

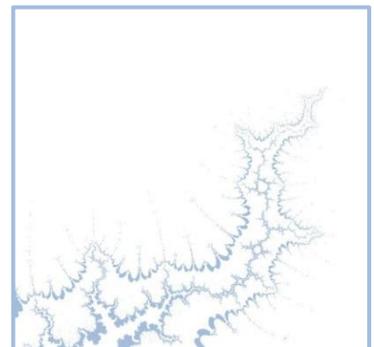
Assumptions for the Baseline and ‘Smart Efficiency and Growth’ Scenarios for Worcestershire Districts

**A briefing note for Worcester City Council
and Partners**

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1 Introduction

This briefing note sets out the assumptions underlying the Baseline and 'Smart Efficiency and Growth' economic scenarios developed by Cambridge Econometrics in consultation with Amion Consulting for Worcestershire LEP.

2 Local Economy Forecasting Model

The scenarios were developed in versions of Cambridge Econometrics' (CE) Local Economy Forecasting Model (LEFM) tailored to the economies of the Worcestershire districts.

LEFM (see Appendix for a more detailed description) has been designed to project economic indicators for a local area by explaining the output of local industries through an explicit representation of expenditure flows in the area and their links with the world outside the local area. In this it differs from other methods of local economy modelling which typically link local output or employment (by sector) directly to national or regional output or employment.

It allows the user to develop alternative scenarios by changing underlying assumptions (eg demand for local output in particular sectors, alternative population projections), undertake impact analysis, or look at the implications for replacement demand for employment by occupation or qualifications.

3 Assumptions for the Baseline Scenario

The Baseline scenario projections in LEFM are based on the historical relationship between growth in the local area relative to the region or UK (depending on which area it has the strongest relationship with), on an industry-by-industry basis. The Baseline projections assume that these relationships will continue to hold in the future. Thus, if growth in an industry in the local area (district) outperformed the industry in the West Midlands (or UK) as a whole in the past, then it will be assumed to do so in the future. Similarly, if it underperformed the region (or UK) in the past then it will be assumed to underperform the region (or UK) in the future.

The projections for some sectors, in which growth is more closely related to changes in population, are based on historical relationships between growth in output per capita in the local area and output per capita in the region or UK as a whole. These industries are: retail, public administration, education, health, and miscellaneous services (which includes leisure services).

The forecasts for the West Midlands and UK come from CE's regional economic forecast, developed using CE's UK regional economic forecasting model. The projections for the Worcestershire districts are consistent with the forecasts for the West Midlands and UK as published by CE in March 2013.



CE's forecasts for key UK variables in the March 2013 release are presented alongside forecasts from other organisations in the July 2013 edition of The Treasury's [Forecasts for the UK economy: a comparison of independent forecasts](#) publication (edition 315, HM Treasury, July 2013).

The population projections, which are used for the projections for population-related sectors described above, and based on ONS' 2011-based interim Sub-National Population Projections (SNPP), extrapolated beyond 2021 (the 2011-based interim SNPP only go to 2021) using growth rates from the ONS' 2010-based SNPP.

The local area employment data are based on Business Register and Employment Survey (BRES) data to 2011. The local area GVA data are based on productivity from ONS sub-regional accounts data for Nuts 2 areas to 2010, applied to the local area employment estimates. Data beyond these years are projections calibrated to CE's regional data and forecasts.

Table 3.1 shows CE's forecasts for GVA and employment in the West Midlands and UK as published in March 2013, which provide the context for the baseline projections for the Worcestershire districts.

Table 3.1: GVA and employment forecast for the West Midlands and UK

| | 2010-13 | 2013-15 | 2015-20 | 2020-25 |
|---|---------|---------|---------|---------|
| GVA growth (% pa) | | | | |
| West Midlands | 0.8 | 1.0 | 1.9 | 2.0 |
| UK | 0.7 | 1.2 | 2.1 | 2.1 |
| Employment growth (% pa) | | | | |
| West Midlands | 1.1 | 1.1 | 0.5 | 0.6 |
| UK | 0.8 | 0.4 | 0.5 | 0.6 |
| Source: Cambridge Econometrics, forecast revision 10918, March 2013 | | | | |

In the Baseline scenario projections, employment in Worcestershire is projected to increase by 0.5% pa (15,500) over 2013-25, compared with an increase of 0.6% pa in the West Midlands as a whole and 0.5% pa in the UK over the same period.

Within Worcestershire, Malvern Hills is projected to see the fastest employment growth (0.8% pa) over 2013-25, followed by Worcester (0.6% pa) and Bromsgrove and Redditch (0.5% pa). The districts projected to see the slowest growth in employment over this period are Wychavon (0.3% pa) and Wyre Forest (0.2% pa).



4 Assumptions for the 'Smart Efficiency and Growth' Scenario

The Smart Efficiency and Growth scenario, developed for Worcestershire LEP, is based on aspirational targets for growth in employment and GVA in Worcestershire over 2013-2025. These are:

- to grow employment (gross) by 25,000 by 2025 compared with 2013; and
- to increase GVA by £2.9 billion (2009 prices) by 2025 compared with 2013.

The LEP is developing a package of interventions that includes transformational actions that: target growth sectors (manufacturing, cyber/defence, tourism, low carbon, and food and horticulture); develop a series of 'Game Changer' sites (the lack of strategic sites has been a major constraint - the first four of these have the potential to accommodate over 10,000 jobs) and hubs (or centres) of research/excellence. There are also plans to develop Worcester further as a centre for retail, leisure and commercial activity.

The LEP is keen to attract inward investment (despite its good location it has attracted little FDI in the past) and to promote activities to improve productivity and trade. There is a programme of training and education initiatives also proposed, along with financial support and infrastructure improvements.

The scenario was developed by focusing on industries among CE's 45 sectors (see Appendix for a list of the 45 sectors) that are likely to be affected by the interventions described above. The industries are: Metals & metal products, Electronics, Electrical equipment, Machinery etc, Motor vehicles etc, Other transport equipment, Other manufacturing & repair, Warehousing & postal, Media, IT services, Financial & insurance, Legal & accounting, Head offices & management consultants, Architecture & engineering services, Other professional services, and Business support services

The scenario was developed by assuming growth (employment and productivity) in these sectors in each district would be boosted by the interventions and increased FDI, to meet the aspirational targets for the Worcestershire economy as a whole, as set by the LEP.

NB. The Smart Efficiency and Growth scenario is still in development and is expected to be completed by 22 November.



5 Appendix: The Local Economy Forecasting Model (LEFM)

5.1 Introduction

LEFM has been developed by CE in collaboration with the Institute for Employment Research at the University of Warwick. It is, to our knowledge, the only software package in Europe tailored to model regional and local economies and designed to conventional commercial software standards. It has been commercially available since the early 1990s (since when it has been continually developed) and is designed to empower organisations to undertake detailed economic analysis in-house. It is used extensively by local agencies, including local authorities, and by CE for more specialised analysis often commissioned by development agencies.

LEFM has been designed to project economic indicators for a local area by explaining the output of local industries through an explicit representation of expenditure flows in the area and their links with the world outside the local area. In this it differs from other methods of local economy modelling which typically link local output or employment (by sector) directly to national or regional output or employment. Such methods include shift-share or econometrically estimated equations. While these methods allow a user to derive projections for local output or employment growth from national or regional projections, they offer little scope for introducing an explanation of local performance relative to these higher levels, and they are typically not suitable for analysing the indirect effects on the local economy arising from the opening of a new enterprise or the closure of an existing one.

LEFM is also distinguished from other approaches by its sectoral detail. It identifies 45 sectors (defined on SIC07), allowing (for example) electronics to be distinguished from electrical engineering & instruments, and computing from other business services. Detailed disaggregation by sector is usually valuable because different sectors have different prospects (eg technological change is driving much faster growth in electronics and computing than in the other sectors with which they are commonly combined), because they have different employment characteristics, and also because it allows local knowledge about specific firms to be more easily incorporated in the forecast. There is, however, a cost to working in such detail: most variables in the model have to be disaggregated by sector (or a similar classification: see below for more details).

LEFM's structure draws heavily on that of MDM, Cambridge Econometrics' multi-sectoral model of the UK economy and its regions, and it shares the same software.

5.2 LEFM's Main Inputs and Outputs

The main input assumptions used in LEFM are:

- forecasts for the UK and region in which the local economy lies for selected variables, including



- the components of domestic final expenditure, disaggregated into spending by function as published in the UK National Accounts
 - components of personal incomes
 - gross output, value-added and employment by 45 sectors
 - matrices to convert the components of domestic final expenditure into commodity demand for 45 sectors
 - input-output coefficients and projected changes
 - projected changes in occupational structure and gender forecasts for the local economy
 - population by 5-year age band and gender
 - participation rate by gender for a constant level of unemployment (these are then adjusted by the model in response to actual changes in unemployment)
- Outputs for the local economy (to 2025) include:
 - value-added and employment by sector (45)
 - employment by gender and status (full-time, part-time, self-employed)
 - employment by occupation (25 occupations, SOC2010)
 - disposable income and consumer spending
 - population and labour force by age (7 age bands) and gender
 - net commuting
 - implications for qualifications and key and generic skills

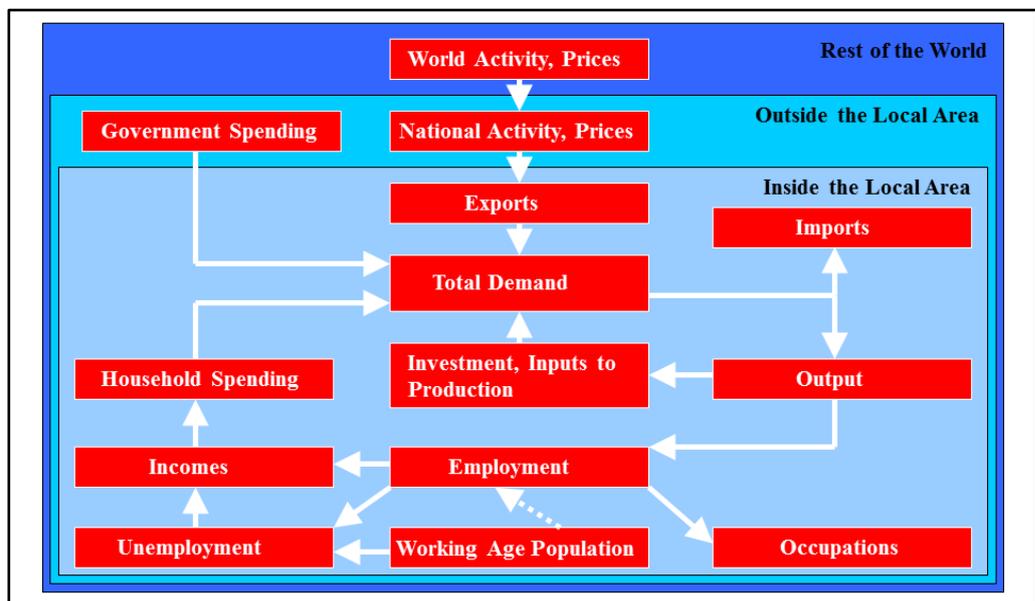
5.3 LEFM's Main Relationships

Accounting structure

Figure 5.1 summarises the model's accounting structure, which follows the social accounting matrix approach adopted in MDM. In most cases, the variables shown in the diagram are disaggregated (eg by sector for output and employment).

Each industry's gross output is determined as the difference between commodity demand (the sum of demand coming from the final expenditure

Figure 5.1: The main relationships in LEFM



components together with intermediate demand coming from production in the local economy) and imports to the local area. Each industry's value-added is assumed to be in the same proportion to its gross output as is the case for the region as a whole.

How the main variables are determined

Employment in the local area generates incomes. Assumptions are made for net commuting, which determines the extent to which incomes from local employment accrue to non-residents. Similarly, some incomes in the local area are derived from employment outside the area, or from non-employment sources (eg unemployment benefit). Aggregate household expenditure by residents in the local area is determined by real household disposable incomes (deflated by the national household expenditure deflator) and projections for the household saving ratio (derived from changes in the regional household saving ratio). Household expenditure is then disaggregated into spending by function according to the proportions forecast for the region.

Government final expenditure (disaggregated by type) in the local economy is projected on the basis of changes in the local area's share of the region's population.

Investment by sector is determined by a simple relationship with output. Projections for social investment (eg education, health) and investment in social services (eg roads), which are treated as assumptions at the UK level in MDM, are allocated to the local area according to population changes.

Intermediate expenditure by sector and commodity is determined by applying the national input-output coefficients to local economy gross output by sector.

Exports by sector from the local economy are linked to national gross commodity output in each sector. In effect, local firms are treated as competing in the national pool. Export projections then depend upon UK gross commodity output in each sector, and on assumptions for trends in the local economy's share of this output. In some cases, simple methods have been tried to model these export shares (eg to represent the effects of policies to promote inward investment). Imports by sector to the local economy depend on the demand for commodities in the local economy and on assumptions for import shares.

Employment by sector is determined by gross output and trends in productivity per person employed derived from regional projections (which in turn are derived from econometric estimates). Employment by gender and type is determined by the sectoral composition of employment and local information on the representation of genders and types of employment in each industry. The default projections for trends in this representation are based on historical data for the local area, with the user given the option to change these default values. A similar procedure is followed for employment by occupation.

Projections for the resident workforce are derived from assumptions for the population for working age (by gender) and projected participation rates which vary with the unemployment rate. Unemployment is the difference between the workforce, local employment and 'net commuting'.



Scenario capabilities

The LEFM software allows various forms of scenario analysis, including:

- Specifying target levels of output/employment by sector for the whole economy
- Altering prospects for specific sectors
- Alternative population, activity rates, commuting to/from local area
- Impact analysis of a major new opening or closure
- Replacement demand for occupations



Table 5.1: LEFM industries defined in terms of SIC 2007

| Industry | SIC2007 |
|--|----------------|
| 1 Agriculture, forestry & fishing | 01-03 |
| 2 Mining & quarrying | 05-09 |
| 3 Food, drink & tobacco | 10-12 |
| 4 Textiles etc | 13-15 |
| 5 Wood & paper | 16-17 |
| 6 Printing & recording | 18 |
| 7 Coke & petroleum | 19 |
| 8 Chemicals | 20 |
| 9 Pharmaceuticals | 21 |
| 10 Non-metallic mineral products | 22-23 |
| 11 Metals & metal products | 24-25 |
| 12 Electronics | 26 |
| 13 Electrical equipment | 27 |
| 14 Machinery | 28 |
| 15 Motor vehicles | 29 |
| 16 Other transport equipment | 30 |
| 17 Other manufacturing & repair | 31-33 |
| 18 Electricity & gas | 35 |
| 19 Water, sewerage & waste | 36-39 |
| 20 Construction | 41-43 |
| 21 Motor vehicles trade | 45 |
| 22 Wholesale trade | 46 |
| 23 Retail trade | 47 |
| 24 Land transport | 49 |
| 25 Water transport | 50 |
| 26 Air transport | 51 |
| 27 Warehousing & postal | 52-53 |
| 28 Accommodation | 55 |
| 29 Food & beverage services | 56 |
| 30 Media | 58-60 |
| 31 IT services | 61-63 |
| 32 Financial & insurance | 64-66 |
| 33 Real estate | 68 |
| 34 Legal & accounting | 69 |
| 35 Head offices & management consultancies | 70 |
| 36 Architectural & engineering services | 71 |
| 37 Other professional services | 72-75 |
| 38 Business support services | 77-82 |
| 39 Public Administration & Defence | 84 |
| 40 Education | 85 |
| 41 Health | 86 |
| 42 Residential & social | 87-88 |
| 43 Arts | 90-91 |
| 44 Recreational services | 92-93 |
| 45 Other services | 94-96 |

