Experian™
A world of insight

Regional household forecasts & scenarios

National Housing & Planning Advice Unit

March 2008

Regional household forecasts & scenarios

National Housing & Planning Advice Unit

Contents

Introduction **1**

1 Regional forecasting methodology **2**
1.1 National forecasts 2
1.2 Regional forecasts 2

2 Data sources **5**
2.1 Gross Value Added 5
2.2 Employment 5
2.3 Demographics 5

3 Household forecasts **6**
3.1 Baseline forecast 6
3.2 Economic convergence scenario 7
3.3 Economic divergence scenario 8
3.4 RES target scenario 9
3.5 Individual RES target scenarios 11
3.6 Summary results 13

Appendix A: About us

Approved by: Neil Blake
Position: MD - Global Economics
Date: March 2008

Introduction

Experian were commissioned by the National Housing Planning and Advice Unit (NHPAU) to produce a set of baseline household forecasts for the English Government Office Regions, accompanied by a number of scenarios based upon different macroeconomic assumptions. This document accompanies the Excel dataset supplied to the NHPAU.

Chapters 1 to 3 of this document set out the methodology used by Experian to produce regional economic forecasts. They cover data sources and a description of the models used to produce forecasts. Chapter 4 moves on to discuss the baseline household forecasts and scenario results.

Please contact Experian should you require any further information.

Andrew Goodwin	andrew.goodwin@uk.experian.com	0207 746 8237
Neil Blake	neil.blake@uk.experian.com	0207 746 8233

1 Regional forecasting methodology

We adopt a combination of 'top-down and bottom-up' approaches to produce forecasts at the Government Office Region (GOR) level. At all stages, the national macroeconomic forecast is the main control, followed by the regional forecast.

The starting point for our forecasts is a very wide range of historical economic data that is collected at a highly disaggregated level and covers all the major economic indicators. The majority of this data come from the Office of National Statistics (ONS), formerly the CSO (Central Statistical Office) and OPCS (Office of Population Censuses and Statistics). Data also come from a number of other sources including the Labour Force Survey, the CBI's survey of manufacturing industries, and the European Commission's survey of consumer confidence.

1.1 National forecasts

National forecasts are produced using a combination of short-to-medium and long-term modelling techniques. The short-to-medium term model uses a Keynesian national-income accounting framework incorporating a small input-output model and with price inflation determined using an output gap approach. The relationship between variables is estimated using quarterly data for the last 20 to 30 years.

The short-term forecast is driven largely by demand factors. The longer-term model is much simpler and focuses on supply-side factors. Assumptions are made for population growth (based on the GAD central projections), employment rates, the full-time/part-time mix of employment and productivity growth, enabling us to generate a forecast for potential GVA growth over the course of the cycle. The employment rates are meant to represent long-run sustainable rates (NAIRU consistent in other words). The outputs from the short-to-medium term quarterly model are constrained to eventually converge on the long-term forecast assumptions.

Population (but not the economically active population) is exogenous to both models.

A larger input-output model is used to generate long-term output forecasts for the 58 industry sectors (SIC92).

1.2 Regional forecasts

The regional forecast is also constructed using a two-model approach. The short-to-medium term regional model is similar to, although less detailed than the national model. It also incorporates a small inter-regional input-output model to capture the impact of changes in one region on other regions as well as the impact on changes in one industry within a region on other industries in the same region.

We adopt a 'bottom up' approach to produce long-term forecasts for regions. The long-term county model is used to generate county shares of national employment. The county definitions

used are the pre-local government re-organisation definitions sometimes referred to as “virtual counties”. These county estimates are aggregated to regions, and together with assumptions about regional productivity, determine the shape of the long-term regional forecast.

The short-term and long-term models are then brought together, and the results constrained to the UK view, to produce an initial regional forecast. This is inspected and adjusted by regional and sector experts both internal and external to the company. Alterations are made for significant pieces of inward investment, or infrastructure development, or changes to European funding, in the form of “add factors”. A new forecast is then produced, which is again subject to rigorous inspection. This process continues until those ultimately responsible for the forecast are satisfied with the results.

1.2.1 Population and Migration in the Regional Models

The short-to-medium term model contains a set of net migration equations of the following form:

Equation 1

$$\ln(1+{}^{NM_{r,t}}\!/_{POP_{r,t-1}}) = \beta_1 \ln(1+{}^{NM_{r,t-1}}\!/_{POP_{r,t-2}}) + \beta_2 (U\%_{r,t} - U\%_{rx,r}) + \beta_3 \ln({}^{PH_{r,t-3}}\!/_{PH_{rx,t-3}}) + \beta_4 \ln(1+{}^{NM_{UK,t}}\!/_{POP_{UK,t-1}}) + \beta_0 + R_t$$

Where:

$NM_{r,t}$	is	Net migration (internal and external) for region “r” in quarter “t”
$POP_{r,t}$		Population of region “r” at end of quarter “t”
$U\%_{r,t}$		ILO unemployment rate for region “r” in quarter “t”
$U\%_{rx,t}$		ILO unemployment rate for regions other than region “r” weighted by past migration flows
$PH_{r,t}$		House prices in region “r” in quarter “t”
$PH_{rx,t}$		House prices in regions other than region “r” weighted by past migration flows
R_t		The residual from the fitted equation
$B_{0..4}$		Estimated coefficients and

$$\beta_2 \langle 0,\ \beta_3 \langle 0,\ \beta_4 \rangle 0$$

In other words, if unemployment increases relative to in other regions or if house prices rise net in-migration will fall. The “other region variables are weighted by past migration flows rather than by the size of the other regions. This tends to mean, with some exceptions, that a change in net in-migration to one region will have more impact on net migration in surround rather than more distant regions.

Higher net in-migration at the UK level will increase net in-migration to all regions though at different rates.

Population change is equal to the net natural change in population plus net in-migration.

Relative house prices appear in the short-term migration assumptions but relative house prices are driven by the relative strength of regional economies and by a ripple effect. There are no explicit housing supply constraints in the quarterly model. To get around this, we impose a long-term constraint on regional population growth (by adjusting the net migration forecasts). This says that population has eventually to lie between 97 and 102 per cent of a supply-based projection. The supply-based projection used is a composite projection. It is made up of the average of:

1. The ONS trend-based projection (constrained to the latest national level projections and
2. The policy-based projections implicit is the RSSs or draft RSSs constrained to add up to the England level population projections.

The averaging of the trend-based and policy-based projections is done in recognition of the inability of planning authorities to fully control housing supply (they can only impose a maximum rather than direct numbers and they have little control over conversions and demolitions) with the 50:50 weight being based on research carried out on the predictive accuracy of the old RPG projections. There is also an element of second guessing future central government interventions in planning strategies. The sum of the existing RSSs or draft RSSs falls well short of the government's housing targets which are based on the trend-based household projections so further intervention to close the gap between the national target and the sum of the regional targets is to be expected.

This procedure essentially uses a mix of various bits of information with the aim of producing the most accurate forecasts for our clients. We are moving towards a more theoretically explicit approach where housing supply is included in the model with an upper limit based on the policy-based projections. Regional house prices will then adjust to demand-supply imbalances and regional net migration will be freely determined by the short-term equations.

2 Data sources

2.1 Gross Value Added

Estimates of regional Gross Value Added (GVA) are derived from the Office of National Statistics (ONS) Regional Accounts. These forecasts incorporate the 2006 Regional Accounts (data up to 2005), which were the most recent available at the time of the Autumn 2007 Regional Planning Service. We have then used a combination of employment and business survey data to estimate regional GVA growth levels up to the latest UK GVA data point.

2.2 Employment

The ONS workforce jobs release provides quarterly employees and self employment data at the 2 digit SIC92 level by Government Office Region. The latest data point for the regional workforce employment data is 2007q2.

2.3 Demographics

Regional level demographic estimates and forecasts incorporate data from the following sources:

- ONS mid-year national and sub-national estimates, 1982-2006
- 2006-based Government Actuary Department's (GAD) national projections, 2006-2041
- ONS 2004-based sub-national projections, 2004-2028 (revised, September 2007)
- DCLG revised 2004-based household projections (released February 2008)

Population forecasts are converted to household forecasts using the average household size projections published by DCLG. They do not take recent movements in Labour Force Survey (LFS) data into account. Average household size is exogenous in the model used and does not vary with GDP per head or any other income or labour market measure.

3 Household forecasts

This section describes our current baseline forecasts for household numbers for the GORs together with the results of a number of scenarios run for NHPAU. The baseline forecasts are based on our published Autumn 2007 regional economic forecasts adjusted to take into account the 2006-based national population projections average household size.

The scenarios are not constrained by housing supply in that relative house prices are held at their baseline levels. This means that any changes in population and households between the scenarios and the baseline are due to changes in relative regional unemployment (see equation 1). Note that average household size is also held constant at the baseline levels although there is evidence that economic variables do have an impact on household representative rates, particularly for younger age groups.

3.1 Baseline forecast

The baseline forecast used the methodology outlined in sections 1-3. The standard Regional Planning Service (RPS) forecasts run to 2020 so these were extended to 2031 in a way that was consistent with the GAD population projections.

Table 3.1 – England assumptions, 2006-2031

	(%pa)
GDP	2.5
Total population	0.7
Source: Experian Ltd	

The largest increases in households are forecast for regions in the south of England, reflecting the strong economic performance of these areas (see Table 3.2 below). The South East and Greater London are both expected to see the number of households rise by more than 1 million between 2006-2031, reflecting the strong economic performance of these regions. The East of England and East Midlands are expected to see similarly large increases in percentage terms – the economic performance of these regions is also favourable and they are further supported by the government's desire to locate large amounts of new housing in these regions. The smallest change is expected to be in the North East, with the North West also lagging behind in percentage terms.

Table 3.2 – Baseline household forecasts by region (levels, millions)

	2006	2016	2026	2031	Change 2006-2031
North East	1.136	1.239	1.313	1.330	0.194
Yorkshire & the Humber	2.231	2.518	2.789	2.895	0.664
East Midlands	1.892	2.182	2.469	2.587	0.695
East of England	2.420	2.785	3.145	3.296	0.876
Greater London	3.228	3.729	4.190	4.381	1.153
South East	3.540	4.063	4.593	4.816	1.276
South West	2.274	2.624	2.967	3.111	0.837
West Midlands	2.285	2.545	2.791	2.898	0.613
North West	2.997	3.325	3.619	3.730	0.733

Source: Experian Ltd

3.2 Economic convergence scenario

The first scenario that we tested involved greater regional economic convergence. This took the form of regional employment rates converging upon the English average.

In the model net-migration is driven by relative, not absolute, unemployment rates and higher population growth in one region will be offset by lower population growth elsewhere. The impact of this scenario on net migration is shown in Table 3.3 below. The largest increases in net migration – relative to base – are in the regions with below average employment rates, such as Yorkshire & the Humber, which catch up in this scenario.

Table 3.3 – Net migration 2006-2031 – Economic convergence scenario and baseline compared (levels, millions)

	Baseline	Economic convergence scenario	Difference from base
North East	0.087	0.107	0.020
Yorkshire & the Humber	0.477	0.544	0.067
East Midlands	0.791	0.741	-0.050
East of England	0.868	0.850	-0.018
Greater London	-0.261	-0.258	0.003
South East	0.938	0.886	-0.052
South West	1.051	0.981	-0.070
West Midlands	0.272	0.310	0.038
North West	0.288	0.368	0.080

Source: Experian Ltd

The results show stronger household growth than in the baseline for those regions where employment rates are below the English average (see Table 3.4 below). In percentage terms, the largest increase relative to base is in Yorkshire & Humber – where the workplace employment rate was more than 2% below the national average in 2006 – and the North West.

However, the extra growth in these regions is offset by weaker growth in the other regions where the employment rate is falling back towards the English average from above. It should be noted that in this study, the average household size is not assumed to vary with GVA or unemployment – in other studies we have undertaken we have found evidence that it does.

Table 3.4 – Economic convergence scenario - household forecasts by region (levels, millions)

	2006	2016	2026	2031	Change 2006-2031	Difference from base
North East	1.136	1.240	1.322	1.343	0.206	0.012
Yorkshire & the Humber	2.231	2.524	2.815	2.930	0.699	0.035
East Midlands	1.892	2.177	2.451	2.563	0.670	-0.025
East of England	2.420	2.784	3.138	3.287	0.867	-0.009
Greater London	3.228	3.729	4.192	4.383	1.155	0.002
South East	3.540	4.059	4.575	4.790	1.250	-0.026
South West	2.274	2.618	2.942	3.075	0.801	-0.036
West Midlands	2.285	2.549	2.804	2.915	0.630	0.017
North West	2.997	3.332	3.647	3.770	0.772	0.039

Source: Experian Ltd

3.3 Economic divergence scenario

The economic divergence scenario took the form of employment rates diverging from the English average. For those regions where employment rates were already higher than those in England as a whole, rates returned to their 1980s highs. In those regions where employment rates were below the national mean they were assumed to worsen further.

The majority of regions achieve slower household growth than in the baseline (see Table 3.5 below), with the North East showing a particularly large difference (-2.6% compared with the baseline, 2006-2031). As in the convergence scenario, declines in some regions are offset by gains elsewhere, and in this case there is a clear north-south split. Greater London attracts the greatest influx of migrants (2.2% higher than the baseline, 2006-2031), while the South East and East of England also attracts higher household growth than in the baseline.

Table 3.5 – Economic divergence scenario - household forecasts by region (levels, millions)

	2006	2016	2026	2031	Change 2006-2031	Difference from base
North East	1.136	1.237	1.296	1.300	0.164	-0.030
Yorkshire & the Humber	2.231	2.515	2.770	2.862	0.631	-0.033
East Midlands	1.892	2.182	2.469	2.586	0.694	-0.001
East of England	2.420	2.786	3.146	3.300	0.880	0.004
Greater London	3.228	3.735	4.233	4.453	1.225	0.072
South East	3.540	4.064	4.596	4.820	1.281	0.005
South West	2.274	2.623	2.964	3.105	0.831	-0.006
West Midlands	2.285	2.543	2.784	2.885	0.599	-0.014
North West	2.997	3.323	3.610	3.716	0.718	-0.015

Source: Experian Ltd

3.4 RES target scenario

The fourth scenario assessed the impact of each region achieving the targets laid out in the Regional Economic Strategies (RES). In contrast to the baseline and other scenarios, where regional and employment levels were constrained to UK level assumptions, this scenario had no such constraint – were each region to achieve its target, UK GVA growth would comfortably exceed the 2.5% per annum we have assumed. However, total population and net migration were constrained to national levels.

For this scenario, GVA, productivity and employment growth was assumed to grow in line with our interpretation of the RES targets. The assumptions used are detailed in Table 3.6 below:

Table 3.6 – RES target assumptions

North East	GVA per head to reach 90% of the UK average by 2016 and 95% by 2025
Yorkshire & the Humber	Productivity to grow by 30% between 2003 and 2016 and to continue with a similar rate of improvement relative to base to 2031
East Midlands	Productivity to reach UK average by end of 2008
East of England	GVA to grow at an average annual rate of 2.8% over the forecast period
Greater London	No change from base
South East	GVA to grow at an average annual rate of 3.0% over the forecast period
South West	GVA to grow at an average annual rate of 3.2% over the forecast period
West Midlands	GVA per head to reach UK average by 2031
North West	GVA per head to reach UK average by 2026

Source: Experian Ltd

Increases in GVA (relative to base) are assumed to comprise a mixture of an improvement in productivity and an increase in employment in a ratio of 2:1, except in the South West where 3:1 was used to prevent unemployment falling below zero.

Regions where the RES target is for an increase in productivity, employment is also assumed to improve but by half as much. This preserves the same productivity/employment improvement balance as for the regions with a GVA or GVA per head target.

All adjustments were made relative to the base and do not take account of induced changes. For example an increase in GVA and employment in-line with a GVA per head target is calculated using baseline population. The scenario will lead to increased net in-migration which will mean that the improvement in GVA per head is not actually as high as in the target.

Table 3.7 below compares the GVA growth and ILO unemployment rates in this scenario with those from the baseline forecast.

Table 3.7 – GVA growth and average unemployment rates – Baseline and RES target scenario compared

	GVA growth (2006-2031), %pa			Average ILO unemployment rate (2006-2031), %		
	Baseline	Scenario	Difference from base	Baseline	Scenario	Difference from base
North East	1.8	2.6	0.8	6.4	4.4	-2.0
Yorkshire & Humber	2.4	2.9	0.6	4.0	2.7	-1.3
East Midlands	2.4	2.7	0.3	4.0	3.0	-0.9
East of England	2.5	2.8	0.3	4.0	3.6	-0.3
Greater London	2.7	2.7	0.0	7.9	7.8	-0.1
South East	2.7	3.0	0.3	3.7	3.5	-0.3
South West	2.4	3.1	0.8	2.7	1.8	-0.9
West Midlands	2.2	2.7	0.5	6.3	5.6	-0.7
North West	2.1	2.8	0.7	6.4	5.2	-1.2
England	2.5	2.8	0.4	5.1	4.2	-0.9

Source: Experian Ltd

The scenario results show the largest increases from base in the North East and North West (see Table 3.8 below). These are the regions with the most stretching RES targets, i.e. those where GVA growth implied by the RES target is furthest away from our baseline GVA forecast. There is a clear north-south split, with the southern regions expected to see slower household growth than in the base case. This is unsurprising, given that these regions appear to have less ambitious RES targets, with the net effect being an element of regional convergence.

Table 3.8 – RES target scenario - household forecasts by region (levels, millions)

	2006	2016	2026	2031	Change 2006-2031	Difference from base
North East	1.136	1.242	1.325	1.346	0.210	0.016
Yorkshire & the Humber	2.231	2.518	2.797	2.909	0.678	0.014
East Midlands	1.892	2.186	2.476	2.594	0.701	0.006
East of England	2.420	2.785	3.141	3.291	0.871	-0.005
Greater London	3.228	3.727	4.179	4.363	1.135	-0.018
South East	3.540	4.062	4.585	4.802	1.262	-0.014
South West	2.274	2.625	2.975	3.125	0.850	0.013
West Midlands	2.285	2.544	2.791	2.897	0.612	-0.001
North West	2.997	3.326	3.630	3.748	0.751	0.018
Source: Experian Ltd						

3.5 Individual RES target scenarios

We were then asked to assess the impact of an individual region achieving its RES target, while all other regions grew at the same rate as in the baseline forecast. Eight individual forecasts were created (the London RES forecast involved no change from base). Table 3.9 below shows the summary results – each line shows the impact of that region achieving its RES target while all others grow at the same rate as the baseline forecast.

Table 3.9 – Individual RES target scenarios - household forecasts by region (levels, millions)

	2006	2016	2026	2031	Change 2006-2031	Difference from base
North East	1.136	1.242	1.329	1.353	0.217	0.023
Yorkshire & the Humber	2.231	2.521	2.807	2.924	0.693	0.029
East Midlands	1.892	2.187	2.484	2.608	0.716	0.021
East of England	2.420	2.786	3.149	3.304	0.884	0.008
Greater London	3.228	3.729	4.190	4.381	1.153	0.000
South East	3.540	4.064	4.599	4.825	1.285	0.009
South West	2.274	2.626	2.982	3.136	0.862	0.025
West Midlands	2.285	2.546	2.800	2.913	0.628	0.015
North West	2.997	3.328	3.641	3.766	0.769	0.036
Source: Experian Ltd						

Figures 3.1 and 3.2 below compare the RES target scenarios, showing the difference from base for each region if they individually achieved their RES target (while the other regions grew in line with the baseline) and if they all hit their RES targets.

Figure 3.1 – Change in household numbers (2006-2031), compared with the baseline, of an individual region achieving its RES target or all regions hitting their RES targets (millions)

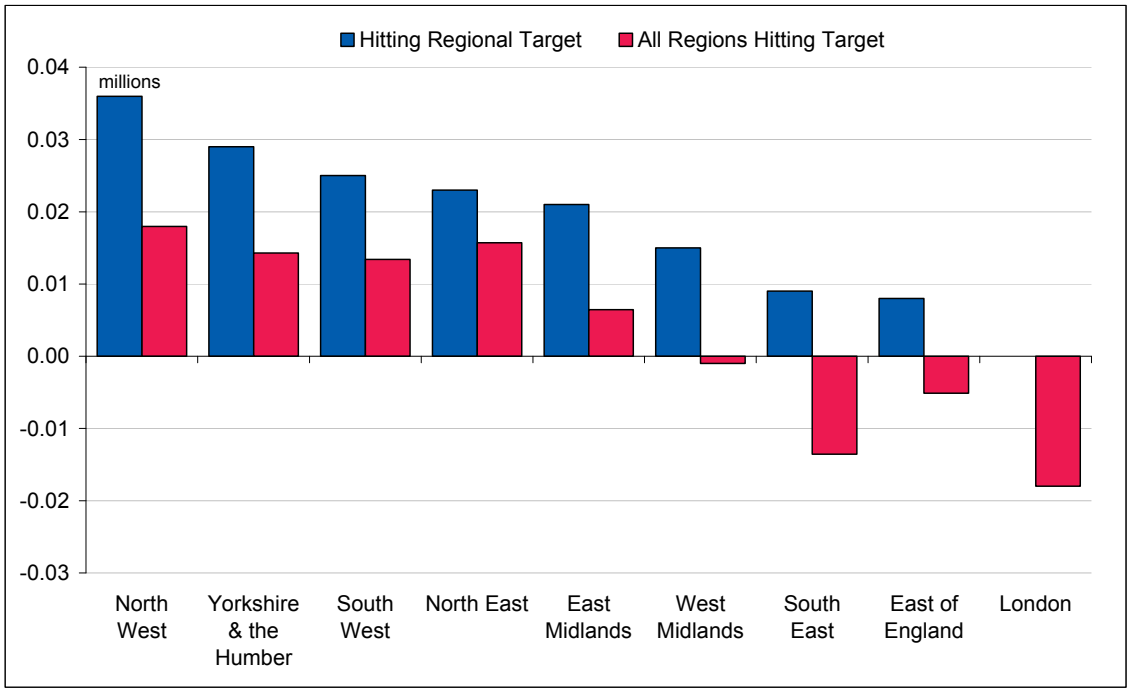
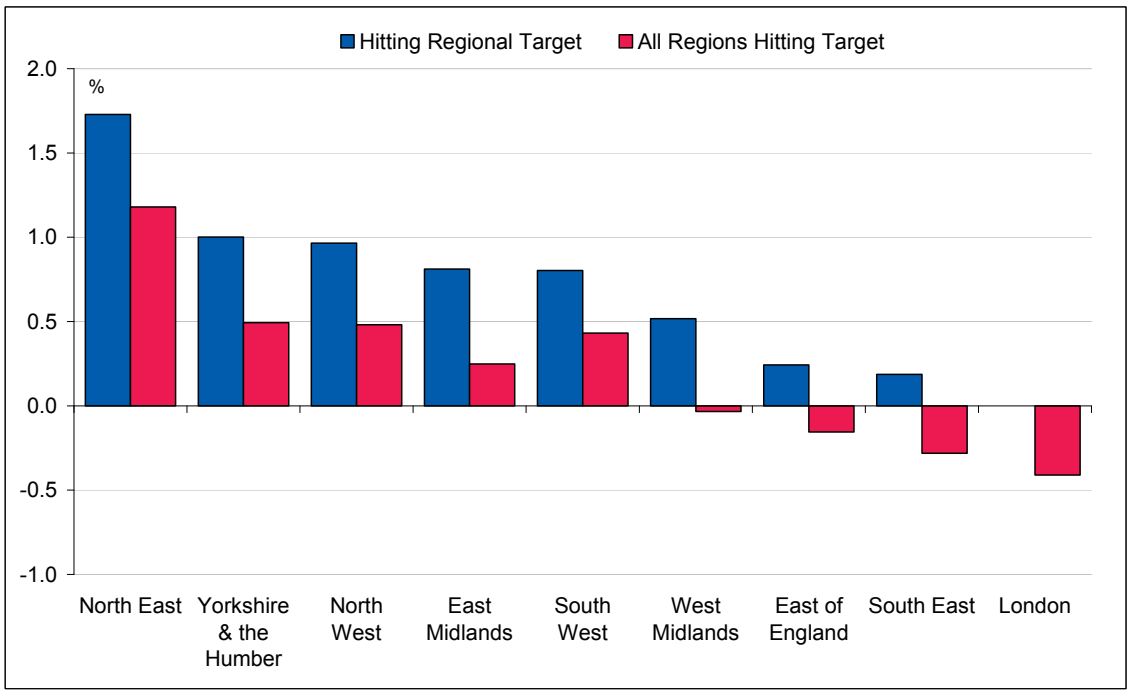


Figure 3.2 – Change in household numbers (2006-2031), compared with the baseline, of an individual region achieving its RES target or all regions hitting their RES targets (%)



As before, the data demonstrate a clear north-south split. The North East would achieve proportionately the largest increase in households were it the only region to achieve its RES target, which is unsurprising given the size of the gap between its target and its baseline economic prospects.

Full results for the eight scenarios are included in the Excel spreadsheet which accompanies this report. This includes charts for each region comparing the household forecasts for the four scenarios (convergence, divergence, individual region achieves RES target, all regions hit RES targets) with the baseline forecasts.

3.6 Summary results

Table 3.10 below summarises the results of the various scenarios, providing a range of forecasts for average annual new household creation.

Table 3.10 – Summary results – average annual newly forming households, 2006-2031

	Baseline	Economic convergence	Economic divergence	All regions hit RES target	Individual region hits RES target
North East	7,760	8,257	6,564	8,388	8,680
Yorkshire & the Humber	26,560	27,976	25,237	27,132	27,720
East Midlands	27,800	26,813	27,747	28,058	28,640
East of England	35,040	34,673	35,196	34,835	35,360
Greater London	46,120	46,199	49,010	45,400	46,120
South East	51,040	50,010	51,224	50,498	51,400
South West	33,480	32,048	33,248	34,017	34,480
West Midlands	24,520	25,184	23,979	24,481	25,120
North West	29,320	30,898	28,736	30,038	30,760
England	281,640	282,057	280,941	282,846	288,280

Source: Experian Ltd

Appendix A

About us

Who we are

Experian's Business Strategies Division

Experian's Business Strategies Division provides an understanding of consumers, markets and economies in the UK and around the world, past, present and future. Its focus is consumer profiling and market segmentation, retail property analysis, economic forecasting and public policy research, supporting businesses, policy makers and investors in making tactical and strategic decisions. As part of the Experian group, it has access to a wealth of research data and innovative software solutions. The division's economic research team is devoted to analysing national, regional and local economies for a range of public and private sector clients. Its statisticians, econometricians, sociologists, geographers, market researchers and economists carry out extensive research into the underlying drivers of social, economic and market change.

For more information, visit www.business-strategies.co.uk

Experian

Experian is a global leader in providing information, analytical and marketing services to organisations and consumers to help manage the risk and reward of commercial and financial decisions.

Combining its unique information tools and deep understanding of individuals, markets and economies, Experian partners with organisations around the world to establish and strengthen customer relationships and provide their businesses with competitive advantage.
For consumers, Experian delivers critical information that enables them to make financial and purchasing decisions with greater control and confidence.

Clients include organisations from financial services, retail and catalogue, telecommunications, utilities, media, insurance, automotive, leisure, e-commerce, manufacturing, property and government sectors.

Experian Group Limited is listed on the London Stock Exchange (EXPN) and is a constituent of the FTSE 100 index. It has corporate headquarters in Dublin, Ireland, and operational headquarters in Costa Mesa, California and Nottingham, UK. Experian employs around 15,500 people in 36 countries worldwide, supporting clients in more than 65 countries. Annual sales are in excess of $3.8 billion (£1.9 billion/€2.8 billion).

For more information, visit the Group's website on www.experiangroup.com.