OXFORD ECONOMICS

PUSH modelling approach

December 2011

A note prepared for PUSH

OXFORD ECONOMICS

Contents

1 Introduction

1 Oxford Economics were commissioned alongside DTZ in 2009 to prepare a revised Economics Development Strategy for the PUSH area. Oxford Economcs were tasked with developing a be-spoke model capable of providing baseline and scenario forecasts for the area.

2 Information on the modelling approach was provided and discussed during the various presentations of the results. It was also provided to DTZ for inclusion in the final report. To augment the information provided previously, this short document sets out key relationships and assumptions used in the modelling. It has been commissioned by PUSH to support the updating of its spatial strategy and has been drafted to provide planning inspectors and others with an easy to read explanation of the forecasting methodology.

3 This document has been compiled some 18-24 months after the forecasts were prepared, and relates to the data available and economic outlook at that time. The unusual level of uncertainty in the economy, subsequent data releases, and political and financial shocks mean that the macroeconomic environment is now very different. The outlook for the UK economy (and that of South Hampshire) is less optimistic and the return to growth is turning out to be slower than was envisaged when the forecasts were undertaken for PUSH in 2009/10. Consequently the scale of the recession, likely duration of recovery (given the risks from Europe, commerical banks in the Eurozone, and slow growth in the US) and downside risks were not fully factored into the forecasts.

1.1 Using forecasts

4 Since the on set of the financial crisis the world economy has been subject to an unusual amount of uncertainty. Consequently baseline outlooks for the UK, its regions and local areas have been revised frequently to take account of major data releases. This project was undertaken in 2009/10, and used forecasts produced during this time. Since then Oxford Economics have produced a number of updated outlooks. As such data and outlooks used in this study may differ from our current outlook.

1.2 Structure of the report

5 This report takes the following structure:

- Baseline forecasts;
- A be-spoke PUSH impact model;
- Modelling assumptions and scenario discussion; and
- Implications for population, migration and housing.

2 Baseline forecasts

6 Oxford Economics provided baseline and scenario forecasts for the Partnership for Urban South Hampshire Economic Strategy 2010. The economic data covered a range of variables and all modelling work was undertaken at a local authority level before being summed up and presented at the wider PUSH level.

7 This section discusses how the baseline economic forecasts are produced within Oxford Economics' suite of models.

2.1 The PUSH geography

8 The first task of the assignment was to agree the PUSH geography to be modeled. At a local level, PUSH incorporates:

- Eastleigh;
- Fareham;
- Gosport;
- Havant;
- Portsmouth;
- Southampton;
- Parts of East Hampshire;
- Parts of New Forest;
- Parts of Test Valley; and
- Parts of Winchester.

9 DTZ and Oxford Economics were provided with a list of wards in East Hampshire, New Forest, Test Valley and Winchester that were part of PUSH. Using ward data from the 2001 Census and more up to date labour market data (e.g. unemployment), Oxford Economics were able to determine the share of local authorities that fell within the PUSH boundary. Table 2.1 shows the size of the PUSH share of each local authority across a range of variables.

Table 2.1: The PUSH share of local authorities

	East Hampshire	New Forest	Test Valley	Winchester
Population	18.2%	40.1%	36.6%	33.7%
Total employment	18.5%	43.9%	36.6%	34.9%
Agriculture	11.5%	20.9%	21.0%	38.9%
Extraction	28.9%	64.1%	50.0%	35.8%
Manufacturing	22.2%	51.7%	29.3%	42.1%
Construction	19.3%	43.6%	38.2%	42.5%
Wholesale and retail	18.6%	45.4%	36.6%	35.0%
Hotels and restaurants	18.0%	35.3%	35.7%	31.5%
Transport & Communications	15.9%	50.9%	38.0%	35.6%
Financial Services	18.3%	45.8%	31.0%	39.8%
Business services	18.5%	39.1%	42.7%	31.2%
Public admin & defence	18.5%	55.4%	26.3%	39.6%
Education	18.2%	40.0%	44.8%	30.0%
Health	18.7%	39.8%	44.1%	32.4%
Other	13.9%	39.6%	40.9%	29.1%
Unemployment	18.7%	51.5%	36.2%	30.4%
Housing	18.3%	38.1%	36.7%	32.9%

Source: Census, National Statistics

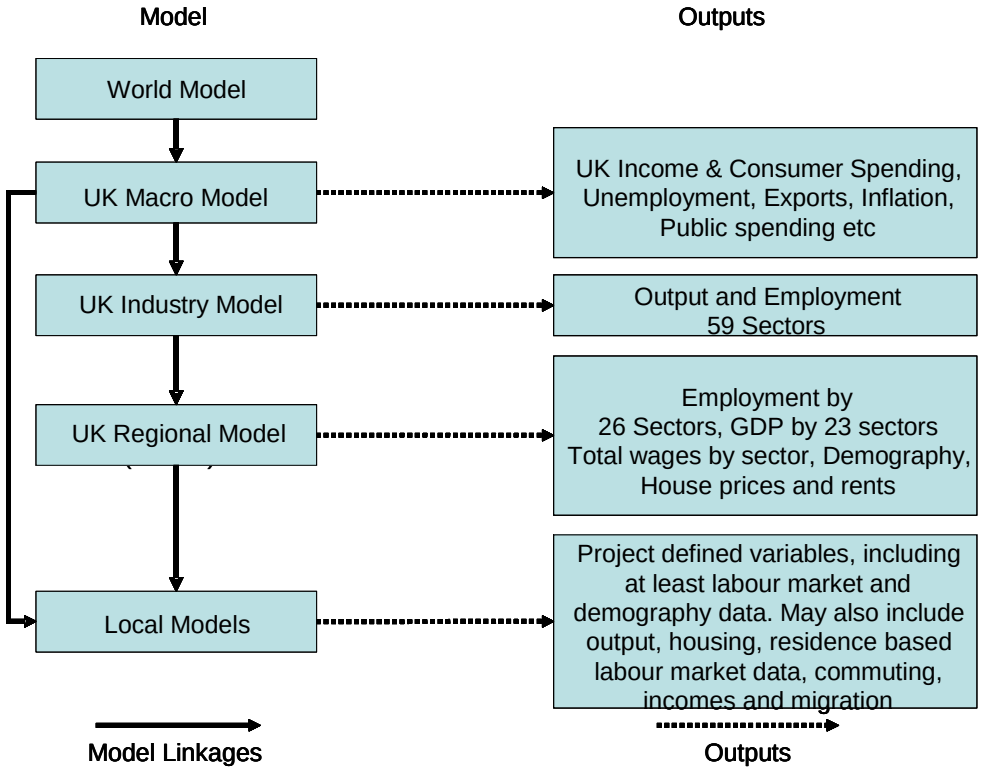
10 All of the demographic and economic modeling was undertaken at a local authority level. We then took the results for each of the four local authorities above and applied the appropriate share. The results were then added to the remaining local authorities noted in the bulleted list above to produce overall PUSH estimates.

11 The remainder of this section describes how we produced baseline forecasts for the PUSH economy.

2.2 Oxford Economics suite of models

12 The respected Oxford Economics UK macro model is linked to our wider suite of world models and thus is consistent with global trends in demand / commodity prices / exchange rates etc. The UK macro model feeds down into the UK industry model which disaggregates employment and output into broad sectors. This is then a parent to the UK regional model. Finally our local models (LAD model), sit within this regional framework. Figure 2.1 depicts this hierarchal structure of the models.

Figure 2.1: Hierarchal structure of Oxford Economics' suite of models



13 This structure ensures that global factors have a significant impact, indirectly on the forecasts, for say Eastleigh. This empirical framework (or set of 'controls') must be borne in mind when considering the historical trend element of the approach.

2.3 Regional modelling

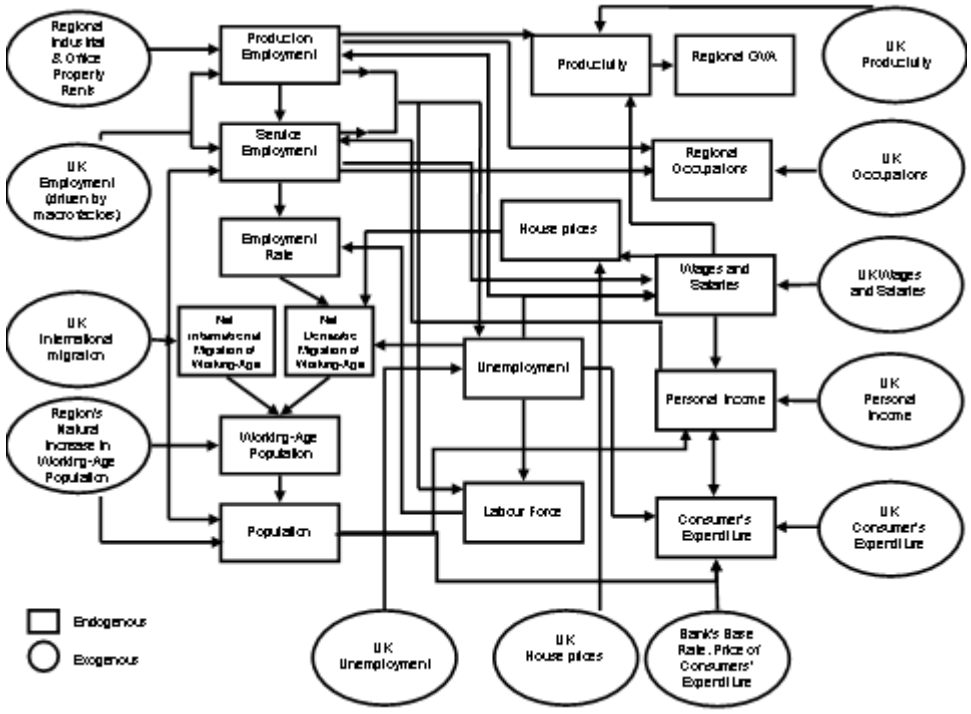
14 The historical trend in an area is used as an important driver of future trends, within the confines of the economic fundamentals and the macro environment. The use of historical trends as a basis for projection is often, unfairly, criticised for being too basic and not capturing the local dimension. However, a more complex forecasting approach such as that used within regional and national models are not suitable for local use. Local data is not sufficiently robust with respect to drivers of demand such as rents, prices, rates, wages etc, to facilitate econometric estimation of relationships. Basic 'relationships' are adhered to 'control' the forecasts and make the trend-based approach an appropriate technique.

15 This method of historical-trend based projection is augmented by local knowledge and principles of forecasting built up over decades of expertise. This is sometimes considered the 'art' that complements the 'science'. It may take the form of imposing maximums on trends (e.g. retailing will

always stay within certain parameters with respect to local spending in a non-exporting retail location). Equally there are minima to projections as a given level of supporting, or secondary, employment is required in a location which may bring to an end a declining trend. Finally known major announcements (closing of a prison, opening a new out of town retail mall) would be factored in if, and only if, they are confirmed as happening in the next 12/24 months (even apparently confirmed developments can fail to come to market for political, funding or other reasons). The displacement effects are handled by the regional forecasts which ensure that forecasts are, in overall, terms still appropriate given the fundamental economic relationships (see below)

16 The regional model (much as the macro and sectoral models 'above' it in the hierarchy structure) adheres to a set of well established economic relationships which interlink the various elements of the outlook. This is best explained via a flow diagram setting out the basic elements of the model.

Figure 2.2: Economic relationships within the UK regional model



17 This framework sets out how each of the elements of the model interact and 'bind' together. A couple of points are worth making:

- **Employment driven:** The model determines employment and, via productivity forecasts, GVA forecasts are projected. This is distinct from, for example an output based model, which determines output and productivity with employment the final step. Employment is projected independently by sector (59 sectors are covered in the standard model).

- **Indirect multipliers:** The regional model does not employ a detailed input –output framework (unlike the be-spoke model developed for the PUSH assignment and discussed in the next section). There is difficulty in accessing reliable regional purchasing data. As the model links retail and distribution employment into spending outlooks, public services to population and business-to-business activities and construction into total employment, there are implicit multipliers within the model. The overall indirect / induced employment are cross checked to ensure they are broadly in line with the secondary jobs that an input output framework would produce.
- **Population and labour market linked**: The population forecasts are linked into employment and vice-versa though a number of mechanisms. Migration forecasts, which are key to the population outlooks, depend upon unemployment and house price outlooks (which themselves link to the labour market) and a range of sectors, most notably the public services, have employment linked back into population outlooks. Similarly population forecasts produce income which in turn drives employment in retail and hotel & restaurants.
- **Resident and workplace handled separately:** The main employment and output forecasts are workplace based. Employment forecasts count the number of jobs (so someone with two jobs is counted more than once). Population is obviously resident based and resident employment (people based) is also projected using a fixed commuting matrix to translate workplace jobs into resident employment.

2.4 Oxford Economics UK Local Authority Forecast Model

18 Oxford Economics also maintain a local authority forecast model providing forecasts at local authority level across the UK. This was used to produce the individual local level baseline forecasts for the PUSH assignment. The model uses our well established regional model as its basis and is widely used by our clients. The model holds detailed historical data (back to 1991) and forecasts (up to 2028) at local authority level for a wide range of indicators.

19 **Demography:** we take the published historical population data from National Statistics. We also take the Government Actuarial Department's forecasts of natural increase. To this we apply our own estimate of migration. Official migration estimates are trend based. We prefer to estimate our own that are driven by labour market trends (i.e. they react to tightening labour markets, falling unemployment and job creation). Demographic data / forecasts include:

- Population (total and working age)
- Migration
- Natural Increase

20 **Labour Market:** we sourced employee jobs (or workplace jobs) from National Statistics Annual Business Inquiry (ABI) which has since been replaced by the Business Register Employment Survey (BRES). Sectoral data was based on the 2003 Standard Industrial Classification (SIC 03) definition of sectors.

21 Self employment levels were estimated at a local level given the volatile nature of the published data in the Annual Population Survey (APS). In estimating local self employment we used 2001 Census data to give us a relationship between employees and self employment. We then applied this to the employee data and used the published and up to date regional self employment estimates as a control total for the underlying local authorities. Unemployment in the model was claimant count unemployment taken from Nomis.

22 Net commuting was estimated in the model using the difference between published and forecast workplace based employment (i.e. the jobs in an area) and residence based employment (i.e. the number of residents in work).

23 Occupation estimates are produced by applying a SIC / SOC matrix (i.e. an industry by occupation matrix) to employment forecasts. The SIC / SOC matrix is taken from the Labour Force Survey at a regional level and applied to local sectoral employment forecasts. The results are scaled to the Census and a balancing procedure ensures that employment totals across the local authority and region.

24 The Annual Survey of Hours and Earnings (ASHE) provided us the with average earnings or wage data. Overall the following variables were forecast:

- Employee jobs (26 sectors)
- Self employment (26 sectors)
- Employment (26 sectors, including land forces and government supported trainees)
- Total workplace employed people
- Resident employment
- Resident employment rate
- Net commuting
- Unemployment level
- Unemployment rate
- Workplace wages
- Resident wages

- Resident occupations (9 occ split)
- Workplace occupations (9 occ split)

25 **Economy:** The data used to estimate GVA was taken from the ONS. Local authority GVA data is not published anywhere due to the lack of reliable data. The lowest level of geographical detail that is published is NUTS3 level data which is also published in Regional Accounts. NUTS3 areas are aggregates of local authorities, and are therefore used in the estimation of local authority level GVA.

26 As such, we estimate GVA by sector for the local authority by taking historical and projected regional productivity by sector (i.e. the amount of output per job) and multiply it by the local authority employment levels by sector. This gives us a first round estimate of GVA.

27 Given that GVA is the sum of profits and wages, and we know the wage levels from the ASHE (Annual Survey of Profits and Wages), we make an adjustment to account for the relative wage level. estimates will be scaled down accordingly. A further step in the GVA methodology is to apply an adjustment factor which ensures that the final estimates match the published data for NUTS3 areas. This adjustment factor is held constant over the forecast period. This system ensures that the final estimates of GVA for local authorities will match up with the published NUTS3 data.

28 Finally we apply scaling factors to the entire series which ensures that local authority GVA adds to the regional series. Therefore this is consistent with regional and national patterns of growth.

29 Business stock, registrations and de-registrations were taken from Nomis. National Statistics have since introduced a new approach to measuring business starts, closures and stock across the UK.

30 Overall the model includes the following economic variables:

- GVA
- Productivity
- Consumer expenditure
- Disposable household income
- VAT stock, registrations and de-registrations

31 **Housing**: Housing stock data was taken from the Department of Communities and Local Government (DCLG). Local authority data for dwelling stock (occupied and vacant) is collected from the HSSA (Housing Strategy Statistical Appendix) which is based upon information supplied by local authority bodies. Housing stock forecasts in the model were driven by population change and occupancy rates.

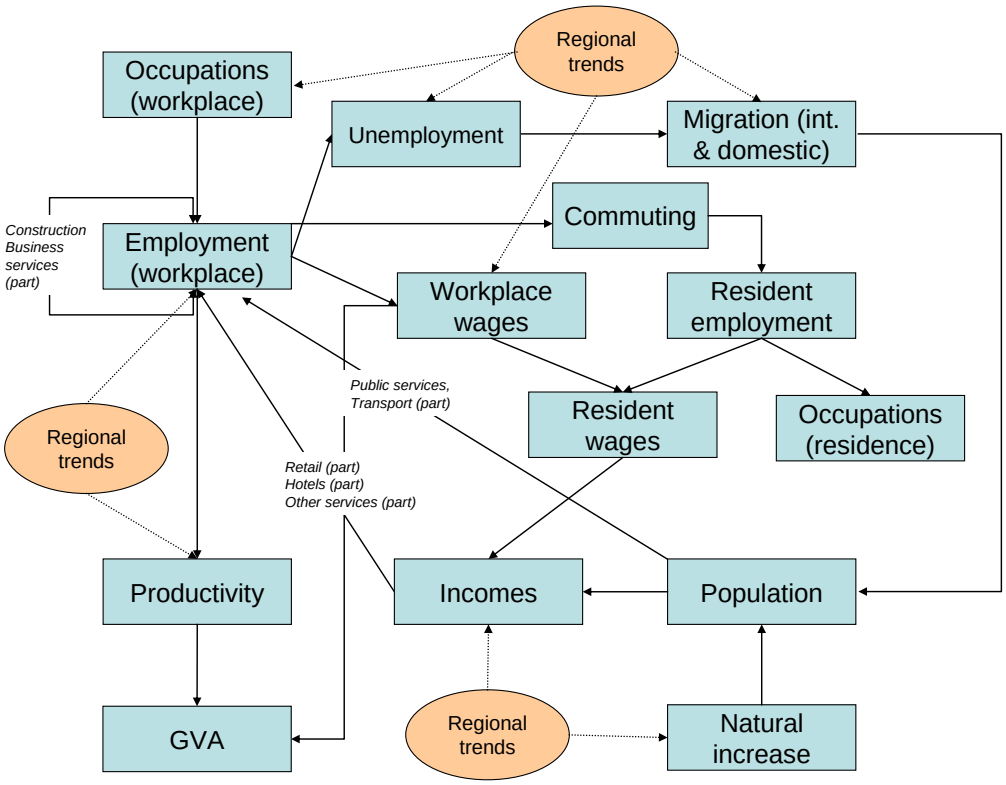
32 House prices were also taken from DCLG and forecasts are linked to changes in local level unemployment and relative wages.

33 In total we used two housing variables in the modelling:

- House prices; and
- Housing stock.

34 Figure 2.3 below sets out the relationships within the local model which given data concerns are necessarily less complex. The relationships are more basic due to the limitations of data available (the diagram also identifies the links into the local framework from the regional model).

Figure 2.3: Economic relationships within the local model



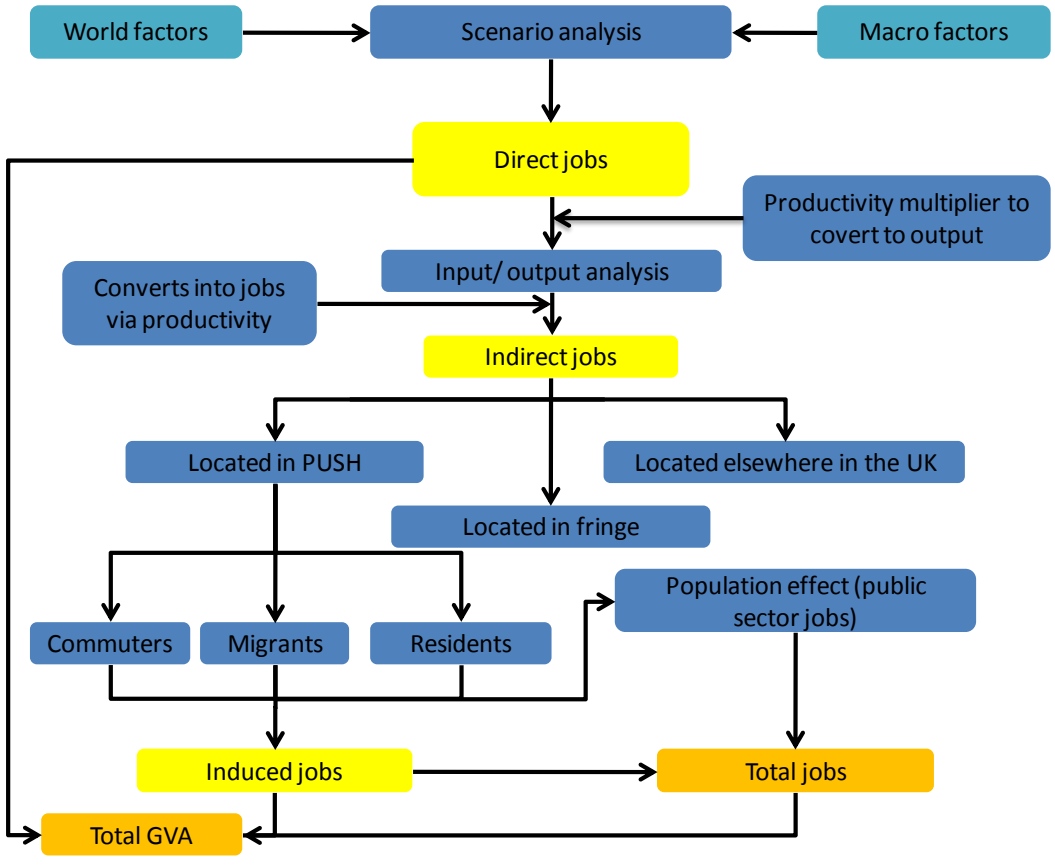
3 A be-spoke PUSH impact model

35 Given the requirement for running a range of scenarios on the PUSH economy, it was necessary to produce a be-spoke impact model for the assignment. This section discusses the model linkages.

3.1 Estimating jobs, wages, population and output

36 The impact module (enhanced specifically for this project) allowed the testing of alternate sectoral scenarios through a detailed input / output and labour market framework. Figure 3.1 below provides a conceptual overview of the impact model.

Figure 3.1: Conceptual overview of the impact model



37 At a high level the modeling steps included (see Figure 3.1):

- **Scenario analysis and Direct jobs:** Development of a scenario (i.e. changes to employment or GVA) to influence the outlook for the relevant local authorities and ultimately the PUSH economy;
- **Input-output analysis:** the direct impacts were ran through an input-output model. An input-output model gives a snapshot of an economy at any point

in time. The model shows the major spending flows from "final demand" (i.e. consumer spending, government spending investment and exports to the rest of the world); intermediate spending patterns (i.e. what each sector buys from every other sector – the supply chain in other words); how much of that spending stays within the economy; and the distribution of income between employment incomes and other income (mainly profits). In essence an input-output model is a table which shows who buys what from whom in the economy. As such direct changes to employment or GVA (the exact scenarios / direct inputs used in the study are discussed in the next section) can be inputted into the model and fed through the Input – Output framework to calculate indirect GVA by sector (via output to GVA ratios). Productivity by sector is then applied to calculate the indirect employment impact (note this is a different approach to that used in Oxford Economics suite of forecasting models producing baseline outlooks, and discussed in the previous section);

- **Location of jobs:** As noted in the bullet above, the creation of jobs in the PUSH economy will create indirect employment as businesses spend on their supply chain. In reality firms' supply chains are unlikely to be locally based. Instead they purchase goods and services from across the region, UK and internationally. The input-output tables remove the need to estimate international impacts, and instead focus only on the UK wide impact. Consequently there is a need to estimate the likely geographical distribution of indirect jobs. The model was designed to distribute the indirect jobs across the PUSH local economies, remainder of the region and elsewhere in the UK. In doing so it used sectoral employment concentrations and series of assumptions (see Table 3.1). The model used sectoral employment location quotients[1] and associated assumptions on the percent of the supply chain that could be found locally, regionally or elsewhere in the UK. Thus if a local authority had significantly more employment in a particular sector relative to the UK average we assumed that they would spend a greater proportion locally.

[1] A location quotient is method for analysing relative sectoral employment in a location in relation to the UK. So for example we take employment in agriculture in Fareham and divide it by total employment in Fareham. We do the same calculation for the UK, and then divide the Fareham results by the UK results. If Fareham has the same proportion of its total employment in agriculture as the UK, the resulting figure will be 1. If it is above 1 then Fareham has a higher concentration of employment in agriculture, and if it is below 1 it has a lower concentration of employment in agriculture.

Table 3.1: Estimating the location of additional jobs

Sectoral employment location quotients	Assumption: % of demand sourced within the Local Authority
3.0 or greater	60
2.5	50
2.0	40
1.5	30
1.0	20
0.5 or less	10

- **Who takes the jobs?:** With an estimate of the number of additional jobs in each local authority, the model then moved on to estimate who takes the jobs (i.e. commuters, residents or migrants). It follows the steps below:
    - **Commuters:** The 2001 census provides information on the proportion of workplace jobs (i.e. the number of jobs in a local authority) which are taken up residents and the proportion that are taken by in-commuting. This is also available by sector. Assuming these commuting patterns had not changed over time, we were able to estimate the number of additional jobs (direct and indirect) taken by commuters in each local authority by sector;
    - **Initial estimate of migrants:** the baseline outlook for migration takes account of net internal and international migration. When running a scenario in the be-spoke input-output model we consider the need for additional migrants in the PUSH economy. The first step is to estimate a sensible share of the new jobs to be taken by international migrants. Unfortunately there is no up to date detailed migration data available by sector. The 2001 Census however allowed us to breakdown the nationality of workers by sector for each local authority. We used this breakdown to produce an initial estimate of the likely number of new migrants coming each year to take up a proportion of additional jobs.
    - **Residents:** the remainder of the additional jobs are initially assumed to be taken by residents. However a feedback system in the model (discussed in more detail in the box below) checks the change in resident employment rates. If the resident employment rate is too high, the model brings in additional migrants; and
    - **Second estimate of migrants:** as noted, if resident employment rates rise to high, then additional migrants are needed to fill new jobs. On this second pass, the model does not distinguish between internal UK migrants or international migrants. The overall effect on PUSH will be additional people and demand for housing.

Quality assuring the distribution of jobs

When modelling faster growth scenarios at a local level there is a risk that the speed of job creation will result in the number unemployed falling to unrealistic lows, and or resident employment rates soaring to unrealistic highs.

In reality economies will always have unemployment as people move between jobs (so called frictional unemployment), some graduate from education and training and enter the labour market, and the existing unemployed are not suited to the jobs being created. Likewise there will also be people of working age that are inactive in the labour market putting downward pressure on resident employment rates (e.g. people looking after the home or relatives, unable to work due to illness, students, etc).

To stop unemployment falling beyond unrealistic levels and resident employment rising above unrealistic highs we included a feedback system into the model. As additional jobs are assigned to residents and migrants the model checks the unemployment and resident employment rates. If needs be it re-assigns the additional jobs in favour of increased numbers of migrants. As unemployment falls closer to record low levels, or resident employment rates rise to record highs, the model will bring in increasingly more migrants.

In other words, the local resident population will not be able to supply business with the skills it needs, and instead skills and labour are sourced from elsewhere in the model. Intuitively this feedback loop has implications for population growth (discussed below).

- **Induced jobs:** as direct and indirect jobs are created in the economy, there will be more wages, more spending and a further round of job creation. The model estimates firstly the increase in wages in the economy by applying average sector wage levels at a local level to the additional jobs created. This is done for commuters, migrants and residents. We assume that commuters will spend 20% of their income in the local authority they work in (the remainder is spent elsewhere). For migrants we assume that £2,000 of earnings are saved or sent back to their place of birth, with 80% of the remainder available for spend in the local economy. For residents we remove £10,000 from their additional salary to take account of unemployment benefits that they would have received in the absence of the job and assume that 80% of the remaining salary is spent in the local economy.

  From the input-output tables the model is able to distribute this spending by sector. The next step is to translate the spending into induced jobs. We do this by applying the average turnover per employee in each sector.

  Finally we adopt a similar approach to that discussed above to assign these induced jobs to commuters, migrants and residents.

- **Population effects**: given the scenario has influenced migrant numbers there will be a population impact at a local level. In estimating this, the model sums the collective changes in working age migration. It then applies a factor of 1.5 to take account of migrants' spouses, children, etc. The total migrant estimate is then applied to our baseline population outlook for the area. The model has one last task. Changes to local population levels will have implications for public services. Additional people will put increased demand on health and education for example. A fall in people (through a lower scenario) would remove demand for public services). The model uses the ratio of public sector jobs to people and applies this to the change in population. Again the change in public sector jobs are then assigned to commuters, migrants and residents.
- **Total jobs and GVA**: finally the model will sum the direct, indirect, induced and population related jobs to get a total sectoral employment estimates. Average sectoral productivity is then applied to estimate the likely impact to GVA.

3.2 Estimating housing impact

38 Forecasting is a complex and challenging exercise at the best of times and the recent trauma of the global recession and consequent fragile recovery, has only added to the level of difficulty. The government has recognised this increased uncertainty and is looking to see increased flexibility within strategy work. It is imperative that strategies look at the range of alternate possibilities and use scenario planning to explore the key 'what if' outcomes. Prior to the recession this was not always the case with point in time fixed forecasts being used. With the prevailing uncertainty, the range of potential outcomes is much wider, making strategic planning more complex than ever before. The forecasting profession has a number of searching questions to ask regarding its accuracy and it is therefore imperative that forecasts used can be clearly explained and evidenced ensuring transparency in decision making.

39 Turning to the issue of housing, where forecasting is also becoming increasingly complex, detailed housing forecast models are used by companies to forecast housing. Using household and 5 year age band forecasts to project future demand have proved largely inadequate. The precision of the data is not, in our view, sufficient to warrant this level of disaggregation. In addition they do not incorporate the impact of migrants or financial constraints.

40 Oxford Economics believe a more high level approach exploring a range of possible occupancy rates and population trajectories is more relevant to make effective housing forecasts (note population data is in itself very unreliable and the 2011 Census results are eagerly awaited to confirm the actual trajectory over the last decade).

41 Consequently the PUSH impact model was designed to take our population forecasts under the various scenarios and apply future occupancy rates to estimate changes in housing demand.

42 To estimate occupancy rates and housing demand under the baseline outlook, we take total housing stock and vacant housing stock data from Department of Communities and Local Government. From this we can estimate occupied housing stock (though this was only available to 2009). The next step is to apply population estimates to produce occupancy rates to 2009. We then take official household and population projections to estimate official occupancy rate forecasts.

43 We take these occupancy rate forecasts and apply them to Oxford Economics own population series to produce housing demand forecasts. Oxford Economics population forecasts differ from official projections due to our own migration assumptions which are based on the economic need of the UK, its regions, and local areas.

4 Modelling assumptions and scenario discussion

44 This section sets out the modelling assumptions used in the preferred growth scenario as agreed by DTZ and the Steering Group.

4.1 Overview of preferred growth assumptions

45 Over the course of the study Oxford Economics ran a number of scenarios, the result of which were passed to DTZ and presented to the Steering Group. This included upper and lower scenarios with a mix of local and macro events that influenced sectoral employment growth and productivity. Following guidance from DTZ and the Steering Group, a preferred scenario was developed.

46 The preferred growth scenario was based on the following assumptions, all of which were designed to by DTZ and the Steering Group to reflect the aims of the final revised economic development strategy:

- **Productivity:** a 10% productivity uplift to all sectors of the economy. Productivity was assumed to rise across the economy given skills initiatives, higher levels of innovation and extra competition from growth in priority sectors. Priority sectors (discussed below) were assumed to enjoy a 20% productivity uplift. It was assumed that new or additional jobs in priority sectors have further boosts to productivity to reflect higher levels of support in terms of skills and innovation. These productivity uplift assumptions were integral elements in the Economic Development Strategy adopted by PUSH and assumed successful implementation of new economic interventions by PUSH and its partners to, for example, up skill the South Hampshire workforce and stimulate higher levels of innovation;
- **Employment:** a 0.4% per annum uplift to employment in priority sectors to reflect inward investment activity and higher levels of skills and innovation support. Priority sectors included:
    - Other chemicals;
    - Aerospace;
    - Other transport equipment;
    - Insurance and pension funding, except compulsory social security;
    - Activities auxiliary to insurance and pension funding;
    - Research and experimental development on natural sciences and engineering; and
    - Architectural and engineering activities and related technical consultancy.

- **Migration:** a 2% per annum reduction in baseline inward migration to the PUSH area as a result of increased resident skills, workforce engagement and facilitation of residents into work. A 75% reduction in nominal migrant levels for 'above baseline' employment to reflect prioritisation of skills investment and workforce development to enable residents to access employment opportunities. These migration assumptions reflect the central intention of the PUSH Economic Development Strategy to reduce the need for South Hampshire employers to bring in labour from other areas through actions to increase the employment rate and to up skill the indigenous workforce.
- **Strategy Impact Phasing:** The impacts were phased over time to reflect the phasing in of the refreshed Economic Development Strategy, its peak impact and move towards steady state in the medium term. The greatest impact was timed to fit with the strongest period of the recovery (see table below). So for example rather than assuming the employment and productivity growth rates (set out above) have an immediate impact on the economy, we assumed that only 70% of the effect would happen in the first year (across all sectors and locations).

Figure 4.1: Impact of assumptions / scenario

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020+
Impact of assumptions	70%	85%	100%	100%	100%	75%	75%	50%	50%	25%

5 Implications for population, migration and housing

47 This section provides PUSH with some additional information, over and above that presented in DTZ's document "PUSH Economic Development Strategy: Preferred Growth Scenario (June 2010)". All our forecasts were set out to 2031. However for consistency with the previous development strategy, the data was presented to 2026 in the published reports.

5.1 A unique economic period

48 Before setting out our baseline and scenario estimates, it is worth reminding the reader that the forecasts used in this modelling assignment were developed in late 2009 and revised in early 2010. The unusual level of uncertainty in the economy at that time, subsequent data releases and political and financial shocks mean the macro economic environment is now very different to that only 18 months ago.

49 In addition the BRES data released at the end of December 2010 dramatically changed the collective understanding of labour market performance in the UK.

50 Since then Oxford Economics have regularly revised their Global and UK outlooks to reflect the more challenging short-term outlook facing most developed economies in the EU. Consequently the scale of the recession, recent requirements to re-capitalise banks in Europe, the implications on confidence and investment, and finally the greater risk of a return to recession were not factored into the forecasts.

51 The short term outlook for the UK is now more subdued. For example Oxford Economics forecast UK GDP growth to be only 1% in 2012 compared to the 3% estimated in Spring 2010.

5.2 Baseline outlook

5.2.1 Demography and migration

52 Our baseline population forecasts for PUSH and the South East were similar over the short and medium term (Table 5.1). Growth in the population was expected to continue due to trends in natural increase (taken from official projection) and the continued relative strength of the South East labour market (i.e. continued net in-migration).

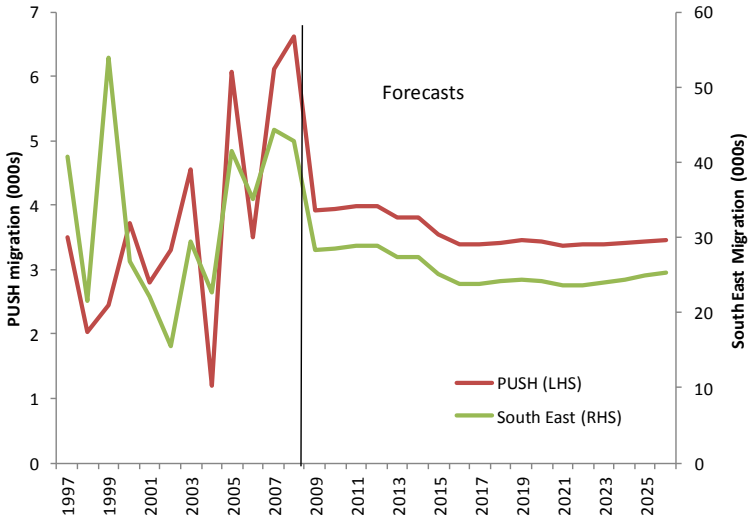
Table 5:1 Annual average baseline population growth, 1998 to 2026

	1998-08	2008-11	2011-21	2021-26
PUSH	0.6%	0.7%	0.6%	0.6%
South East	0.6%	0.7%	0.6%	0.6%

Source: Oxford Economics

53 The strong labour market performance of the PUSH and South East economies in the decade to 2008 had feed through to migration. The tight labour market conditions in the economy created the conditions to retain residents and attract increasing numbers of migrants to the area. From the end of the 1990s to the onset of recession in 2008, the PUSH economy experienced a gradual increase in net migration. At a local level migration data can be volatile and the data for PUSH is no exception. Despite this, by 2008 the PUSH economy experienced net in migration of 6,600 people (Figure 5.1).

Figure 5.1: Baseline migration, PUSH and South East



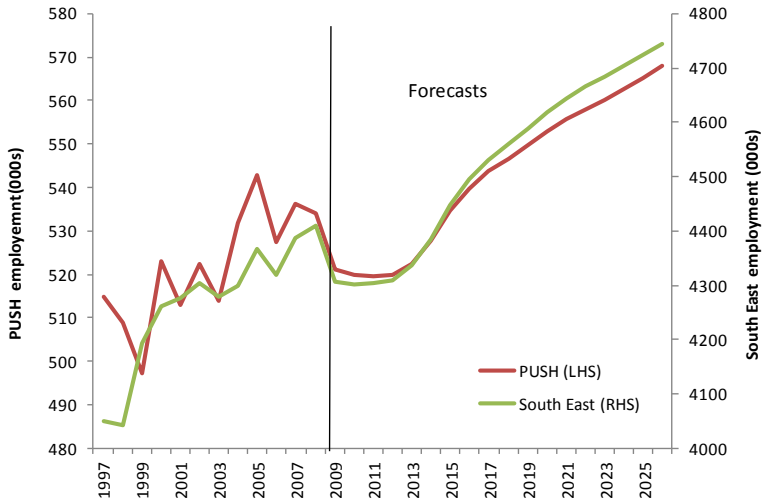
Source: Oxford Economics

54 Looking forward, given the downturn in the economy and more subdued labour market outlook (relative to that enjoyed pre 2008), we estimated net migration levels would fall back to levels last experienced in early 2000s. Our forecasts for migration are economically driven (being produced as a function of unemployment levels, relative house prices and wages). Consequently higher levels of unemployment over the forecast period were expected to keep migration levels below recent peaks.

5.2.2 Labour market performance

55 Overall, the PUSH labour market was estimated to have experienced a deeper and longer contraction in employment terms than the South East. Employment in the PUSH economy had contracted in three of the four years since 2005 (Figure 5.2). Given the economic data available at the time, we expected the PUSH and South East economies to return to growth in 2012 and 2011 respectively.

Figure 5.2: Baseline employment, PUSH and South East



Source: Oxford Economics

56 Across the UK, future employment growth was expected to be driven by business services (and in particular tradable services) while manufacturing was expected to continue its long-term decline in employment numbers. Given PUSH's greater reliance on the manufacturing sector for employment and underdeveloped business services sector, it was estimated to lag behind growth in the wider region. Consequently we estimated that it would take until 2017 for the PUSH economy to return to peak employment levels compared to only 2015 for the South East.

Table 5.2: Baseline per annum employment growth, 1998 to 2026

	1998-08	2008-11	2011-21	2021-26
PUSH	0.5%	-0.9%	0.7%	0.4%
South East	0.9%	-0.8%	0.8%	0.4%

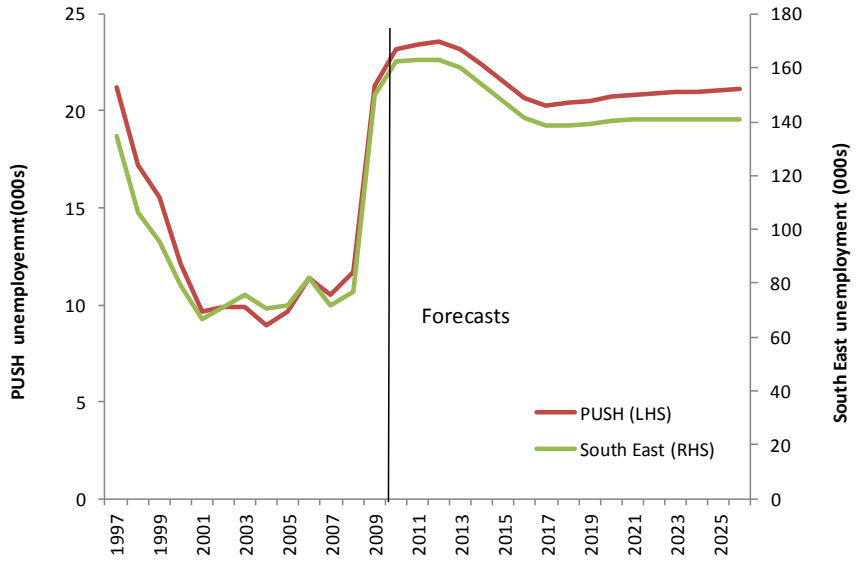
Source: Oxford Economics

57 Unemployment numbers had already more than doubled at the time of writing. The construction sector was one of the first casualties of the

financial crisis, and the reduction in consumer spending and correction in the housing market had knock on impacts in the retail sector. Furthermore across the economy, the private sector cut employee numbers and were reluctant to recruit further. Therefore an analysis of unemployment showed that most of those flowing onto the ranks of the unemployed at the time were from relatively lower level occupations and those aged under 25.

58 However looking forward, the breakdown of future jobs growth suggested that the local (and indeed national) economy would become increasingly skills hungry. Consequently Oxford Economics forecast that unemployment levels would remain above the recent lows enjoyed pre-recession.

Figure 5.3: Baseline unemployment, PUSH and South East



Source: Oxford Economics

5.2.3 Housing demand

59 In general population was expected to continue growing over the forecast period (driven by natural increase and migration). Combined with a downward trend in occupancy rates we estimated that demand for housing would continue to grow over the forecast period at approximately 1% per annum.

Table 5.3: Baseline housing demand (000s), PUSH and South East

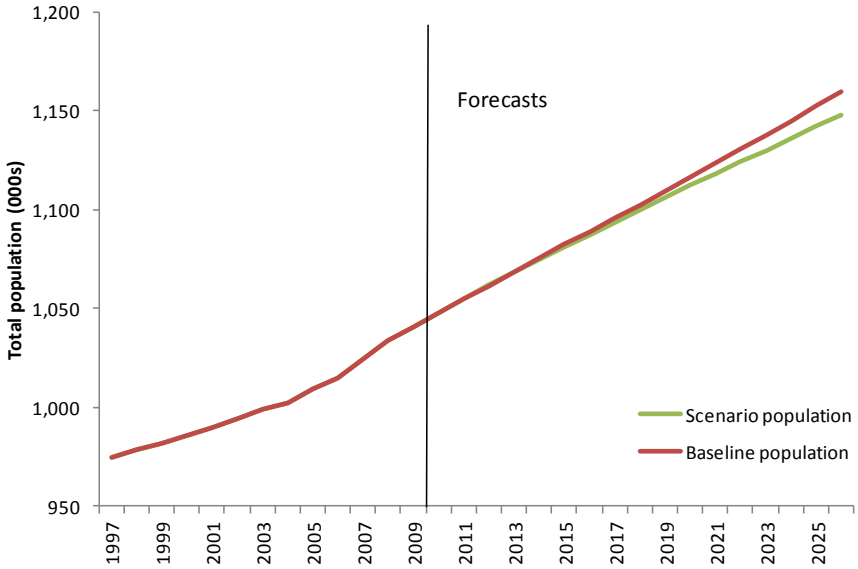
	2008	2011	2016	2021	2026
PUSH	432	441	466	489	514
South East	3,513	3,590	3,786	3,962	4,164

Source: Oxford Economics

5.3 Preferred growth scenario outlook

60 Typically a faster growth scenario will lead to faster population growth as residents are encouraged to stay to take up the job opportunities, and migrants are attracted into the area. However the inclusion of assumptions that encourage resident take up of jobs instead of migrants has had the effect of slowing population growth under the preferred scenario (see Figure 5.4). These assumptions were considered achievable and therefore agreed by DTZ and PUSH.

Figure 5.4: Population growth



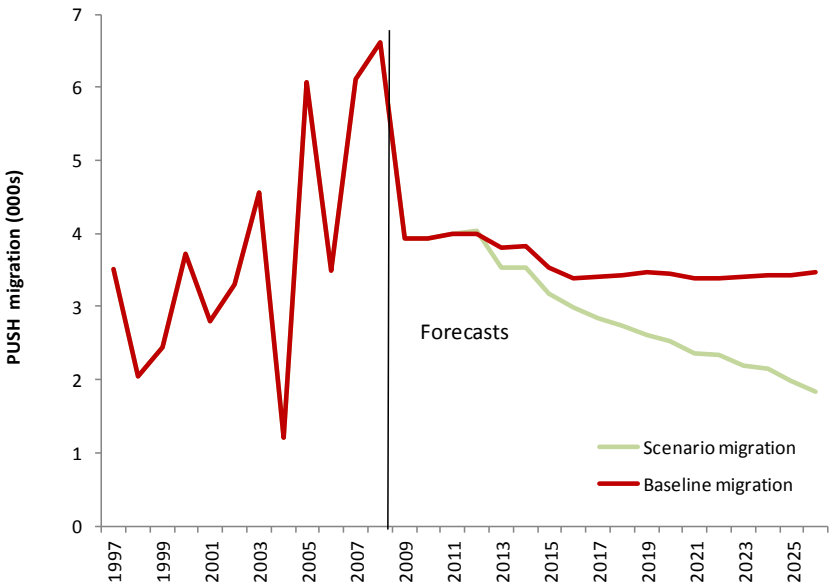
Source: Oxford Economics, DTZ

61 Under the baseline forecasts we estimated that population would grow at an annual average rate of 0.64% adding 105,200 people between 2011 and 2026. Under the preferred growth scenario annual average population growth is estimated to be lower at 0.57%, adding only 93,200 people to the PUSH economy. The difference is accounted for by the reduction in net migration.

62 It was assumed that under a new Economic Strategy for the PUSH economies, future in migration could be reduced by up-skilling existing residents to take future job opportunities and encouraging the implementation of local charters which would also prioritise employment for residents. Consequently the positive net migration expected over the forecast period under the baseline outlook was reduced (see Figure 5.5). In agreement with DTZ and PUSH, it was assumed that the baseline level of migration would be reduced by 2% per annum. Therefore by 2026 annual

net migration was assumed to have been reduced by 30% under the scenario forecasts.

Figure 5.5: Net migration



Source: Oxford Economics, DTZ

63 In effect, net migration fell from an annual average of 3,550 under the baseline outlook to an annual average 2,800 under the preferred growth scenario outlook over the period 2011 to 2026.

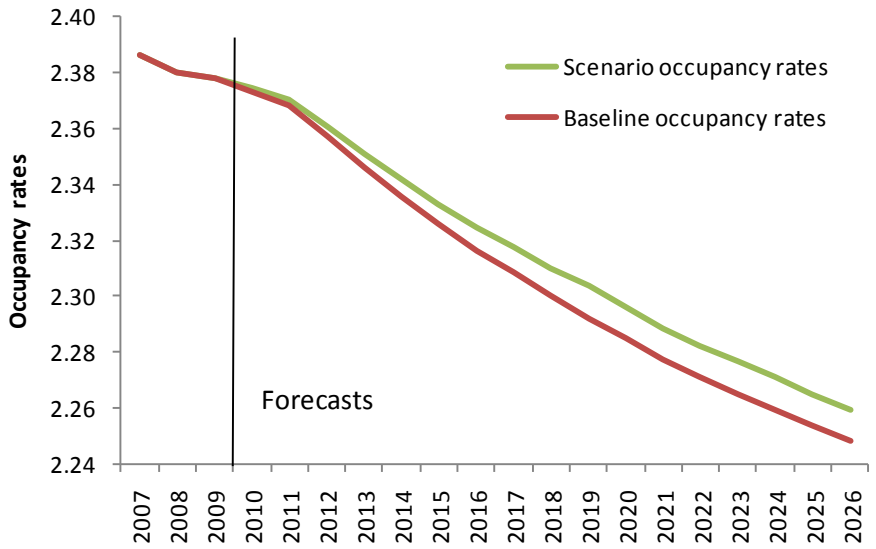
5.4 Housing demand

64 In estimating housing demand we took our population forecasts and applied occupancy rate forecasts as discussed in section 3. Under this preferred growth scenario it was assumed that occupancy rates (the number of people per house) would fall at a slower rate than the under the baseline by 0.5% (phased in over ten years at a rate of 0.05 percentage points a year). The uplift in occupancy rates was agreed by DTZ and PUSH. Even before the recession, research by the National Housing and Planning Advice Unit (NHPAU)[2] using the CLG Affordability Model suggested that the decline in household size nationally will moderate because worsening housing affordability could inhibit rates of household formation, with young people leaving home later, or joining others in mutual households rather than forming independent households, leading to the end of the downward trend

[2] National Housing and Planning Advice Unit, July 2008, NHPAU RESEARCH FINDINGS NUMBER 2: Impact of worsening affordability on demand for social and affordable housing tenure choice and household formation.

in average household size established since 1960s. Other research[3] has gone further, in actually suggesting a rise in average household size in the South East region between 2004 and 2029 based on modeling the implications of market based assumptions for household size. This evidence underpinned the occupancy rate assumptions determined by DTZ and fed into the OE model. The impact this makes is shown in Figure 5.6.

Figure 5.6: PUSH occupancy rate forecasts



Source: Oxford Economics, DTZ

65 The 12,000 reduction in population growth by 2026 and the increase in occupancy rates translate through to a reduction in the demand for housing of 9,700 by the end of the period (Table 5.4). Over the period 2006 to 2026 an estimated 74,000 houses are required under the preferred scenario, compared to over 84,000 under our baseline forecasts.

Table 5.4: Population and housing demand, 2006 to 2026

	2006	2011	2016	2021	2026	Change (2006 to 2026)
Population (000s)	1,015	1,055	1,088	1,118	1,148	133
Housing stock (000s)	430	445	467	487	504	74

Source: Oxford Economics, DTZ

[3] Geoffrey Meen and Mark Andrew, August 2007, Planning for Housing in the Post-Barker Era: Affordability, Household Formation and Tenure Choice, ICHUE Paper No. 8.

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

OXFORD ECONOMICS