OE Baseline forecasts

The baseline forecasts provided were produced within Oxford Economics Local Authority District Forecasting Model. The model covers all local authorities within the UK and sits within the Oxford suite of forecasting models. Such a modelling framework ensures that global and national factors (such as developments in the Eurozone and UK Government fiscal policy) have an appropriate impact on the forecasts at a local authority level. This empirical framework (or set of 'controls') is critical in ensuring that the forecasts are much more than just an extrapolation of historical trends. Rather, the trends in our global, national and sectoral forecasts have an impact on the local area forecasts. In the current economic climate this means most, if not all, local areas will face challenges in the short-term, irrespective of how they have performed over the past 15 years.

Figure 1.1: Hierarchal structure of Oxford Economics' suite of models
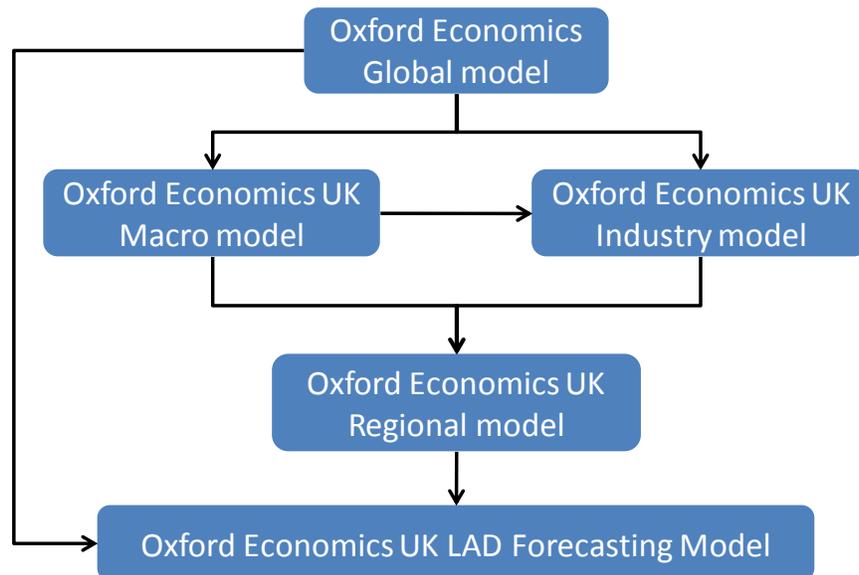
The baseline forecasts are essentially shaped by three factors:-

- **International, national and regional outlooks** - all the local area forecasts produced by Oxford Economics are fully consistent with broader regional, national and international models and forecasts. This ensures global events that impact on the performance of UK local economies, such as the strength of global trade which is particularly important for sea port activity, are fully captured in the forecasts for a local area. So too are national level growth and policies, whether that be the impact of monetary policy on consumer spending or government spending on locally provided public services;

- **Historical trends in an area**, which implicitly factor in supply side factors affecting demand, combined with Oxford Economics' staff knowledge of local areas and the patterns of local economic development. This ensures for example, that we recognise and factor in to the forecasts any evidence of particularly high/low levels of competitiveness that local economies have in particular activities. It also means national policy programs that have a particular local impact and that are very likely to happen - such as the Government's Northern powerhouse agenda - are appropriately reflected in the forecasts; and
- **Fundamental economic relationships** which interlink the various elements of the outlook. Oxford Economics' models ensure full consistency between variables in a local area. For example, employment, commuting, migration and population are all affected by one another.

The forecasts are produced within a fully-integrated system, which makes assumptions about migration, commuting and activity rates when producing employment and population forecasts. The main internal relationships between variables are summarised in Figure 1.2.

Figure 1.2: Main Relationships
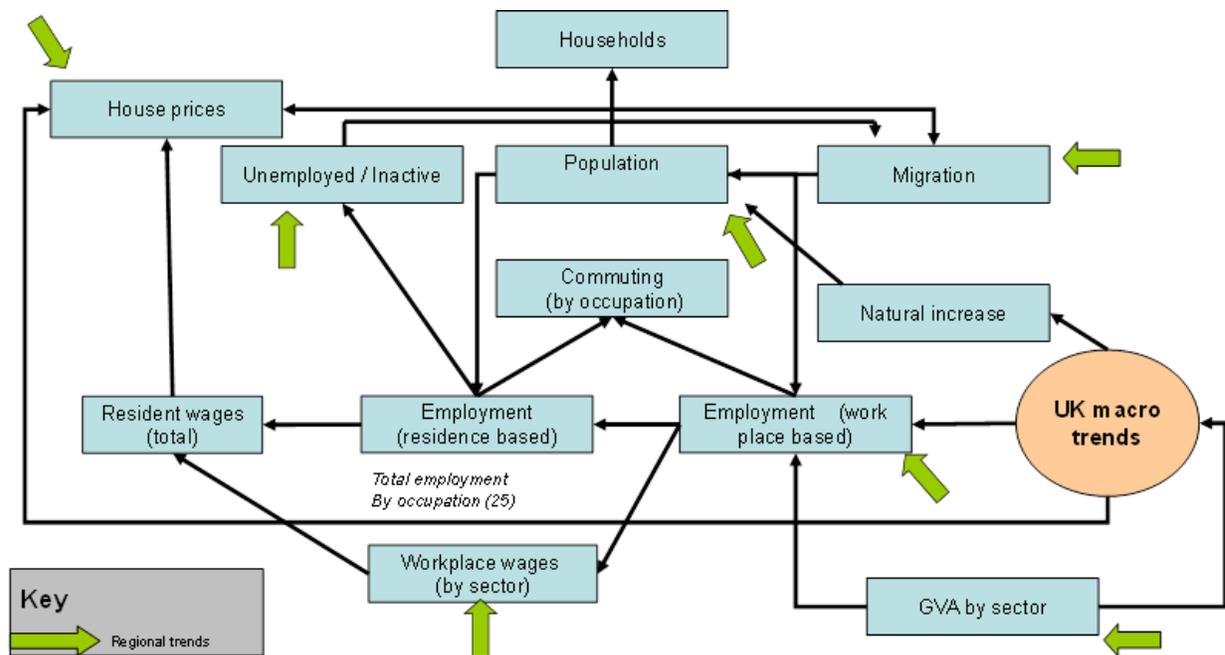
Data and assumptions

Population

Oxford Economics produce their own forecasts of population which are economically driven and thus differ from the official population projections. Official births and deaths projections from the 2012-based population projections are used but we have our own view on migration. Oxford Economics forecasts consider how demand in the economy affects migration.

At the local level, migration is linked to the employment rate forecast. If the employment rate within an area is falling too fast, migration reacts as the model assumes that people would not

be attracted into this area to live, given that the employment prospects are weak. This ensures that the relationship between the labour market outlook and the demographic forecast is sensible. This series is scaled to be consistent with the migration forecast for the region from the UK Regional Model.

The total population forecast is then constructed using the forecast of migration and the natural increase assumptions. Natural increase for local areas is forecast based upon recent trends in both the historical data and the official projections.

Working age population

Working age population data is also collected from the Mid-Year estimates (MYE) for each area up to 2014. It is defined as all people aged 16 to 64.

The share of working age to total population is forecast using both trends in the official projections and trends in the regional forecast from our UK Regional Model. This is applied to the total population forecast and scaled to be consistent with the working age population for the region and UK.

Population aged 16 plus

Population aged 16 plus data is also collected from the Mid-Year estimates (MYE) for each area up to 2014.

The share of population aged 16 plus to total population is also forecast using both trends in the official projections and trends in the regional forecast from our UK Regional Model. This is applied to the total population forecast and scaled to be consistent with the forecast of population aged 16 plus the region and UK..

Employees in employment

There are two key sources for the employee jobs data – ONS Workforce Jobs (WFJ) and the Business Register and Employment Survey (BRES):

- The WFJ series is reported on a quarterly basis, providing estimates of employee jobs by sector (based on the 2007 Standard Industrial Classification – SIC 2007) for the UK and its constituent government office regions, over the period 1981 Q3 to 2015 Q4.
- The BRES is an employment survey which has replaced the Annual Business Inquiry (ABI). Similar to WFJ, BRES data is based upon SIC 2007, but it is only published for the years 2008-14. Prior to this, ABI and Annual Employment Survey (AES) data is available for employee jobs data, however this is based on an older industrial classification (SIC 2003). Data is available at local authority level and more detailed sector definitions. It is worth noting that the BRES is first and foremost a survey and is therefore subject to volatility, particularly when the level of detail becomes more refined. The survey is collected in September of each year and not seasonally adjusted.

There are a number of steps in constructing regional employee jobs, due to changes in sectoral classifications across the various sources, and restrictions on data availability over

particular periods of time. Initially, we take employee jobs data for each sector directly from the BRES over the years 2009-14, which reflects recent methodological changes to the BRES in accounting for working proprietors. This relates to September figures and is based upon SIC 2007 sectors. In 2008, levels of employee jobs are constructed by extrapolating back the trend in the old BRES. Data from the ABI and AES is used to construct the data back to 1991.

This constructed local dataset is then scaled to be consistent with the UK employee jobs series from WFJ, by applying an adjustment factor to all sectors which converts the data to annual average values (seasonally adjusted). This is measured on a workplace basis.

The starting point in producing employment forecasts is the determination of workplace-based employees in employment in each of broad 19 SIC2007 based sectors consistent with the regional and UK outlooks. At local authority level some of the sectors are driven predominantly by population estimates, others by total employment in the area and the reminder relative to the regional performance (largely exporting sectors). All sectors are also influenced by past trends in the local area. Taken in totality, employment is cross referenced with a number of variables (including population, relative performance across similar areas, historical cyclical performance and known policy) for checking and validation purposes. Where necessary, manual adjustments are made to the projected trends to reflect this validation process.   The methods of sectoral projection are as follows, each of which are forecast based upon recent trends:

- Agriculture - share of the region
- Mining and quarrying - share of the region
- Manufacturing - share of the region
- Electricity, gas, & steam - share of the region
- Water supply; sewerage, waste management - share of the region
- Construction - location quotient based upon total employment
- Wholesale and retail trade - location quotient based upon consumer spending
- Transportation and storage - location quotient based upon consumer spending
- Accommodation and food service activities - location quotient based upon consumer spending
- Information and communication - share of the region
- Financial and insurance activities - share of the region
- Real estate activities - location quotient based upon total employment
- Professional, scientific and technical activities - location quotient based upon total employment
- Administrative and support service activities - location quotient based upon total employment
- Public administration and defence - location quotient based upon population
- Education - location quotient based upon population
- Human health and social work activities - location quotient based upon population
- Arts, entertainment and recreation - location quotient based upon consumer spending
- Other service activities - location quotient based upon consumer spending

Self-employment

Self-employment data by region is taken from Workforce jobs (19 sector detail). The data is broken down into detailed sectors using both employee trends and the UK data for self-employment by 2 digit SIC2007 sector. Data for the local authorities is Census based (and scaled to the regional self-employed jobs estimates) and is broken down using the employees in employment sectoral structure. The sectors are forecast using the growth in the sectoral employees in employment data and the estimates are scaled to the regional estimate of self-employment by sector.

Total employment (jobs)

Total employment includes employees in employment, the self-employed and Her Majesty's Forces. This is measured on a workplace basis. No specific forecasting for this measure is required - it is calculated from the forecasted elements discussed above.

Note that this estimate is a jobs and not people measure (i.e. one person can have more than one job and would be counted more than once in this indicator).

Total employment (people)

The data for employment from the Business Register and Employment Survey (BRES) measures jobs rather than individuals. Given the need to focus on people, we convert the number of jobs into numbers of employed people. One person can have more than one job, but working people would only be counted once in this indicator.

To do this we measure and project numbers of full-time and part-time employees in each area. Shares of part-time employees (which are trend forecasts linked to national projections) are applied to the workplace employee estimates described above. Full-time employees are simply the total of employees minus the part-time employees.

Individuals are assumed to hold only one full-time job each. Part-time jobs are assumed to account for half a full-time job. The self-employed people are added to the full-time employees plus half of the part-time employees to arrive at an estimate of workplace based employment. An adjustment factor is applied to ensure consistency with the Census. No specific forecasting for this measure is required; it is calculated from the forecasted elements discussed above.

Unemployment

Claimant count unemployment data is taken from ONS, via NOMIS. Annual average values are calculated from the monthly data.

Unemployment is projected based on regional trends and a measure of overall labour market tightness (relative employment rate) in the local area. It is not at present directly affected by migration though they do impact indirectly through the employment rate (which has working age population as its denominator).

Unemployment rate is defined as claimant count unemployment as a percentage of the working age population. No specific forecasting of this measure is required.

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Resident employment

This is a measure of the number of people living in an area who are in work. Resident employment data is taken from the Annual Population Survey. The latest year of available data is 2014. Given that this data is survey based and tends to be very volatile, data is 'smoothed' by taking a 3 year average.

Residence employment is based on a commuting matrix taken from the 2011 Census. This matrix tells us where employed residents of an area work. Using this information each available job (see workplace employment people based above) is allocated to a resident of a given authority. This method assumes the proportions of commuting do not change over time.

Employment rate is defined as residence employment as a percentage of the population aged 16 plus. No specific forecasting of this measure is required.

Net commuting

Net commuting is the sum of people based employment less resident employment. No specific forecasting for this measure is required - it is calculated from the forecasted elements discussed above.

Gross Value Added

GVA forecasts are available for detailed sectors for the UK regions from our UK Regional Model. For areas within the region, data on total GVA is available at NUTS 3 level. This includes counties and former Metropolitan counties. Our forecasts at local authority level are obtained firstly by calculating an 'expected' GVA in each area. This is calculated by multiplying the region's GVA per employee in each sector by workplace employment in each sector within each local authority area. An adjustment factor based upon relative earnings is also applied as areas with higher wages should produce higher levels of GVA. Expected GVA is then scaled to add the GVA at NUTS 3 level to the regional sectoral forecasts from the UK Regional Model.