OXFORD ECONOMICS

Solent LEP

Technical annex

March 2014

A report prepared for Solent LEP

OXFORD ECONOMICS

Contents

1 Introduction

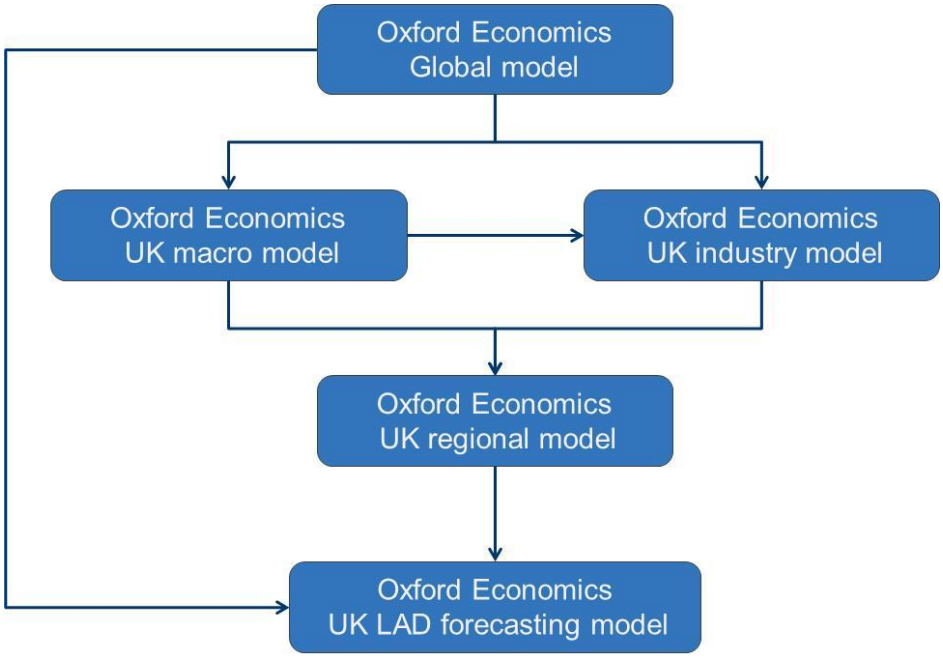
1.1 Overview

This report sets out the technical elements of the Solent LEP Forecast Model. It provides insight into the relationships in the model, including details on the linkages between the model and Oxford's wider suite of models.

1.2 Oxford Economics' suite of models

Oxford Economics has a suite of models which cover every country in the world. Within this a UK macroeconomic model is embedded. This includes global factors such as oil prices, world trade (exports and imports), exchange rates, etc. Consequently, changing world conditions will feed into the forecasts for the UK economy in the UK macro model.

Chart 1: Hierarchal structure of Oxford Economics' suite of models



In tandem with the UK macro model, we have a UK industry model which provides forecasts of output and employment by 85 sectors in the UK economy. As such, global factors such as rising oil prices will affect the outlook for industries which depend upon oil for the production of goods. Similarly, sectors which depend on exports to overseas markets will be influenced by changes in the global economy. For example, demand for imports from the UK economy could be influenced by changes in the exchange rate. Thus, sectors which are forecast to grow based on export potential would perform better or worse depending on the outlook for the UK exchange rate.

Both the macro and industry models feed directly into the UK Regional Model. In doing this, events in the global economy, and also UK economic factors (e.g. exchange rates, fiscal tightening, interest rates, etc) will have an impact on regional trends throughout the forecast period.. Similarly, the local model – from which the Solent LEP forecast model is derived - will be influenced by the same factors.

1.3 Local baseline / policy off forecasting

Oxford Economics Local Authority District Forecasting Modell should be viewed as one piece of evidence in making policy decisions and tracking economic and demographic change. As with all models it is subject to margins of error which increase as the level of geographical detail becomes smaller, and relies heavily upon published data.

Models, though predominantly quantitative, also require a degree of local knowledge and past experience, or more generally forecasting art, to make plausible long term projections. To this end the Oxford model has been developed by a team of senior staff who have a long history in model building and forecasting at both local and regional levels.

The Local Authority District Forecasting Model sits within the Oxford suite of forecasting models. This structure 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.

The Local Authority District Forecasting Model produces base forecasts, which can be compared with other published forecasts (though care should be taken over data definition issues), and as a guide to aid commentary or analysis of Solent LEP and its local authority economies. These forecasts can in one sense be considered to provide baseline 'policy off' projections with which the actual outturn under policy initiatives could be compared. However it must be realised that there are inherent difficulties in using the forecasts as a 'policy-off' baseline. In particular the base projections are 'unconstrained' in the sense that they make no allowance for constraints on development which may be greater than in the past.

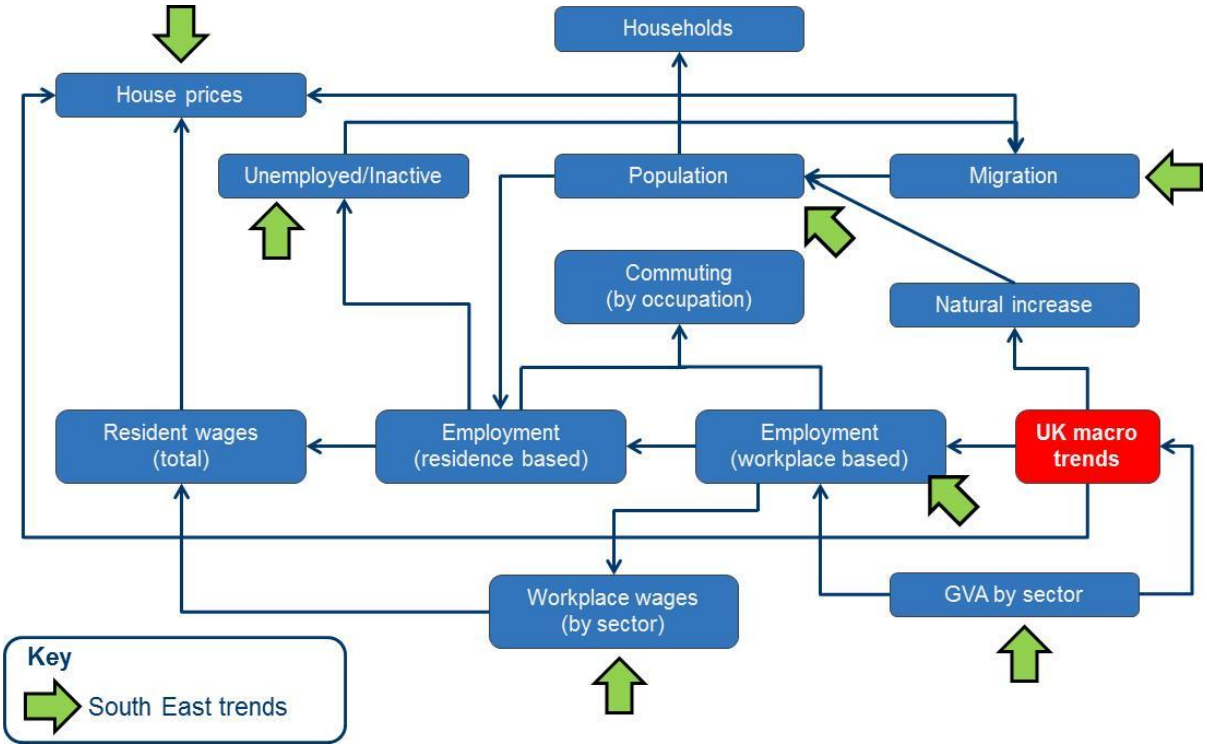
Our local forecasting model depends essentially upon three factors:

- National/regional outlooks – all the forecasting models we operate are fully consistent with the broader global and national forecasts which are updated on a monthly basis.

- Historical trends in an area (which implicitly factor in supply side factors impinging on demand), augmented where appropriate by local knowledge and understanding of patterns of economic development built up over decades of expertise, and
- Fundamental economic relationships which interlink the various elements of the outlook.

The main internal relationships between variables are summarised below. Each variable is related to others within the models. Key variables are also related to variables in the other Oxford Economics models.

Chart 2: Local Authority District Forecasting Model structure



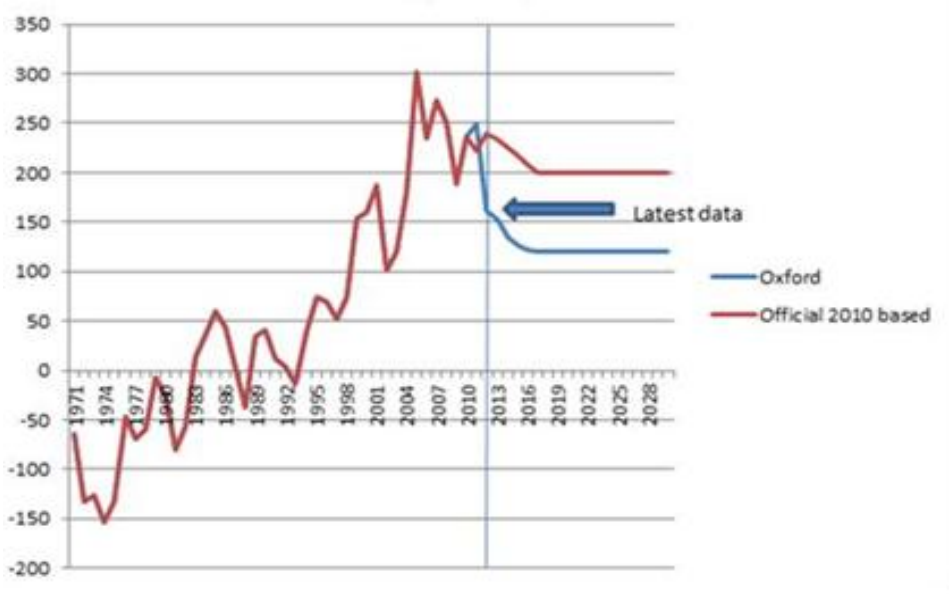
1.4 Population and migration assumptions

Population and migration data are collected from the Mid-Year estimates (MYE) for each area. These have been revised in line with the 2011 Census results. The latest data available is for 2012 (the 2013 data is not available until June 2014).

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 2010-based population projections are used but we have our own view on UK migration. The chart below sets out the Oxford migration forecast for the UK compared with the 2010-based population

projection. Oxford Economics expect UK net migration to average 120,000 per annum compared to 200,000 in the official projections. The latest data suggests that UK net migration has slowed to 163,000 in 2012 which is already considerably below the official projections (240,000).

Chart 3: UK: Population projections



Source: ONS and Oxford Economics

The divergence reflects the removal of one-off effects from EU enlargement and weaker economic prospects. Oxford Economics' population forecasts are derived from an economically driven model whereas official projections are trend based and do not consider how demand in the economy (and the likely impact on employment rates) 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 approach ensures that the relationship between the labour market outlook and the demographic forecasts is sensible. This series is scaled to be consistent with the migration forecast for the South East 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.

2 An overview of the model approach

This section provides an understanding of how the scenario model has been developed to simulate scenario analysis. A high level conceptual model of the framework is introduced before discussing the key components in detail.

2.1 Variable, geographical and time period coverage

The time period covered runs from 2000 to 2030 and the model covers the following geographies:

- Eastleigh
- Fareham
- Gosport
- Havant
- Isle of Wight
- Portsmouth
- Southampton
- Part of East Hampshire
- Part of New Forest
- Part of Test Valley
- Part of Winchester
- Rest of South East
- South East
- Rest of UK
- UK

The data covered in the model is listed below. Broadly, it is separated into 4 broad categories – demography, labour market, economy and housing. These are listed below:

- **Demographic indicators**
    - Population (total and working age)
    - Migration
- **Labour market**
    - Employment (workplace jobs, by 85 sectors)
    - Workplace people in employment (total only)

  - Resident people in employment (level and rate)
  - Unemployment (claimant – level and rate)
  - Net commuting levels
- **Economy**
  - Gross Value Added (2010 prices, by 85 sectors)
  - Productivity (2010 prices, by 85 sectors)
- **Housing**
  - Occupied dwelling stock

2.2 Scenario model framework

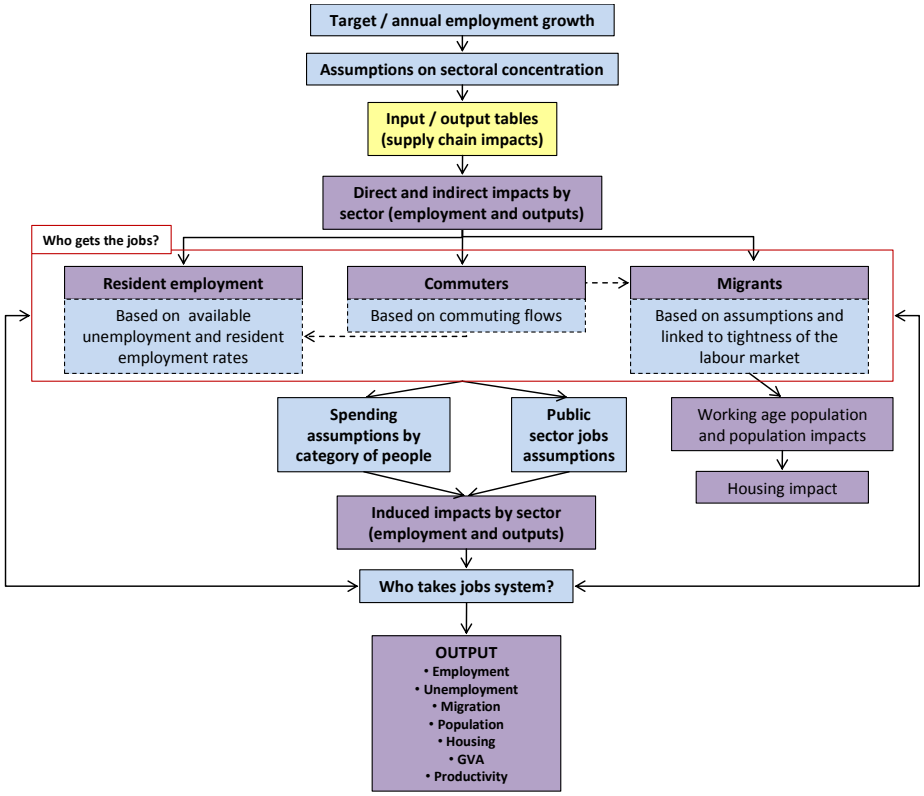
As noted above the models designed by Oxford Economics (and therefore the Solent LEP forecast model) are economically driven models. The key dimensions of the economy – labour market, demography, output and housing – are all interlinked such that a change in one dimension will feed through to the rest of the model.

It is our view that an economically driven model is the best way to estimate the future outlook for the area.

For example, if employment or productivity changes in one sector, there are implications for all sectors of the economy through indirect (supply chain) and induced impacts. The employment creation will then put downward pressure on unemployment, while encouraging increased commuting into the economy, and making it a more attractive location for migrants. This would drive up population and housing demand, and thus put more demand on public services.

The starting point for scenario analysis in the Solent LEP scenario model is to take the baseline forecasts and build upon these to estimate the impact of a specific scenario. The diagram below sets out the framework which has been used to estimate the scenario impacts. A more detailed explanation of the mechanics of the model in estimating scenario results is provided below.

Figure 2.1: The Solent LEP model framework



2.3 An input-output framework

The model contains an input-output framework. The data used is taken from UK input-output tables published by the ONS and contains details of which sectors purchase goods and services from other sectors. Specifically we take the domestic use tables which measures where purchases are made within the UK economy, thus excluding imports and exports. Using this, we are able to quantify the magnitude of spending by a particular sector on goods and services from other sectors within the economy. We adjust the UK model to account for the local focus of the model. We do this in line with the Flegg and Webber approach to local input-output modelling.

2.4 Direct impacts

The model is primarily driven by changes in jobs levels. The model is designed to compute the impacts of an uplift / downgrade to the baseline growth rate by measuring the amount of **direct** additional jobs required to achieve the new target rate of growth. Or alternative to model a specific change in the number of jobs by sector at either a LEP or local authority level. In doing so, the model also estimates the resulting indirect and induced jobs (explained below), which combined with the direct jobs provides the new rate of employment growth.

Accounting for the impact of City Deal

We typically allocate direct jobs across Solent local authorities based on their current share of the LEP's sectoral jobs. So for example if a local authority had 10% of the LEP's finance jobs and the growth scenario created 1,000 new direct finance jobs, then the same local authority would be allocated 100 of these new jobs. This system allows us to capture the location choices of sectors and agglomerations while also ensuring that where a local economy does not have jobs in a given sub-sector, it is not allocated these types of jobs.

Discussions with Solent LEP revealed ongoing efforts through the City Deal to secure more jobs in the two cities of Portsmouth and Southampton. Consequently we have added a system to allocate more jobs to the two cities.

We have assumed Portsmouth and Southampton have an additional 25 percentage point increase in employment across all sectors of the economy (excluding agri and fishing). Once the model scales out sectoral employment shares, the 25 percentage point boost to the two cities fall. The system essentially provides a small improvement in overall resident employment rates in the two cities (discussed in more detail in the main report).

In much of a similar way to the original work undertaken for PUSH we have assumed the growth scenario is accompanied with improvements in productivity of new jobs. We have assumed that a skills strategy results in a 20% increase in productivity levels of new jobs by 2020. This increase is phased in from 2014 to 2020. The productivity uplift is concentrated in tradable activity and therefore excludes agri, retail, personal services, accommodation, etc.

2.5 Indirect and induced effects

When additional direct jobs are created in an area, there will be 'knock-on' impacts generated elsewhere through supply chain spending. These are the additional jobs created as a result of the increased demand from the sector where the direct jobs have been added. We refer to these 'knock-on' impacts as **indirect** effects.

In addition to this, further jobs are created through **induced** effects. This third round of employment impacts arise when those employed in the new direct and indirect jobs spend their income in the economy (i.e. where the additional wages generated as a result of the extra jobs will be spent elsewhere in the economy). The exact steps of estimating indirect and induced impacts are discussed in detail below.

2.6 Who takes the jobs?

The next step in the analysis is to estimate who takes the jobs within local economies that make up the LEP. Broadly, the additional jobs are taken by either residents, commuters from outside the area or migrants. We use a combination of commuting matrices from the Census and rules on how far unemployment levels can fall and resident employment rates can rise. We typically set the unemployment floor equal to the low recorded in the period 2000 to 2008.

As the economy approaches the unemployment floor or the resident employment rate ceiling, the model brings in more and more migrants to fill the jobs.

The additional migration generated as a result of the indirect jobs will push up the level of population. This will drive up demand for public services and therefore will lead to an increase in the number of public sector jobs located within the local authorities. This is estimated by applying baseline ratios of public sector jobs to the number of people in the local economies.

OXFORD
Abbey House, 121 St Aldates
Oxford, OX1 1HB, UK
Tel: +44 1865 268900

LONDON
Broadwall House, 21 Broadwall
London, SE1 9PL, UK
Tel: +44 207 803 1400

BELFAST
Lagan House, Sackville Street
Lisburn, BT27 4AB, UK
Tel: +44 28 9266 0669

NEW YORK
817 Broadway, 10th Floor
New York, NY 10003, USA
Tel: +1 646 786 1863

PHILADELPHIA
303 Lancaster Avenue, Suite 1b
Wayne PA 19087, USA
Tel: +1 610 995 9600

SINGAPORE
No.1 North Bridge Road
High Street Centre #22-07
Singapore 179094
Tel: +65 6338 1235

PARIS
9 rue Huysmans
75006 Paris, France
Tel: + 33 6 79 900 846

email: mailbox@oxfordeconomics.com

www.oxfordeconomics.com

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