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MODELLING DEMOGRAPHICS and HOUSING in MANCHESTER and SALFORD

Manchester Salford Housing Market Renewal Pathfinder.

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MODELLING DEMOGRAPHICS AND HOUSING IN MANCHESTER AND SALFORD

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MODELLING DEMOGRAPHICS AND HOUSING IN MANCHESTER AND SALFORD

EXECUTIVE SUMMARY

This report presents updated forecasts from Oxford Economic Forecasting Ltd and Regional Forecasts Ltd for population change in Manchester and Salford, together with analysis of the implications for housing. As explained in the companion report on our economic analysis and forecast, this report contains revised forecasts, reflecting changes in important employment data from the Annual Business Inquiry (ABI) and also some changes to forecasts for Oldham and Rochdale resulting from a more intensive examination of the February forecasts as part of a piece of work specially commissioned by the two local authorities.

The economic, demographic and housing models ultimately part of a single unified modelling framework. This ensures that the resulting forecasts are fully consistent with each other (as well as with OEF and RF's regular forecasts for UK regions, the national economy and world economic developments). For example, the forecasts for the economy take account of the impact of population changes on the demand for local services, while the population forecasts take account of the impact that changing economic circumstances can have on migration patterns. This integrated model structure also means that the model can be used for looking at the likely impact on each component of the system of alternative policies or projections affecting another part.

In modelling the demographics:

- the 'natural increase' in the population is modelled by applying projected birth and death rates to appropriate elements of the existing population;

- domestic migration is modelled as the result of the interaction of a variety of economic, social and demographic factors, including the index of multiple deprivation; housing vacancy rates; the age structure of the population; and changes in net migration at the regional level, which itself is affected by relative unemployment, relative wages and relative house prices; and

- international migration is projected by applying estimated local shares of both inward and outward flows to forecasts of international migration at the regional level, which in turn are affected by overall flows into the UK, and relative house prices and wages.

There are a number of key messages that emerge:

- Our base forecast suggests a strong rise in Manchester's population and a sharp slowing of Salford's decline.

- However, for Manchester in particular, this depends critically on flows of international migration into the North West, and on Manchester's share of these flows.

- This means that alternative plausible assumptions about Manchester's share of international migration could lead to much lower population growth than in our base projections.

One other point of potential relevance to housing market renewal emerges from the analysis of the determinants of migration. Both deprivation and high levels of vacancies tend to deter inward migrants. An important implication of this is that an improving position will tend to be self-reinforcing – increasing inward migration would, other things being equal, tend to reduce the number of vacant houses, which in turn would lower the disincentive effects on other potential migrants that high vacancies can represent. But there is also a corollary. Building new homes in an area of limited demand can increase the vacancy rate and therefore discourage inward migrants. This is the opposite effect that tends to be seen in regions of persistent high demand for housing such as the South East, where building new homes tends to increase inward migration by providing somewhere for the new people to live.

Key elements of the housing modelling are:

- the use of projected 'headship rates' to turn population forecasts into projections for the number of households forecast for each district;

- a breakdown of the number of households by tenure choice, to estimate demand for owner-occupation, social housing and private rented housing;

- modelling of changes in the housing stock through demolitions and new completions; and

- modelling of house prices in each district relative to the regional average, depending on factors such as the degree of deprivation in the district and the prevalence of owner-occupation.

In summary, the implications of our housing market modelling for discussions about housing market renewal policy include:

- The number of households is likely to increase in both Manchester and Salford.

- Under the baseline forecast, the number of households is expected to increase by 39,000 in Manchester and 6,000 in Salford between 2001-2016.

- Even under an alternative scenario which assumes lower inward international migration, there are likely to be 25,000 extra households between 2001and 2016 in Manchester.

- Our economic forecasts suggest that the workforce will continue to become more highly skilled, more especially in Manchester with the nature of city centre jobs. This will drive further increases in the proportion of owner-occupied housing.

- The increase in housing stock implied by our baseline forecast requires a fairly high level of completions in both Manchester and Salford.

- But projections are heavily dependent on the outlook for migration, since this is a key driver of population.

MODELLING DEMOGRAPHICS AND HOUSING IN MANCHESTER AND SALFORD

1. Introduction

This report presents our forecasts for population change in Manchester and Salford, together with analysis of the implications for housing. As explained in the companion report on our economic analysis and forecast, this report contains revised forecasts, reflecting changes in important employment data from the Annual Business Inquiry (ABI) and also some changes to forecasts for Oldham and Rochdale resulting from a more intensive examination of the February forecasts as part of a piece of work specially commissioned by the two local authorities. Together with the companion report, this completes the description of the modelling work we have done to study the inter-linkages between the economy, demography and housing in Manchester and Salford, and the resulting projections.

Although the economic, demographic and housing models are presented separately in describing the structure of the models, it is important to realise that they are ultimately part of a single unified modelling framework. This ensures that the resulting forecasts are fully consistent with each other (as well as with OEF and RF's regular forecasts for UK regions, the national economy and world economic developments). For example, the forecasts for the economy take account of the impact of population changes on the demand for local services, while the population forecasts take account of the impact that changing economic circumstances can have on migration patterns. This integrated model structure also means that the model can be used for looking at the likely impact on each component of the system of alternative policies or projections affecting another part.

The remainder of the report is structured as follows:

- Section 2 sets out the structure of the demographic model and the key equations.
- Section 3 presents key results from the model showing population projections for Manchester and Salford, and discusses the implications of these results.
- Section 4 sets out the structure of the housing model and the assumptions on which it is based.
- Finally Section 5 covers results from the housing model, in particular the implications for housing demand and construction of the economic and demographic projections.

2. The Demographic Model

Geography

The geographical coverage of the demographic model is based on the same approach as the economic model, with model constructed for each of the unitary authorities and counties within the North West region. Forecasts have been produced for local authority areas beyond Greater Manchester because of the close economic and social links between Greater Manchester and these areas, especially with the surrounding rural areas, and due to the need to maintain consistency with our forecasts for the North West and other regions. Forecasts are available outside Greater Manchester for the counties (Cheshire, Lancashire and Cumbria), the unitary authorities (Blackburn, Blackpool, Warrington, and Halton) and for the Merseyside Districts.

Time Periods

The demographic, and other, models are constructed on an annual basis. Historic data for most variables has been collected for 10 or 20 years to provide a basis for estimating inter-relationships between variables and future trends. Forecasts are discussed up to 2016, but we have extended the forecast period to 2021, and detailed tables showing figures for each year up to 2021, are provided in the Appendix, which also includes tables showing the results of illustrative scenarios of alternative assumptions about outward migration.

Coverage

The model produces forecasts for the population of each district split into males and females, and within this into 5year age bands (0-4 years old, 5-9, 10-14, and so on up to 80-84 and 85 upwards). It also produces forecasts for inward and outward migration flows, separately for flows within the UK and those to/from the rest of the world, split between working-age migration and others. Net domestic and international migration (ie the balance of inflows over outflows or vice versa) are further disaggregated into the same sex and age bands as the population projections. The use of population forecasts to produce forecasts for households is discussed in Chapter 4 on the housing model.

Model Structure

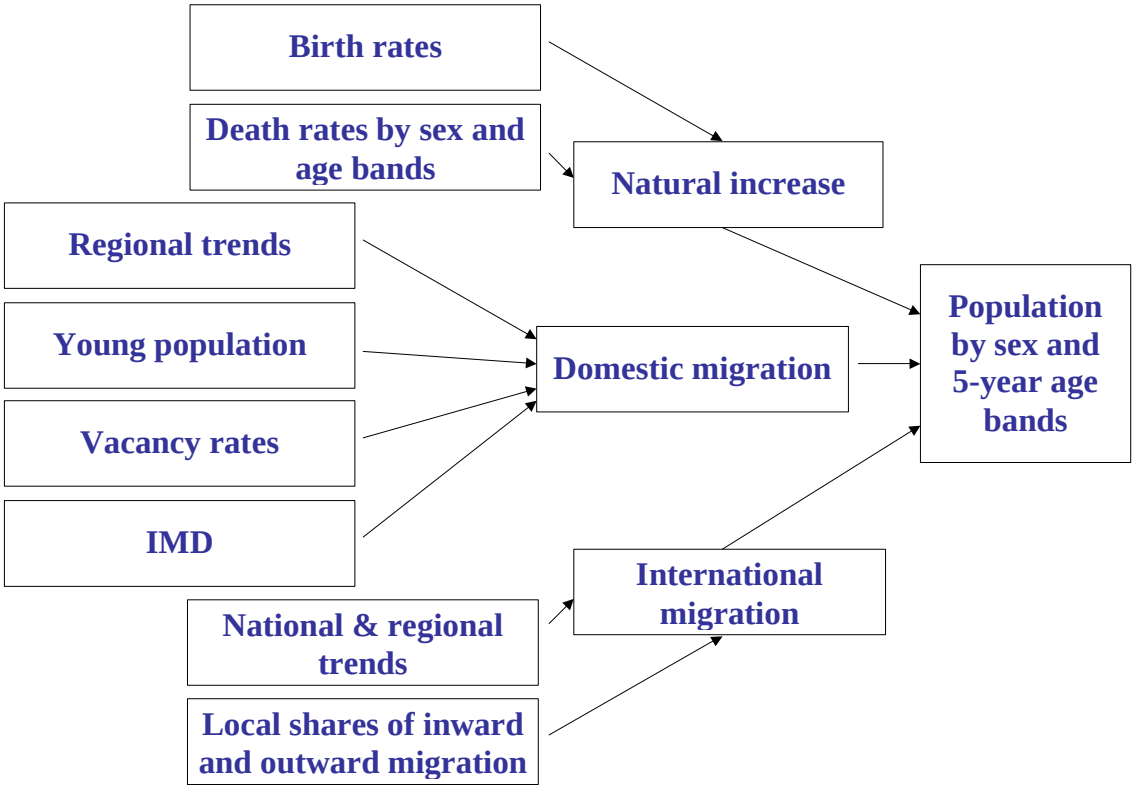
Figure 2.1 illustrates the basic structure of the demographic model for each local authority, with changes in population broken down into 3 elements, each of which are described in more detail below. In summary, though:

- the ‘natural increase’ in the population is modelled by applying projected birth and death rates to appropriate elements of the existing population;

- domestic migration is modelled as the result of the interaction of a variety of economic, social and demographic factors; and

- international migration is projected by applying estimated local shares of both inward and outward flows to forecast levels of international migration at the regional level.

Figure 2.1: The Demographic Model



The natural increase in population

Birth rates have been derived for each district as a proportion of women aged 15-44, from Census data (see Table 2.1). These show a significant variation between districts – for baby boys the range is from 37 a year per 1000 women aged 15-44 in Blackburn to 24 in Liverpool, with similar differences for baby girls. Such differences can arise from a variety of compositional differences between the populations of different districts, which might include factors such as ethnic origin, educational attainment, income levels and so on.

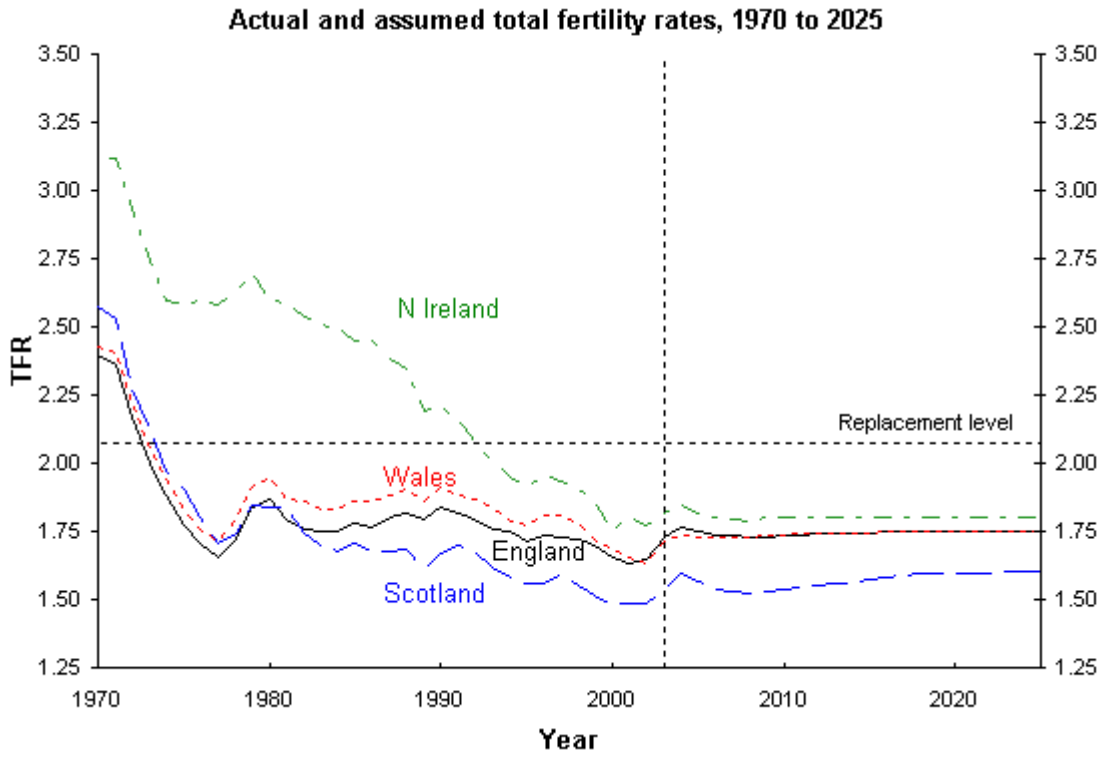
The projections assume that these differences in birth rates between districts persist into the future, but we do not attempt to model variations in these differentials over the future as, for example, the ethnic composition of the population changes. In practice, future fertility rate assumptions used by the Government Actuary's Department in population projections are very stable (see Figure 2.2), so we have projected birth rates in each to remain at current levels.

Table 2.1: Birth rates[1] by District

	Male	Female
Blackburn	37.2	31.0
Blackpool	29.6	26.2
Bolton	31.1	27.9
Bury	29.6	27.2
Cheshire	26.4	26.5
Cumbria	26.5	25.2
Halton	27.6	27.7
Knowsley	27.3	27.0
Lancashire	27.5	26.4
Liverpool	24.4	22.6
Manchester	26.6	24.2
Oldham	35.8	31.0
Rochdale	32.6	28.2
Salford	28.6	26.5
Sefton	26.1	25.8
St Helens	25.4	25.4
Stockport	26.5	26.2
Tameside	26.8	26.8
Trafford	29.6	25.2
Warrington	27.6	25.3
Wigan	28.9	27.6
Wirral	29.4	25.8

Source: OEF/RF, derived from 2001 Census

Figure 2.2



Source: GAD

[1] Babies aged less than 1 per 1000 women aged 15-44

Death rates are specified for each sex and age group, derived from ONS figures for the North West region. These range from well under 1 death per year for every 1000 young people in the population, up to around 194 deaths per year for every 1000 men aged 85 or more (see Table 2.2).

Table 2.2: Death Rates in the North West, 2003

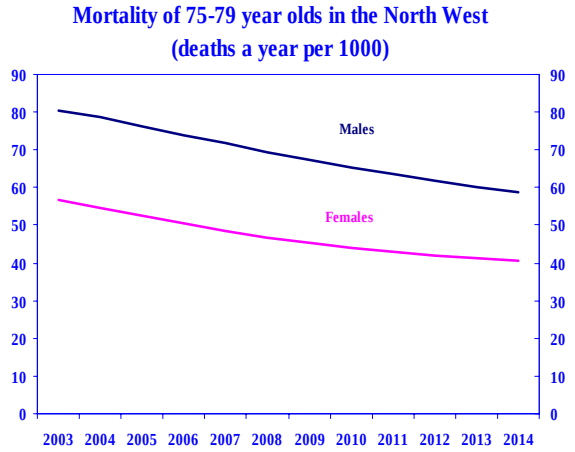
(per 1000 of the population in each group)

	Male	Female
1-4	0.2	0.2
5-9	0.1	0.1
10-14	0.1	0.1
15-19	0.7	0.3
20-24	0.7	0.3
25-29	1.1	0.5
30-34	1.1	0.5
35-44	2.0	1.0
45-54	4.5	2.9
55-64	11.3	7.0
65-74	30.8	20.5
75-84	80.5	56.8
85+	193.7	172.1

Source: ONS Mortality Statistics

Projections are also available from the same source, showing the extent to which mortality rates are expected to continue falling – figure 2.3 illustrates this for 75-79 year olds, where death rates are expected to fall from around 80 per 1000 for men in 2003 to just under 60 per 1000 by 2014, with a comparable fall for women, although with consistently lower death rates. (The official assumptions are at five-year intervals, and these are simply interpolated where required to provide us with rates to apply in each year).

Figure 2.3



Source: OEF

The **natural increase** in the population therefore results from a combination of a) the ageing of the surviving population by a year at a time, b) applying death rates to each sex and age group, and c) adding new births based on the number of women of child-bearing age.

One final step applied is to ensure consistency with our forecasts of the natural increase in the population at the regional level, which may require a small adjustment to the figures to make sure they add up.

Domestic migration

Domestic migration is modelled by an equation relating net inflows to a variety of economic and demographic factors. Equations were originally estimated separately for inflows and outflows, using data from the Census across all local authorities in the north of England.[2] Similar factors affect both inward and outward migration flows, but in net terms, working age domestic migration depends on:

- Index of multiple deprivation (-). An increase in the level of deprivation in a district tends to reduce net migration. (Higher deprivation is associated with both lower inflows into a district as potential migrants find it a less attractive place to move to, and lower outflows, perhaps because deprived people find it difficult to move at all. But the effect on inflows is larger than the effect on outflows, producing a net negative effect on inward migration from higher deprivation.)

- Housing vacancy rate (-). Similarly, an increase in the housing vacancy rate has a net detrimental impact on people's willingness to move into an area.

- % of young people in population (+/-). Younger people tend to be more mobile and therefore districts with higher proportions of young people tend to see both higher inflows and outflows. In net terms, areas with a high proportion of 16-24 year olds tend to see more inflows, those with a high proportion of 25-29 year olds tend to see lower inflows.

- Share of the change in NW net migration (+/0). In addition to migration flows that can be explained in terms of local factors, there are also more regional influences on migration within the UK. The final section of this chapter discusses in more detail how regional migration flows are modelled, but the impact of changes in these flows appears to differ across districts. In practice, as net domestic migration into the North West has risen (to around zero from a historical tendency for net outflows each year) this has had more impact on net migration flows in the more rural districts of the region than in the cities, in particular in Cheshire, Cumbria and Lancashire rather than the districts of Greater Manchester or Merseyside. This means that where our regional modelling produces a different level of net domestic migration than that produced by the purely local equations, we allocate the difference across certain districts only rather than across all districts equally – the shares are shown in Table 2.3.

[2] See Geoffrey Meen, 'A Simulation Model of Economic Segregation and Deprivation', University of Reading Centre for Spatial and Real Estate Economics, August 2004 for more details.

Table 2.3: Changes in regional domestic net migration- allocation by district

	%
Blackburn	5
Blackpool	5
Bolton	1
Bury	1
Cheshire	16
Cumbria	15
Halton	0
Knowsley	6
Lancashire	30
Liverpool	0
Manchester	0
Oldham	0
Rochdale	0
Salford	0
Sefton	0
St Helens	0
Stockport	0
Tameside	5
Trafford	9
Warrington	0
Wigan	1
Wirral	6

Source: OEF/RF calculations

Although these are the factors that are identified explicitly in the domestic migration equations, that does not mean that they are the only factors that will affect migration, since effects can operate indirectly through an impact on the direct drivers. This is the case with house prices, for example. We have not been able to identify a separate effect from house prices at the local level, but this does not mean that house prices have no effect on migration in the model – there is an effect at the regional level, and this will feed through into the districts as described above. Similarly, although unemployment and wages are not identified directly as driving forces in the local domestic migration equations, they will have an impact through the regional equation. And, perhaps more importantly, in the case of unemployment there will also be an impact through the equation for deprivation, which in turn will impact on migration.

Changes in deprivation are modelled in the same underlying way as migration, through a relationship estimated on cross-section data across local authorities, derived primarily from the Census[3]. The index of multiple deprivation depends on the following factors that are correlated with areas of deprivation:

- Unemployment (+)
- % of population with no qualifications (+)

[3] See Geoffrey Meen, 'Non-Linear Behaviour in Local Housing Markets and the implications for Sustainable Mixed-Income Communities in England', University of Reading Centre for Spatial and Real Estate Economics, March 2004 for more details.

- % of elderly in population (-)
- % of population with long-term illness (+)
- % of non-white in population (+)

Once these economic and demographic factors determine our projections of net inward or outward migration, these are then split between the sex and age groups on the model in accordance with the average pattern over recent years.

International migration

International migration is modelled primarily at the regional level (see below). Both inflows and outflows are then disaggregated across local authority districts according to estimates of the appropriate shares. This is not entirely straightforward. The Census, for example, provides information on the destination by district of international immigrants into the North West for a specific year, but provides no information on which districts international emigrants from the North West have come from. Our main projections are based on extracting assumptions from GAD projections for local authorities, which explicitly identify international migration flows in each direction. These imply, for example, that 25% of international immigration into the North West are projected to go to Manchester, while 18% of international outflows are projected to come from Manchester (see Table 2.4). Our main projections assume these proportions remain constant over the future, and therefore each district is affected if projections for aggregate international migration to and from the region are changed.

There is, however, an element of policy about these figures rather than just the outcome of behavioural decisions, particularly regarding the destination of asylum seekers, and we have produced an alternative set of projections based primarily on different assumptions about how international migration flows are split between districts (see below).

Table 2.4: International Migration to/from the North West

(LA districts' % of North West total)

	2001 inflow Census	2004 inflow GAD	2004 outflow GAD
Blackburn	1.9	1.4	1.3
Blackpool	1.2	2.4	2.2
Bolton	3.1	2.4	2.5
Bury	2.1	2.4	2.0
Cheshire	10.1	10.4	14.5
Cumbria	5.1	7.5	8.0
Halton	0.6	0.6	1.3
Knowlsey	0.6	0.4	0.9
Lancashire	17.6	14.1	15.0
Liverpool	9.5	10.6	7.6
Manchester	20.4	24.6	17.9
Oldham	2.2	1.6	1.8
Rochdale	2.0	2.4	2.0
Salford	4.7	3.5	2.0
Sefton	2.5	1.4	2.0
St Helens	1.0	0.6	2.2
Stockport	3.3	2.4	5.1
Tameside	1.5	1.2	1.6
Trafford	3.7	2.2	1.8
Warrington	2.1	1.8	2.7
Wigan	2.2	2.2	2.0
Wirral	2.4	3.5	3.6

Source: ONS, GAD

Modelling population at the regional level

Our population forecasts at the local authority level are constrained to be consistent with our forecasts for changes in the population of the North West region as a whole. In this sense, our model is 'top-down', although the detailed modelling at the local authority level means the model has many of the characteristics of a 'bottom-up' model. In practice we find that the constraints have little impact on the forecast, but they are valuable in ensuring that the full set of numbers produced is internally consistent. They also mean that the factors we identify as important in determining population changes at the regional level, and which are reflected in our regular forecasts for the regions across the UK, are automatically reflected at a sub-regional level as well.

The natural increase in population at the regional level is derived from official projections, as a proportion of the existing population. In this sense, therefore, our regional forecasts are entirely consistent with the official projections. However, this is very different from saying we are simply taking the official projections as an assumption, since the migration element of population change is modelled explicitly within our forecasts. This is an important feature of analysing the links between economic, demographic and housing markets. Official projections of migration are based simply on the continuation of recent trends, while our

approach depends on looking at the economic forces driving recent patterns of migration as well as simple trends.

Our estimation of the relationship between past developments in the net domestic migration of working age people into the North West and economic drivers has identified four significant factors:

- An increase in unemployment in the North West relative to UK average tends to push up outward migration or reduce inward migration (and vice versa).

- Similarly, an increase in house prices in the North West relative to London tends to push up outward migration or reduce inward migration.

- In contrast, an increase in average wages in the North West relative to London tends to push up inward migration or reduce outward migration.

- There is a relatively small effect from changes in net international migration into the UK, whereby the share of this coming into the North West is enough to generate some crowding out of domestic migration in the sense that an increase in net inward international migration to the UK tends to lead to a reduction in net domestic migration into the North West (or an increase in net domestic migration out of the North West).

Similar effects are identified by our estimation of the determinants of net international migration into the North West:

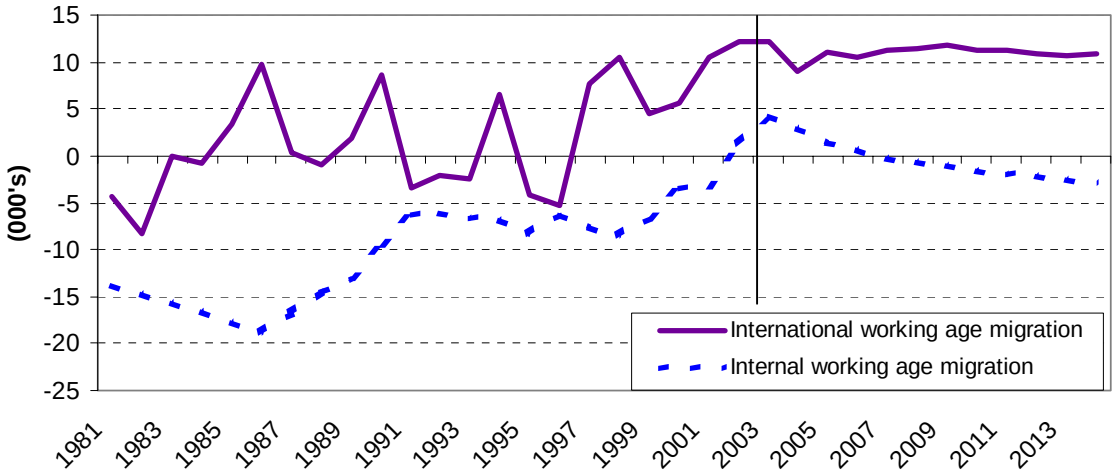
- An increase in house prices in the North West relative to London tends to reduce the amount of international migration coming into the region.

- In contrast, an increase in average wages in the North West relative to London tends to push up inward international migration to the region.

- An increase in the overall level of international migration into the UK pushes up the numbers migration from overseas into the North West – other things equal, around 8% of any increase in overall international migrants to the UK find their way into the North West.

Forecasting the overall number of international migrants into the UK (and therefore the effect this will have on the North West) is far from straightforward given the political sensitivity of the figures and debate about how policy should seek to control immigration. Our projections are close to central official projections in assuming a net inflow of around 135,000 a year – not as high as some recent years where figures have reached 160,000, but still sufficient to have a substantial cumulative impact on the population of the UK and of the North West. For the region as a whole, this leads to the migration forecasts shown in chart 2.4, which underlie the district forecasts presented next.

Figure 2.4: North West net migration of working age people



3. Population Forecasts

Figures 3.1 and 3.2 show the results of the modelling and assumptions presented above, for Manchester. As the description of the model makes clear, migration projections are very important for population forecasts. The combination of forecasts at the regional level and our methodology for breaking this down between the local authority districts implies that net international migration into Manchester is expected to continue at around 3,000 people a year, close to recent levels. Domestic migration is projected at a net outflow of around 3,000 people a year. It's worth bearing in mind, though, that this relatively small net outflow is the difference between quite substantial inflows and outflows. Domestic working age migration is projected to average around 24,000 people a year moving into Manchester, together with an average of around 25,000 people a year moving out of the district. In addition, the projections show net outflows of an average of around 2,000 a year of children and people above working age.

On these projections, Manchester's population is expected to rise by 33,000 between 2003 and 2016, enough to see the overall population of the district return to its 1981 level by then.

Figure 3.1

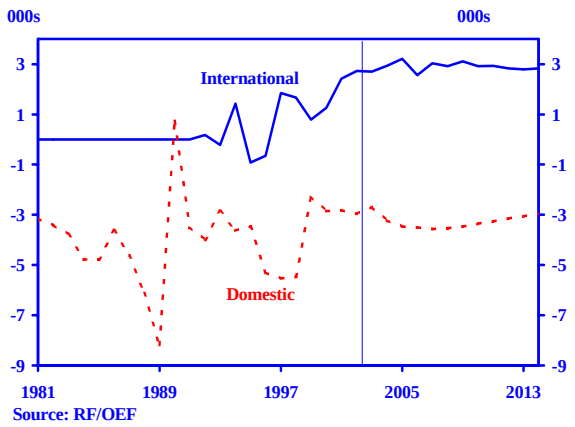
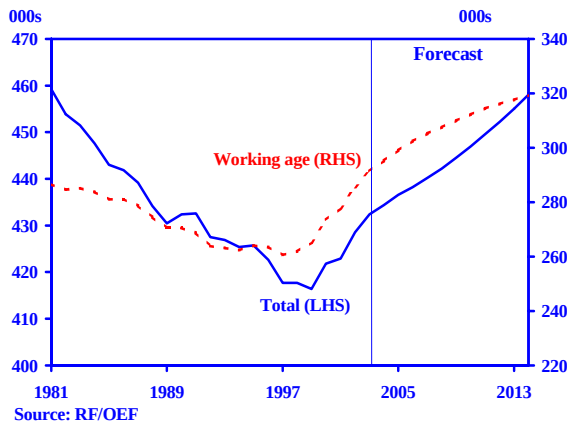


Figure 3.2



Figures 3.3 and 3.4 present the equivalent picture for Salford. International migration has made a much smaller contribution to Salford's population in recent years, and the forecast shows a continued fall in the overall population of the district of 4,000 between 2003 and 2016. Although the working-age element of the population shows some signs of stabilising, a renewed fall is likely by the second half of the forecast period – consistent with a general trend across most areas for the working-age share of the population to fall.

Figure 3.3

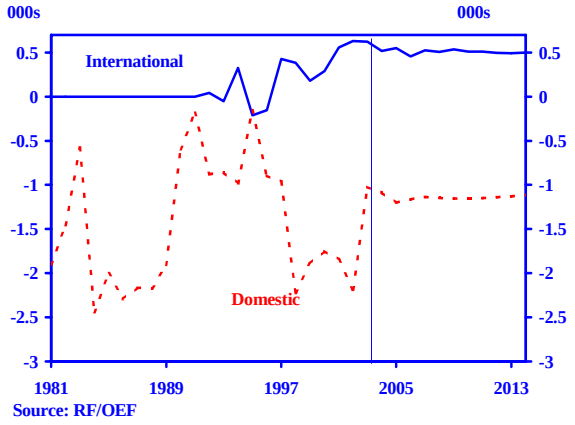
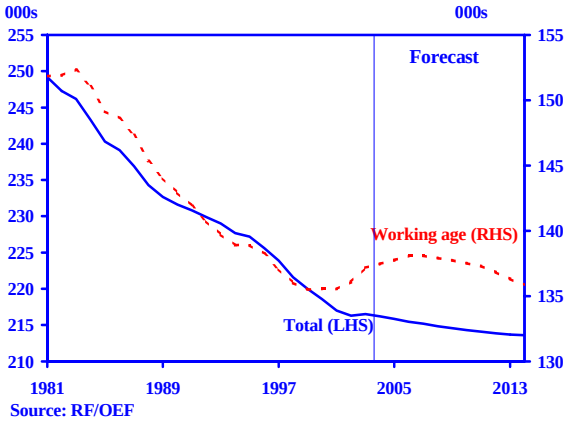


Figure 3.4



The impact of alternative assumptions

We have already stressed that the forecasts depend a lot on migration, but there is particular uncertainty about future international migration. This uncertainty applies both to forecasts of aggregate international migration into the North West (and the UK), and also how the aggregate figure breaks down between different local authorities. As discussed in chapter 2, our base case is derived using assumed shares of inward and outward international flows in official district-level projections.

To illustrate the uncertainties involved we have prepared an alternative set of projections based on information from the census on the destination of international migrants into the region (the first column of figures in Table 2.4). The corresponding shares of international migration are applied to both inward and outward international migration flows over the forecast, and the alternative scenario also assumes that net domestic migration is a bit closer to its longer-term average – figures 3.5 and 3.6 illustrate the impact of these alternative assumptions for net international and domestic migration flows into Manchester and Salford.

Figure 3.5

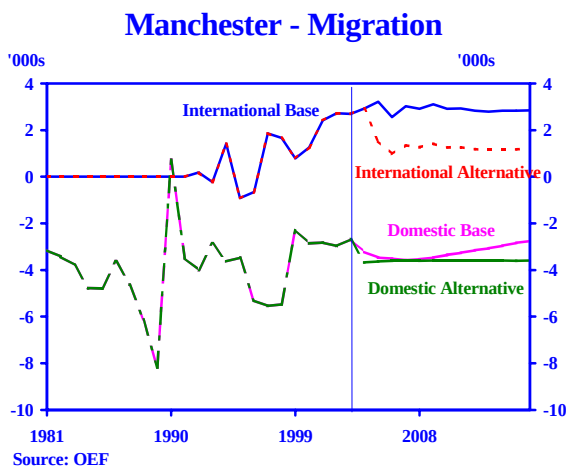
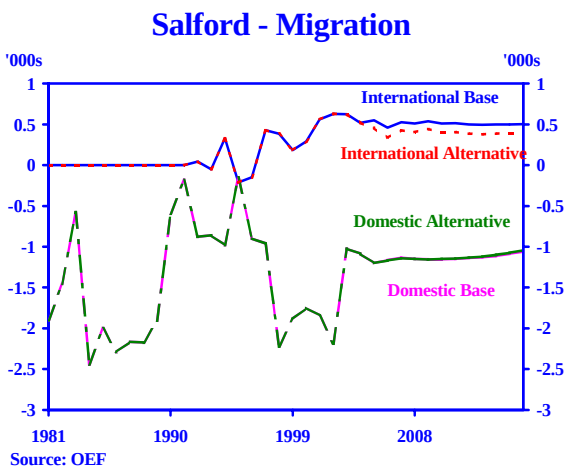


Figure 3.6



Although the impact on the migration projections looks relatively small and well within the possible range of outcomes, the effect on the population forecasts once this has fed through the full model is striking. Using the alternative assumptions outlined, Manchester's population is projected hardly to grow over the next decade – instead of rising from 432,000 in 2003 to 465,000 by 2016, the population is only projected to reach 439,000 by 2016 (Figure 3.7). The next chapter looks at the implications of these alternative demographic projections for the housing market. But it's also worth noting that there are implications for the economic forecasts. A rising population generates additional demand for local services in both the public sector (eg in schools and hospitals) and the private sector (eg retailing and personal services), and therefore tends to lead to higher employment. With the much smaller rise in population using the alternative assumptions, we would expect the total number of jobs in Manchester rise by around 18,000 fewer than in the base case.

Figure 3.7

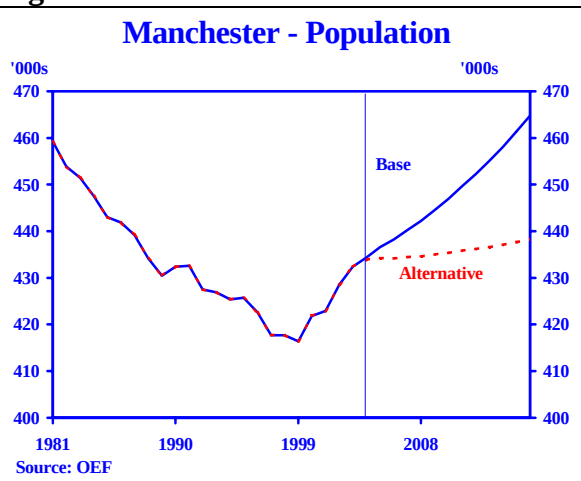
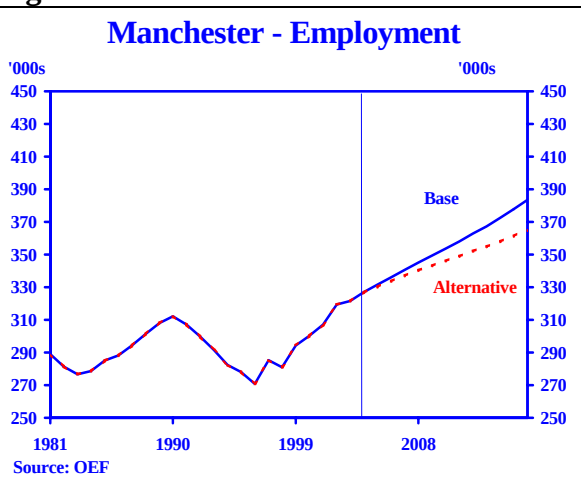


Figure 3.8



The impact of these alternative migration assumptions is less significant in Salford, given the much lower contribution international migration is expected to make to the population in the base case than in Manchester. The overall population is projected to fall from 216,500 in 2003 to 212,000 in 2016, compared with a fall to 213,500 in the base case (Figure 3.9). And the knock-on effect on employment is correspondingly limited, with only around 300 fewer jobs in the alternative case than in the base case (Figure 3.10).

Figure 3.9

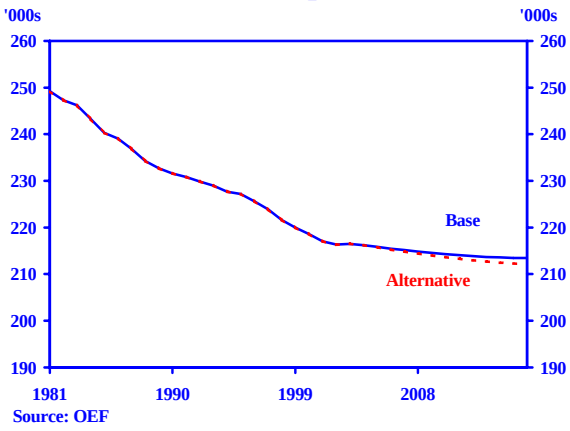
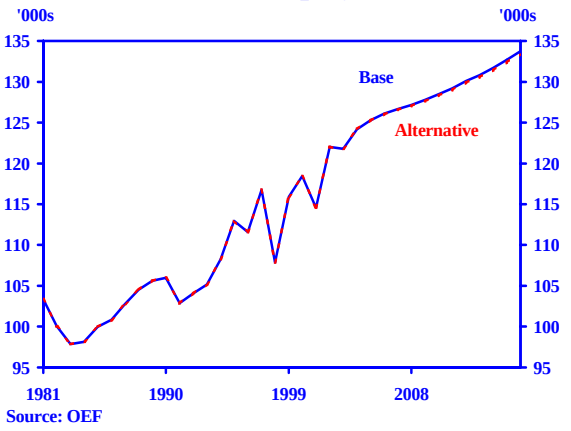


Figure 3.10



Conclusions

There are a number of key messages emerging from these results:

- Our base forecast suggests a strong rise in Manchester's population and a sharp slowing of Salford's decline.

- However, for Manchester in particular, this depends criticallyon flows of international migration into the North West, and on Manchester's share of these flows.

- This means that alternative plausible assumptions about Manchester's share of international migration could lead to much lower population growth than in our base projections.

One other point of potential relevance to housing market renewal emerges from the analysis of the determinants of migration. Both deprivation and high levels of vacancies tend to deter inward migrants. An important implication of this is that an improving position will tend to be self-reinforcing – increasing inward migration would, other things being equal, tend to reduce the number of vacant houses, which in turn would lower the disincentive effects on other potential migrants that high vacancies can represent. But there is also a corollary. Building new homes in an area of limited demand can increase the vacancy rate and therefore discourage inward migrants. This is the opposite effect that tends to be seen in regions of persistent high demand for housing such as the South East, where building new homes tends to increase inward migration by providing somewhere for the new people to live.

4. The Housing Model

Coverage

The geographical coverage of the housing model is the same as for the demographic model, with models constructed for each of the unitary authorities and counties within the North West region.

The housing, and other, models are constructed on an annual basis. Historic data is much more limited for housing than for most other elements of the system, and in a number of cases it has only been possible to collect data for the period 1998-2004. As with the demographic modelling, forecasts are discussed up to 2016, but we have extended the forecast period to 2021, and detailed tables showing figures for each year up to 2021, as well as the historical data where available from 1981, are provided in the Appendix.

The model produces forecasts for housing demand and supply, split between owner-occupied housing, the social rental sector and the private rental sector. There are also forecasts for housing vacancies, consistent with the supply and demand estimates, and for house prices relative to the regional average. The impossibility of sourcing adequate data means that we have not been able to distinguish between different sizes of houses (eg flats, terraced, semis and detached, or 1-bed, 2-bed, 3-bed, etc) within the housing model.

Data issues

The model requires a time-series of data for the key variables. In principle, a consistent stock-flow accounting of housing data over time would be desirable, so that in any period the change in the housing stock can be matched exactly to the level of completions less demolitions. But in practice the available data does not appear robust to enough achieve this consistency over time. The housing model uses Housing Investment Programme data on housing stock and combines this with data on completions and demolitions supplied by the local authorities themselves where available. Over the past, we allow for a residual category so that the system 'adds up'. In the historical data this residual may be large in any one year, but tends to cancel out over time, suggesting that one of the main inconsistencies between the different sources of data is in terms of timing differences. Over the forecast this residual category is set to zero, so that the housing flows identity is achieved by assumption.

A further complication is that the available data on vacant property does not always appear to be consistent with estimates of the number of vacant dwellings calculated by subtracting the numbers of households from the dwelling stock. Indeed, in some cases the vacancy data clearly look implausible. It is hard to reconcile the apparent increase in vacancies in Manchester over the past five years (see Chart 4.1) with the rising population of the district, for example. In the model we therefore define a 'model consistent' vacancy rate defined as the excess of properties over households, as a percentage of households. While the different direction of change in the recent past in Manchester makes it hard to reconcile this model consistent rate with the actual vacancy data, in the case of Salford (Chart 4.2), it has been suggested to us that a plausible real vacancy rate might lie half way between the two.

Figure 4.1

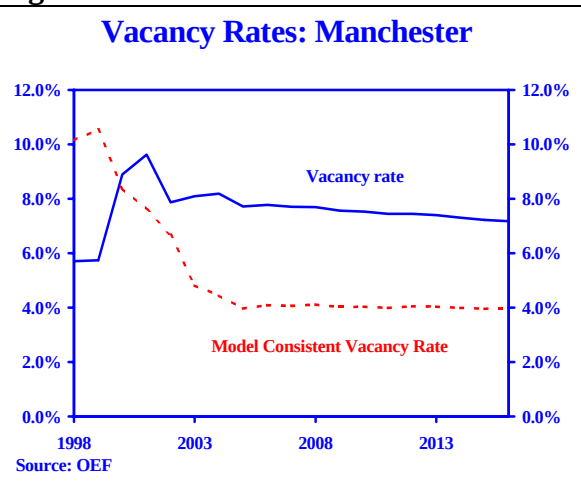
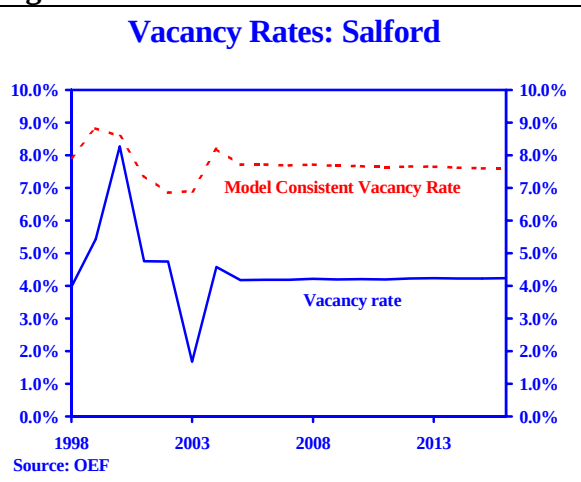


Figure 4.2



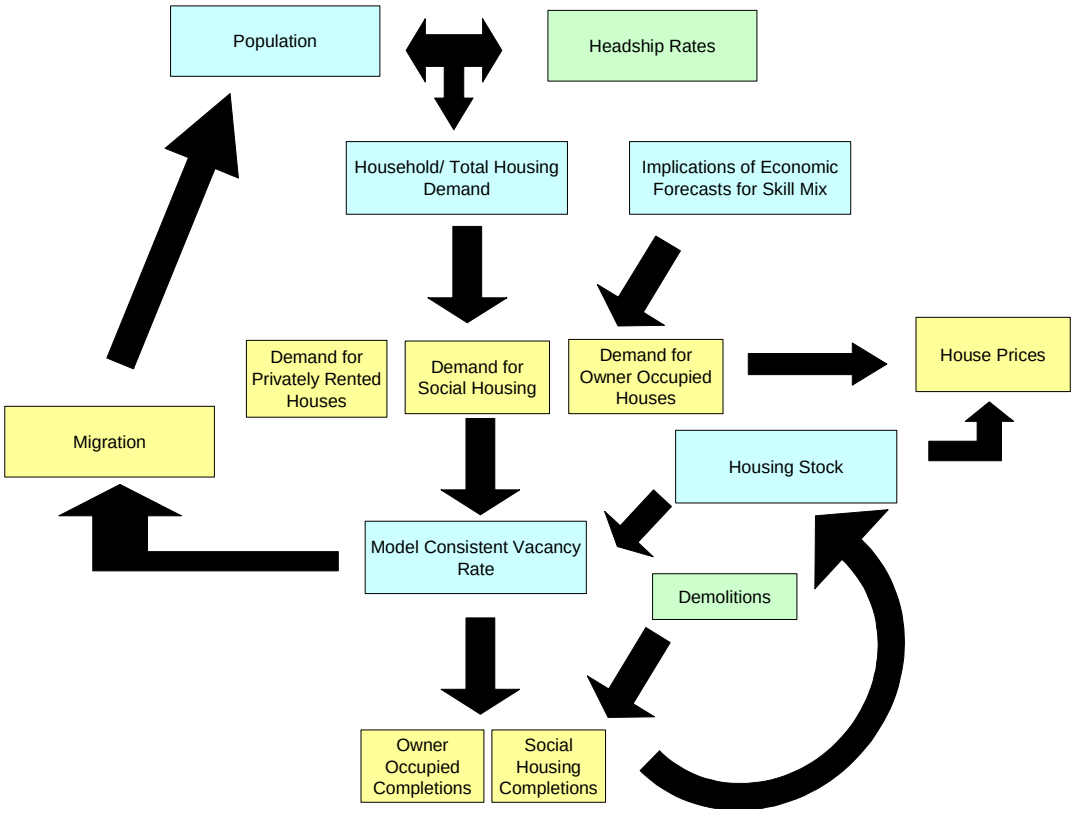
Model Structure

Figure 4.3 illustrates the basic structure of the housing model for each local authority. Key elements of this structure, which are discussed in turn below, are:

- the use of 'headship rates' to turn population forecasts into projections for the number of households forecast for each district;
- a breakdown of the number of households by tenure choice, to estimate demand for owner-occupation, social housing and private rented housing;
- modelling of the housing stock through demolitions and new completions; and
- modelling of house prices in each district relative to the regional average, depending on factors such as the degree of deprivation in the district and the prevalence of owner-occupation.

The diagram also illustrates feedbacks into the demographic part of the modelling through the impact on migration decisions (as discussed in Section 2) of vacancy rates, themselves derived from interactions between numbers of households and the housing stock.

Figure 4.3: The Housing Model



From Population to Households

The model produces forecasts for the population by five-year age groups (POPj). These are combined with estimates of the share of the population of each five-year age group who form households (rather than being part of someone else's household), known as the 'headship rate'. Table 4.1 illustrates how headship rates vary with age for broad age categories: in Manchester, 20% of 16-24 year olds form their own household, compared with 65% for 35-54 year olds. Headship rates are slightly lower in each age group in Salford, although the different age structure of the population means that the overall average headship rate is slightly higher.

Table 4.1: Headship rates by age (%)

	Manchester	Salford	North West
All ages	52.7	53.3	51.4
16-24	20.2	17.0	13.6
25-34	53.9	52.1	48.0
35-54	65.4	60.7	58.5
55-64	66.7	63.0	60.1
65-74	73.8	73.0	70.9

Source: OEF/RF calculations based on 2001 Census

Combining headship rates for each five-year age group with the detailed demographic forecasts allows us to estimate the number of households in each age group, and summing these gives a forecast for total households.

Forecasts for these headship rates need to reflect that the average household size continues to get smaller, implying rising headship rates over time. We have done this by ensuring that the average household size declines in a way consistent with official ODPM projections. This implies headship rates rising by an average of 0.35% a year.

Housing Demand for Owner Occupied Housing

Our forecast of households gives us the implied total demand for housing. In order to forecast the proportion of owner-occupied housing, we use our forecasts for the share of workforce of skill level 0 to 6 and apply the associated owner-occupied tenure rates. This effectively gives us a skill-weighted tenure rate that will track how changes in the composition of the workforce are likely to affect the demand for owner-occupied housing.

Previous research has found that it is more difficult to estimate the factors that determine the choice between different forms of renting than those that affect the owner-occupancy decision. For the non-owner-occupied sector, our projections of demand by hold the relative proportions of private rented housing and social housing constant.

The owner-occupation rates for the different skills levels are estimated from Census data. In practice, there are many other factors that might affect tenure choice, including the distribution of income, the effects of right-to-buy legislation, and so on, and the possible impact of these should be borne in mind when interpreting our results. However, the NVQ skills levels are part of the labour market forecasts covered by the economic model, making it possible to reflect expected changes over the future in the skills composition of the workforce.

Importantly, this methodology takes into account, in particular, the proportion of graduates in the workforce (NVQ 4/5) – as Table 4.2 shows, the owner-occupancy rate is substantially higher for graduates (for example, one in two in Manchester compared with one in three for those with no NVQs.) The table also illustrates how much lower owner-occupancy rates are in Manchester than in Salford, let alone the North West as a whole, with only 40% of households in Manchester being owner-occupied compared with just over two-thirds across the whole region. These differences are assumed to persist over the forecast in the results shown in Chapter 5, although to the extent that they represent different availabilities of different types of housing it's possible that policy decisions will have an impact on the scale of the differences.

Table 4.2: Owner-occupation by skills level (%)

	All	No NVQs	NVQ 4/5
Manchester	40.0	33.2	50.6
Salford	56.5	48.5	67.4
North West	68.7	60.9	78.4

Source: OEF/RF calculations from Census[4]

Housing Supply

The evolution of the housing stock (HS) will depend upon the number of completions and the number of demolitions each year. In practice these are to some extent policy variables. But in order to illustrate the implications of our other projections for housing, the model includes equations that aim to mimic the impact of policy that is, in a sense, 'neutral'. This means that demolitions are projected to continue at a level in line with the average over recent years, while completions are projected at a level that matches the change in housing demand in such a way that the model consistent vacancy rate remains broadly constant.

House Prices

The housing model also contains equations for average house prices in each district relative to overall North West average house prices. The equations show this relativity being affected by:

- the relative Index of Multiple Deprivation (IMD);
- the relative level of wages; and
- the relative share of owner occupied housing.

In practice, the key feed-backs from the housing model work through the effects on migration of changes in the property vacancy rate. House prices themselves are largely an output of the system rather than an input elsewhere in the model.

[4] The Census tables themselves provide a breakdown of tenure type by socio-economic group rather than by skills level. We use the distribution of skills levels within each socio-economic group to estimate the likely breakdown of tenure type for each skill level.

5. Housing Forecasts

Households

Any change in the overall demand for housing in Manchester and Salford over the forecast can come from at least two broad sources. First, the average size of a household may change over the forecast, so that even if the overall population is unchanged there may be a change in the demand for housing. Household sizes have indeed been falling over the last few decades, as the number of single households rise and as the average number of children per household falls. Therefore, for unchanged population we would expect the demand for housing to be rising over the forecast for Manchester and Salford. And, second, our forecasts for population in Manchester and Salford do indeed indicate some change over the projection: in the case of Manchester a rising population, while in the case of Salford a falling population. These forecast population changes will also imply that the demand for housing will change over the projection period.

Table 5.1: Household Projections for Manchester and Salford

	Manchester				Salford			
	2001	**2006**	**2011**	**2016**	**2001**	**2006**	**2011**	**2016**
Population (000s)	423	438	450	465	217	215	214	213
Households (000s)	180	192	204	219	94	95	98	100
Average Household Size	2.35	2.29	2.20	2.13	2.30	2.26	2.19	2.12

Source: OEF/RF forecasts

Our base case indicates that in Manchester there will be around 39,000 more households in 2016 than in 2001. This increase is driven by the 42,000 rise in overall population we expect by 2016, alongside a projected further decline in the average size of population per household consistent with the ODPM official projections. In Salford, our forecast is for population to fall by 4,000 by 2016. But this is offset by the decline in average household size, so that overall we expect there to be around 6,000 more households in Salford by 2016.

Tenure choice

The forecast growth in households therefore implies that the demand for housing will increase by 39,000 and 6,000 units in Manchester and Salford respectively. What form will this demand take? As explained in Chapter 4, our models allow us to break the extra demand down by owner occupation, privately rented accommodation and demand for social housing (see Table 5.2). In order to do this we allow for the fact that the demand for differing housing tenures will change over the forecast as the composition of the resident workforce changes over time. Over the projection our economic forecasts suggest that the occupational mix will shift further towards jobs requiring higher skills, and therefore earning higher wages. These higher skilled jobs are associated with a higher demand for owner occupied housing. Therefore our forecast suggests that the proportion of the demand for housing that is associated with owner occupation will rise (Charts 5.1 and 5.2). For Manchester, this implies that the demand for owner occupied housing will increase by around 15,000 by the end of 2016 – a little less than half of the overall increase in households. For Salford , the demand for owner occupied housing will increase by around 4,000- accounting for all the increase in households by 2016.

Table 5.2: Housing Demand Projections for Manchester and Salford

	Manchester				Salford			
	2001	2006	2011	2016	2001	2006	2011	2016
Overall (000s)	180	192	204	219	94	95	98	100
Owner Occupation (000s)	75	77	83	90	53	54	55	57
Private Rental (000s)	29	32	34	36	8	8	9	9
Social (000s)	76	83	88	93	33	33	34	35

Source: OEF/RF forecasts

Figure 5.1

The Demand for Housing: Manchester

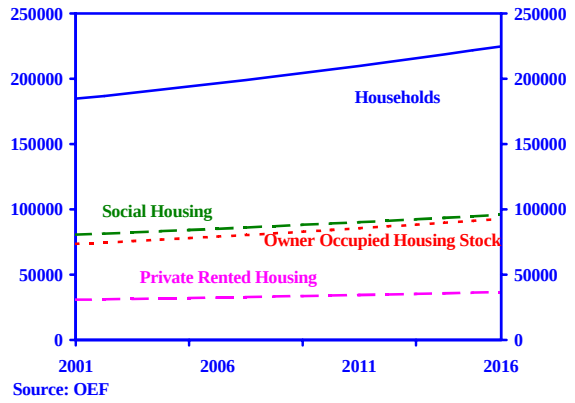
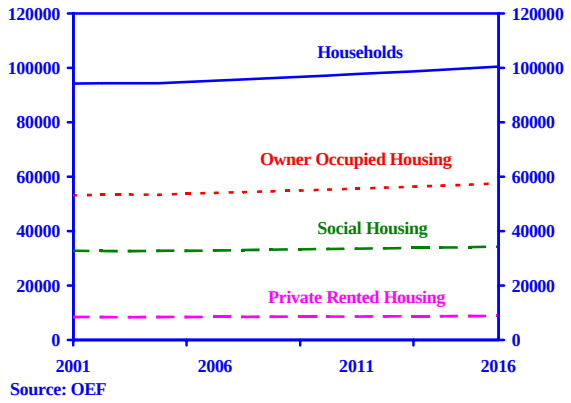


Figure 5.2

The Demand for Housing: Salford



Housing supply

How will the forecast increase in the demand for housing be met? Of course, this is partly a policy question. Our forecasts suggest that there will need to be a net increase of 2,600 dwellings a year being used in Manchester between 2001 and 2016. For Salford, this figure is much smaller, at around 380. But these net figures can be achieved by differing combinations of completions, demolitions and changes in the property vacancy rate. On the one hand, a given annual level of demolitions will imply that the level of completions will need to exceed these net figures by some margin. But, on the other hand, Manchester in particular appears to have a high rate of vacant properties, at least according to the reported vacancy data if not according to our estimates of the number of households and the number of houses. Any policy to reduce vacancy rates as part of re-generation efforts may imply the number of completions could be lower.

Chart 5.3 illustrates the implications of 'neutral' assumptions in Manchester. This means that demolitions are projected to continue at a level in line with the average over recent years of around 700 a year, while completions are projected at a level that matches the change in housing demand in such a way that the model-consistent vacancy rate remains broadly constant. To do this would, on the basis of the baseline housing demand projections above, require gross completions of over 3,000 a year, a very high rate compared with recent outturns.

Chart 5.4 illustrates the corresponding changes in housing supply in Salford on the basis of the same assumptions. Despite the projected continuing fall in population, the corresponding level of housing completions required is still relatively high compared with recent outturns.

Figure 5.3

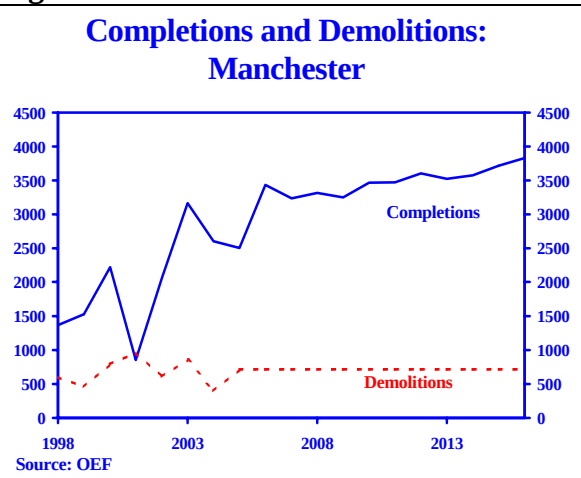
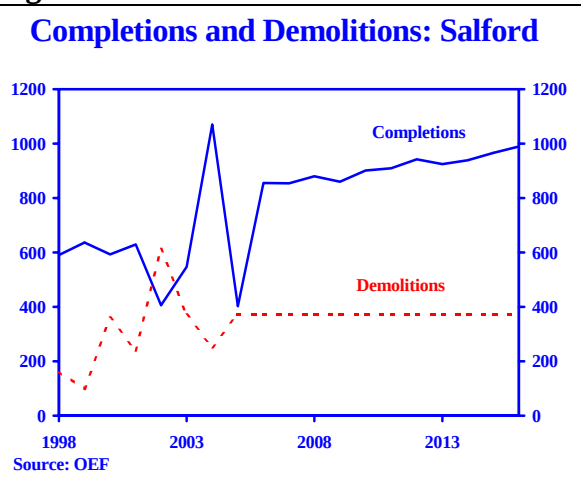


Figure 5.4



The implications of alternative population projections

These housing projections are obviously heavily dependent on the population projections, however. Chapter 3 looked at the implications for population growth of alternative forecasts for migration flows, and it is natural to consider what those alternative population projections might mean for the number of households and the required level of housing completions.

Charts 5.5 and 5.6 show the implications for Manchester. With a much more muted increase in population, the alternative scenario shows the number of households projected to rise by around 25,000 between 2001 and 2016 rather than the 39,000 in the base case. With the same assumptions about the responsiveness of housing supply to demand, the implied level of housing completions required would be somewhat below 2,500 a year, which looks a lot closer to what has been achieved in recent years.

Figure 5.5

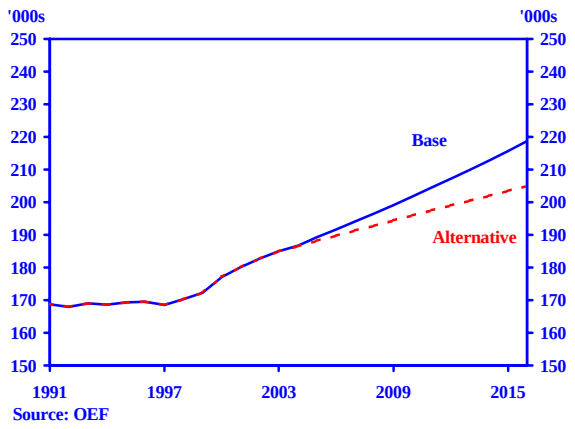
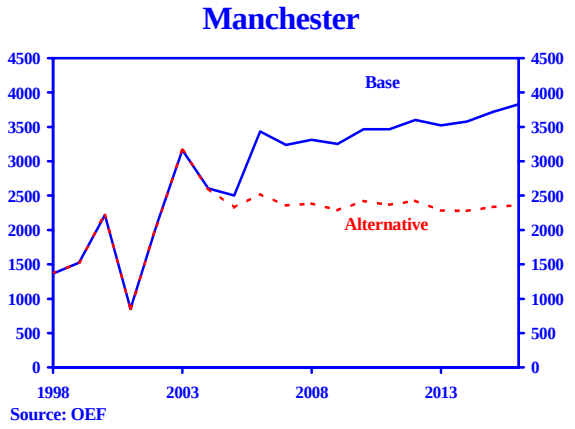


Figure 5.6



As discussed in Chapter 3, the alternative population scenario for Salford is rather closer to the base forecasts than is the case for Manchester - because international migration is a much less important source of population growth in Salford, changing assumptions about the level of international migration have a smaller impact. In terms of households (Chart 5.7), the projections still show a rise over the forecast period despite the larger fall in the projected population – once again, this is more than offset by expected falls in the average household size. With demolitions still set at the average of recent years (nearly 400 a year), housing completions would need to be a little under 1000 a year in order to meet the projected demand while leaving the vacancy rate broadly unchanged.

Figure 5.7

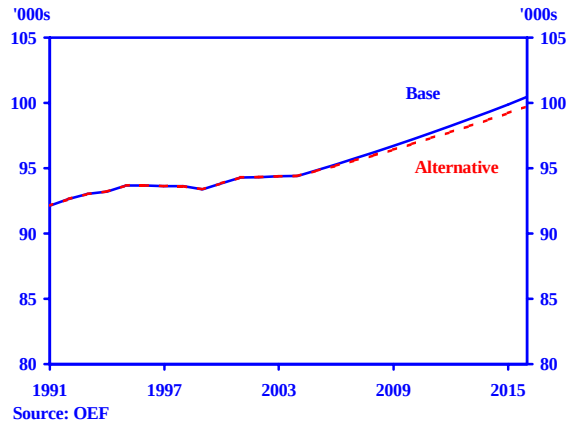


Figure 5.8

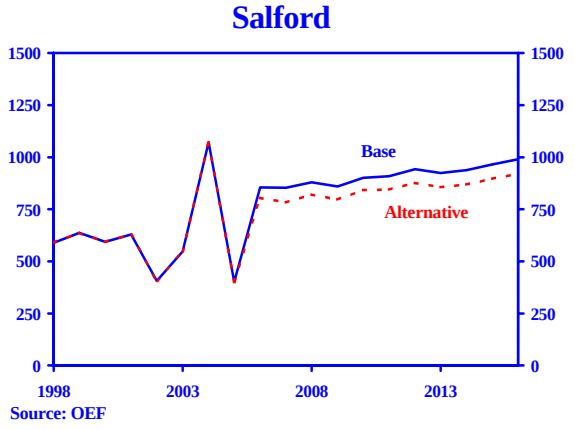


Table 5.3: Household Projections for Manchester and Salford - alternative case

	Manchester				Salford			
	2001	**2006**	**2011**	**2016**	**2001**	**2006**	**2011**	**2016**
Population (000s)	423	434	436	438	217	215	213	212
Households (000s)	180	190	198	205	94	95	97	100
Average Household Size	2.35	2.29	2.20	2.13	2.30	2.26	2.19	2.13

Source: OEF/RF forecasts

Table 5.4: Housing Demand Projections for Manchester and Salford - alternative case

	Manchester				Salford			
	2001	**2006**	**2011**	**2016**	**2001**	**2006**	**2011**	**2016**
Overall (000s)	180	190	198	205	94	95	97	100
Owner Occupation (000s)	75	76	80	84	53	53	55	56
Private Rental (000s)	29	31	32	34	8	8	9	9
Social (000s)	76	82	85	88	33	33	34	34

Source: OEF/RF forecasts

Conclusions

In summary, the implications of our housing market modelling for discussions about housing market renewal policy include:

- The number of households is likely to increase in both Manchester and Salford.
- Under the baseline forecast, the number of households is expected to increase by 39,000 in Manchester and 6,000 in Salford between 2001-2016.
- Even under an alternative scenario which assumes lower inward international migration, there are likely to be 25,000 extra households between 2001and 2016 in Manchester.
- Our economic forecasts suggest that the workforce will continue to become more highly skilled, more especially in Manchester with the nature of city centre jobs. This will drive further increases in the proportion of owner-occupied housing.
- The increase in housing stock implied by our baseline forecast requires a fairly high level of completions in both Manchester and Salford.
- But projections are heavily dependent on the outlook for migration, since this is a key driver of population.

It is worth bearing in mind that Manchester's population has been rising in recent years, and that the main house building recently has been in city-centre style apartments. This strongly suggests that rising demand has been forthcoming from the well-qualified workers who are

being drawn into the city centre labour market, and underpins the credibility of the outlook implied by our modelling which points to this pattern continuing as the nature of city-centre employment continues to be transformed[5].

[5] The conclusions of our companion 'Revised Economic Analysis and Forecast Report' discuss the implications of projected changes in the composition of the workforce in more detail.

APPENDIX

A) Detailed forecast tables

Table A1 – Population: Total

Table A2 – Outward domestic migration (working age)

Table A3 – Inward domestic migration (working age)

Table A4 – Outward international migration (working age)

Table A5 – Inward domestic migration (working age)

Table A6 - Natural increase in population

Table A7 - Households: Total

B) Migration scenarios

Notes page

Table B1 – Migration scenarios: summary results, Greater Manchester

Table B2 – Migration scenarios: summary results, Manchester

Table B3 – Migration scenarios: summary results, Salford

Table B4 – Greater Manchester sectoral employment changes, 10% migration scenario

Table B5 – Greater Manchester sectoral employment changes, 30% migration scenario

Table B6 – Greater Manchester sectoral employment changes, 50% migration scenario

TABLE A 1: Population: Total

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
								(thousands)														
Manchester	421.8	422.9	428.5	432.4	434.4	436.6	438.3	440.3	442.3	444.7	447.1	449.8	452.4	455.2	458.3	461.6	465.0	468.6	472.3	476.3	480.3	484.4
Salford	218.6	217.0	216.3	216.5	216.2	215.9	215.5	215.2	214.9	214.6	214.4	214.2	214.0	213.8	213.7	213.6	213.6	213.7	213.7	213.8	214.0	214.2
Bolton	260.2	261.4	262.3	263.8	264.1	264.5	264.9	265.3	265.6	265.9	266.1	266.3	266.5	266.7	266.9	267.1	267.3	267.5	267.7	267.9	268.2	268.4
Bury	180.8	180.7	181.3	181.9	182.4	183.0	183.5	184.0	184.5	184.9	185.3	185.6	185.9	186.2	186.5	186.7	186.9	187.2	187.4	187.6	187.8	188.0
Oldham	218.1	218.6	218.2	218.0	217.8	217.8	217.8	217.8	217.7	217.6	217.4	217.2	217.0	216.8	216.6	216.4	216.2	216.0	215.8	215.6	215.5	215.3
Rochdale	206.1	206.4	206.3	206.6	207.1	207.8	208.4	209.1	209.6	210.2	210.6	211.0	211.4	211.8	212.1	212.4	212.8	213.1	213.5	213.8	214.2	214.6
Stockport	284.4	284.6	283.5	282.5	282.2	282.1	282.2	282.3	282.4	282.4	282.3	282.2	282.0	281.8	281.6	281.5	281.3	281.1	281.0	280.9	280.8	280.7
Tameside	212.9	213.1	213.2	213.5	213.8	214.2	214.7	215.2	215.6	216.0	216.4	216.7	217.0	217.3	217.5	217.7	217.8	217.9	218.0	218.0	218.0	217.9
Trafford	211.3	210.2	210.6	211.7	212.5	213.1	213.3	213.5	213.7	214.0	214.2	214.4	214.6	214.9	215.1	215.3	215.5	215.7	215.8	215.9	215.9	215.9
Wigan	302.0	301.5	302.2	303.9	304.7	305.6	306.5	307.3	308.1	308.7	309.3	309.8	310.3	310.7	311.1	311.5	311.9	312.3	312.7	313.0	313.4	313.8
Liverpool	446.1	441.8	441.7	441.9	442.5	442.7	442.3	441.8	441.1	440.4	439.6	438.8	438.1	437.3	436.7	436.2	435.7	435.3	435.0	434.8	434.7	434.6
Halton	119.1	118.6	118.2	118.4	117.8	117.1	116.4	115.7	115.0	114.2	113.3	112.4	111.6	110.7	109.7	108.8	107.9	107.0	106.1	105.2	104.3	103.4
Knowsley	151.4	151.3	150.7	150.2	149.9	150.2	150.2	150.1	149.8	149.6	149.2	148.9	148.4	147.9	147.4	146.7	146.1	145.3	144.6	143.7	142.8	141.7
Sefton	283.4	282.8	281.8	281.6	281.4	281.0	280.5	280.1	279.5	278.8	278.1	277.3	276.5	275.6	274.7	273.7	272.8	271.8	270.9	270.0	269.0	268.1
St Helens	176.8	176.8	176.7	176.7	176.9	177.1	177.3	177.5	177.7	177.8	177.8	177.9	177.9	178.0	178.0	178.0	178.0	178.0	178.1	178.1	178.1	178.1
Warrington	190.7	191.2	191.8	193.2	194.2	195.1	195.9	196.7	197.4	198.0	198.7	199.3	199.8	200.4	201.0	201.5	202.1	202.7	203.4	204.0	204.7	205.4
Wirral	316.5	315.0	314.3	313.8	314.7	315.6	316.1	316.6	317.0	317.4	317.6	317.7	317.8	317.9	317.9	317.8	317.7	317.6	317.4	317.2	316.9	316.5
Cheshire	672.3	674.2	675.4	678.7	681.5	684.0	685.9	687.9	689.9	692.0	694.2	696.4	698.8	701.2	703.5	706.0	708.4	710.9	713.3	715.6	717.9	720.0
Lancashire	1132.8	1136.4	1141.2	1147.3	1153.1	1158.4	1162.4	1166.3	1170.2	1174.3	1178.5	1182.8	1187.2	1191.7	1196.1	1200.5	1204.9	1209.3	1213.5	1217.6	1221.4	1224.9
Blackpool	143.1	142.2	142.2	142.4	143.4	144.5	145.3	146.2	147.1	148.0	149.0	150.0	151.0	152.1	153.1	154.2	155.3	156.3	157.4	158.4	159.4	160.3
Blackburn	138.2	138.5	139.3	139.8	140.7	141.6	142.3	142.9	143.6	144.4	145.1	145.8	146.6	147.4	148.1	148.9	149.6	150.3	151.0	151.6	152.2	152.7
Cumbria	487.6	487.8	487.8	489.8	491.0	491.7	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.6	491.4	491.3	491.1	490.8	490.4	489.8	489.1	488.3
North West	**6774.2**	**6773.0**	**6783.5**	**6804.6**	**6822.3**	**6839.2**	**6851.3**	**6863.2**	**6874.0**	**6885.2**	**6895.5**	**6906.1**	**6916.5**	**6926.9**	**6937.0**	**6947.4**	**6957.9**	**6968.4**	**6978.8**	**6988.8**	**6998.3**	**7007.0**

Table A2: Outward domestic migration (working age)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
	(thousands)																					
Manchester	23.7	23.7	23.7	24.7	25.0	25.0	24.9	24.8	24.7	24.6	24.4	24.3	24.2	24.1	24.0	23.9	23.8	23.8	23.7	23.6	23.6	23.5
Salford	8.4	8.2	8.3	8.4	8.6	8.6	8.5	8.5	8.4	8.4	8.4	8.4	8.4	8.4	8.3	8.3	8.3	8.3	8.3	8.2	8.2	8.2
Bolton	5.9	5.9	6.1	6.3	6.2	6.1	6.0	6.0	6.0	6.0	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.0	6.0	6.0
Bury	5.5	5.2	5.2	5.3	5.3	5.2	5.2	5.2	5.2	5.2	5.2	5.3	5.3	5.3	5.3	5.4	5.4	5.4	5.4	5.4	5.4	5.4
Oldham	4.9	4.6	4.9	4.9	4.6	4.5	4.5	4.4	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.4	4.4
Rochdale	5.3	5.1	5.2	5.1	5.1	4.9	4.9	4.9	4.9	4.9	5.0	5.0	5.0	5.1	5.1	5.1	5.1	5.1	5.0	5.0	5.0	5.0
Stockport	8.0	7.8	7.9	7.7	7.6	7.4	7.2	7.2	7.2	7.3	7.3	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.3
Tameside	4.9	4.8	4.7	4.8	4.8	4.8	4.6	4.6	4.6	4.6	4.7	4.7	4.7	4.7	4.8	4.8	4.8	4.9	4.9	4.9	4.9	5.0
Trafford	7.7	7.2	7.3	7.4	7.2	7.3	7.4	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.6	7.6	7.6	7.7	7.7	7.8
Wigan	5.4	5.6	5.4	5.3	5.8	5.6	5.5	5.5	5.6	5.6	5.6	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.6	5.6

Table A3: Inbound domestic migration (working age)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
	(thousands)																					
Manchester	23.4	23.3	23.0	24.2	24.1	23.9	23.8	23.5	23.5	23.4	23.4	23.3	23.3	23.3	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.3
Salford	7.6	7.3	7.2	7.9	7.9	7.8	7.8	7.7	7.7	7.7	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Bolton	5.9	6.0	5.8	5.9	5.9	5.8	5.8	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
Bury	5.3	5.0	5.2	5.3	5.3	5.2	5.2	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Oldham	3.9	3.9	3.9	3.9	3.9	3.9	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Rochdale	4.8	4.6	4.7	4.8	4.8	4.7	4.7	4.7	4.7	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Stockport	7.8	7.4	7.4	7.6	7.5	7.5	7.4	7.4	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Tameside	4.5	5.0	4.9	5.0	5.0	4.9	4.9	4.9	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
Trafford	7.0	6.8	6.9	7.6	7.6	7.5	7.5	7.4	7.4	7.4	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Wigan	5.8	5.5	5.7	5.8	5.8	5.7	5.7	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.6

Table A4: Outbound international migration (working age)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
								(thousands)														
Manchester	3.6	4.0	4.0	4.0	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.7	3.7
Salford	0.8	0.9	0.9	0.9	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Bolton	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Bury	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Oldham	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Rochdale	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Stockport	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Tameside	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Trafford	0.7	0.7	0.7	0.7	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Wigan	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4

Table A5: Inbound international migration (working age)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
								(thousands)														
Manchester	4.7	6.1	6.4	6.4	6.4	6.6	6.1	6.5	6.4	6.6	6.4	6.4	6.3	6.3	6.4	6.4	6.4	6.4	6.4	6.4	6.5	6.5
Salford	1.1	1.4	1.5	1.5	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Bolton	0.7	0.9	1.0	1.0	0.6	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Bury	0.5	0.6	0.7	0.7	0.6	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Oldham	0.5	0.7	0.7	0.7	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Rochdale	0.5	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Stockport	0.8	1.0	1.0	1.0	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9
Tameside	0.4	0.5	0.5	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Trafford	0.9	1.1	1.2	1.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Wigan	0.5	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

TABLE A6: Natural increase in population

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
								(thousands)														
Manchester	7.0	1.6	5.9	4.0	2.3	2.4	2.6	2.6	2.6	2.7	2.8	3.0	3.0	3.1	3.2	3.3	3.3	3.4	3.4	3.6	3.6	3.5
Salford	0.1	-0.3	0.9	0.6	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5
Bolton	-0.1	0.4	1.1	1.3	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5
Bury	-0.3	-0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3
Oldham	1.0	1.1	0.9	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8
Rochdale	1.5	0.7	0.3	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7
Stockport	-1.6	0.4	-1.1	-1.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Tameside	-0.2	0.0	-0.3	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
Trafford	-1.1	-1.2	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Wigan	-0.2	0.0	0.4	1.4	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1
Liverpool	-0.6	-2.4	1.1	2.1	0.9	1.0	1.0	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8
Halton	-0.3	-0.2	-0.2	0.2	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0
Knowsley	0.1	0.2	-0.1	-0.2	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1
Sefton	-1.1	-1.3	-1.2	-1.1	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.8	-0.7	-0.7	-0.8	-0.7	-0.8	-0.8	-0.8	-0.9	-0.9
St Helens	0.1	0.1	-0.5	-0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1
Warrington	0.5	0.3	0.1	1.1	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1
Wirral	0.0	-1.1	-1.0	-0.8	-0.4	-0.4	-0.4	-0.4	-0.4	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3
Cheshire	-1.6	-1.6	-3.2	-1.6	-0.7	-0.7	-0.8	-0.8	-0.8	-0.8	-0.7	-0.6	-0.6	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4	-0.4	-0.5	-0.5
Lancashire	0.3	-1.8	-3.3	-1.5	-0.3	-0.2	-0.3	-0.4	-0.4	-0.4	-0.3	-0.2	-0.1	0.0	-0.1	0.0	0.0	-0.1	-0.1	-0.3	-0.4	-0.6
Blackpool	-0.7	-1.5	-1.1	-0.8	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Blackburn	1.0	1.0	1.2	0.7	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9
Cumbria	-2.7	-1.6	-3.2	-1.6	-1.3	-1.3	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.4	-1.3	-1.4	-1.4	-1.4	-1.5	-1.5	-1.6	-1.7	-1.8
North West	**1.27**	**-7.46**	**-2.73**	**4.21**	**5.45**	**5.84**	**5.39**	**5.11**	**4.86**	**5.12**	**5.58**	**6.21**	**6.63**	**7.21**	**7.28**	**7.49**	**7.53**	**7.41**	**7.23**	**6.75**	**5.98**	**5.19**

TABLE A7 - Households: Total

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
								(thousands)														
Manchester	177.1	180.1	182.7	185.0	186.7	189.3	191.7	194.1	196.6	199.2	201.8	204.6	207.2	209.9	212.8	215.8	218.8	221.9	225.1	228.4	231.8	235.2
Salford	93.9	94.3	94.3	94.4	94.4	94.9	95.3	95.8	96.2	96.7	97.2	97.8	98.3	98.8	99.4	100.0	100.5	101.1	101.8	102.4	103.1	103.8
Bolton	106.8	107.7	108.3	109.3	109.8	110.8	111.8	112.9	113.9	114.9	115.9	116.9	117.9	118.9	119.9	120.9	121.9	122.9	123.9	124.9	125.9	126.9
Bury	74.2	74.2	74.6	74.8	75.3	76.0	76.8	77.6	78.3	79.1	79.9	80.7	81.4	82.2	82.9	83.6	84.4	85.1	85.8	86.5	87.2	87.8
Oldham	87.9	88.1	88.0	87.9	88.1	88.6	89.2	89.8	90.4	90.9	91.5	92.1	92.6	93.2	93.8	94.3	94.9	95.5	96.1	96.6	97.2	97.8
Rochdale	83.0	83.5	83.6	83.9	84.4	85.3	86.3	87.2	88.1	89.1	90.0	90.9	91.8	92.6	93.5	94.4	95.2	96.1	97.0	97.9	98.7	99.6
Stockport	119.7	120.3	120.0	120.1	120.2	121.0	121.9	122.7	123.6	124.5	125.4	126.3	127.2	128.1	129.0	129.8	130.7	131.6	132.5	133.4	134.3	135.2
Tameside	88.7	89.1	89.2	89.9	90.7	91.5	92.5	93.5	94.4	95.4	96.4	97.3	98.3	99.2	100.1	101.0	101.9	102.7	103.6	104.4	105.1	105.9
Trafford	88.9	89.9	89.7	90.0	90.4	91.1	91.8	92.4	93.1	93.8	94.5	95.2	95.9	96.6	97.4	98.1	98.8	99.5	100.2	100.9	101.5	102.1
Wigan	124.7	125.0	125.6	126.4	127.3	128.8	130.2	131.7	133.1	134.5	135.8	137.2	138.5	139.8	141.1	142.4	143.7	144.9	146.2	147.4	148.7	149.9
Liverpool	187.7	188.2	188.6	188.8	190.0	191.6	192.9	194.2	195.3	196.5	197.6	198.7	199.8	200.9	202.0	203.1	204.3	205.5	206.7	208.0	209.3	210.6
Halton	47.7	48.0	47.9	48.3	48.2	48.4	48.6	48.8	48.9	49.1	49.2	49.3	49.3	49.4	49.4	49.5	49.5	49.5	49.5	49.5	49.5	49.4
Knowsley	60.3	60.7	60.7	60.7	60.9	61.5	62.1	62.6	63.1	63.6	64.0	64.5	64.9	65.3	65.6	65.9	66.2	66.5	66.7	67.0	67.1	67.2
Sefton	116.5	116.8	116.5	116.7	116.8	117.4	118.0	118.7	119.3	119.9	120.5	121.1	121.7	122.3	122.9	123.4	124.0	124.5	125.0	125.5	126.0	126.4
St Helens	72.1	72.5	72.4	72.8	73.3	73.9	74.5	75.1	75.7	76.3	76.9	77.6	78.2	78.8	79.3	79.9	80.5	81.1	81.7	82.3	82.9	83.4
Warrington	77.4	78.0	78.2	79.2	79.9	80.9	81.9	82.9	83.9	84.8	85.8	86.8	87.7	88.7	89.6	90.6	91.5	92.5	93.5	94.4	95.4	96.4
Wirral	133.9	134.3	134.2	134.3	134.9	136.2	137.4	138.6	139.8	141.1	142.3	143.5	144.7	145.9	147.0	148.2	149.3	150.4	151.5	152.5	153.5	154.4
Cheshire	278.1	279.6	281.0	282.8	284.6	287.3	289.9	292.5	295.2	298.1	301.0	304.1	307.1	310.2	313.3	316.4	319.6	322.8	325.9	329.0	332.1	335.1
Lancashire	464.4	467.9	471.5	474.8	479.2	485.1	490.7	496.3	501.9	507.8	513.7	519.7	525.8	531.8	537.9	544.0	550.0	556.0	562.0	567.9	573.7	579.3
Blackpool	63.8	63.6	63.5	63.5	63.9	64.6	65.3	66.0	66.7	67.5	68.2	69.1	69.9	70.7	71.6	72.5	73.4	74.3	75.2	76.1	77.0	77.9
Blackburn	53.3	53.6	53.9	54.0	54.6	55.3	56.0	56.7	57.4	58.2	58.9	59.7	60.5	61.3	62.1	62.9	63.7	64.5	65.3	66.1	66.9	67.6
Cumbria	207.7	208.6	209.3	210.6	212.0	214.1	215.9	217.8	219.7	221.7	223.6	225.6	227.6	229.6	231.5	233.4	235.3	237.1	238.9	240.6	242.1	243.6
North West	**2807.7**	**2823.8**	**2833.5**	**2848.1**	**2865.4**	**2893.4**	**2920.8**	**2947.9**	**2974.7**	**3002.4**	**3030.2**	**3058.5**	**3086.3**	**3114.1**	**3142.0**	**3170.1**	**3198.1**	**3225.9**	**3253.7**	**3281.5**	**3308.8**	**3335.4**

MIGRATION SCENARIOS – NOTES

We have constructed 3 alternative scenarios based on assumptions about reducing outward migration from Greater Manchester local authorities by 10%, 30% and 50%. It is important to bear in mind that these are not necessarily intended to be realistic for a variety of reasons:

1 We have not made any assumptions about what policies or other developments might bring this about.

2 In order to illustrate the potential impact on population and household dynamics we have imposed the reductions in outward migration onto net migration.

3 This means that we have not allowed for any feedbacks onto inward migration

4 In practice large changes in outward migration would be expected to impact on inward migration as well, for example through competition for housing.

These limitations are particularly important for the scenarios illustrating larger changes. In reality, if for any reason there were reductions in outward migration on the scale simulated, it would be inconceivable for the full effect to feed through into population changes, as rising house prices, for example, discouraged others.

TABLE B1: MIGRATION SCENARIOS - GREATER MANCHESTER

Greater Manchester - Base Scenario - consistent with figures released in August 2005

	2005	2015	2021
Population	2,540	2,584	2,613
Total Employment	1,302	1,387	1,454
Housholds	1,077	1,180	1,244

Greater Manchester - 10% Reduction in Outward Migration Scenario

	2005		2015		2021	
	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)
Population	2,550	9	2,690	106	2,782	169
Total Employment	1,305	3	1,435	49	1,535	81
Housholds	1,081	3	1,225	45	1,320	76

Greater Manchester - 30% Reduction in Outward Migration Scenario

	2005		2015		2021	
	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)
Population	2,568	27	2,903	2,903	3,120	536
Total Employment	1,311	9	1,531	1,531	1,693	307
Housholds	1,088	10	1,316	1,316	1,471	290

Greater Manchester - 50% Reduction in Outward Migration Scenario

	2005		2015		2021	
	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)
Population	2,585	45	3,102	518	3,437	824
Total Employment	1,317	15	1,620	233	1,839	386
Housholds	1,094	17	1,401	221	1,613	369

TABLE B2: MIGRATION SCENARIOS - MANCHESTER

Manchester - Base Scenario - consistent with figures released in August 2005

	2005	2015	2021
Population	437	462	484
Total Employment	331	377	413
Housholds	189	216	235

Manchester - 10% Reduction in Outward Migration Scenario

	2005		2015		2021	
	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)
Population	440	3	501	40	548	63
Total Employment	332	2	404	27	458	45
Housholds	191	1	234	18	265	30

Manchester - 30% Reduction in Outward Migration Scenario

	2005		2015		2021	
	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)
Population	447	10	580	119	674	190
Total Employment	336	5	457	80	546	133
Housholds	193	4	269	53	325	90

Manchester - 50% Reduction in Outward Migration Scenario

	2005		2015		2021	
	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)
Population	454	17	659	197	800	316
Total Employment	339	8	509	131	631	218
Housholds	196	7	305	89	385	149

TABLE B3: MIGRATION SCENARIOS - SALFORD

Salford - Base Scenario - consistent with figures released in August 2005

	2005	2015	2021
Population	216	214	214
Total Employment	125	133	139
Housholds	95	100	104

Salford - 10% Reduction in Outward Migration Scenario

	2005		2015		2021	
	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)
Population	217	1	227	13	235	21
Total Employment	126	0	139	6	149	10
Housholds	95	0	105	6	113	9

Salford - 30% Reduction in Outward Migration Scenario

	2005		2015		2021	
	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)
Population	219	3	252	39	276	62
Total Employment	126	1	151	18	169	31
Housholds	96	1	116	17	131	28

Salford - 50% Reduction in Outward Migration Scenario

	2005		2015		2021	
	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)	Number (000s)	Difference from base Scenario (000s)
Population	221	6	278	64	317	103
Total Employment	127	2	163	30	189	50
Housholds	97	2	127	28	150	46

Table B4: Changes in employee jobs by Sector - Greater Manchester
Difference between 10% reduction in out migration scenario and base scenario

	2005 (000s)	2015 (000s)	2021 (000s)
Employees - Agriculture	0.0	0.0	0.0
Employees - Extraction	0.0	0.0	0.0
Employees - Food Products; Bev. & Tob.	0.0	0.0	0.0
Employees - Textiles & Leather	0.0	0.0	0.0
Employees - Wood & Wood Products	0.0	0.0	0.0
Employees - Pulp Paper & Printing	0.0	0.0	0.0
Employees - Coke, Oil Ref.& Nuc. Fuel	0.0	0.0	0.0
Employees - Chemicals & Man Made Fibres	0.0	0.0	0.0
Employees - Rubber & Plastic Products	0.0	0.0	0.0
Employees - Other Non-Metallic Mineral	0.0	0.0	0.0
Employees - Metals	0.0	0.0	0.0
Employees - Machinery & Equipment nec	0.0	0.0	0.0
Employees - Electrical & Optical Equip.	0.0	0.0	0.0
Employees - Transport Equipment	0.0	0.0	0.0
Employees - Manufacturing nec	0.0	0.0	0.0
Employees - Electricity, Gas & Water Sup.	0.0	0.0	0.0
Employees - Construction	0.0	1.8	3.0
Employees - Distribution	0.7	8.6	13.8
Employees - Hotels & Restaurants	0.3	3.5	5.5
Employees - Transport & Communications	0.3	3.3	5.2
Employees - Financial Intermediation	0.2	1.9	3.0
Employees - Real Estate, Rent.& Business	0.0	7.6	14.8
Employees - Public Admin. & Defence	0.2	2.7	4.2
Employees - Manufacturing	0.0	0.0	0.0
Employees - Education	0.4	5.1	8.4
Employees - Health & Social Work	0.5	6.6	10.8
Employees - Other Personal Services	0.2	2.8	4.5
Employees - Total	**2.9**	**43.9**	**73.4**

Table B5: Changes in employee jobs by Sector - Greater Manchester
Difference between 30% reduction in out migration scenario and base scenario

	2005 (000s)	2015 (000s)	2021 (000s)
Employees - Agriculture	0.0	0.0	0.0
Employees - Extraction	0.0	0.0	0.0
Employees - Food Products; Bev. & Tob.	0.0	0.0	0.0
Employees - Textiles & Leather	0.0	0.0	0.0
Employees - Wood & Wood Products	0.0	0.0	0.0
Employees - Pulp Paper & Printing	0.0	0.0	0.0
Employees - Coke, Oil Ref.& Nuc. Fuel	0.0	0.0	0.0
Employees - Chemicals & Man Made Fibres	0.0	0.0	0.0
Employees - Rubber & Plastic Products	0.0	0.0	0.0
Employees - Other Non-Metallic Mineral	0.0	0.0	0.0
Employees - Metals	0.0	0.0	0.0
Employees - Machinery & Equipment nec	0.0	0.0	0.0
Employees - Electrical & Optical Equip.	0.0	0.0	0.0
Employees - Transport Equipment	0.0	0.0	0.0
Employees - Manufacturing nec	0.0	0.0	0.0
Employees - Electricity, Gas & Water Sup.	0.0	0.0	0.0
Employees - Construction	0.0	5.3	8.9
Employees - Distribution	2.2	25.7	41.2
Employees - Hotels & Restaurants	0.9	10.5	16.6
Employees - Transport & Communications	0.9	9.7	15.0
Employees - Financial Intermediation	0.5	5.6	8.7
Employees - Real Estate, Rent.& Business	0.0	22.4	42.9
Employees - Public Admin. & Defence	0.7	8.1	12.4
Employees - Manufacturing	0.0	0.0	0.0
Employees - Education	1.2	15.2	24.9
Employees - Health & Social Work	1.6	19.6	32.2
Employees - Other Personal Services	0.6	8.2	13.3
Employees - Total	**8.6**	**130.1**	**215.9**

Table B6: Changes in employee jobs by Sector - Greater Manchester
Difference between 50% reduction in out migration scenario and base scenario

	2005 (000s)	2015 (000s)	2021 (000s)
Employees - Agriculture	0.0	0.0	0.0
Employees - Extraction	0.0	0.0	0.0
Employees - Food Products; Bev. & Tob.	0.0	0.0	0.0
Employees - Textiles & Leather	0.0	0.0	0.0
Employees - Wood & Wood Products	0.0	0.0	0.0
Employees - Pulp Paper & Printing	0.0	0.0	0.0
Employees - Coke, Oil Ref.& Nuc. Fuel	0.0	0.0	0.0
Employees - Chemicals & Man Made Fibres	0.0	0.0	0.0
Employees - Rubber & Plastic Products	0.0	0.0	0.0
Employees - Other Non-Metallic Mineral	0.0	0.0	0.0
Employees - Metals	0.0	0.0	0.0
Employees - Machinery & Equipment nec	0.0	0.0	0.0
Employees - Electrical & Optical Equip.	0.0	0.0	0.0
Employees - Transport Equipment	0.0	0.0	0.0
Employees - Manufacturing nec	0.0	0.0	0.0
Employees - Electricity, Gas & Water Sup.	0.0	0.0	0.0
Employees - Construction	0.0	8.5	14.3
Employees - Distribution	3.5	41.7	66.6
Employees - Hotels & Restaurants	1.5	17.1	27.1
Employees - Transport & Communications	1.4	15.5	23.6
Employees - Financial Intermediation	0.8	9.0	13.6
Employees - Real Estate, Rent.& Business	0.0	35.9	68.2
Employees - Public Admin. & Defence	1.2	13.1	20.0
Employees - Manufacturing	0.0	0.0	0.0
Employees - Education	2.0	24.6	40.1
Employees - Health & Social Work	2.5	31.8	52.1
Employees - Other Personal Services	1.1	13.2	21.3
Employees - Total	**14.1**	**210.4**	**346.8**