the South East border, have quite low predicted increases in population, particularly around London. Only Dartford, Elmbridge and South Bucks are listed in Table 1 above. Authorities on the border are often recipients of students from outside the South East and can therefore face additional pressures, especially on the borders of London. We analyse cross-border movements in a later section.

### 4.2 Other sources of information regarding population projections

The ONS figures for population are trends which may not reflect all the information available at a more local level, such as planned new towns or housing developments, etc. (The ONS figures do take account of population migration both internationally and internally, though it is recognised that there can be a great deal of uncertainty about some of these data.) We have therefore researched local authority web sites, the South East Plan, SEEDA's Regional Economic Strategy and other possible sources of information to supplement the ONS projections.

## From the South East plan

(http://www.seeda.co.uk/Publications/Developments_\&_Infrastructure/docs/
RegionalHousingStrategy2006.pdf we have obtained data on the planned average annual growth in the housing stock. Multiplying this by 11 we get the growth up to 2015 (from our base year of 2004 for which we have the housing stock). We can therefore calculate the expected growth rate of the housing stock, with which we can compare to our growth rate of population. Where the former is significantly greater than the latter, we might have cause to doubt the ONS population projections.

Table 2 shows the authorities which have the largest anticipated growth of the housing stock and compares this to their projected population growth figures. (The full table is given in Appendix 3, Table A3.2.)
than those projected by ONS. The figures for Milton Keynes and Aylesbury Vale are also consistent with information in SEEDA's Regional Economic Strategy 20062016, which suggests additional housing of 70,000 by 2031 (MK) and 18,300 by 2021 (AV). We will make use of the information in this table as a form of 'traffic light' warning when interpreting the results from our modelling, which only uses the ONS projections.

The above information relates to the population (particularly 16-17 year olds) rather than the number of learners. Hence we also need to examine the participation rate and how this is expected to unfold in the future. We therefore now turn our attention to a review of participation rates.

### 4.3 Participation rates

The main policy driver of likely future changes in post-16 participation rates is legislation, with the government recently (May 2008) announcing an increase in the legal school-leaving age, to 17 in 2013 and 18 in 2015. These proposals therefore form the centrepiece of our forecast and these are the main drivers of changes in participation rates. First however, we look at some of the evidence regarding trends in participation rates in the recent past.

From a rate of around $10 \%$ in 1950, post-compulsory participation increased steadily until reaching a rate of around $85 \%$ by $2006^{2}$. The experience since 1985 is shown in Figure 6 below.

Figure 6: Participation rate (1985-2006) in education and training of 16 and 17 year olds in England


The main features are the steady growth from 1985 to 1995, but a level performance since then. Clark suggests that rising unemployment prior to 1993

[^1]could explain part of the growth, with falling unemployment after 1993 offsetting the positive effects on participation of increasing examination success (at GCSE level). The perception of generally increasing economic returns to education is also likely to encourage participation (see our literature review above) and it is perhaps surprising that the participation rate has stagnated.

To obtain a more nuanced picture of the recent trends in participation we examine briefly the data at education authority level across the whole of England. For this we use data from the DCSF/DIUS website
(http://www.dfes.gov.uk/rsgateway/DB/SFR/s000734/index.shtml). We will look at the full-time, part-time and WBL participation rates but we start off with the total participation rate, aggregating all three of these categories. We examine the data from 1998 to 2005 (for which the data are complete and consistent).

### 4.4 The total participation rate

We begin by looking at 16 year old students. The overall participation rate rises only slightly, from $83.5 \%$ to $86.0 \%$, over the seven years. The distribution across authorities tells an interesting and not unexpected story: the distribution is squeezed from below as the poorer performers catch up and, of course, the rate is limited above by $100 \%$.

Figure 7: Distribution of growth rates of participation by 16 year olds, English education authorities, 1998 and 2005
(a) 1998



An alternative way of looking at the same data is via a multiple box plot. From left to right (1998 to 2005) we observe a fluctuating average participation rate but with a steadily declining spread (Figure 8 below). (Note: The central box of the box plot shows the central $50 \%$ of the data, i.e. between the first and third quartiles. For 1998 this can be seen as lying between 79 and 88, approximately. The horizontal line within the box represents the median - the value at the centre of the distribution. This would be the local authority in the middle of the distribution of participation rates. The 'whiskers' extending above and below the box contain all 'reasonable' values and beyond the whiskers lie the extreme values or outliers, represented by dots. The height of each whisker is, by convention, 1.5 times the height of the box.)

Figure 8: Box plots of 16 year old total participation rate, 1998-2005


We can perform the same analysis for 17 year olds, capturing the relevant features of the data in similar box plots:

Figure 9: Box plots of 17 year old total participation rate, 1998-2005


We observe a similar pattern, though the average participation rate is lower: 75.8\% in 1998 and $76.2 \%$ in 2005. It is interesting that, for both ages, the distributions are fairly symmetric (the horizontal bar representing the median is roughly in the middle of the box). One might have expected many authorities clustered at a high level, then a longer tail of lower achieving authorities, but this does not appear to be the case.

We can look in the same way at the individual components of the overall figure.

### 4.5 Full time participation rates

Figures 10 and 11: Box plots of 16 and 17 year old full time participation rate, 1998-2005


There is a more clearly discernable upward trend to the full time figures and there is a consistent difference of around $12 \%$ points between the figures for 16 year olds and 17 year olds. Since the total participation rate drops by $8-10 \%$ between 17 and 16 year olds, it follows that much of the decline in full-time participation results in non-participation rather than a switch to part-time or WBL.

### 4.6 Part-time participation rates

Similar box plots are drawn below to illustrate the trends in part-time participation rates.

Figure 12 and 13: Box plots of 16 and 17 year old part-time participation rate, 1998-2005


Here we can observe the small shift out of full-time into part-time education at age 17, where the part-time participation rate is $1.5 \%$ to $2 \%$ points higher than the rate at 16. The trend over time is clearly downwards which is partly due to the disappearance of very high rates (over 20\%) in some areas in the late 90s. (Kingston upon Thames and Sutton are the only such areas in the south east region.)

### 4.7 Work-based learning

These graphs demonstrate a similar pattern to part-time learning, with a decline over time and a small jump up from the rate at 16 to that at 17 . The jump is again of the order of $2 \%$ points. WBL is slightly more popular than other forms of parttime learning, though the orders of magnitude are fairly similar. It may be reasonable to consider these two categories together for some purposes, as there is likely to be considerable variation within each category (e.g. in terms on numbers of hours in education).

Figures 14 and 15: Box plots of 16 and 17 year old WBL participation rate, 19982005


### 4.8 Summary of findings for population and participation trends

For the purposes of our modelling exercises we have learned the following stylised facts, which will inform the assumptions we make for the future regarding participation rates:

- The overall participation rate has not changed much over the recent past
- There has been an increase in full-time participation and a fall in parttime participation, the latter due largely to falls from high levels in some authorities.
- There is a fall in participation between 16 and 17 , a small part of which is a switch from full-time to part-time education.

Combining these findings with the falling size of the 16-18 cohort over time, it suggests that without a change in external factors we would not expect the numbers of students participating post-16 to increase. Increases in numbers must come from increases in participation driven by exogenous events, such as changes in legislation (the school-leaving age) or the curriculum (the new diplomas), etc. The legislation regarding the school leaving clearly dominates other events so this is the focus of our forecast.

### 4.9 Travel to learn patterns

The participation rates we will calculate from our model are on the basis of residence, but these figures do not indicate where students actually attend school or college as there may be substantial cross-border movement. We can gain insight into such movements by analysis of the ILR (college) and PLASC (school) databases, using data for 2006-7. These contain, for each student, both the local authority of the residence and the local authority of the education provider. We can therefore work out how many students each authority is 'exporting' and 'importing' as well as the numbers attending school or college within their own local authority. Not only can we observe cross-border transfers within the South East, we can also observe transfers across the South East boundary with the rest of the country. Large numbers of students crossing district boundaries imply a need to be more careful about translating any increases in participation by residents into a need for additional supply within the same authority, especially as this pattern of transfers may change over time.

## Transfers across the South East boundary

First we look at the transfers into and out of the South East as a whole. The numbers of transfers can be seen in Table 3 below.

Table 3: Numbers of students crossing the South East border - 16 and 17 year olds

|  | Number of learners resident in the SE | Exports | Imports | Net imports | Number taught in SE | Net imports as \% of learners |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Full-time school | 56,772 | 46 | 3,196 | 3,150 | 59,922 | 6\% |
| Full-time college | 74,392 | 2,119 | 7,560 | 5,441 | 79,833 | 7\% |
| Part-time | 22,015 | 3,033 | 2,294 | -739 | 21,276 | -3\% |
| Total | 153,179 | 5,198 | 13,050 | 7,852 | 161,031 | 5\% |

We see that the SE region is a net importer of full-time students, to the order of $6.5 \%$. This adds a total of about 8,600 full time students to the total taught, with slightly more than half of these in college rather than in secondary school. For parttime education, there is modest export of about $3 \%$ of the students. Not surprisingly, colleges engage in more trade than schools.

The authorities which are the biggest importers across the SE boundary are shown in Table 4 below.

Table 4: Numbers of students imported from outside the South East - 16 and 17 year olds (authorities with 5\% or more imports)

| LA | Population,$16 \text { \& } 17 \text { yo }$ | Schools <br> Imports | ILR imports - full time <br> Imports | ILRimports- parttimeImports | Total full time <br> Imports | Total - all |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  | Imports | \% of population |
| Epsom and Ewell | 1863 | 340 | 679 | 203 | 1019 | 1222 | 66\% |
| Dartford | 2360 | 438 | 729 | 150 | 1167 | 1317 | 56\% |
| Elmbridge | 3033 | 75 | 1077 | 85 | 1152 | 1237 | 41\% |
| New Forest Reigate and | 4196 | 180 | 1066 | 172 | 1246 | 1418 | 34\% |
| Banstead | 3165 | 78 | 662 | 113 | 740 | 853 | 27\% |
| Tandridge | 2362 | 549 | 8 | 0 | 557 | 557 | 24\% |
| Slough | 3165 | 241 | 269 | 139 | 510 | 649 | 21\% |
| Chiltern | 2373 | 198 | 138 | 37 | 336 | 373 | 16\% |
| Chichester West | 2365 | 0 | 237 | 111 | 237 | 348 | 15\% |
| Oxfordshire | 2628 | 56 | 321 | 3 | 377 | 380 | 14\% |
| Runnymede | 1656 | 1 | 174 | 14 | 175 | 189 | 11\% |
| Spelthorne | 2115 | 75 | 122 | 22 | 197 | 219 | 10\% |
| Gravesham | 2750 | 19 | 118 | 101 | 137 | 238 | 9\% |
| Hastings | 2361 | 6 | 17 | 179 | 23 | 202 | 9\% |
| Guildford | 3493 | 10 | 130 | 157 | 140 | 297 | 9\% |
| Swale | 3605 | 53 | 225 | 2 | 278 | 280 | 8\% |
| Thanet Milton | 3461 | 16 | 224 | 7 | 240 | 247 | 7\% |
| Keynes | 6096 | 72 | 243 | 79 | 315 | 394 | 6\% |
| Cherwell | 3587 | 20 | 131 | 37 | 151 | 188 | 5\% |
| Tunbridge Wells |  |  |  |  |  |  |  |
| Wells Tonbridge | 3102 | 141 | 4 | 11 | 145 | 156 | 5\% |
| and Malling | 3362 | 50 | 49 | 70 | 99 | 169 | 5\% |
| Aylesbury Vale | 4867 | 103 | 62 | 45 | 165 | 210 | 4\% |

Figure 16 illustrates these figures on a map of the South East, for schools and colleges separately. Note that the map illustrates the actual number of students imported, not imports as a percentage of the resident population.

Figure 16: Students (16 and 17) received from outside the South East
School students received from outside SE
(a) Schools (all full time)

Schoolstudents received from outside SE

(b) Colleges (full time and part time)

College students received from outside SE


Imports into schools are heaviest on the northern borders of the SE, especially around south west London. The college map shows a more even geographical distribution, with fewer transfers into the SE amongst some of the boroughs bordering London. Boroughs which are not on the boundary generally do not receive large numbers of students from outside the SE (one exception is Chichester, where large numbers from outside the SE attend Chichester College).

In contrast, exports (which are almost exclusively from colleges, not schools) are more evenly spread and no authority exports more than 7\% of 16-17 year olds outside the SE, apart from Spelthorne (12\%). Figure 17 below shows the map of exports (again, this is numbers of students).

Figure 17: South East students (16 and 17 full time and part time) taught outside the region

SE students taught outside SE


Once again we see, not surprisingly, most exports from the border authorities. (Note that exports are smaller than imports - the dark blue areas imply exports of between 94 and 451 students, whereas for college imports the dark blue areas represent 168 to 1238.) The authorities with the largest exports are as follows (remember these are all from colleges, not schools):

Table 5: Exports of 16-17 year old pupils to outside the South East

|  | Full |  |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: |
| Population | Part <br> time | All <br> time <br> exports | $\%$ of <br> population |  |  |
| Milton Keynes | 6096 | 209 | 242 | 451 | $7 \%$ |
| Portsmouth | 4726 | 185 | 120 | 305 | $6 \%$ |
| Spelthorne | 2115 | 194 | 68 | 262 | $12 \%$ |
| New Forest | 4196 | 129 | 106 | 235 | $6 \%$ |
| Cherwell | 3587 | 105 | 66 | 171 | $5 \%$ |
| Slough | 3165 | 103 | 67 | 170 | $5 \%$ |
| Vale of White |  |  |  |  |  |
| Horse | 3468 | 110 | 49 | 159 | $5 \%$ |
| Aylesbury Vale | 4867 | 71 | 74 | 145 | $3 \%$ |
| Havant | 3244 | 89 | 51 | 140 | $4 \%$ |


| Southampton | 5035 | 9 | 121 | 130 | $3 \%$ |
| :--- | ---: | ---: | ---: | ---: | ---: |
| Elmbridge | 3033 | 91 | 33 | 124 | $4 \%$ |
| Dartford | 2360 | 41 | 75 | 116 | $5 \%$ |
| Sevenoaks | 2984 | 62 | 52 | 114 | $4 \%$ |
| Epsom and Ewell | 1863 | 63 | 39 | 102 | $5 \%$ |

We conclude that imports are a more important feature than exports when forecasting student numbers; not only are imports larger, they are also more concentrated in a few authorities. It is also noticeable that, unsurprisingly, it is the colleges which have higher proportions of students from outside the SE.

These transfers do not have large implications for our forecasts if the patterns of transfer remain constant, e.g. if the growth of population and participation rates of authorities outside the South East are similar to those inside. However, if these rates diverged or, for instance, if one of those authorities outside the South East were to build a new college, then we might see a change in the patterns of transfer.

## Transfers within the South East

We now turn to patterns of movement within the South East. Table 6 shows the authorities who are most affected by trade across their borders, either importing or exporting within the SE authorities (not across the SE border).

Table 6: Numbers of students moving between local authorities - 16 and 17 year olds (extremes of the distribution)

|  | Schools |  | Colleges |  |  |  |  |  |  | Total |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | :---: | :---: | :---: | :---: |
| LA | Resident <br> learners | Net <br> imports | Resident <br> learners | Net <br> imports | net <br> imports | $\%$ <br> learners | Number <br> taught |  |  |  |  |
| Rushmoor | 113 | -113 | 1610 | 2697 | 2584 | $150 \%$ | 4307 |  |  |  |  |
| Elmbridge | 422 | 253 | 1190 | 1885 | 2138 | $133 \%$ | 3750 |  |  |  |  |
| Havant | 144 | 31 | 2327 | 2805 | 2836 | $115 \%$ | 5307 |  |  |  |  |
| Dartford | 738 | 603 | 783 | 959 | 1562 | $103 \%$ | 3083 |  |  |  |  |
| Chichester | 654 | 159 | 1249 | 1759 | 1918 | $101 \%$ | 3821 |  |  |  |  |
| Epsom and Ewell | 621 | 330 | 507 | 794 | 1124 | $100 \%$ | 2252 |  |  |  |  |
| Canterbury | 1515 | 220 | 1056 | 1691 | 1911 | $74 \%$ | 4482 |  |  |  |  |
| Guildford | 895 | 257 | 1219 | 1263 | 1520 | $72 \%$ | 3634 |  |  |  |  |
| Winchester | 18 | -18 | 2313 | 1689 | 1671 | $72 \%$ | 4002 |  |  |  |  |
| Tonbridge and Malling | 1435 | 221 | 850 | 960 | 1181 | $52 \%$ | 3466 |  |  |  |  |
| Eastbourne | 20 | -20 | 1536 | 819 | 799 | $51 \%$ | 2355 |  |  |  |  |
| Chiltern | 1387 | 508 | 468 | 424 | 932 | $50 \%$ | 2787 |  |  |  |  |
|  | $\vdots$ | $\vdots$ | $\vdots$ | $\vdots$ | $\vdots$ | $\vdots$ | $\vdots$ |  |  |  |  |
| Portsmouth | 27 | -27 | 3325 | -1777 | -1804 | $-54 \%$ | 1548 |  |  |  |  |
| Spelthorne | 183 | 28 | 1366 | -897 | -869 | $-56 \%$ | 680 |  |  |  |  |
| Adur | 378 | -82 | 720 | -561 | -643 | $-59 \%$ | 455 |  |  |  |  |
| Surrey Heath | 648 | -39 | 986 | -962 | -1001 | $-61 \%$ | 633 |  |  |  |  |
| Arun | 1010 | -116 | 1635 | -1594 | -1710 | $-65 \%$ | 935 |  |  |  |  |
| Test Valley | 8 | -7 | 2272 | -1533 | -1540 | $-68 \%$ | 740 |  |  |  |  |
| Sevenoaks | 1190 | -885 | 693 | -688 | -1573 | $-84 \%$ | 310 |  |  |  |  |
| Hart | 228 | 17 | 1552 | -1541 | -1524 | $-86 \%$ | 256 |  |  |  |  |

Thus Rushmoor, proportionately the largest importer, has 1723 resident learners, most in colleges somewhere. There are also net imports of 2584 (the balance of those residents educated outside Rushmoor and non-residents educated within the borough), which amount to $150 \%$ of the resident learners, making the number taught much larger than the number of resident learners. In contrast, Hart exports most of its learners, i.e. most go to college outside the borough. The full table is given in Appendix 3, table A3.6(a) and A3.6(b).

It might be thought that the percentage exported would be inversely proportional to the number of resident 16-17 year olds, on the grounds that 'small' authorities are less able to provide sufficient educational opportunities within their boundaries. However, this is not the case as there appears to be no relationship between the variables (correlation coefficient $=0.018$ ).

The average value of trade (i.e. the average value of net imports, ignoring the minus signs) is $17 \%$ and gives the number of students crossing the LA boundary (in either direction), as a proportion of the resident population. This figure is larger if we compare it to the proportion of 16-17 year olds in full-time education $(61 \%$ on average). Thus in the typical authority, about $28 \%$ of full time learners are crossing LA boundaries.

In terms of the need to supply education, it matters little if the imports to an authority are from another authority inside or outside the SE. Hence Figure 18 shows the figures in terms of numbers of imports from whatever district, with the darker blue areas indicating a higher level of net imports. This shows a variegated pattern, with less of a 'SE border effect'.

Figure 18: Net imports of students by local authorities
Net imports between LAs


### 4.10 Implications of travel to learn patterns for forecasting

The overall evidence suggests that calculating population growth rates and participation rates for district level authorities is only part of the information required. We also need to take account of travel patterns, as illustrated in Figure 18 above. The interpretation could be ambiguous however. If we observe a projected increase in learners in a district that typically exports many of its learners, we could either conclude that the increase will likely be met by provision outside the borough, or that there is an additional argument for provision within the borough itself. This is, of course, a policy judgement. For authorities with large imports, the number taught will be larger than the resident population, possibly significantly so. Hence a large percentage increase relative to resident learners might not be so large when compared to numbers taught.

## 5. Modelling

Having written in some detail about the context of future participation rates we now move on to describe how we have modelled future events and then present our results. First we briefly describe the data used.

### 5.1 Population data

As described earlier, we rely upon ONS sub-national population projections. As far as data availability goes, published figures give population from the present up to 2020, at the level of the district, by broad age bands (15-19 is the relevant age band in this case). From this we need to extract estimates of the numbers aged 16,17 and 18. Unpublished ONS figures giving this breakdown were provided by the LSC and we use these estimates without further adjustment. It is worth noting that the ONS census date is in January whereas the census date for participation data is August $31^{\text {st }}$. However, this is likely to impart only a small bias to the numbers and, in any case, would cancel out when calculating growth figures.

## 5. 2 Participation rates data

We described earlier that we use data from DCSF on participation rates, which are only available at county/UA level, not district level. Hence part of our modelling procedure is to disaggregate this to district level.

Future numbers of learners are by definition equal to the relevant population multiplied by the participation rate. Since we have population projections, our task is to forecast the participation rates.

## 5. 3 Forecasting participation rates

For participation rates, we have data for 2006 and earlier at the level of counties and unitary authorities, but not for the districts. We therefore need to (a) find a way of estimating 2006 participation rates for districts and (b) projecting forward the participation rates.

Our methodology to calculate future participation rates is as follows:

1. Estimate participation rates for districts in 2006, varying around the relevant county averages.
2. Disaggregate those participation rates into full time school, full time college, part time, work-based learning and the independent sector.
3. Estimate the overall participation rates for 2013/2015 for each district
4. Estimate the overall participation rate for intervening years
5. Project forward the component parts (full-time, etc) of the overall participation rate, consistent with the overall rate in each year.
6. Project forward beyond 2013/2015.

At various stages of the calculations we need to ensure consistency, e.g. that the participation rates estimated for districts in 2006 are consistent with the published overall participation rates for the counties, or that the projections for full-time, parttime, etc. participation rates add up to the overall rate in each year of the forecast. In effect, this means that one category must always be a residual, i.e. the amount needed to be consistent with the total for all categories. This implies that any errors in estimating one category will have corresponding off-setting errors in another. A further implication is that we can generally have greater confidence in the estimate of a total than in the estimate for a component category. This should be borne in mind when interpreting the results of the model. We now explain in more detail each stage of the forecasting procedure.

## 1. Estimating district participation rates in the South East in 2006

After some experimentation with different methods we decided the best approach is to use information from the ILR and PLASC databases. Using these, we obtain a count of the numbers of full time and part time learners (in both schools and colleges) in each district. Dividing these by our population estimates gives an estimate of the district participation rate. Our method can be verified by the fact that it gives estimates for counties and unitary authorities which are close to those reported by the DCSF. We can therefore have some confidence that the method provides reasonably accurate estimates at the district level also.

Hence the participation rate for a district can be calculated as

$$
p_{\text {district }}^{2006}=p_{\text {county }}^{2006} \times\left(\frac{p_{\text {district }}}{p_{\text {county }}}\right)_{\text {PLASC }}
$$

This is probably best explained by example. To calculate Aylesbury Vale's participation rate, we first take the published rate for Buckinghamshire ( $p_{\text {county }}^{2006}=$ 0.720 ). We then look at the PLASC and ILR data which suggest the district participation rate for Aylesbury Vale is 0.635 and the county rate is 0.692 . Note that there is a slight discrepancy between the DCSF figure and the PLASC figure for the county. The PLASC/ILR data suggest that Aylesbury Vale's figure is about $92 \%$ of the county figure $(0.635 / 0.692)$. We therefore estimate the district participation rate as $0.72 \times \frac{0.635}{0.692}=0.660$ or $66 \%$. This gives us a figure which is consistent with the published DCSF figure for the county. (This example is for 16 year olds in full time education.)

Note that, if the DSCF and PLASC/ILR data give the same county participation rate, the estimated participation rate we use is precisely the PLASC/ILR figure. We only make adjustments because there are discrepancies between the two sources, and these are generally quite minor.

Applying this method to all districts in turn, we can estimate the overall district participation rates. Note that, although the PLASC.ILR data covers full time and part time learners, it does not include the independent sector, which is included in the DCSF figure. We assume the full time rates as calculated from PLASC/ILR are the
best measure for estimating the overall participation rate, although there will be a small degree of inaccuracy using this method.

## 2. Disaggregating the overall participation rate for 2006

For full time students either in school or college, we calculate the participation rate in a similar manner to step 1 above. We know the full time school participation rate for Buckinghamshire from the DCSF data. Using the PLASC or ILR data we know that the district rate for Aylesbury Vale differs from the county average by a certain amount. We can therefore work out the district participation rate, consistent with the DCSF county figure.

For part time students we apply the same method, except that we use part time participation rates in the ILR data (there are virtually no part-time students in the PLASC data).

For work-based learning we assume the patterns of WBL are similar to patterns of part time learning. We use the same methodology as for full time and part time, except that we have to use ILR data from part time data to generate the district participation rates consistent with (and varying around) the county WBL participation rate reported by DCSF.

There only remains the independent sector, about which we have very little information. We therefore calculate the independent school participation rate as a residual. It is calculated as:

Independent rate $=$ overall rate - full time rate - part-time rate - WBL rate
Since it is calculated as a residual, any errors in the calculation of the other participation rates will affect the independent rate. Since the full time rate in particular is much larger than the independent sector rate, a small error in the former could result in a relatively large error in the latter. For example:

|  | True rate | Estimated <br> rate |
| :--- | ---: | ---: |
| Full time rate | 65 | 63 |
| Part time | 5 | 5 |
| WBL | 5 | 5 |
| Independent | 10 | 12 |

The underestimate of the full time rate is just $3 \%(=63 / 65-1)$ but the resulting overestimate of the independent rate is $20 \%(=12 / 10-1)$. However, the independent sector is not the central focus of this study, so we are not so concerned about errors (which are probably quite small in absolute value) in this sector.

We comment more generally on some of the approximations in our data at the end of this section.

## 3. Estimate the overall participation rates for $\mathbf{2 0 1 3 / 2 0 1 5}$ for each district

For modelling purposes, we presume that the school leaving age is raised to 17 in 2013 and to 18 in 2015, in line with government proposals. We interpret 'compulsory schooling' to mean a participation rate of $98 \%$ rather than $100 \%$, on the grounds that even if compulsory, there will be a minority who will not participate. Evidence from DCFS (Statistical Release: Pupil Absence - Autumn 2008 Term Report (Provisional), 6 May 2008) suggests that $0.7 \%$ of pupils in the South East may be regarded as persistent truants, this figure ranging from $0.4 \%$ in Buckinghamshire to $1.3 \%$ in Southampton. This figure applies across the secondary sector and it is therefore likely that the figure is higher towards the end of compulsory schooling. We therefore feel justified in assuming a figure of around $2 \%$ once the age is raised to 17 and then 18.
(We also report the outcome of assuming a 100\% participation rate in all authorities as one alternative scenario, though we believe this is less realistic than our central projection.)

Not all authorities will be at precisely $98 \%$ however, so we allow authorities to vary around this figure in 2013/2015. We calculate the future overall participation rates as follows. We have the 2006 participation rates for district and unitary authorities from steps 1 and 2. We then assume that participation rates grow in line with the patterns identified earlier for 1998-2005, with lower participation authorities (in 2006) following a faster rate of growth. There is a convergence of participation rates from the bottom up. Hence we specify a narrowing of the range of participation rates over the period. For 2006 we have a mean participation rate of $86 \%$ and a range of $35 \%$ points (between $65 \%$ and $100 \%$ ). For 20013, we set the mean to $98 \%$ and the range to $17 \%$ points (half its value in 2006) for 16 year olds. In schematic form we have the following mapping of participation rates:


The halving of the range is a matter of judgement, based on the observed diminution of the range between 1998 and 2005 and the need to be spread around a higher average of $98 \%$. Again, this assumption can be adjusted within the spreadsheet to explore alternative scenarios.

The precise formula we use is

$$
p_{i}^{2013}=0.98+\left(p_{i}^{2006}-0.86\right) \times \frac{0.17}{0.34}
$$

- $p_{i}^{2006}-0.86$ gives the deviation of authority $i$ from the SE average in 2006.
- This is then scaled by $0.17 / 0.35$, which is the shrinking of the range, to give a smaller deviation...
- ... around the 2013 mean of 0.98 .

Example: Aylesbury Vale, with a 2006 participation rate of 0.798 gets mapped onto:

$$
0.98+(0.798-0.86) \times \frac{0.17}{0.35}=0.942
$$

We apply this formula to each authority to determine its 2013 participation rate for 16 year olds. For 17 year olds we adopt the same methodology, except that we assume the $98 \%$ rate is achieved in 2015.

## 4. Estimate the overall participation rate for intervening years

In our original proposal we modelled the progression of participation rates over time as a logistic curve (an S-shape). Our implementation is actually slightly different, and simpler. One reason for this is that participation rates for most authorities are already fairly high (they are near the top of the S ) and the logistic curve is fairly straight in this region. Therefore there is very little difference between a logistic curve and a straight line interpolation. The second reason is that our new method is easier to implement and adjust in a spreadsheet model.

The difference between the two methods is quite small in practice. Compared to the logistic method, our implementation has a slower increase in the early years after 2006 but speeding up later on. This might turn out to be a more accurate method if the main upward pressure on the participation rate comes from the change in legislation around 2013.

In our implementation therefore, the participation rate grows at a constant rate each year, between 2006 and 2103 (2015 for 17 year olds). The actual formula used is:

$$
p_{i}^{t+1}=p_{i}^{t} \times\left(1+g_{i}\right)
$$

Where $g_{i}$ is the rate of growth for authority $i$ each year, calculated as $g_{i}=\left(\frac{p_{i}^{2013}}{p_{i}^{2006}}\right)^{1 / 7}$.

## Example:

Buckinghamshire's participation rate goes from $87 \%$ to $97.2 \%$. The average rate of growth of the participation rate is therefore $\left(\frac{0.972}{0.87}\right)^{1 / 7}=1.016$, or by $1.6 \%$ each year over the seven year period. Hence the participation rate in 2007 is calculated as $0.87 \times 1.016=0.884$. For 2008 it becomes $0.886 \times 1.032=0.899$, and so on.

## 5. Project forward the component parts of the overall participation rate

We now need to project forward the component parts of the overall participation rate, in such a way as to be consistent with the overall rate. The simplest method would be to assume that each component retains its share of the total, however this is unlikely to be correct and we can do better than this.

We make a number of (we believe) reasonable assumptions about future trends in the components of participation. These can obviously be challenged and it is simple to examine the effects of alternative assumptions in the spreadsheet model. In particular, we assume:
a) The independent share of learners remains constant. The policy driver of an increase in the school leaving age is unlikely to affect the independent sector.
b) The work-based learning participation rate increases by $50 \%$. We base this assumption on the government's response to the Leitch Report ${ }^{3}$ which sets a target of a doubling of apprenticeships by 2020. If the implied rate of growth is taken to 2013 it implies an increase of $50 \%$.
c) We assume the part time participation rate remains constant. There is not much basis for any particular assumption, but it is in line with the data from 1998-2005 and it is unlikely to grow given the policy driver makes education compulsory and presumably full time for most.
d) The full time participation rate therefore becomes the residual component and accounts for most of the growth (apart from WBL) in overall participation.

## 6. Projections post 2013/2015

These years are simply set to be the same as for 2013 (for 16 year olds) or 2015 (for 17 year olds). It is possible that the participation rate will eventually climb above $98 \%$ and there might be continuing convergence, but the differences are likely to be small and any estimates rely on a substantial degree of speculation.

Commentary on the general quality of the data and caveats for our results
Undertaking this project we encountered difficulties with some aspects of the data and with combining it with our methodology, which suggest some limits to the

[^2]accuracy of the results. This is not unique to our chosen methodology, but applies generally as long as we have the current data.

We make our remarks under three headings:

- Missing data
- Accuracy and compatibility of the data
- Use of the data with our methodology


## Missing data

In some places we would want to have more information, but it is simply unavailable. For example, we have no data on numbers in private education (by residence), or in work-based learning at the district level. We therefore have to make estimates, which may be inappropriate. For example, for work-based learning we assume that it is similar in distribution to the pattern of part time learning. This is an untested assumption. As a significant part of growth is expected to come from WBL, this uncertainty about the starting point is problematic.

Accuracy and compatibility
We make use of information from various sources and it is not always clear that they are compatible (e.g. whether they use the same definition of variables). We might illustrate this problem by noting that the DCSF's own participation figures are not without fault. The published rates for 2005 include a statement that says "Due to the margin of error surrounding local level participation estimates and the use of school level data for independent schools, participation rates can be over 100 per cent. For these areas, an asterisk is placed in the table." This is the case for both Wokingham and Reading and is especially surprising the published participation rates for 2004 are $83 \%$ and $90 \%$, and for 2006 are $91 \%$ and $91 \%$. Hence it is remarkable that a margin of error seems to lead to a change of over $10 \%$ points. These are unitary authorities with education departments, so the task of estimating such rates for districts which are not themselves education authorities should be much harder.

As explained earlier, we use PLASC and ILR data to disaggregate participation rates to district level. We believe that there is a risk here that these data sources exaggerate the variability of the participation rate within counties, but we have no other data to test this hypothesis against. The reason for our suspicion is that the variability suggested by the PLASC/ILR data implies some districts have participation rates greater than 100\% (this is because other districts have low rates, and we need them to average out at the known county rate). We found this applied particularly in Oxfordshire and may be due to the unusual nature of the education 'market' in that county, with the presence of the university and perhaps, private schools. Since participation rates cannot rise above $100 \%$ we have had to make ad hoc adjustments to our data to ensure our numbers are feasible. (We do this, for example, by assuming one district within a county has a similar participation pattern to another of similar size). We have only had to do this for Oxfordshire but the problem may also occur on a lesser scale in a few other districts.

The implication of this is that there are off-setting errors: if one district's rate is under-estimated, another's must be overestimated. Since, over time, these are converging towards compulsory participation in 2023/2015, this implies off-setting forecasts of growth in numbers: if it is under-estimated in one district, it is likely to be over-estimated in another within the county.

Use of the data with our methodology
Any methodology of forecasting, not just ours, has to be internally consistent when it comes to the forecast. The numbers for a district must add up to the total for the county, and that the sub-components must add up to the overall participation rate. This means that, inevitably, some items have to be treated as a residual, and calculated as such. This can result in large proportionate errors in this residual, particularly if it is a small item. This may not matter too much if the item is not of interest per se, such as the numbers in independent schools. However, the growth of this from the estimated value in 2006 will then influence the values of other variables and lead to uncertainty in the forecast.

Overall, we believe we have made the best use that we can of the data available. Our model's estimates are at least internally consistent. However, it would be useful if further research could shed light on some of the issues where data are missing or where there are puzzling anomalies between data series.

## A comment on NET/NEET data

It would be useful to make use of NET/NEET data (Not in Education or Training/Not in Education, Employment or Training) in construction of the participation rates, or as a check. However there are some formidable problems of consistency between the various series. The figures are published by DCFS in the Statistical First Release Series but are not disaggregated to the local level. This can be done using data from the Connexions service, but this is not directly comparable to the SFR series due to differences of definition of the series and because Connexions is only aware of some, not all, persons within the NET category. The local breakdown is available for the NEET series, but to be compatible with our series we should use the NET series, which is the complement of our participation rate. Furthermore, the NEET rates are based on the numbers in schools and colleges in each district, not on the basis of residence, which is what is used in this report.

## 6. Results

The result of our modelling are contained in our spreadsheet model and there are many outputs which could be produced (e.g. for different age groups, or exploring different scenarios), so we will present a 'central' forecast here. Alternative outputs can be explored by the user of the spreadsheet model.

Table 7 below presents our estimates of learner numbers (16 and 17 year olds combined), by district and unitary authority, for the years 2006 and 2013. We break these figures down by school (full time), college (full time), independent school, part time (in colleges, not schools) and WBL. It is difficult to comment on particular details as there are so many different numbers; however, there are a couple of points worth noting:

1. The greatest reliance can be placed upon the figures for total learners. Once we break this down into its component parts we introduce another element of estimation and hence of uncertainty. Hence the work-based learning numbers increase proportionately more than the other categories because of the government's targets for increasing this category. The independent and part-time learner numbers decline in some districts, because we assume a constant participation rate for these, coupled with a declining population size. The school and college numbers then make up the residual numbers. Any errors in our assumptions (e.g. regarding WBL participation) will affect all the categories.
2. The growth figures should be read in the context of the travel to learn numbers that we derived earlier and also the earlier comments about housing. To incorporate these, Table 8 reports the authorities with the largest projected increases in learner numbers, along with the figure for net imports calculated earlier, plus the figure for projected new housing, where this was significantly higher than the population projection. Thus it is interesting to compare Milton Keynes and Elmbridge for example, at the top of the table. The projected increases in school plus college numbers are fairly similar, but Elmbridge also has a large net import of students, whilst Milton Keynes has a very slight net export of its resident students. The increased demand in Elmbridge could be met therefore by increased provision, or it could be met by increased provision in neighbouring boroughs, reducing the imports into Elmbridge, which would leave room in Elmbridge for its own increased numbers. (Note that the Net imports figure is a per annum figure, while the other numbers refer to increases over time. Hence care has to be taken in interpretation, one cannot simply compare these numbers.) Note also that our projection for Milton Keynes might be an underestimate if the figure for housing growth proves accurate.

Thus we see that judgement is needed when interpreting the figures and that, in particular, one cannot simply look at a district in isolation.

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 Participation rates for 2006 are based on DCFS data（for counties and unitary authorities）．Disaggregating to district level is done using Population figures for each district and year are obtained from the Office for National Statistics．
Learner numbers are calculated as number of 16／17 year olds in the local population $\times$ participation rate


| L9－ | $0 \varepsilon$ | ¢－ | ャて－ | 29－ | Ll－ | 0102 | 815 | L | 818 | t601 | 6† | ［40z | 88 | 92 | 20 | $9+15$ | 998 | бu！${ }^{\text {¢ }}$ |
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| t62 | セ | ¢－ | £z－ | 821 | 89 | 1202 | 96 | $\angle 9$ | 8 ¢¢ | 999 | 998 | LZLL | K | 19 | ${ }^{1} \mathrm{~L}$ | L29 | 269 | әбр！ирие $\perp$ |
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| ${ }^{\text {Pefol }}$ | 78 M |  | $\begin{aligned} & \text { dopul } \\ & \text { coz ose } \end{aligned}$ | วu｜ | 100405 | ${ }_{\text {lefol }}$ | 78 M | $\begin{aligned} & \text { oull? } \\ & \text { yed } \end{aligned}$ | ${ }_{\text {dopul }}$ | ә6өा०О | ${ }^{1004} 5$ | $1 \mathrm{IP}, 10^{1}$ | 79 M | $\begin{aligned} & \text { oull? } \\ & \text { yed } \end{aligned}$ | $\begin{aligned} & \text { dəpul } \\ & 900 z \end{aligned}$ | ข6өाणО | 100405 | 10．14s！ |
| 291 | L | て－ | Ll－ | 09 | 901 | 9202 | ＂ | 9 | 12t | t¢ | 816 | 6981 | 99 | 87 |  | SLD | 2t8 |  |
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Table 8: Districts with the largest projected increases in learners

| District | School | College | Increase 2006-2013 |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Total school plus college | Indep | Part time | WBL | Total | Net imports | \% growth of housing stock |
| Milton Keynes | 460 | 280 | 740 | -1 | -4 | 145 | 879 | -46 | 25\% |
| Medway | 411 | 244 | 655 | -15 | -20 | 124 | 744 | 185 |  |
| Elmbridge | 190 | 458 | 648 | 23 | 4 | 46 | 720 | 3124 |  |
| Aylesbury Vale | 394 | 164 | 559 | -5 | -10 | 117 | 661 | 111 | 14\% |
| Waverley | 28 | 520 | 548 | -57 | -9 | 25 | 507 | 256 |  |
| Thanet | 281 | 210 | 491 | 3 | 3 | 121 | 618 | -186 |  |
| Isle of Wight | 266 | 191 | 457 | 3 | 2 | 146 | 606 | -117 | 8\% |
| Horsham | 141 | 310 | 452 | 15 | 6 | 62 | 534 | -52 | 11\% |
| Canterbury | 302 | 148 | 451 | -18 | -7 | 61 | 486 | 1943 |  |
| Dartford | 235 | 180 | 416 | 2 | 3 | 59 | 479 | 2250 | 20\% |
| Guildford | 202 | 212 | 415 | -14 | -3 | 53 | 451 | 1646 |  |
| New Forest | 92 | 321 | 412 | -3 | -4 | 109 | 514 | 2062 |  |
| Mid Sussex | 126 | 269 | 394 | -5 | -2 | 53 | 440 | -891 | 12\% |
| Swale | 251 | 138 | 389 | -3 | 0 | 79 | 466 | -801 |  |
| Ashford | 245 | 139 | 385 | 23 | 10 | 89 | 507 | -385 | 23\% |
| Arun | 156 | 196 | 352 | -1 | 0 | 73 | 424 | -1714 |  |
| Winchester | 3 | 346 | 349 | -2 | -7 | 112 | 451 | 1983 | 11\% |
| Shepway | 205 | 141 | 346 | -2 | -1 | 51 | 394 | -189 |  |
| Eastbourne | 5 | 339 | 343 | 0 | 0 | 46 | 389 | 834 |  |
| Windsor and Maidenhead | 238 | 102 | 340 | -104 | -15 | 33 | 255 | 228 |  |
| Sevenoaks | 229 | 94 | 323 | -16 | -4 | 40 | 342 | -1635 |  |
| Tonbridge and Malling | 229 | 93 | 322 | -14 | -4 | 54 | 358 | 1398 | 9\% |
| Maidstone | 226 | 95 | 321 | -15 | -5 | 63 | 364 | 514 |  |
| Hart | 40 | 262 | 302 | -1 | -1 | 40 | 341 | -1530 |  |
| Tandridge | 168 | 128 | 296 | -23 | -4 | 24 | 294 | -280 |  |
| Test Valley | 1 | 293 | 294 | -2 | -5 | 75 | 363 | -1352 | 9\% |
| East Hampshire | 5 | 288 | 293 | -6 | -6 | 62 | 343 | -567 |  |
| Wealden | 160 | 128 | 288 | -18 | -3 | 37 | 303 | -1335 |  |
| Tunbridge Wells | 217 | 69 | 285 | -17 | -3 | 37 | 302 | 146 |  |
| Rother | 41 | 236 | 276 | 4 | 1 | 48 | 330 | -172 |  |
| Wokingham | 181 | 92 | 273 | -11 | -6 | 82 | 337 | -1327 | 8\% |
| West Oxfordshire | 169 | 98 | 267 | -20 | -9 | 56 | 294 | -65 | 8\% |
| Chichester | 105 | 158 | 262 | 12 | 6 | 58 | 339 | 2151 | 8\% |
| Basingstoke and Deane | 15 | 243 | 257 | 1 | 6 | 159 | 424 | 506 | 12\% |
| Lewes | 33 | 210 | 243 | -9 | -5 | 40 | 268 | 787 |  |
| Crawley | 140 | 99 | 239 | 0 | -1 | 58 | 296 | 684 | 8\% |
| Hastings | 61 | 170 | 231 | -2 | -2 | 52 | 279 | -217 |  |
| Bracknell Forest | 113 | 114 | 228 | -65 | -24 | 23 | 163 | -576 | 11\% |
| West Berkshire | 156 | 58 | 214 | -64 | -21 | 62 | 191 | 92 | 8\% |
| Dover | 134 | 65 | 200 | -18 | -7 | 48 | 223 | -498 |  |

Because we should go beyond looking at a particular district in isolation, it may be helpful to look at a map of the projected increases in numbers, shown in Figure 19
below. This shows nine separate categories, with approximately equal numbers of districts in each. The darker colours represent larger increases in learner numbers.

Figure 19: Map of growth in total learner numbers
Growth in total learner numbers


Note that this map includes learners in the independent sector as well as those following a WBL route. Using this map we get an idea of where there are groups of neighbouring authorities with large increases in numbers, for example in North Kent and in the north of Buckinghamshire.

Figure 20 shows a similar map, but includes only full time learners (in both schools and colleges). This leaves out part time learners, WBL and students in the independent sector. This gives a similar pattern to the figure above (note that the colours represent different values in the two graphs), but again suggests the northern districts of Kent as areas of growth, as well as Milton Keynes and Aylesbury Vale together in the north of the region.

Figure 20: Map of growth of full time learners

Growth in full time learner numbers


From our model we can also measure the growth to the year 2015, by which time all 17 year olds should be in education or training. These numbers obviously reveal a little more growth, and are shown in Table 9 below. Note that the numbers of students in education or training in 2015 are fairly similar to the numbers in 2013 (on average about $1 \%$ higher) but that when measured as the growth from 2006, the 2015 figure is about $11 \%$ larger than the 2013 figure. (Example: Horsham's 2013 number is estimated to be 3358 and in 2015 to be 3410, an increase of $1.6 \%$. The growth from 2006's figure of 2824 is 534 (to 2013) and 587 (to 2015), which is an increase of $9.8 \%$.) There are wide variations around this average and this illustrates the difficulty of accurately measuring the rate of growth, rather than the level, of a variable.

| OSt | t81 | t | 1 | 9 TZ | St | $168 \varepsilon$ | 629 | 202 | $8 \varepsilon$ | St6z | LLI | LTEE | StE | L61 | $\llcorner\varepsilon$ | 00LZ | 291 | pue әуоłsбu！seg |
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| 897 | 69 | 9 － | L－ | 乙6 | 0¢ | 88\＆乙 | 961 | $1 \varepsilon \downarrow$ | 67 | £6L | 6 6LL | OZıZ | L\＆ | L\＆ | 9¢1 | 102 | 686 | Кәјмедо |
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| Lto | 08 | $\varepsilon$－ | 9 － | SOZ | t91 | レレE\＆ | OGZ | 991 | $8 \varepsilon 乙$ | $\angle L t L$ | 08LL | 0＜8Z | 691 | 691 | とヶて | ZLZし | 9101 | und $\forall$ |
| tSt | 61 | 6 － | Sl－ | 96 | 29 | ¢981 | †8 | 99 | 001 | t89 | Ott | LLZL | ¢9 | 99 | SHL | 889 | $8\llcorner\varepsilon$ | ınp $\quad$ ¢ |
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| Z6Z | z9 | て－ | L－ | 921 | ¢9 | OSZZ | 861 | 88 | HL | ttel | 6＜t | L961 | 981 | 06 | Ltb | 891L | 91t | sбu！${ }^{\text {SeH }}$ |
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| 6レレー | $\angle \varepsilon$ | $6 \varepsilon^{-}$ | 0 | Zs－ | 99－ | 1097 | 961 | ¢8ا | 0 | 626 | でてし | OZLZ | 6 Sl | てZZ | 0 | 1801 | 80\＆1 | 46nols |
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The figures in Table 9 are illustrated in Figure 21 below.
Figure 21: Growth in full time learner numbers to 2015
Growth in full time learner numbers


This yields a similar map to that of Figure 20 for the growth to 2013. Alternative scenarios

It is relatively easy to explore alternative scenarios using the model. We explore two in this report:
(a) Assuming work-based learner numbers double by 2013 (instead of increasing by 50\%)
(b) Assuming 100\% participation in some form of education or training by 2013/2015

The first of these increases the proportion of growth that is accounted for by WBL and may be a reasonable alternative to our central assumption, given that we must expect growth to come from students who have traditionally dropped out and are unlikely to want to follow more academic routes. However, it should be noted that this is a significantly larger increase than is implicit in government policy (which implies growth of about $50 \%$ by 2013). The impact of this alternative is to increase the numbers in WBL, obviously, and to decrease the numbers in school and college. The overall participation rate remains the same.

These results are illustrated in Table 10 and it is perhaps most useful in seeing how changing this assumption affects the various projections. For example, in Aylesbury Vale (the first district in the table), the WBL number increases by 127 (we are comparing
the figure of 244 with that of 117 in Table 7), resulting in fall in school growth from 394 to $305(-89)$ and college growth to be reduced from 164 to 127 (-37). The independent sector is unchanged, as we believe it is unlikely to be involved in the same client group as WBL. The part-time sector is also unchanged, again by assumption, though the borderline between part-time learning and WBL may be a fine one, so we could interpret this scenario as an increase in either WBL or part-time learning.

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| t6z | 8L1 | 6－ | 02－ | GL | O\＆L | てたとて | $9 \angle Z$ | ¢91 | てた | 129 | 066 | 8t0z | 891 | ZLI | 298 | 967 | 198 | әı！ |
| SOZ | 6SL | 02－ | ¢ $\varepsilon^{-}$ | Ot | 19 | 280\＆ | t88 | LZZ | 1St | 008 | OZZL | L 42 | G＜Z | Ltz | 986 | 092 | 6SLL |  |
| \＆\＆ | $\angle L$ | ¢z－ | セع－ | 6 | 9 | 6662 | tot | 298 | t98 | LLLL | ISL | 9982 | L92 | $\angle 82$ | 868 | 8915 | StL | әג！¢spıojxO પłnos |
| SOZ | SOL | L－ | Sz－ | Ot | 乙6 | 81LZ | 6 t Z | Ltr | LIS | tGs | LGZ1 | ELSZ | tol | SG1 | ¢¢G | tis | S9LL | profe |
| L81 | 621 | L－ | 82－ | to | 67 | GLEE | 862 | 9／1 | 189 | ZSOL | 891L | $881 \varepsilon$ | 691 | ¢8ا | 602 | 8001 | 8LIL | ॥әмıәчつ |
| 628 | 26Z | t－ | － | $\downarrow$ ¢ | 698 | L999 | 699 | OLZ | 09 | L8LL | 1t62 | 8LLt | L9E | DIC | 19 | E9S1 | ZLEZ | səuКə＞＞1 uot！！ |
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| 209 | 69 | 6 － | Ls－ | 887 | 9 | t062 | OSL | 0 | LLt | 1012 | ZLI | 868 | 16 | 62 | 829 | $\varepsilon เ$ | 98 | кәиәлем |
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| 8 － | $\varepsilon 9$ | 0 | 0 | ¢ $\varepsilon^{-}$ | 92－ | L20Z | 815 | ＋s | 088 | 928 | tog | 6002 | 99 | tG | 088 | 016 | 029 | पleer kaxins |
| くて－ | ZL | － | てz－ | ＋9－ | OL－ | 986 | 69 | 82 | ＋88 |  | 821 | ع10z | $\angle 6$ | 28 | 904 | OtZ | 881 | әиıочıәds |

The second scenario, of $100 \%$ participation, represents the maximum possible out-turn. It is therefore interesting to explore this scenario, even if we think it is less likely than our central projection. These tables (for the changes to 2013 and to 2015) are contained in Appendix 4, Table A4.1 and A4.2. Because we are now adding an additional $2 \%$ points to the participation rate, we need to modify our assumption about the growth of WBL (otherwise, the extension from $98 \%$ to $100 \%$ participation is assumed all to occur in schools and colleges. Since these are the most marginal learners, this outcome seems unlikely and it is more reasonable to assume some increase in WBL.). We therefore assume a growth of $75 \%$ in WBL (rather than the $50 \%$ in our central scenario), although other figures could reasonably be used. This illustrates again the difficulty of estimating the individual components of the overall growth.

Looking at the growth numbers in this scenario, it now predicts around 24,100 additional learners in the South East, compared to an estimate of 19,880 in our central projection, a difference of $21.4 \%$. Again, there are wide variations around the average: where the overall participation rate was equal or near to $100 \%$ already in Table 7, there will be little difference reported in Table A4.1. For some authorities (e.g. Medway) there is a big difference because in our central projection we had them falling short of our average figure of $98 \%$ participation.

## 7. Conclusions

Our work has provided a mass of contextual information regarding post-16 participation and has derived a methodology for making projections of learner numbers (with various degrees of disaggregation) up to the year 2020. We have identified possible reasons for adjustments to our basic specification and we have demonstrated how the results may be interpreted. In particular we noted that transfers across local authority borders mean it is important to take these into account when interpreting the results of the model. We have examined two different scenarios to illustrate how the model might be used.

In the light of this, it would be dangerous simply to take the predicted increase in learner numbers in a district as a guide to the need for additional provision. That decision would need to take account of other factors such as:

- the flows of students between districts in the vicinity
- the plans of neighbouring districts and colleges
- the split of students into the various components such as full-time or part-time learners

It is also important to continue monitoring changes as time goes on. For example, it may become apparent that the assumptions made in this model regarding the growth of WBL participation turn out to be wrong. In this case the forecasts should be revised in the light of new information.

There are areas where the model could possibly be improved and hence where further research might be worthwhile. We have already discussed some of the issues around the data at the end of section 5 above. We were unable to obtain much useful information about the independent sector and this is calculated as a residual in our model. The DCSF does provide participation rates for the independent sector at the country/unitary authority level and, depending upon the source of that data, it might be possible to obtain that at district level. There are also some inconsistencies, we believe, between the DCSF data and the PLASC/ILR data, which we have had to circumvent.

There is also some debate over population forecasts, as the ONS figures are projections based upon birth and death rates, coupled with estimates of migration. They do not take account of information contained in local plans such as new housing developments, which might prove to be more accurate. However, it might be difficult to integrate such figures into our model and maintain the consistency that is given by using the ONS figures.

## 8. Appendices

## Appendix 1: References for literature review

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Appendix 2：Summary table of findings of studies reported in the literature review

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Appendix 3: Full versions of selected tables in the main text
Table A3.1: Authorities with the largest predicted increase in the 16 and 17 year old population, 2006-2013 (Full version of Table 1 in text)

| Authority | 2006 | Growth | growth |  |
| :--- | ---: | ---: | ---: | :---: |
| Ashford | 2843 | 266 | $9 \%$ |  |
| Chichester | 2365 | 136 | $6 \%$ |  |
| Elmbridge | 3033 | 156 | $5 \%$ |  |
| Horsham | 3331 | 128 | $4 \%$ |  |
| Basingstoke and Deane | 3810 | 103 | $3 \%$ |  |
| Isle of Wight | 3494 | 92 | $3 \%$ |  |
| Thanet | 3461 | 86 | $2 \%$ |  |
| Rother | 2070 | 48 | $2 \%$ |  |
| Dartford | 2360 | 54 | $2 \%$ |  |
| Runnymede | 1656 | 33 | $2 \%$ |  |
| Chiltern | 2373 | 29 | $1 \%$ |  |
| South Bucks | 1618 | 11 | $1 \%$ |  |
| Arun | 3408 | -5 | $0 \%$ |  |
| Eastbourne | 2296 | -6 | $0 \%$ |  |
| Surrey Heath | 2079 | -8 | $0 \%$ |  |
| Crawley | 2545 | -13 | $-1 \%$ |  |
| Swale | 3605 | -26 | $-1 \%$ |  |
| Shepway | 2577 | -28 | $-1 \%$ |  |
| Hart | 2552 | -32 | $-1 \%$ |  |
| Hastings | 2361 | -39 | $-2 \%$ |  |
| Mid Sussex | 3464 | -61 | $-2 \%$ |  |
| Milton Keynes | 6096 | -110 | $-2 \%$ |  |
| Wokingham | 3978 | -92 | $-2 \%$ |  |
| Guildford | 3493 | -90 | $-3 \%$ |  |
| New Forest | 4196 | -116 | $-3 \%$ |  |
| Test Valley | 3102 | -108 | $-3 \%$ |  |
| Mole Valley | 2148 | -82 | $-4 \%$ |  |
| Cherwell | 3587 | -144 | $-4 \%$ |  |
| Epsom and Ewell | 1863 | -77 | $-4 \%$ |  |
| Wealden | 3790 | -157 | $-4 \%$ |  |
| Worthing | 2383 | -100 | $-4 \%$ |  |
| Aylesbury Vale | 4867 | -213 | $-4 \%$ |  |
| Reigate and Banstead | 3165 | -141 | $-4 \%$ |  |
| Oxford | 2984 | -140 | $-5 \%$ |  |
| Maidstone | 3718 | -177 | $-5 \%$ |  |
| West Oxfordshire | 2628 | -131 | $-5 \%$ |  |
| East Hampshire | 3235 | -163 | $-5 \%$ |  |
| Tonbridge and Malling | 3362 | -170 | $-5 \%$ |  |
| Spelthorne | 2115 | -108 | $-5 \%$ |  |
| Tunbridge Wells | -173 | $-6 \%$ |  |  |
| Winchester | -195 | $-6 \%$ |  |  |
|  |  |  |  |  |


| Lewes | 2479 | -145 | $-6 \%$ <br> $\%$ |
| :--- | :---: | :---: | :---: |
| Authority | 2006 | Growth | growth |$|$| Woking | 2155 | -128 | $-6 \%$ |
| :--- | :---: | ---: | :--- |
| Tandridge | 4030 | -145 | $-6 \%$ |
| Canterbury | 2984 | -258 | $-6 \%$ |
| Sevenoaks | 4322 | -294 | $-7 \%$ |
| Wycombe | 3210 | -236 | $-7 \%$ |
| Eastleigh | 7367 | -554 | $-8 \%$ |
| Medway | 2330 | -179 | $-8 \%$ |
| Rushmoor | 3078 | -240 | $-8 \%$ |
| Dover | 5322 | -419 | $-8 \%$ |
| Brighton and Hove | 3468 | -276 | $-8 \%$ |
| Vale of White Horse | 3396 | -292 | $-9 \%$ |
| South Oxfordshire | 2750 | -250 | $-9 \%$ |
| Gravesham | 2917 | -279 | $-10 \%$ |
| Fareham | 4349 | -439 | $-10 \%$ |
| West Berkshire | 1683 | -170 | $-10 \%$ |
| Adur | 2092 | -216 | $-10 \%$ |
| Gosport | 3244 | -347 | $-11 \%$ |
| Havant | 3853 | -417 | $-11 \%$ |
| Waverley | 5035 | -566 | $-11 \%$ |
| Southampton | 4360 | -494 | $-11 \%$ |
| Windsor and Maidenhead | 3165 | -369 | $-12 \%$ |
| Slough | 3408 | -420 | $-12 \%$ |
| Bracknell Forest | 4726 | -654 | $-14 \%$ |
| Portsmouth | 3328 | -551 | $-17 \%$ |
| Reading |  |  |  |

Table A3.2: Growth in housing stock and growth of population* (full version of Table 2 in main text).

| Authority | $\begin{aligned} & \text { Housing } \\ & \text { Stock } \\ & 2004 \\ & \hline \end{aligned}$ | Housing stock 2015 | \% growth in housing stock | $\begin{gathered} \text { Population } \\ 2006 \\ (000) \\ \hline \end{gathered}$ | $\begin{gathered} \text { Population } \\ 2015 \\ (000) \\ \hline \end{gathered}$ | \% growth in population |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Berkshire |  |  |  |  |  |  |
| Bracknell Forest | 44000 | 48851 | 11\% | 3408 | 2952 | -13\% |
| Reading | 57000 | 61689 | 8\% | 3328 | 2658 | -20\% |
| Slough | 45000 | 47115 | 5\% | 3165 | 2601 | -18\% |
| West Berkshire | 58000 | 62725 | 8\% | 4349 | 3857 | -11\% |
| Windsor and |  |  |  |  |  |  |
| Maidenhead | 55000 | 57529 | 5\% | 4360 | 3919 | -10\% |
| Wokingham | 58000 | 62707 | 8\% | 3978 | 3807 | -4\% |

Buckinghamshire

| Authority | Housing Stock 2004 | Housing stock 2015 | \% growth in housing stock | $\begin{gathered} \text { Population } \\ 2006 \\ (000) \\ \hline \end{gathered}$ | $\begin{gathered} \text { Population } \\ 2015 \\ (000) \\ \hline \end{gathered}$ | \% growth in population |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Aylesbury Vale | 67000 | 76540 | 14\% | 4867 | 4674 | -4\% |
| Chiltern | 36000 | 37080 | 3\% | 2373 | 2442 | 3\% |
| Milton Keynes | 89000 | 110960 | 25\% | 6096 | 5912 | -3\% |
| South Bucks | 25000 | 25810 | 3\% | 1618 | 1577 | -3\% |
| Wycombe | 64000 | 66970 | 5\% | 4322 | 4022 | -7\% |
| East Sussex |  |  |  |  |  |  |
| Brighton and |  |  |  |  |  |  |
| Hove | 115000 | 119950 | 4\% | 5322 | 4803 | -10\% |
| Eastbourne | 43000 | 45160 | 5\% | 2296 | 2340 | 2\% |
| Hastings | 39000 | 40890 | 5\% | 2361 | 2276 | -4\% |
| Lewes | 41000 | 42980 | 5\% | 2479 | 2273 | -8\% |
| Rother | 39000 | 41520 | 6\% | 2070 | 2066 | 0\% |
| Wealden | 60000 | 63600 | 6\% | 3790 | 3671 | -3\% |
| Hampshire |  |  |  |  |  |  |
| Basingstoke and |  |  |  |  |  |  |
| Deane | 64000 | 71425 | 12\% | 3810 | 3891 | 2\% |
| East Hampshire | 44000 | 46340 | 5\% | 3235 | 3002 | -7\% |
| Eastleigh | 48000 | 51186 | 7\% | 3210 | 2897 | -10\% |
| Fareham | 44000 | 45674 | 4\% | 2917 | 2641 | -9\% |
| Gosport | 32000 | 33125 | 4\% | 2092 | 1792 | -14\% |
| Hart | 34000 | 35800 | 5\% | 2552 | 2544 | 0\% |
| Havant | 49000 | 51835 | 6\% | 3244 | 2812 | -13\% |
| New Forest | 74000 | 75863 | 3\% | 4196 | 4008 | -4\% |
| Portsmouth | 81000 | 87615 | 8\% | 4726 | 3989 | -16\% |
| Rushmoor | 35000 | 37790 | 8\% | 2330 | 2075 | -11\% |
| Southampton | 94000 | 101335 | 8\% | 5035 | 4304 | -15\% |
| Test Valley | 45000 | 49014 | 9\% | 3102 | 2871 | -7\% |
| Winchester | 44000 | 48698 | 11\% | 3420 | 3199 | -6\% |
| Isle of Wight | 60000 | 64680 | 8\% | 3494 | 3550 | 2\% |
| Kent |  |  |  |  |  |  |
| Ashford | 44000 | 54215 | 23\% | 2843 | 3089 | 9\% |
| Canterbury | 59000 | 62240 | 5\% | 4030 | 3765 | -7\% |
| Dartford | 36000 | 43065 | 20\% | 2360 | 2307 | -2\% |
| Dover | 46000 | 48745 | 6\% | 3078 | 2765 | -10\% |
| Gravesham | 39000 | 43185 | 11\% | 2750 | 2508 | -9\% |


| Maidstone | 58000 | 61690 | 6\% | 3718 | 3472 | -7\% |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Medway | 102000 | 109335 | 7\% | 7367 | 6606 | -10\% |
| Sevenoaks | 45000 | 46395 | 3\% | 2984 | 2784 | -7\% |
| Authority | $\begin{aligned} & \text { Housing } \\ & \text { Stock } \\ & 2004 \\ & \hline \end{aligned}$ | Housing stock 2015 | \% growth in housing stock | $\begin{aligned} & \text { Population } \\ & 2006 \\ & (000) \\ & \hline \end{aligned}$ | $\begin{gathered} \text { Population } \\ 2015 \\ (000) \\ \hline \end{gathered}$ | \% growth in population |
| Shepway | 43000 | 45295 | 5\% | 2577 | 2525 | -2\% |
| Swale | 52000 | 55735 | 7\% | 3605 | 3536 | -2\% |
| Thanet | 57000 | 59925 | 5\% | 3461 | 3416 | -1\% |
| Tonbridge and |  |  |  |  |  |  |
| Malling | 45000 | 48825 | 9\% | 3362 | 3165 | -6\% |
| Tunbridge Wells | 43000 | 45250 | 5\% | 3102 | 2798 | -10\% |
| Oxfordshire |  |  |  |  |  |  |
| Cherwell | 56000 | 61310 | 9\% | 3587 | 3498 | -2\% |
| Oxford | 54000 | 57150 | 6\% | 2984 | 2817 | -6\% |
| South |  |  |  |  |  |  |
| Oxfordshire | 52000 | 56590 | 9\% | 3396 | 3032 | -11\% |
| Vale of White |  |  |  |  |  |  |
| Horse | 47000 | 52175 | 11\% | 3468 | 3104 | -10\% |
| West Oxfordshire | 40000 | 43015 | 8\% | 2628 | 2478 | -6\% |
| Surrey |  |  |  |  |  |  |
| Elmbridge | 52000 | 54079 | 4\% | 3033 | 3290 | 8\% |
| Epsom and Ewell | 28000 | 29629 | 6\% | 1863 | 1819 | -2\% |
| Guildford | 53000 | 55898 | 5\% | 3493 | 3400 | -3\% |
| Mole Valley | 34000 | 35539 | 5\% | 2148 | 2061 | -4\% |
| Reigate and |  |  |  |  |  |  |
| Banstead | 53000 | 56483 | 7\% | 3165 | 3055 | -3\% |
| Runnymede | 33000 | 34314 | 4\% | 1656 | 1624 | -2\% |
| Spelthorne | 39000 | 40359 | 3\% | 2115 | 1967 | -7\% |
| Surrey Heath | 32000 | 33683 | 5\% | 2079 | 2041 | -2\% |
| Tandridge | 32000 | 33008 | 3\% | 2362 | 2200 | -7\% |
| Waverley | 47000 | 49070 | 4\% | 3853 | 3394 | -12\% |
| Woking | 38000 | 40178 | 6\% | 2155 | 1983 | -8\% |
| West Sussex |  |  |  |  |  |  |
| Adur | 26000 | 27170 | 5\% | 1683 | 1460 | -13\% |
| Arun | 65000 | 69185 | 6\% | 3408 | 3335 | -2\% |
| Chichester | 47000 | 50870 | 8\% | 2365 | 2430 | 3\% |
| Crawley | 41000 | 44150 | 8\% | 2545 | 2432 | -4\% |
| Horsham | 52000 | 57580 | 11\% | 3331 | 3449 | 4\% |
| Mid Sussex | 53000 | 59345 | 12\% | 3464 | 3314 | -4\% |
| Worthing | 45000 | 46800 | 4\% | 2383 | 2299 | -4\% |

* Note to table: The population growth figures are based on ONS projections.

Table A3.6a: Imports and exports of school pupils across LA boundaries (full version of Table 6 in the main text)

|  | Number of learners | Number <br> who <br> stay | Number exported | Number imported | Net imports | Number taught | \% of learners taught |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Adur | 378 | 281 | 97 | 15 | -82 | 296 | 78 |
| Arun | 1010 | 851 | 159 | 43 | -116 | 894 | 89 |
| Ashford | 1264 | 1052 | 212 | 106 | -106 | 1158 | 92 |
| Aylesbury Vale Basingstoke and | 2024 | 1798 | 226 | 440 | 214 | 2238 | 111 |
| Deane | 154 | 0 | 154 | 0 | -154 | 0 | 0 |
| Bracknell Forest | 926 | 625 | 301 | 165 | -136 | 790 | 85 |
| Brighton and Hove | 780 | 770 | 10 | 97 | 87 | 867 | 111 |
| Canterbury | 1515 | 1345 | 170 | 390 | 220 | 1735 | 115 |
| Cherwell | 1011 | 745 | 266 | 35 | -231 | 780 | 77 |
| Chichester | 654 | 584 | 70 | 229 | 159 | 813 | 124 |
| Chiltern | 1387 | 1228 | 159 | 667 | 508 | 1895 | 137 |
| Crawley | 999 | 990 | 9 | 106 | 97 | 1096 | 110 |
| Dartford | 738 | 601 | 137 | 740 | 603 | 1341 | 182 |
| Dover | 1274 | 1157 | 117 | 136 | 19 | 1293 | 101 |
| East Hampshire | 38 | 0 | 38 | 0 | -38 | 0 | 0 |
| Eastbourne | 20 | 0 | 20 | 0 | -20 | 0 | 0 |
| Eastleigh | 13 | 1 | 12 | 0 | -12 | 1 | 8 |
| Elmbridge | 422 | 319 | 103 | 356 | 253 | 675 | 160 |
| Epsom and Ewell | 621 | 437 | 184 | 514 | 330 | 951 | 153 |
| Fareham | 105 | 0 | 105 | 0 | -105 | 0 | 0 |
| Gosport | 248 | 248 |  | 73 | 73 | 321 | 129 |
| Gravesham | 1129 | 1018 | 111 | 254 | 143 | 1272 | 113 |
| Guildford | 895 | 812 | 83 | 340 | 257 | 1152 | 129 |
| Hart | 228 | 201 | 27 | 44 | 17 | 245 | 107 |
| Hastings | 405 | 396 | 9 | 28 | 19 | 424 | 105 |
| Havant | 144 | 96 | 48 | 79 | 31 | 175 | 122 |
| Horsham | 691 | 603 | 88 | 97 | 9 | 700 | 101 |
| Isle of Wight | 1310 | 1309 | 1 | 12 | 11 | 1321 | 101 |
| Lewes | 199 | 144 | 55 | 6 | -49 | 150 | 75 |
| Maidstone | 1633 | 1399 | 234 | 553 | 319 | 1952 | 120 |
| Medway | 2887 | 2753 | 134 | 332 | 198 | 3085 | 107 |
| Mid Sussex | 716 | 671 | 45 | 173 | 128 | 844 | 118 |
| Milton Keynes | 2462 | 2257 | 205 | 94 | -111 | 2351 | 95 |
| Mole Valley | 801 | 534 | 267 | 263 | -4 | 797 | 100 |
| New Forest | 613 | 605 | 8 | 184 | 176 | 789 | 129 |
| Oxford | 1108 | 868 | 240 | 98 | -142 | 966 | 87 |
| Portsmouth | 27 | 0 | 27 | 0 | -27 | 0 | 0 |
| Reading | 1133 | 603 | 530 | 422 | -108 | 1025 | 90 |
| Reigate and |  |  |  |  |  |  |  |
| Banstead | 587 | 328 | 259 | 194 | -65 | 522 | 89 |
| Rother | 194 | 0 | 194 | 0 | -194 | 0 | 0 |
| Runnymede | 336 | 231 | 105 | 181 | 76 | 412 | 123 |
| Rushmoor | 113 | 0 | 113 | 0 | -113 | 0 | 0 |
| Sevenoaks | 1190 | 219 | 971 | 86 | -885 | 305 | 26 |
| Shepway | 914 | 760 | 154 | 51 | -103 | 811 | 89 |
| Slough | 1306 | 1012 | 294 | 510 | 216 | 1522 | 117 |


| South Bucks | 814 | 323 | 491 | 352 | -139 | 675 | 83 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| South Oxfordshire | 1049 | 920 | 129 | 342 | 213 | 1262 | 120 |
| Southampton | 60 | 55 | 5 | 44 | 39 | 99 | 165 |
| Spelthorne | 183 | 132 | 51 | 79 | 28 | 211 | 115 |
|  | Number of learners | Number who stay | Number exported | Number imported | Net imports | Number taught | \% of learners taught |
| Surrey Heath | 648 | 540 | 108 | 69 | -39 | 609 | 94 |
| Swale | 1493 | 1316 | 177 | 196 | 19 | 1512 | 101 |
| Tandridge | 661 | 489 | 172 | 592 | 420 | 1081 | 164 |
| Test Valley | 8 | 1 | 7 | 0 | -7 | 1 | 13 |
| Thanet | 1192 | 1107 | 85 | 81 | -4 | 1188 | 100 |
| Tonbridge and Malling | 1435 | 739 | 696 | 917 | 221 | 1656 | 115 |
| Tunbridge Wells | 1450 | 973 | 477 | 935 | 458 | 1908 | 132 |
| Vale of White Horse | 1057 | 845 | 212 | 215 | 3 | 1060 | 100 |
| Waverley | 84 | 32 | 52 | 100 | 48 | 132 | 157 |
| Wealden | 1388 | 1100 | 288 | 249 | -39 | 1349 | 97 |
| West Berkshire | 1710 | 1624 | 86 | 566 | 480 | 2190 | 128 |
| West Oxfordshire | 1018 | 988 | 30 | 304 | 274 | 1292 | 127 |
| Winchester | 18 |  | 18 | 0 | -18 | 0 | 0 |
| Windsor and |  |  |  |  |  |  |  |
| Maidenhead | 1474 | 1140 | 334 | 446 | 112 | 1586 | 108 |
| Woking | 344 | 165 | 179 | 43 | -136 | 208 | 60 |
| Wokingham | 1860 | 1476 | 384 | 314 | -70 | 1790 | 96 |
| Worthing | 33 | 0 | 33 | 0 | -33 | 0 | 0 |
| Wycombe | 2145 | 1699 | 446 | 450 | 4 | 2149 | 100 |

Table A3.6b: Imports and exports of college pupils across LA boundaries (full version of Table 6 in the main text)

|  | Number <br> of <br> learners | Number <br> who <br> stay | Number <br> exported | Number <br> imported | Net <br> imports | Number <br> taught | learners <br> taught |
| :--- | ---: | :--- | ---: | :--- | ---: | ---: | ---: |
| Adur | 720 | 37 | 683 | 122 | -561 | 159 | 22 |
| Arun | 1635 | 37 | 1,598 | 4 | -1594 | 41 | 3 |
| Ashford | 983 | 483 | 500 | 213 | -287 | 696 | 71 |
| Aylesbury Vale | 1298 | 771 | 527 | 433 | -94 | 1204 | 93 |
| Basingstoke and |  |  |  |  |  |  |  |
| Deane | 3131 | 2,623 | 508 | 1,133 | 625 | 3756 | 120 |
| Bracknell Forest | 1225 | 586 | 639 | 202 | -437 | 788 | 64 |
| Brighton and Hove | 3145 | 2,533 | 612 | 1,360 | 748 | 3893 | 124 |
| Canterbury | 1056 | 923 | 133 | 1,824 | 1691 | 2747 | 260 |
| Cherwell | 1182 | 699 | 483 | 305 | -178 | 1004 | 85 |
| Chichester | 1249 | 800 | 449 | 2,208 | 1759 | 3008 | 241 |
| Chiltern | 468 | 211 | 257 | 681 | 424 | 892 | 191 |
| Crawley | 1009 | 657 | 352 | 930 | 578 | 1587 | 157 |
| Dartford | 783 | 437 | 346 | 1,305 | 959 | 1742 | 222 |
| Dover | 887 | 235 | 652 | 132 | -520 | 367 | 41 |
| East Hampshire | 2257 | 1,106 | 1,151 | 624 | -527 | 1730 | 77 |
| Eastbourne | 1536 | 1,336 | 200 | 1,019 | 819 | 2355 | 153 |
| Eastleigh | 2565 | 1,509 | 1,056 | 1,828 | 772 | 3337 | 130 |
| Elmbridge | 1190 | 792 | 398 | 2,283 | 1885 | 3075 | 258 |
| Epsom and Ewell | 507 | 227 | 280 | 1,074 | 794 | 1301 | 257 |


| Fareham | 2181 | 626 | 1,555 | 720 | -835 | 1346 | 62 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Gosport | 1274 | 643 | 631 | 351 | -280 | 994 | 78 |
| Gravesham | 880 | 511 | 369 | 716 | 347 | 1227 | 139 |
| Guildford | 1219 | 550 | 669 | 1,932 | 1263 | 2482 | 204 |
| Hart | 1552 | 8 | 1,544 | 3 | -1541 | 11 | 1 |
| Hastings | 1400 | 692 | 708 | 544 | -164 | 1236 | 88 |
|  | Number of learners | Number who stay | Number exported | Number imported | Net imports | Number taught | \% of learners taught |
| Havant | 2327 | 1,891 | 436 | 3,241 | 2805 | 5132 | 221 |
| Horsham | 1786 | 1,118 | 668 | 590 | -78 | 1708 | 96 |
| Isle of Wight | 1253 | 1,083 | 170 | 26 | -144 | 1109 | 89 |
| Lewes | 1505 | 844 | 661 | 1,454 | 793 | 2298 | 153 |
| Maidstone | 994 | 615 | 379 | 569 | 190 | 1184 | 119 |
| Medway | 2411 | 1,849 | 562 | 540 | -22 | 2389 | 99 |
| Mid Sussex | 1786 | 622 | 1,164 | 149 | -1015 | 771 | 43 |
| Milton Keynes | 2207 | 1,741 | 466 | 497 | 31 | 2238 | 101 |
| Mole Valley | 564 | 2 | 562 | 11 | -551 | 13 | 2 |
| New Forest | 2540 | 1,910 | 630 | 1,579 | 949 | 3489 | 137 |
| Oxford | 697 | 571 | 126 | 1,003 | 877 | 1574 | 226 |
| Portsmouth | 3325 | 1,200 | 2,125 | 348 | -1777 | 1548 | 47 |
| Reading | 1209 | 784 | 425 | 1,371 | 946 | 2155 | 178 |
| Reigate and Banstead | 1643 | 1,188 | 455 | 1,436 | 981 | 2624 | 160 |
| Rother | 1352 | 754 | 598 | 610 | 12 | 1364 | 101 |
| Runnymede | 785 | 207 | 578 | 812 | 234 | 1019 | 130 |
| Rushmoor | 1610 | 1,262 | 348 | 3,045 | 2697 | 4307 | 268 |
| Sevenoaks | 693 | 3 | 690 | 2 | -688 | 5 | 1 |
| Shepway | 834 | 390 | 444 | 359 | -85 | 749 | 90 |
| Slough | 1348 | 671 | 677 | 769 | 92 | 1440 | 107 |
| South Bucks | 410 | 1 | 409 | 1 | -408 | 2 | 0 |
| South Oxfordshire | 2051 | 1,408 | 643 | 1,049 | 406 | 2457 | 120 |
| Southampton | 3784 | 2,632 | 1,152 | 1,034 | -118 | 3666 | 97 |
| Spelthorne | 1366 | 290 | 1,076 | 179 | -897 | 469 | 34 |
| Surrey Heath | 986 | 19 | 967 | 5 | -962 | 24 | 2 |
| Swale | 1138 | 309 | 829 | 7 | -822 | 316 | 28 |
| Tandridge | 647 | 2 | 645 |  | -645 | 2 | 0 |
| Test Valley | 2272 | 390 | 1,882 | 349 | -1533 | 739 | 33 |
| Thanet | 1353 | 989 | 364 | 176 | -188 | 1165 | 86 |
| Tonbridge and Malling | 850 | 336 | 514 | 1,474 | 960 | 1810 | 213 |
| Tunbridge Wells | 649 | 89 | 560 | 204 | -356 | 293 | 45 |
| Vale of White Horse | 1065 | 604 | 461 | 323 | -138 | 927 | 87 |
| Waverley | 1700 | 907 | 793 | 979 | 186 | 1886 | 111 |
| Wealden | 1323 | 29 | 1,294 | 9 | -1285 | 38 | 3 |
| West Berkshire | 966 | 485 | 481 | 99 | -382 | 584 | 60 |
| West Oxfordshire | 853 | 410 | 443 | 131 | -312 | 541 | 63 |
| Winchester Windsor and | 2313 | 1,488 | 825 | 2,514 | 1689 | 4002 | 173 |
| Maidenhead | 893 | 227 | 666 | 734 | 68 | 961 | 108 |
| Woking | 1259 | 420 | 839 | 193 | -646 | 613 | 49 |
| Wokingham | 1278 | 17 | 1,261 | 12 | -1249 | 29 | 2 |
| Worthing | 1841 | 1,275 | 566 | 844 | 278 | 2119 | 115 |
| Wycombe | 1209 | 247 | 962 | 125 | -837 | 372 | 31 |



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| HLt | 88 | $\mathrm{t}^{-}$ | $\varepsilon \chi^{-}$ | $\varepsilon \angle 1$ | 628 | LせLZ | 601 | LG | $8+\varepsilon$ | 102 | 976 | LZLL | LL | 19 | $1 L \varepsilon$ | LZS | 469 | әбр！ирие」 |
| 8 － | Ot | 0 | 0 | Lて－ | 02－ | 1LOZ | SOL | ts | $08 \varepsilon$ | $\varepsilon 88$ | $6+9$ | 6LOZ | ¢9 | ts | 088 | 016 | $0 \angle 9$ | чъеән Кәגns |
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| $\varepsilon \angle t$ | st | t－ | ¢z－ | L61 | 092 | $00 z z$ | LIL | $\angle \mathrm{C}$ | $9+\varepsilon$ | ちてL | LS6 | LZLL | L | 19 | LLE | LzG | $\angle 69$ | әбр！̣рие」 |
| $8 \varepsilon^{-}$ | 8 | － | G－ | $95^{-}$ | $\downarrow \varepsilon^{-}$ | 160Z | ELL | \＆ | SLE | t98 | 989 | 6LOZ | S9 | ts | $08 \varepsilon$ | 016 | $0<9$ | чъеән Кәıuns |
| $97-$ | 29 | 9－ | 62－ | ＋9－ | OL－ | L961 | 6S1 | L | Lع | 9くい | 821 | Eloz | $\angle 6$ | 乙8 | $90 t$ | OちZL | 881 | әuлочłə |
| $\stackrel{12+101}{ }$ | 79 M | $\begin{aligned} & \text { әul? } \\ & \text { Hed } \\ & \text { sioz- } \end{aligned}$ | dəpu｜ <br> OZ əse | әбә｜ㅇ | 10045 | $\stackrel{\text { letol }}{ }$ | 78 M | $\begin{aligned} & \text { oullit } \\ & \text { Hed } \end{aligned}$ | $\begin{aligned} & \text { dapuI } \\ & \text { LOZ } \end{aligned}$ | ขбә｜ㅇ | 100405 | $\stackrel{\text { letol }}{ }$ | 79 M | $\begin{aligned} & \text { әW!7 } \\ & \mu e_{d} \end{aligned}$ | dəpu\| | әбә｜｜О | 10040 S | ［ग！ 1 ¢S！ |
| 991 | 15 | $\stackrel{ }{ }{ }^{-}$ | 9 － | 62 | Zt | $\downarrow$ †91 | ZZL | 09 | 982 | GSL | $10 t$ | 8Stl | LL | 19 | 162 | $9<9$ | $69 \varepsilon$ | әрәuKuuny |
| L6L | 901 | G－ | $66^{-}$ | 08 | $9 \varepsilon$ | ¢S0E | 297 | 921 | 889 | 28\％1 | LS9 | 8982 | 9 SL | เع1 | 9tS | cotl | IZ9 | peəısueg pue әұеб！əу |





Key to map:


Gosport
Fareham
Winchester
Havant
East Hampshire
Hart
Rushmoor
Basingstoke and Deane
Test Valley
Eastleigh
New Forest
Southampton
Portsmouth
Isle of Wight
Medway
Ashford
Canterbury
Dartford
Dover
Gravesham
Maidstone
Sevenoaks
Shepway
Swale
Thanet
Tonbridge and Malling
Tunbridge Wells



Report prepared for the Learning and Skills Council by Michael Barrow, Department of Economics, University of Sussex Researchers: Ray Bachan, Annelle Bellony, Alvaro Monge Zegarra, University of Sussex.

For more information, please contact:
Jan Jackson
Learning and Skills Council
Price House
53 Queens Road
Brighton
BN1 3XB
Jan.jackson@lsc.gov.uk


[^0]:    ${ }^{1}$ Appendix 5 contains a map with an associated list of district and unitary authorities, to assist identification.

[^1]:    ${ }^{2}$ See Clark (2002) for more detail.

[^2]:    ${ }^{3}$ Prosperity for all in the global economy - world class skills (HM Treasury 2006).

