Oxera

What is the economic impact of Jersey's ageing population?

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Strictly confidential

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1 Introduction

This background report is designed to provide the information required to inform policy-making with respect to Jersey's future population. There are a number of complex interactions between the economy of Jersey, the future population level and the demographics of that population. These interactions tend to present themselves as trade-offs between different dimensions of the possible outturns of population policies (or policies that have an impact on the size and make-up of the resident population). One significant trade-off is the potential size of the population (and hence the size of the economy) and the tax rates required to fund any particular level of public services.

To provide a consistent description of the interactions and trade-offs, a base case scenario is analysed—the 'nil net' migration scenario—and, in turn, the impact of changes from that scenario are analysed. In addition, the nil net scenario is in the first instance itself analysed in the context of the current economy to isolate the impact of the significant change in the make-up of the population that result from the demographic changes brought about by the ageing of the current population.

The main focus of the report is the next 30 years. However, the impact of any policies adopted over this period on the subsequent period(s) should also be taken into account to ensure that the short-term solution does not exacerbate the problem for subsequent generations. It should also be recognised that any analysis that is covering 30 years or more into the future is subject to considerable uncertainty and the scenarios in this report are not predictions as to the actual state of Jersey in thirty years time. What the scenarios try to illuminate is the relationships between population and the *relative* state of the Jersey economy and fiscal balance.

2 Jersey's population dynamics

The make-up of Jersey's population is significantly different from that of the UK. Using census and employment data it is possible to identify three fairly separate groups within the economy. The largest group is made up of long-term permanent Jersey residents (around 72,000 or 83% have been resident since birth or longer than 10 years, 64,000 resident since birth or longer than 20 years); the second group is temporarily resident for a number of years (around 15,000 or 17% have been resident for 10 years or less); and finally there are seasonal residents who live in Jersey for less than a year (but who may return for a number of years) (around 4,000 or an additional 5%).[1] These three groups have significantly different age profiles, and because members of the two latter groups are constantly being lost to and renewed from populations outside Jersey, they do not age in the same way as the permanent resident population. In addition, even the permanent population does not necessarily age in a straight forward way, as some of this group will leave the Island for many years before returning (with or without partners/children), and some will not return at all.

Because the temporary and transient groups make up such a significant part of the population at any one time, there is no single 'natural' evolution of the Jersey population. Therefore, a relatively arbitrary base case has been developed—the 'nil net migration' case—where the size of the temporary and transient populations is held more or less constant, and any net emigration of the permanent population is replaced by permanent inward migration of the same age. This is *not* necessarily the population that would result if it were left to follow its 'natural' course—mainly because the existence of both the transient and temporary populations is dependent on the economy, and the 'natural' level of emigration of the permanent population is also likely to be highly dependent on the economic base of the Island, which is itself currently dependent on the temporary and transient populations. In addition, there is evidence from the past demographic dynamics that the transient and temporary groups entering the Island in these categories are younger than those leaving—the resident population is therefore younger, on average, than may be expected. For this analysis the impact of the demographic changes is first estimated under the simplifying assumption that the resident population ages as normal. The main effects of the recycling[2] of the transient and temporary populations are incorporated in the tables in the main report, and described in more detail in Appendix 1.

Based on the current economy, the nil net migration outcome should be relatively straightforward to achieve. It therefore represents one of the reasonably plausible population projections and, therefore, a sensible base case from which to analyse the impact of higher (or lower) populations and the trade-offs between different population levels.

2.1 The population profile of the nil net scenario to 2065

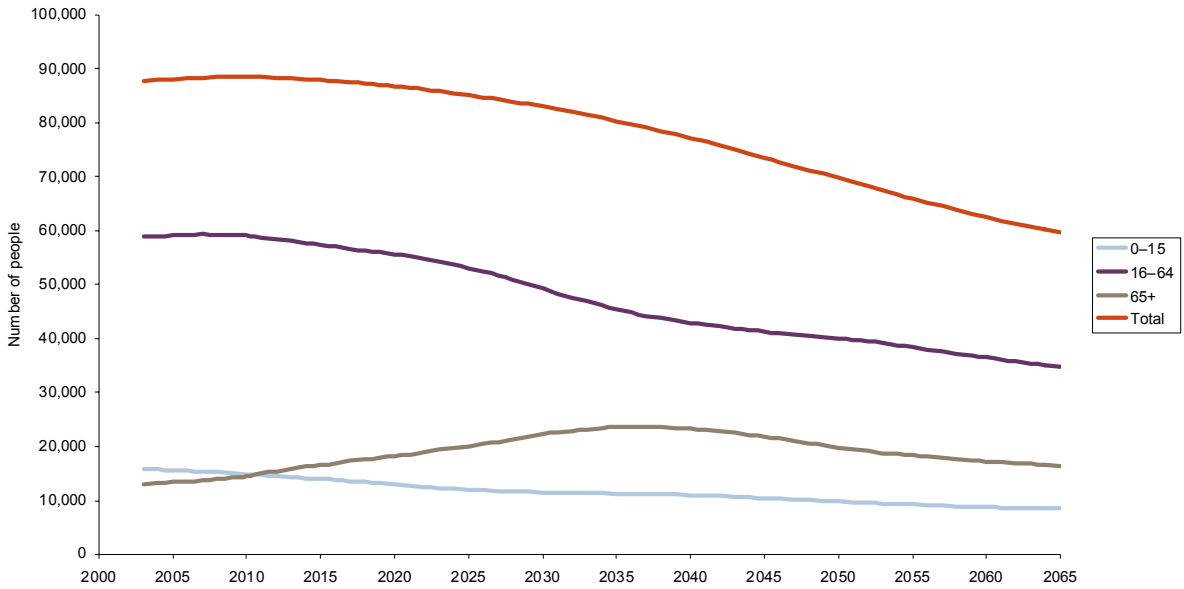
The main changes in the population over the next 30 years are the decline in the proportion of the population between the ages of 16 to 65, ie, the working population, and the growth in the population above working age. The population below working age also decreases. Total population increases slowly until around 2009, with a population of 88,500, and then declines

[1] States of Jersey, Report on the 2001 census, 2002, Chapter 3 and Appendix B. Only a small number of seasonal workers are resident on March 11th – when the census was carried out.

[2] See Appendix 1 for an explanation of population recycling.

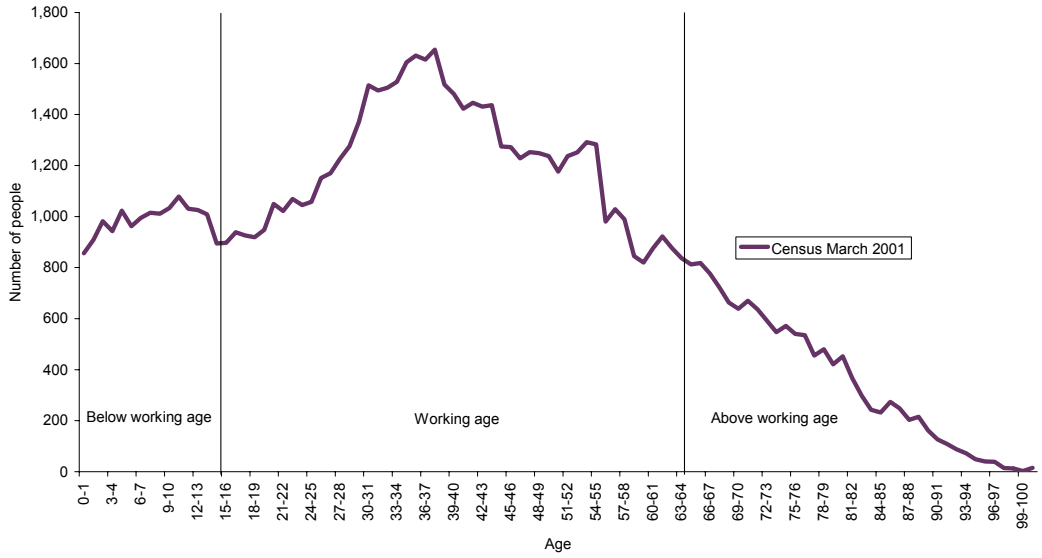
slowly so that, by 2013, it is back to current levels. By 2035 the population has fallen to around 80,000, and by 2065 has fallen significantly to around 60,000. Figure 2.1 shows the general population cohort trends, and Figures 2.2 to 2.9 show the population demographics in more detail at approximately ten-year intervals.

Figure 2.1 Population age cohorts to 2065—nil net migration



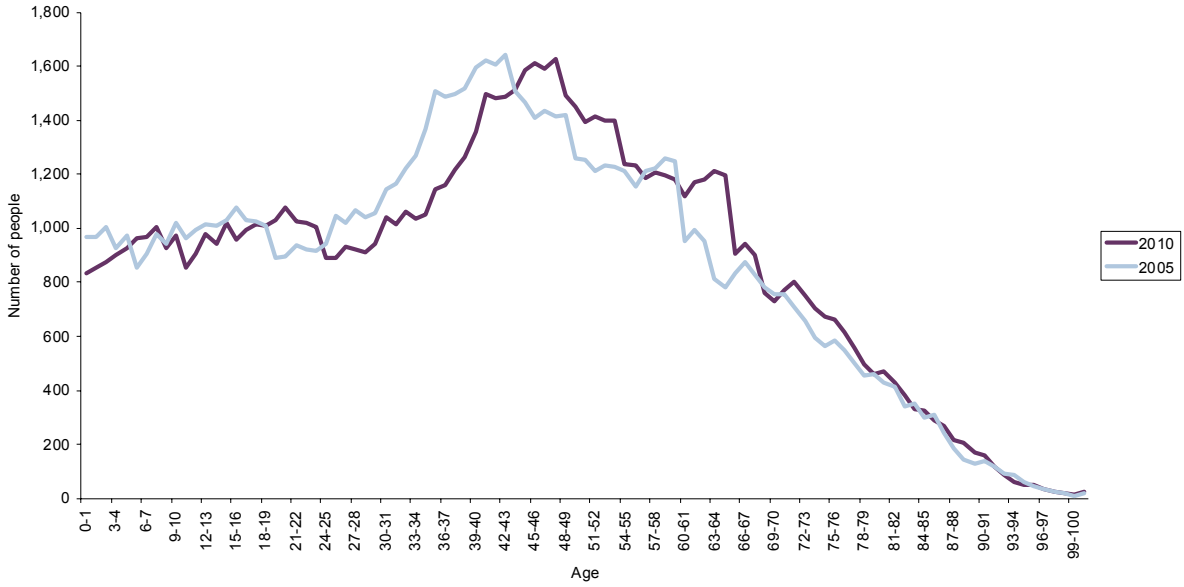
Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 2.2 Detailed population profile: 2001 census



Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 2.3 Detailed population profile: 2010, nil net migration



Source: States of Jersey, Statistics Unit: Oxera calculations.

Figure 2.4 Detailed population profile: 2020, nil net migration

Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 2.5 Detailed population profile: 2030, nil net migration

Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 2.6 Detailed population profile: 2035, nil net migration

Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 2.7 Detailed population profile: 2040, nil net migration

Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 2.8 Detailed population profile: 2050, nil net migration

Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 2.9 Detailed population profile: 2060, nil net migration

Source: States of Jersey Statistics Unit and Oxera calculations.

This overall change in the demographics of the Island population is similar to the population profiles that are likely to be faced by most Western European (and most developed) economies. The causes are mainly the decline in the birth rate, the rise in life expectancy, and the significant increase in the birth rate following the Second World War (the baby boom), which will shortly result in a 'boom' in the population over 65. As indicated above, in the case of Jersey, overlaying this general pattern is the temporary and transient population, as well as a significant working population that permanently migrated to Jersey since the end of the Second World War, many of whom are now also approaching retirement.

3 Fiscal effects of the ageing population: the nil net scenario

This general shift to an older population has a number of significant impacts on the economy and government finances (both on the income and expenditure side). Keeping the shape of the economy and the level of government services delivered to residents in each age group constant (to enable the isolation of the impact of the demographic changes), the following major changes can be identified.

3.1 Government expenditure

3.1.1 Education

As the population aged 16 years and under falls, the demand for education services falls and, therefore, the demand for teachers, schools, school buses, etc also falls. To deliver the same education package to each child will therefore require less total government expenditure on education. By 2035, under the nil net scenario, the under-16 population will have fallen to just over 11,000 from its current level of around 15,500. This represents a decline of around 28%. By 2065 it will have fallen even further to around 8,500—or a fall of around 45%.

If this reduction in demand can be translated into a similar reduction in the amount spent on education on the under-16 age group (see below), expenditure savings in the order of £20m (2005 base year, 2005 prices) may be possible by 2035, and £37m by 2065.[3]

3.1.2 Health and social services

As the number of elderly people increases the total expenditure on health services increases so does the total expenditure on health services. Table 3.1 sets out the average expenditure per age cohort on health and social services for Jersey using an approximate allocation of costs based on the 2005 budget report.

Table 3.1 Average expenditure per age cohort (2005): health and social services

Age group	£ per head	Ratio to average	Ratio to working age
0–15	1,877	1.3	1.9
Working age	991	0.7	1.0
Above working age	2,830	2.0	2.9
Average	1,447	1	

Source: Budget report 2006 and Oxera calculations

The UK Department of Health has also estimated the costs per age cohort (for 2003–04) for the UK NHS. Although this covers a narrower range of services, the pattern of relative costs is similar.

[3] These figures include changes in the provision of education services to other age cohorts.

Table 3.2 Average expenditure per age cohort (1999-00) on hospital and community health services in the UK[4]

Age group	Expenditure per head (from Department of Health expenditure plans, £)
0 (birth event)	2,655
0–4	794
5–15	185
16–44	327
45–64	459
65–74	949
75–84	1,684
Over 85	2,639

Source: Department of Health (2002), 'Departmental Report 2002'.

Applying these Department of Health numbers to the Jersey age cohorts produces the results set out in the table below.

Table 3.3 Average expenditure per age cohort: UK ratios compared with Jersey

Age group	£ per head	Ratio to average	Ratio to working age	Ratio to Jersey model[1]
0–15	538	0.96	1.4	3.5
Working age	380	0.68	1	2.6
Above working age	1,398	2.5	3.7	2.0
Average	563	1		2.6

Note: 1 When 2003-4 expenditure figures are used the ratio to Jersey reduces to an average of 1.9.
Source: Department of Health (2002), 'Departmental Report 2002', and Oxera calculations.

The UK ratios suggest that the method used to calculate the ratios of expenditure to age cohorts using the budget data is underestimating the resources spent on the treatment of those above working age. Applying the UK ratios of expenditure to the current Jersey expenditure on general and acute health services (where no age breakdown is provided for many expenditure categories) provides another approximation of the relationship between age and expenditure. Table 3.4 sets out the expenditure per age cohort using the UK ratios to allocate the total costs of general and acute health services to the age cohorts.

[4] The numerical breakdown of the figure in the Departmental Report is given by the Office of Health Economics at http://www.oheschools.org/ohech6pg7.html. Numerical data for later years is not readily available, but estimates from the graphs in the Departmental Report 2006 indicate that the ratio of costs remains fairly stable, with a slight increase in the relative costs of the 85+ cohort and a reduction in the relative cost of the below working age cohort.

Table 3.4 UK ratios applied to Jersey: average expenditure per age cohort

Age group	Expenditure per head (£)	Ratio to average
0–15	1,383	0.96
Working age	977	0.68
Above working age	3,595	2.5
Average	1,447	1.0

Source: Oxera calculations.

All of these methods of analysis produce the same general pattern. Apart from the event of birth, the average expenditure per person rises significantly for those over working age. As a result, the increase in the proportion of the population over 65 will increase the total costs of providing the same set of health services as are provided today.

However, even if the *current* allocation of costs to the age cohorts can be established, there is still some uncertainty about the precise impact of the ageing population. There are a number of explanations as to what is currently causing this underlying increase in average costs with age. If the 65 and above age groups are broken down further (see Table 3.2 above), the average costs continue to increase with age. However, there are likely to be at least two major underlying causes of this pattern. One is simply that as people get older they require, on average, more medical attention and services. The second is that those nearing the end of their life (eg, the terminally ill) require (again, on average) significantly more medical intervention and services. Like the event of birth, there is a spike in costs at (or, more precisely, just before) death. For the older cohorts, a greater proportion of that group will die in any one year, and as a result the *average* health costs per person increases with age.

As the baby-boomers enter into retirement it is not fully predicable whether the cost pattern will follow the existing age pattern or whether their average health costs will remain low (ie at their pre 65 levels until (just before) death. It is likely that both effects will be present in some degree.

If the former pattern predominates then, as life expectancy increases, the average cost per person per year of those over 65 rises. If the latter effect predominates, then as life expectancy increases the *average* cost per person over 65 falls (slightly). In the base case for this analysis the average annual cost per person over 65 has been kept constant.

Under the nil net migration scenario the health and social services costs will rise and then fall following the demographic changes. By 2035 the additional expenditure required on this account is in the order of £5m to £20m. By around 2040 to 2050 expenditure has returned to current levels as a result of the decline in the total population offsetting the increase in the average costs per head of population, which have increased from around £1,500 in 2005 to between £1,650 and £1,840 by 2035.

3.1.3 Social security

A significant element of social security spending is the States' pension. The liability for this expenditure is incurred by the contributions made by those working in Jersey, and as the population ages, the proportion of the population with those entitlements will increase. (In addition, there are entitlements with respect to those who have worked in Jersey but who now live elsewhere, particularly the past temporary population who have since moved on.) Most of the expenditure on pensions is, however, funded by the *current* contributions of

those working, not the contributions made in the past by those who are now receiving the pension. This is known as the pay-as-you-go (PAYG) principle, and is common for government-funded systems.[5] However, under PAYG schemes, as the total funding requirement rises when more people qualify to draw a pension, the contributions of those still in work and contributing to the scheme has to rise, to cover the increase in current expenditure. This increase can arise in two forms: if the number of people in work increases, individual contributions can remain the same, but the total paid in contributions rises; or the individual contributions can rise (eg, by raising the contribution rate, or raising the contribution ceiling).

Under PAYG systems a simple increase in the number of people in work, and therefore making contributions, also has the effect of increasing the *future* liabilities of the scheme, so may delay, rather than cure, the problem unless the workforce can be perpetually increased.

A further approach is to reduce the total benefits payable under the scheme. For example, by delaying the time at which a pension is claimable the total paid out to any pensioner will decrease, as the length of time they will be paid a pension will be shorter. In addition, if the impact of raising the pension age is for people to remain in work longer, the current income of the PAYG scheme increases as well.

However, if the payments in and benefits paid are kept constant, the impact of an ageing population on a PAYG scheme is to simultaneously increase expenditure and decrease income. Under the nil net scenario, the expenditure on social security will have risen by around £68m by 2035. After this point the *total* expenditure on this item starts to decline, reflecting the absolute decline in the total population and in the population above 65. However, average expenditure per head of population and particularly average expenditure per head of working age population, continue to rise until around 2040 and 2060 respectively. These average expenditures have increased significantly— from around £2,000 per head of total population and £3,000 per head of working population in 2005 to around £3,000 and £5,500 respectively in 2035 and to around £3,000 and £5,000 respectively by 2065.

3.1.4 Other government expenditure

Although spending on social security, health and education represents the majority of government expenditure, it is not all of it. In 2005 the States spent an additional £122m on other activities and capital expenditure was in the order of £40m.[6] Although this expenditure is not significantly related to the demographic profile of the Island, it is likely to be related to the total population. As a first approximation, this total expenditure of £162m has been increased or decreased in proportion to the predicted total population of the Island. On this basis, under the nil net scenario, the expenditure under this category will vary as set out in Table 3.5.

[5] Where the pension is funded from the contributions made by those receiving the pension, this is known as the fully funded principle and it is the basis of most private sector pension schemes (although with pension deficits, this principle is not always fully adhered to).

[6] The net expenditure by the following Committees is included in this figure: Home affairs, Environment and Public Services, Finance and Economics, Economic Development, Policy and Resources, Overseas Aid, Privileges and Procedures, Housing, and Other. The capital expenditure is taken as an approximate average of what has been voted recently.

Table 3.5 Average expenditure per total population: other government expenditure

	2005 base	2035 total	Change to 2035	2050 total	Change to 2050	2065 total	Change to 2065
Other government expenditure (including capital) (£m)	162	148	–14	128	–34	110	–53
Average expenditure per head of total population (£)	1,840	1,840	0	1,840	0	1,840	0
Average expenditure per head working age population (£)	2,786	3,254	468	3,201	415	3,155	369

Source: States of Jersey, Financial Report and Accounts, 2005, and Oxera calculations.

As the total population has fallen slightly by 2035, total expenditure in this category has also fallen, although the change in demographics means that expenditure per head of working age population has grown significantly to 2035, and then starts to decline.

3.1.5 Combined effects

The overall impact on expenditure of the ageing population is set out in Table 3.6.

Table 3.6 Average expenditure per total population: all government expenditure

	2005 (base)	2035 total	Change to 2035	2050 total	Change to 2050	2065 total	Change to 2065
Social security (£m)	180	249	68	211	30	176	–4
Health and social services (£m)[1]	127	147	20	126	–2	106	–22
Education (£m)	91	69	–22	61	–30	54	–37
Other government expenditure (including capital) (£m)	162	148	–14	128	–34	110	–53
Total (£m)	**561**	**613**	**52**	**526**	**–35**	**445**	**–115**
Average per head of total population (£)	6,361	7,627	1,266	7,543	1,183	7,475	1,114
Average per head of working population (£)	9,632	13,491	3,859	13,127	3,495	12,820	3,188

Notes: [1] Using the UK ratios for the assumption of the current expenditure by age cohort.
Source: States of Jersey, Financial Report and Accounts, 2005, and Oxera calculations.

Table 3.7 sets out the same information under the assumption that the transient and temporary populations continue to be recycled (see Appendix 1 for more details).

Table 3.7 Average expenditure per total population: all government expenditure, with population recycling

	2005 (base)	2035 total	Change to 2035	2050 total	Change to 2050	2065 total	Change to 2065
Social security (£m)	180	243	62	209	29	182	1
Health and social services (£m)[1]	127	145	17	125	–2	109	–19
Education (£m)	91	70	–21	61	–30	55	–36
Other government expenditure (including capital) (£m)	162	147	–15	129	–33	111	–51
Total (£m)	561	605	44	524	–37	456	–105
Average per head of total population (£)	6,357	7,539	1,182	7,474	1,118	7,539	1,182
Average per head of working population (£)	9,627	13,184	3,558	12,846	3,219	13,105	3,478

Notes: [1] Using the UK ratios for the assumption of the current expenditure by age cohort.
Source: States of Jersey, Financial Report and Accounts, 2005, and Oxera calculations.

The impact of recycling is relatively small—being slightly positive (lower expenditure per head) up to 2050, and slightly negative after that.

3.2 Tax revenues

The current (2005) major sources of tax revenue for the government are:

– income tax paid by people: £192m (35%);[7]
– income (profits) tax paid by corporations, partnerships, etc: £185m (34%);[8]
– excise taxes on tobacco, alcohol, petrol, etc (Impôts): £50m (9%);[9]
– in addition, for the purpose of this analysis, social security contributions from both employers and employees can be analysed as a type of tax: £115m (21%).[10]

This results a total income of around £542m.

By the time the population starts to exhibit significant demographic change from the current position GST is likely to be an additional major source of taxation revenue, and the contribution of income taxes paid by corporations (but not Jersey resident shareholders) will have declined. (See, for example, States of Jersey, P104, Fiscal Strategy, lodged June 2004 for an explanation of this change.)

Broadly speaking, if the tax *rate* is held constant, the tax yield from the taxes set out above will vary in the following way:

– Income tax paid by people varies with the total personal income, but a decline in the average income of, for example, 10% leads to a reduction of more than 10% in total tax receipts because of the progressive nature of the tax (the *marginal* rate of tax faced by people is higher than the *average* rate of tax).

[7] States of Jersey, Financial Report and Accounts, 2005.
[8] Ibid.
[9] Ibid.
[10] States of Jersey, 'Report and Accounts 2005', Social Security Department

– Income (profits) tax paid by corporations varies with the size of the work force (marginal and average rates of tax are essentially the same).

– GST varies with the total personal income of the Island, with a minor variation dependent on the size of the tourism sector of the economy (average and marginal tax rates are essentially the same).

– Impôts vary with the total expenditure on goods subject to this tax. A first approximation is that expenditure on these items will remain a fairly constant proportion of total personal disposable income on the Island. However, to the extent that these items are essential for those who consume them (eg, cigarettes) consumption may not decline as rapidly as personal income declines, so the tax revenues will not decline as quickly as total personal incomes.

– Social security contributions will vary in proportion to the working population.

The effect of the ageing population on these tax bases is largely as follows.

– The total working population reduces reducing the total economic activity on the Island. Hence corporate income taxes and employers' and employees' contributions fall.

– The total population above 16 years of ages increases (and then falls), so the population with an income and, therefore possibly paying income tax, increases.

– The average income of those above working age is generally lower than those of working age, so the *average* income per person above 16 (ie, including those of working age and those above working age) falls. As a result, the average *rate* of income tax falls.

– The combination of a greater population above working age, but with a lower average income, results in the total personal income of the Island falling, combined with a fall in the average personal income tax rate. This means that total personal income taxes fall.

– The lower total personal income also results in the total tax revenue from GST falling.

– The impact on Impôts is more difficult to estimate, since the increase in the number of people over 16 who can consume the main tax bases—alcohol, tobacco and motor fuel—may well balance the effect of the reduction in average incomes.

Table 3.8 sets out the approximate effect on these taxes.

Table 3.8 Combined impact of revenue effects: nil net scenario (£m)

	2005 (base case: estimate after 0/10 and introduction of GST)	2035	2050	2065
Income tax: personal	202	179	156	134
Income tax: corporate	100	77	68	59
Social security contributions	116	89	78	68
GST	45	41	36	30
Impôts	50	45	39	34
Other[1]	40	40	40	40
Total	553	471	417	365

Note: [1] Other income: stamp duty and other income as reported in States of Jersey, 'Report and Accounts 2005', Social Security Department. It is assumed that this income item does not vary with population size or make-up.
Source: Oxera calculations.

Table 3.9 sets out the impact with recycling.

Table 3.9 Combined impact of revenue effects: nil net scenario (£m), with population recycling

	2005 (base case: estimate after 0/10 and introduction of GST)	2035	2050	2065
Income tax: personal	202	179	158	135
Income tax: corporate	100	78	69	59
Social security contributions	116	90	80	68
GST	45	41	36	31
Impôts	50	45	40	34
Other[1]	40	40	40	40
Total	553	472	422	367

Note: [1] Other income: stamp duty and other income as reported in States of Jersey, 'Report and Accounts 2005', Social Security Department. It is assumed that this income item does not vary with population size or make-up.
Source: Oxera calculations.

There is a small positive impact (up to £5m in total) from recycling the population under the nil net scenario. The impact is more significant with higher levels of net inward migration (see Appendix 1 for more details).

The change from the 2005 position can also be calculated, and this is shown in Table 3.10.

Table 3.10 Combined impact of revenue effects—change from 2005: nil net scenario (£m), no recycling of population

	2005 (base-estimate after 0/10 and introduction of GST)	2035	2050	2065
Income tax: personal	0	–23	–46	–68
Income tax: corporate	0	–23	–32	–41
Social security contributions	0	–27	–37	–48
GST	0	–4	–10	–15
Impôts	0	–5	–11	–16
Total	**0**	**–82**	**–136**	**–188**

Source: Oxera calculations.

The combination of the impact on expenditure and revenues gives an indication of the overall fiscal impact of the ageing population. This combination shows the deterioration in the fiscal position of the government. If the government balanced its budget today (under the assumption of 0/10 and GST introduction), this deterioration would represent the approximate expenditure deficit. However, in this analysis the government would not be balancing its books in 2005 under these assumptions. There are a number of reasons for this.

– Although the social security system is largely PAYG, it is currently running a considerable surplus, largely as a result of the (partial) anticipation of the increasing

liability of future pension payments due to these demographic changes. The 2005 surplus was in the region of £20m–£25m.[11]

– If 0/10, 20=20 and GST were applied to the 2005 economy, the total tax take would fall, by around £30-£40m. Under the current fiscal strategy, this £30-£40m is to be met by around £20m in expenditure savings and around £20m from the impact of economic growth on tax revenues.

For the purposes of this analysis, the government was running a net 'deficit' in 2005 of around £10m–£20m. Strictly speaking, this should be added to net change to fiscal balance as a result of demographic changes to estimate the current account balance in the future. However, for the purposes of this analysis, a simplifying assumption has been made that action has already been taken to address this deficit. Therefore, all the results are reported in terms of changes from the 2005 position.

Table 3.11 shows the overall impact under the assumption of keeping everything constant except the demographics of the population, and assuming a balance in government expenditure and income in 2005. Figure 3.1 shows the development of the fiscal balance through to 2065. Table 3.12 shows the impact under the assumption of population recycling.

Table 3.11 Combined impact of revenue and expenditure effects: nil net scenario, static economy

	2035	2050	2065
Net change in fiscal position (£m)	–135	–101	–73
Deficit as % of total income	–31	–27	–22
Accumulated current account deficit, excluding interest payments (£m)	–1,586	–3,486	–4,726

Source: Oxera calculations.

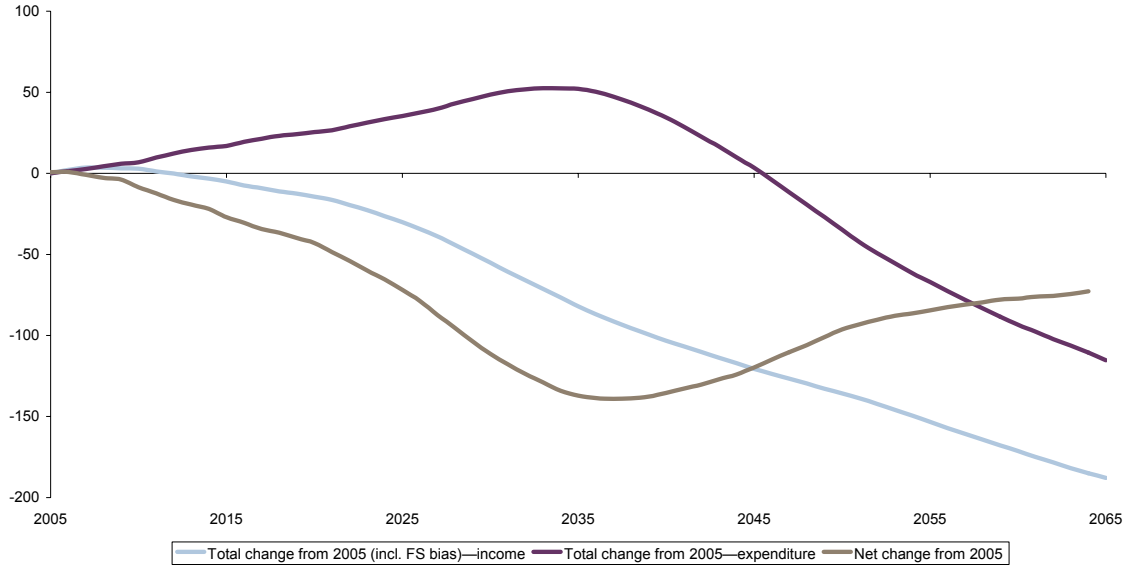
Table 3.12 Combined impact of revenue and expenditure effects: nil net scenario, static economy, population recycling

	2035	2050	2065
Net change in fiscal position (£m)	–125	–94	–81
Deficit as % of total income	–27	–22	–22
Accumulated current account deficit, excluding interest payments (£m)	–1,516	–3,188	–4,512

Source: Oxera calculations.

[11] States of Jersey, 'Report and Accounts 2005', Social Security Department.

Figure 3.1 Development of the fiscal balance to 2065: nil net, static economy (£m)



Source: Oxera calculations.

The outcomes set out in Table 3.11 and Figure 3.1 show the fiscal impact of an ageing population, assuming that, in general, the economy stays the same. Looking ahead to 2035 (when this assumption is not particularly realistic), the economy will change as a result of other factors, irrespective of the ageing population. As a result, the actual fiscal outturn will not be that set out above. Indeed, the accumulated deficits by 2035 would imply fairly large interest payments by the government, which could have a significant impact on the stability of the economy. Action of some sort would almost certainly have been taken by 2035 to address the deficits.

However, notwithstanding these limitations, the analysis set out above does give some indication of the stress that will be placed on the economy as a result of the demographic changes that will take place—demographic changes that are significantly different from those that Jersey has experienced over the last 30 years. Therefore, over the next 30 years the types of action that are likely to be required to address these stresses in the economy may differ from those which have enabled Jersey's economy to grow and for the government to balance its books (and indeed to run a net budget surplus) in the past.

4 Addressing the fiscal balance: broad options

The analysis set out above keeps expenditure per head in each age cohort stable, and shows the effect of reducing the working population on government revenues (taxes and contributions) by tracking the impact on the tax bases. Within this framework, the resulting deficits can be addressed by one or more of the following:

– reduce expenditure per head in each age cohort (primarily by reducing expenditure per head in the above working age cohort);
– increase the size of the tax bases, primarily by increasing the size of the economy (ie, economic growth);
– increasing the tax rate in one or more of the tax bases.

The second option is the primary focus of the following sub-section.

4.1 Increasing the size of the economy: economic growth

4.1.1 Long-run increase in productivity within the static economy

The economy of Jersey can clearly grow, even if the working population shrinks, by increasing the productivity of each (remaining) worker. Over the last 30 years GDP has grown by approximately 130% in real terms. This approximates to an average of 2.85% per annum (compounded). Over this period, the size of the workforce has increased by around 20% (from around 39,000 FTE in 1976 to 48,500 in 2006). In addition, the sector composition of the economy has also changed—from around 7% in financial services in 1976 to almost 25% in 2006. These two components of the change in the economy will account for most, but not all, of the change in the Island's GDP. The remainder (about 1–1.5% per year) represents the average increase in productivity per head in the absence of changing the sector composition of the economy (ie, changing the mix of jobs on the Island towards those that are high wage/high profit and away from those that are relatively low wage/low profit) and keeping the total number of workers constant.

If this historical increase in productivity continued, even if the make-up of the economy remained as it is now, there would be still be an increase in the size of the economy, and as a result the tax bases would be expected to increase along with the tax-take. However, not all this increase can be used to fund a deficit, as the average increase in productivity is also likely to have an impact on the costs of the provision of government services. In particular:

– where cash transfers are indexed to average earnings (eg, pensions, benefits) these will tend to increase at the same rate as the increase in productivity;

– for those parts of the economy that experience a below average increase in productivity the costs of labour per unit of output are likely to increase, as labour rates are increased more rapidly than productivity growth to maintain the (approximate) relative position of these jobs in the economy. Historically, much of the public services has experienced a lower increase in productivity than the economy as a whole.

A considerable proportion (around 20% on pensions alone) of the States' expenditure is cash transfers indexed to average earnings. Taking this into account, along with the more general productivity issues in the public services, means that it would be prudent to assume that no more than 24–50% of the productivity growth will provide *additional* revenue to address the deficit arising from the demographic shift. Table 4.1 sets out the approximate additional income that could be expected from being able to take one-quarter of the underlying

productivity growth, as it manifests itself through increased real wage rates and profits, as a net benefit that could be used to address the demographic deficit.

Table 4.1 Impact of 1% pa productivity growth on government revenues: nil net scenario

	2035	2050	2065	General impact
Total compound growth (%)	35	56	82	10% from 2005 base
Increased government revenue				
Personal income tax (at 20% on additional earnings, £m)	78	112	140	30
Contributions: employer and employee (at 1% each of additional earnings, £m)	8	11	14	3
GST	8	11	14	3
Increase in corporate profits tax (at 10%, £m)	27	38	48	10
Total (£m)	**120**	**172**	**216**	**46**
Net increased government revenue from 25% of productivity growth (£m)	30	43	54	11

Source: Oxera calculations.

4.1.2 Changing the mix in the economy: increase in average productivity

As indicated above, the last 30 years has seen a radical shift in the make-up of the Jersey economy and this change has resulted in a very significant increase in the average GDP per head of population and a significant increase in the tax bases. If this trend could be continued, the subsequent increases in the tax bases would feed through into a significant increase in the tax-take (some of) which could be used to fund the demographic deficit. There are a number of ways in which a shift of this sort could be achieved.

– A continued increase in the proportion of the workforce working in the international financial services sector.

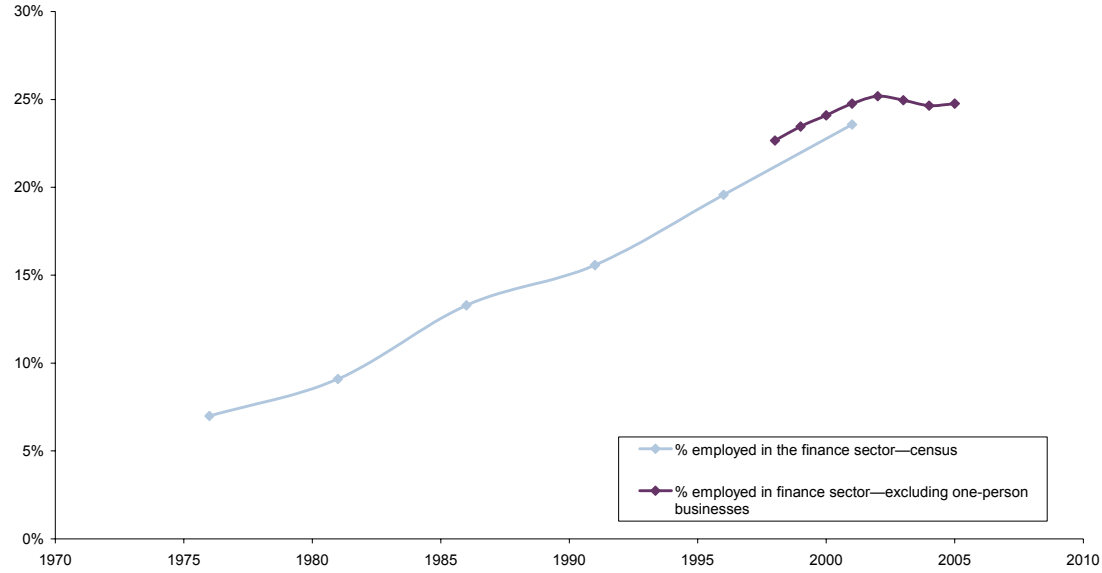
– A shift within a sector(s) of the economy from low-pay and/or low-profitability to high-pay and/or high-profitability activity. (Under the 0/10% structure where there is high profitability, the increased contribution to public finances will be conditional on the businesses being owned by Jersey residents if the business is outside the financial services sector.)

– A shift in the economy to a new sector which delivers higher levels of government revenue per worker than financial services currently delivers.

The financial services sector of the economy currently directly employs around 25% of the workforce. As indicated above, since 1976 the proportion of the workforce employed in this sector has increased significantly, although it has been reasonably stable over the past five

years. Figure 4.1 shows the approximate development of the proportion of the workforce in financial services since 1976. [12]

Figure 4.1 Growth of the share of employment in the financial services sector of the economy



Source: Census for 1976 to 1996 and 2001. States of Jersey Statistics Unit, 'Jersey in figures 2006', Table A3, for the series from 1998 to 2005; and Oxera calculations.

The Oxera CGE (Computable General Equilibrium) model of the economy suggests that for every (additional) worker in the financial services sector, an additional worker is required in the rest of the private sector economy to supply support services. This suggests that the absolute maximum proportion of the private sector that could be directly employed in the financial services sector is around half. Taking the government sector into account—which is about 12% of total employment (excluding trading committees)—around 40% of the working population *could* be employed directly in the financial services sector. However, the resulting economy would be very one-sided and, given the current reliance of the sector on temporary residents to satisfy its skill mix needs, it is likely that such an economy would not provide a good match for the labour skills and desires of the current and future permanent residents.

This analysis does, however, suggest that there may be scope for some additional increase in the proportion of the working population employed in the financial services sector (on the assumption that there are export demands for the additional services that could be produced).

The fiscal impact of moving an additional 5% (or about 2,500) of the working population into the financial sector can be calculated using average earnings and average profitability. Table 4.2 sets out the results.

[12] The definitions used in the various statistical series are not the same, although the pattern of growth is fairly clear, even if the precise definitions change through time.

Table 4.2 Impact of shifting 2,500 existing workers into the financial services sector

	Additional tax yield, 2005 (£m)
Personal income tax (change in average earnings from £25,000 to £34,000, average marginal tax rate 20%)	4.5
Additional profitability taxed at 10% (change in average profitability per worker from £1,500 to £85,000)	20.9
Additional contributions: 1% of additional gross personal income from both employees and employers	0.5
Additional GST (2.5% of additional disposable income: additional gross income less 25% additional income tax and 1% contributions)	0.4
Additional Impôts: assumes that no additional expenditure on these items occurs	0.0
Total increase in government revenues	26.3

Source: Oxera calculations.

If a shift in the economy of this sort could be achieved from within the *existing* future workforce, the impact on government expenditure is likely to be small. It is possible that the increase in the Island average earnings could push up the price of labour outside the financial sector, in which case the labour costs of providing government services would rise, but it is also possible that, as the economy increasingly focuses on financial services, the labour costs outside that sector could fall, as a result of reduced demand for such labour.

4.1.3 Improving productivity within each sector

An alternative to changing the sector balance of the economy is to improve the productivity within the current sectoral composition of the economy. Every government wishes to achieve this outcome, as it is the foundation of economic growth, especially for a large economy that would find a significant sector shift hard to achieve. The underlying determinants of productivity growth are essentially the factors that improve economic efficiency—the ability to reduce inputs of labour and/or capital (or land) to achieve the same level of output. Technical change is one of the main drivers of such improvements. Along this dimension there is likely to be very little, in general, that Jersey could do to improve the *potential* for technical change within the economy. However, even if the drivers of potential technical change are outside the control of the Jersey government, the economy benefits when such technical change is adopted. It is along this dimension that a government like Jersey could have some impact.

Such government intervention can be both positive and negative. Rules and regulations (and, indeed, general practices) that make it more difficult to introduce new technology and new techniques are likely to impose a cost on the economy as they slow down the diffusion of the most economically efficient operation. Land-use restrictions and inflexible labour controls are likely to have this impact. Government subsidies aimed at maintaining an activity on the Island at a competitive level that do not address a market failure will also tend to depress overall economic efficiency, particularly if the economy is labour-constrained. The recipients of the subsidy allow capital and labour to be kept in relatively inefficient operations, while the rest of the economy has its costs increased by the tax revenue needed to pay the subsidy. (This does not necessarily mean that these types of rules or intervention are not worthwhile, as they may be addressing a market failure or other outcome that has higher costs than any inefficiency costs that they impose. The point is that this type of intervention has an indirect cost in the economy that needs to be taken into account.)

On the positive side, government intervention may make the diffusion of improved technology easier if it addresses market failures or where the government itself acts as a 'smart' purchaser of efficient services. In the context of the Jersey economy there are a number of areas where market failures may occur and where (smart) government intervention could improve productivity within sectors. For example, coordination between

suppliers of tourism services, or the generic marketing of Jersey as a destination, may increase the total demand for Jersey as a tourism destination, but it is not in the interests of any particular hotel or attraction to undertake such coordination or marketing. Moving Jersey into a different niche within the tourism market may also require coordination between the different elements that would be needed to attract a different client base.

Within the financial services sector there is a mixture of high/low-value jobs and high/low-profit jobs. Enabling the high-value jobs to be created in Jersey— which may require government intervention in the form of creating the required legal infrastructure—could move the sector into more productive activities.

Ensuring that the education infrastructure delivers the required skills is also likely to deliver a more efficient economy, particularly if this reduces the need for unskilled jobs in Jersey to satisfy the labour demands of residents.

However, governments of already highly developed economies have found it extremely difficult to identify a solution that leads to long-term increases in the rate of productivity growth. Smart exploitation of the, largely export, opportunities that arise may be the optimal way Jersey can maximise its own productivity growth without changing the sector mix significantly.

If this type of productivity improvement could be achieved, each additional 10% productivity improvement per year would yield the same type of fiscal improvements as set out in Table 4.1 above. In addition, if these improvements are the result of changing the output within sectors—for example, by increasing the proportion of high value jobs in the financial services sector, moving the tourism sector into high-value niches— then the knock-on effect on the cost of government services may be reduced. The workforce becomes more skilled, rather than the price of labour at any particular skill level increasing.

4.1.4 Shifting the economy into a new sector

This option requires the identification of a new sector of the economy that can deliver higher wages/higher (taxable) profits than the financial services sector currently delivers. It has not been possible to identify such a sector, but should one emerge, this could help address the demographic deficit. However, *relying* on the future emergence of such a sector would seem to be a high-risk strategy.

4.2 Growing the economy: increasing the size of the workforce

The demographic deficit is caused largely by the shift in the balance between the working population and the retired population. One way in which this change in the balance of the economy could be addressed would be to allow in more workers. The impact on the economy has been estimated under two scenarios: allowing in an additional 325 workers per annum from 2007, and allowing in 650 workers per annum. These workers would bring with them both dependents and partners. Partners of working age are assumed to be able to work and the overall economic activity rate of this group is assumed to be slightly higher than the average for the population (just over 50% of all additional persons of working age are assumed to work in the financial services sector).

These two scenarios have been selected because 325 and 650 additional workers are approximate the numbers of additional workers that would be required to achieve a 1% and 2% real GDP growth on their own, if the maximum proportion of the workers (just over 50%) are employed directly in the financial services sector. (The rest of the workers are required to support those in the financial services sector.) Because some partners are also assumed to work, the actual GDP growth from the additional working population is higher than this, and the actual increase in working age population is also higher – around 565 and 1,130 respectively. With dependents the total population increase by around 700 and 1,400 per

annum respectively. The 650 scenario also provides for a balance between income and expenditure at current rates of tax and current levels of productivity.

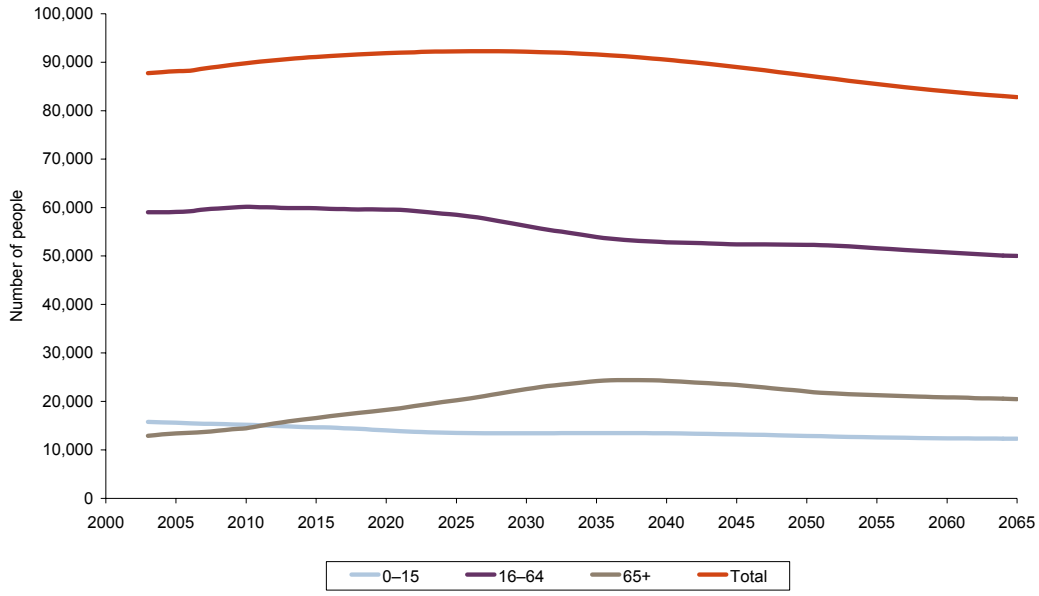
In addition, two other net migration scenarios are modelled: an increase of 150 heads of households and an increase of 250 heads of households. In general, the 250 level compensates for the total population decline that occurs in the nil net scenario, and the 150 scenario is designed to model a small net inward migration.

The within-sector per-head productivity of the economy is held constant in this modelling of the impact of the increase in population.

4.2.1 Population levels

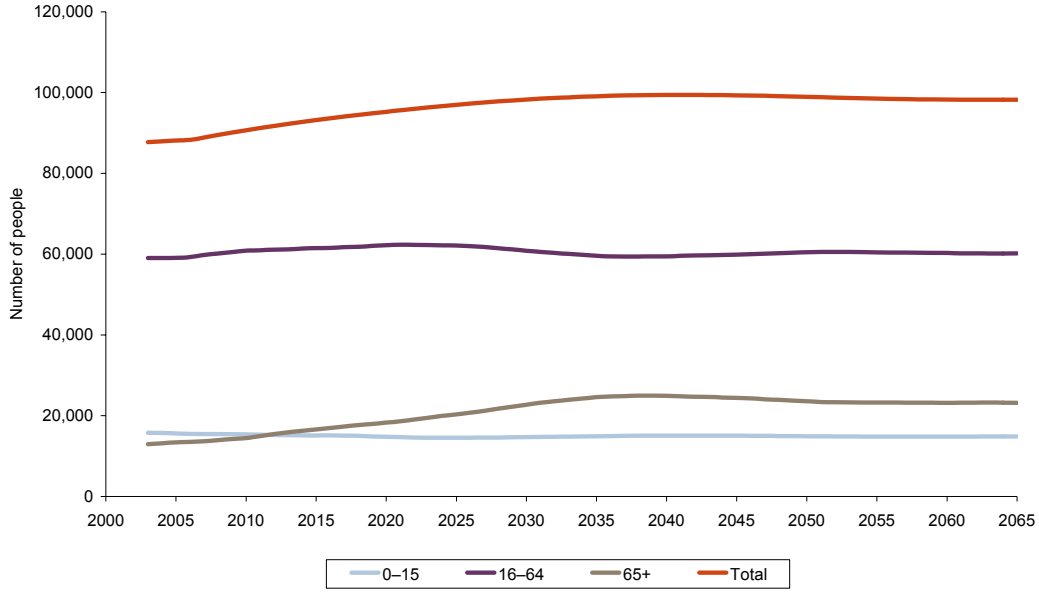
Figures 4.2 to 4.9 show the pattern of cohort change under these four immigration strategies, and the detailed population composition at 2035.

Figure 4.2 Population demographics under the 150 workers per year scenario



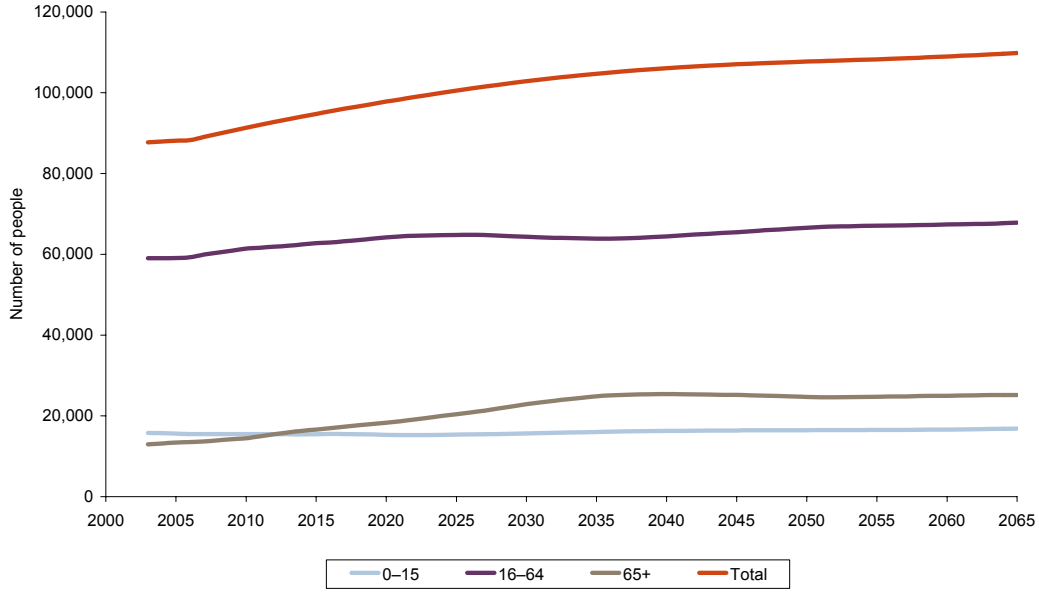
Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 4.3 Population demographics under the 250 workers per year scenario



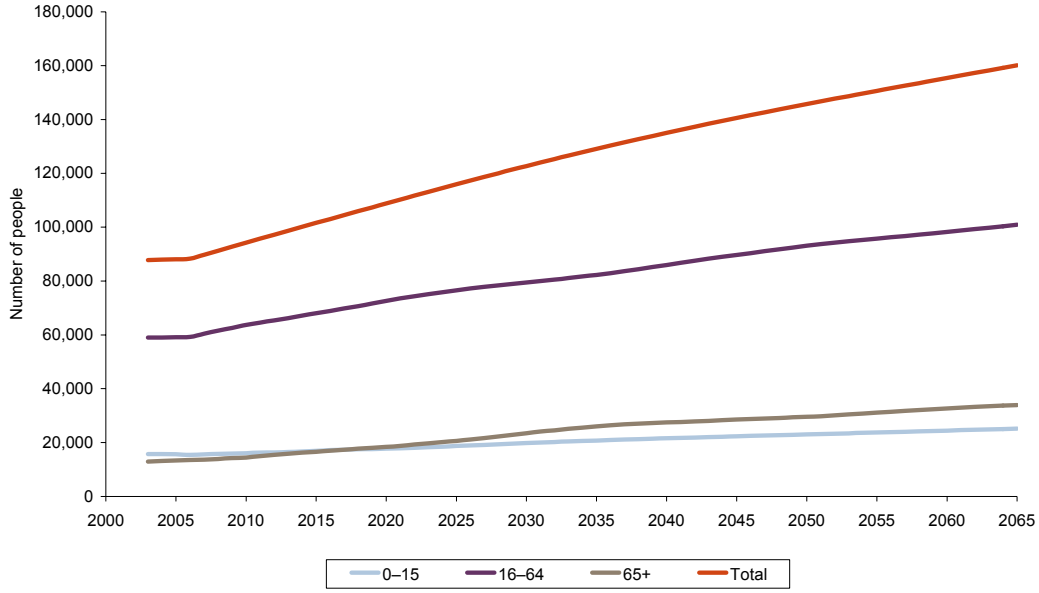
Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 4.4 Population demographics under the 325 workers per year scenario



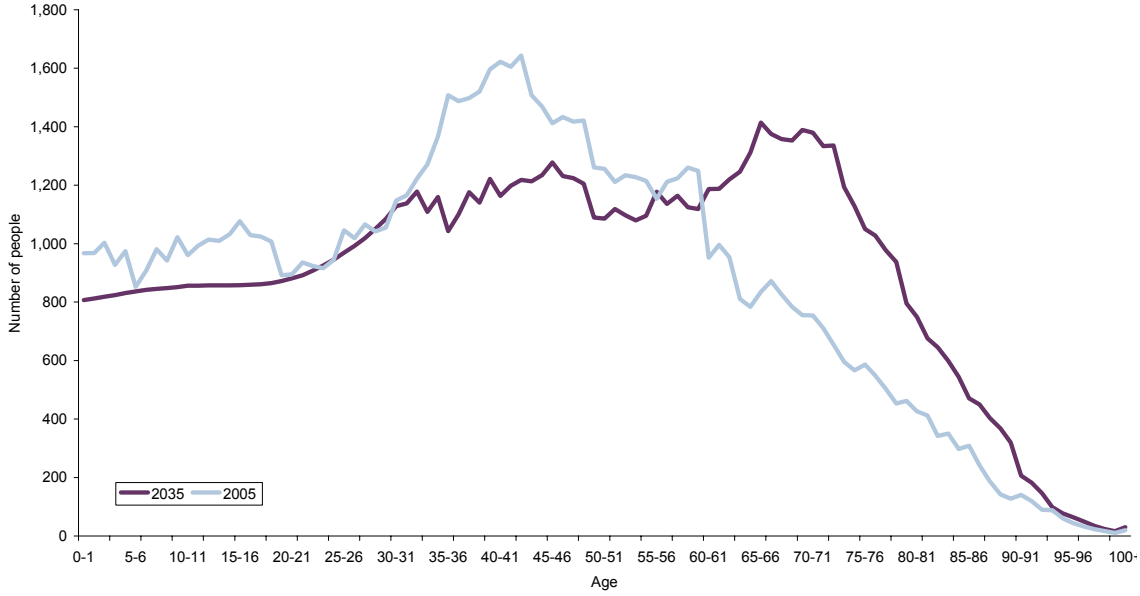
Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 4.5 Population demographics under the 650 workers per year scenario



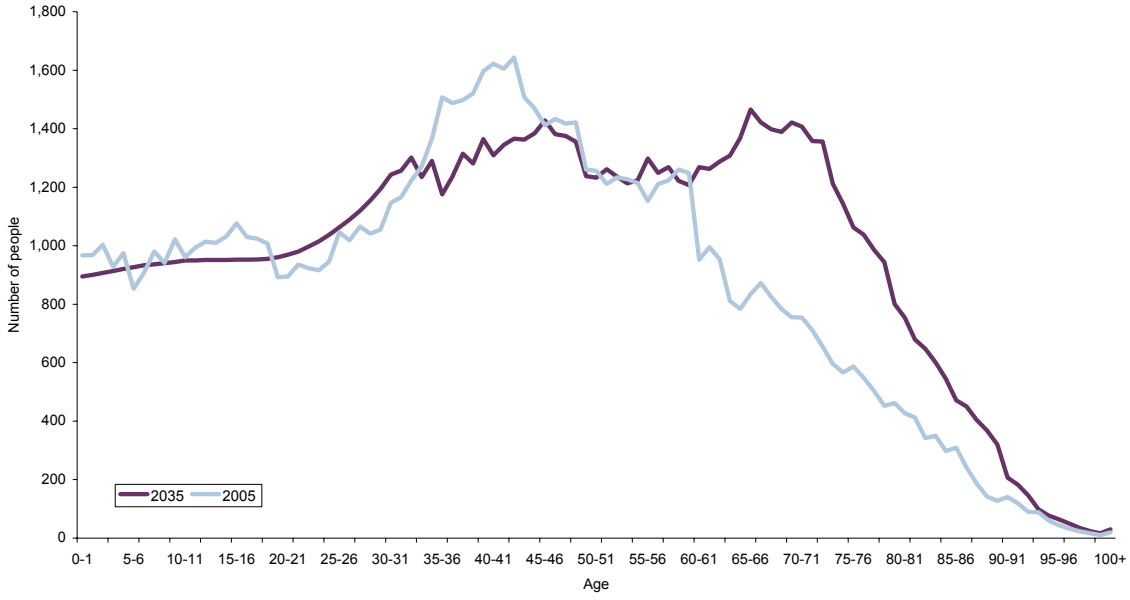
Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 4.6 Detailed population demographics under the 150 workers per year scenario in 2035



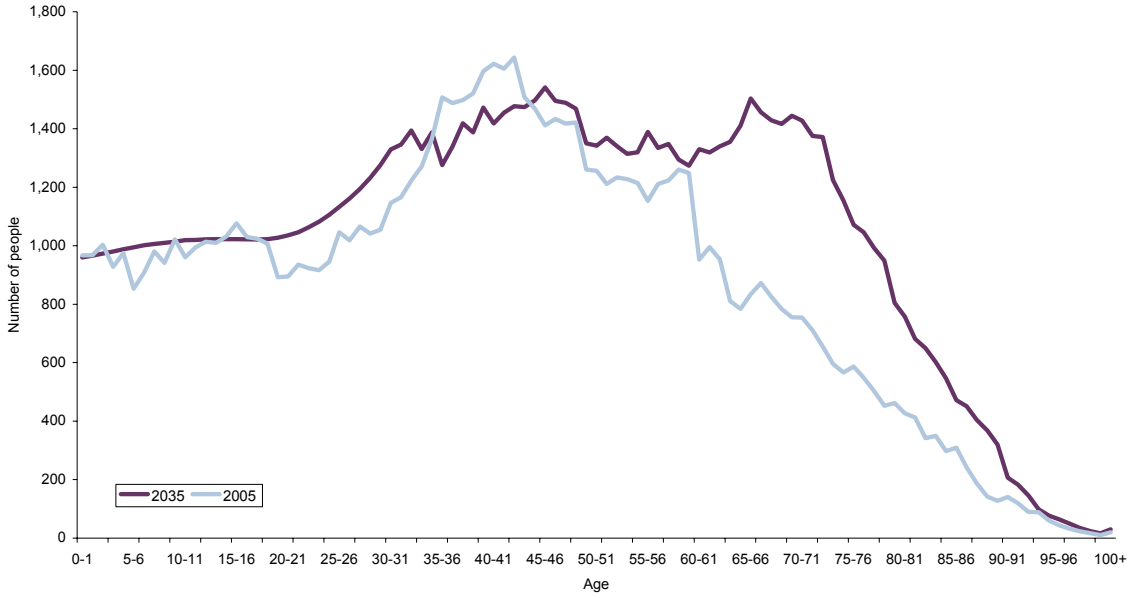
Source: States of Jersey Statistics Unit and Oxera calculations.

Figure 4.7 Detailed population demographics under the 250 workers per year scenario in 2035



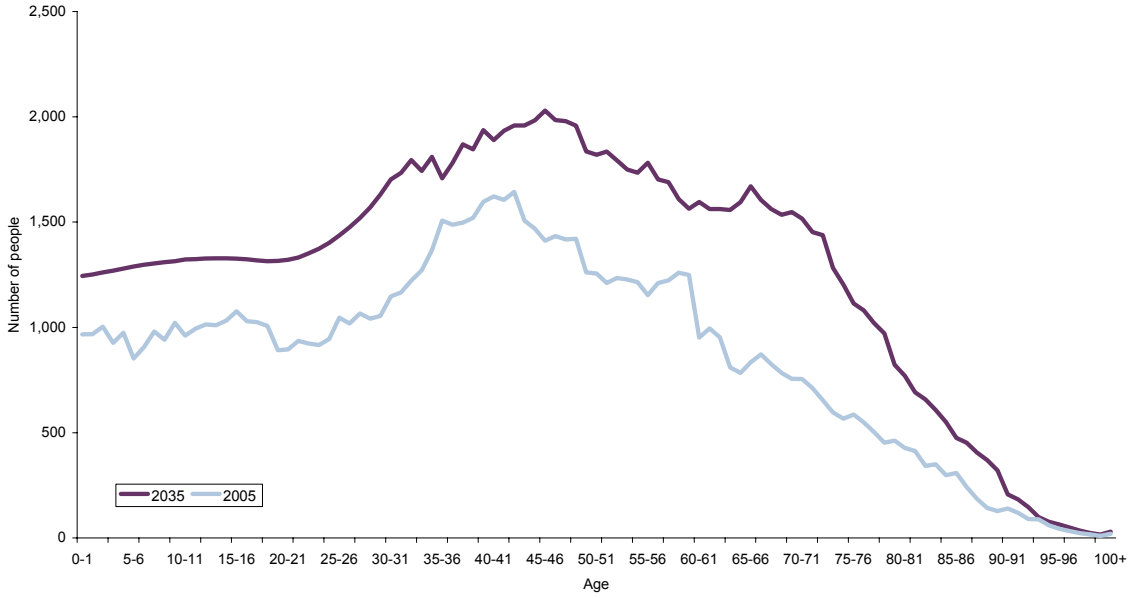
Source: States of Jersey Statistics Unit.

Figure 4.8 Detailed population demographics under the 325 workers per year scenario in 2035



Source: States of Jersey Statistics Unit and Oxera calculations.

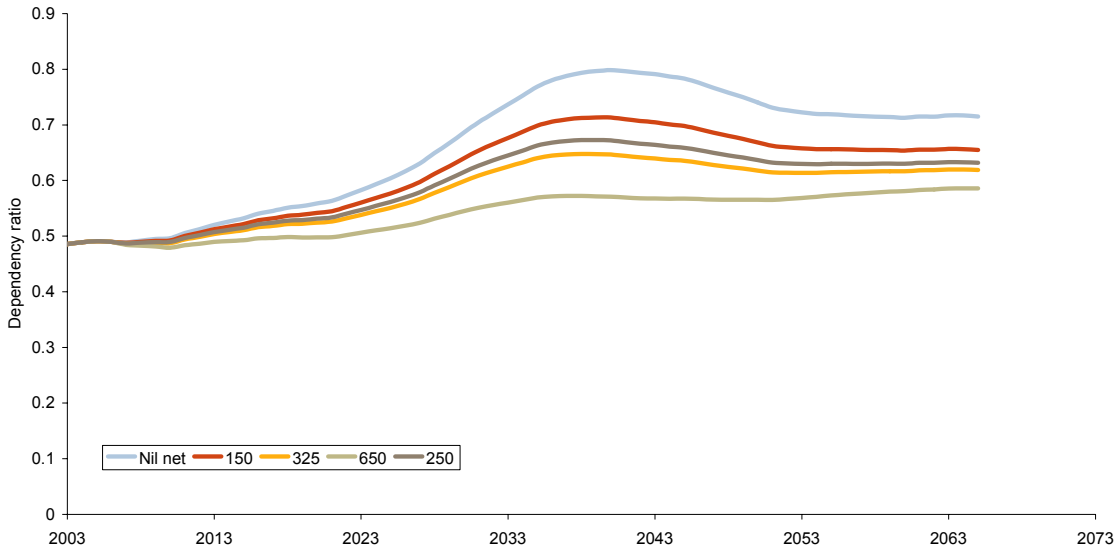
Figure 4.9 Detailed population demographics under the 650 workers per year scenario in 2035



Source: States of Jersey Statistics Unit.

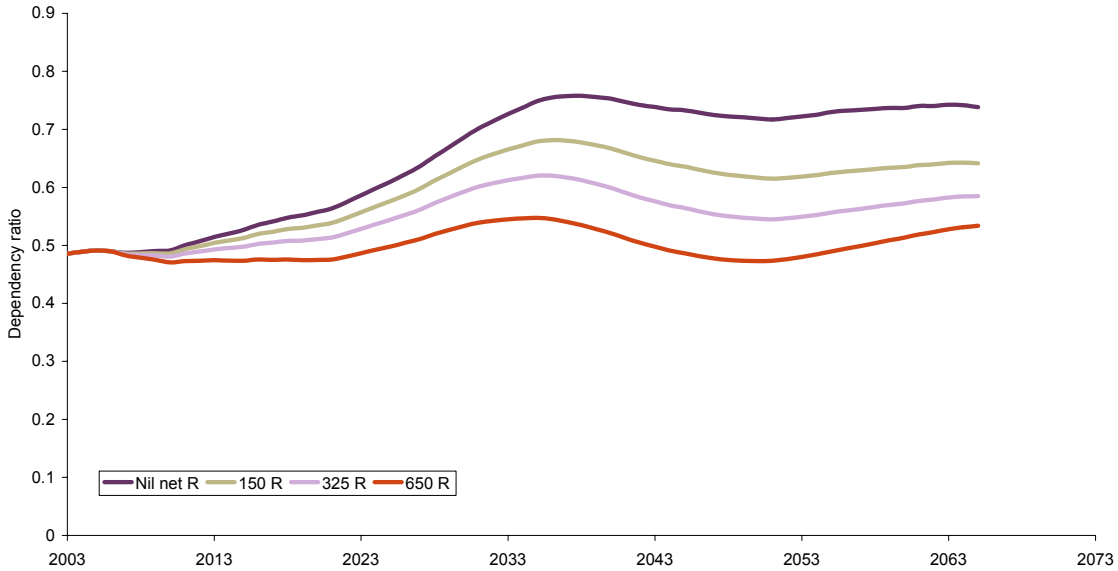
One way of measuring the impact of demographic changes is the dependency ratio — the ratio of the population of working age to the combination of those below the working age (0–16) and above the working age (65 and over). Figure 4.10 plots the dependency ratio for the nil net, plus 150, 250, 325 and 650 scenarios. Figure 4.11 plots the result with recycling. (Appendix 1 shows direct comparison of the outcomes with and without recycling.)

Figure 4.10 Dependency ratios under the five population scenarios, no recycling



Source: States of Jersey Statistics Unit, Oxera calculations.

Figure 4.11 Dependency ratios under the four population scenarios, with recycling



Source: States of Jersey Statistics Unit, Oxera calculations.

As can be seen, the dependency ratio under the nil net scenario rises sharply until around 2040, and then falls to just above 0.7, where it stabilises. Under the 325 and 650 annual increase scenarios, the rise is less steep, and the stabilisation level is lower. However, the nil net scenario applies to a declining total population, while under the 325 scenario the population has risen to around 110,000 by 2065 and under the 650 scenario the population has risen to 160,000 and is still rising. (An increase of around 250 produces a fairly stable population of just under 100,000, and a fairly stable dependency ratio of around 0.63.)

4.2.2 Fiscal impact

The additional population creates both increased expenditure and increased government income. Tables 4.3 to 4.6 set out the impact on both expenditure and income for the 150, 250, 325 and 650 scenarios (without recycling). See Appendix 1 for the impact of recycling the population. Figures 4.12 to 4.14 show the results graphically through time for the 325 and

650 scenarios. For illustrative purposes, expansion of the workforce under the 650 scenario without a bias to international financial services is also shown.

Table 4.3 Fiscal balance under additional 150 heads of households from 2007

Plus 150	2035	2050	2065
Expenditure: total change from 2005 (£m)	112	71	34
Income: total change from 2005 (£m)	–12	–31	–54
Net impact: change from 2005 (£m)	–124	–102	–88
Deficit/surplus as a % of total income	–23	–20	–18
Deficit per head of population (£)	–1,355	–1,168	–1,066
Nil net outcome			
Net change in fiscal position (£m)	*–134*	*–101*	*–73*
Deficit as % of total income	*–31*	*–27*	*–22*
Deficit per head of population (£)	*–1670*	*–1,448*	*–1,220*

Source: Oxera calculations.

Table 4.4 Fiscal balance under additional 250 heads of households from 2007

Plus 250	2035	2050	2065
Expenditure: total change from 2005 (£m)	152	141	134
Income: total change from 2005 (£m)	36	43	39
Net impact: change from 2005 (£m)	–116	–98	–95
Deficit/surplus as a % of total income	–20	–16	–16
Deficit per head of population (£)	–1,168	–992	–967
Nil net outcome			
Net change in fiscal position (£m)	*–134*	*–101*	*–73*
Deficit as % of total income	*–31*	*–27*	*–22*
Deficit per head of population (£)	*–1670*	*–1,448*	*–1,220*

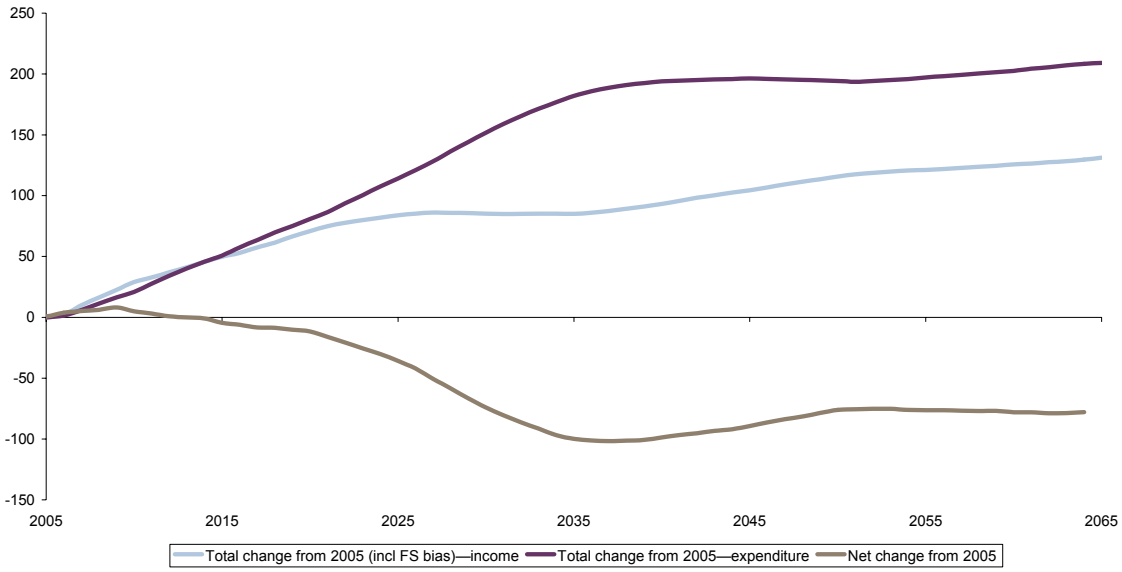
Source: Oxera calculations.

Table 4.5 Fiscal balance under additional 325 heads of households from 2007

Plus 325	2035	2050	2065
Expenditure: total change from 2005 (£m)	182	194	209
Income total change from 2005 (£m)	85	116	131
Net impact: change from 2005 (£m)	–97	–79	–78
Deficit/surplus as a % of total income	–16	–13	–12
Deficit per head of population (£)	–925	–730	–708
Nil net outcome			
Net change in fiscal position (£m)	*–134*	*–101*	*–73*
Deficit as % of total income	*–31*	*–27*	*–22*
Deficit per head of population (£)	*–1670*	*–1,448*	*–1,220*

Source: Oxera calculations.

Figure 4.12 Fiscal impact under the 325 scenario: inward migration biased to financial services sector (£m)



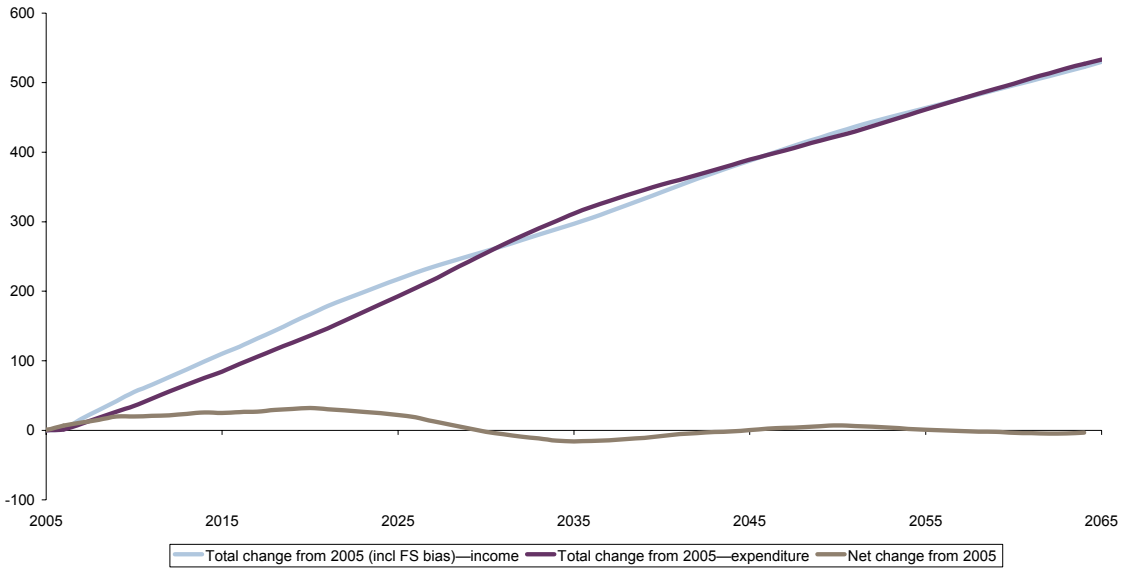
Source: Oxera calculations.

Table 4.6 Fiscal balance under additional 650 heads of households from 2007

Plus 650	2035	2050	2065
Expenditure: total change from 2005 (£m)	312	423	533
Income: total change from 2005 (£m)	297	429	530
Net impact: change from 2005 (£m)	–15	6	–3
Deficit/surplus as a % of total income	–2	1	0
Deficit per head of population (£)	–115	41	–21
Nil net outcome			
Net change in fiscal position (£m)	–134	–101	–73
Deficit as % of total income	–31	–27	–22
Deficit per head of population (£)	–1,670	–1,448	–1,220

Source: Oxera calculations.

Figure 4.13 Fiscal impact under the 650 scenario: inward migration biased to financial services sector (£m)



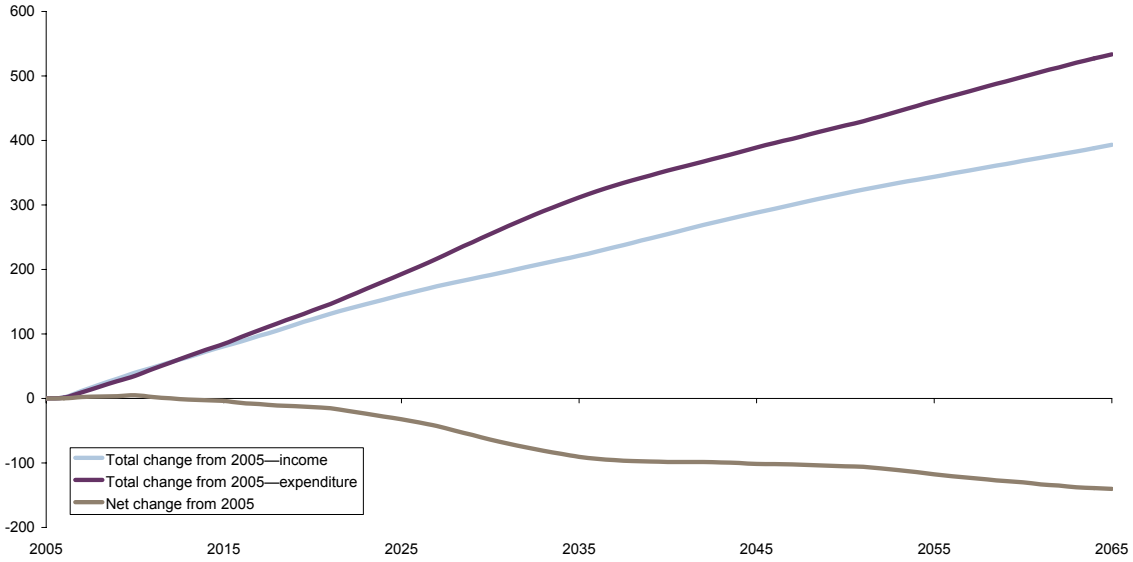
Source: Oxera calculations.

Table 4.7 Fiscal balance under additional 650 heads of households from 2007—financial services remains at 25% of total workforce

Plus 650	2035	2050	2065
Expenditure: total change from 2005 (£m)	312	423	533
Income: total change from 2005 (£m)	221	318	393
Net impact: change from 2005 (£m)	–90	–105	–140
Deficit/surplus as a % of total income	–12	–13	–15
Deficit per head of population (£m)	–701	–721	–874

Source: Oxera calculations.

Figure 4.14 Fiscal impact under the 650 scenario: financial sector remains 25% of workforce (£m)



Source: Oxera calculations.

As can be seen the increase in the working population does help to address the structural deficit caused by the change in the demographics of the population. However, a large part of this impact comes from the biasing of the additional working population towards the financial services sector. If the workforce is expanded using the current sectoral composition, the impact on the deficit is considerably lower. This arises because the additional tax revenues that are available to pay for the demographic deficit arise after any increase in government costs caused by that additional worker have been paid. Financial sector workers provide a significantly larger 'surplus' than other workers. This is the same effect that allows a considerable increase in government revenues if 2,500 of the current workforce could be redeployed in the financial services sector (see Table 4.2 above).

4.3 More economic activity from the same population

As indicated, the demographic impact stems largely from the shift in the balance between the working population and the retired population. In addition to increasing the size of the workforce by increasing inward migration, there are two other ways in which the size of the working population can be increased without changing the total population. The participation rate—the proportion of those of working age that are actually working—can be increased, and those over the (current) retirement age can be encouraged to continue working. Either of option will have an impact on the fiscal effects of the ageing population.

4.3.1 Increasing participation rates

Jersey already has relatively high economic participation rates. At the time of the 2001 census, around 87% of the male working age population, and 76% of the female working age population, were economically active—ie, working, looking for work or temporarily unable to work (eg, due to short term sickness). This is around 4 percentage points higher than the comparable UK rates. Of these, around10% of the economically active were employed part time, and most of these were women. In 2001 around 2% were unemployed. Of the 13% of the working age population that were economically inactive, over 30% were students; almost 40% were looking after the home; and almost 20% were unable to work. Around 10% were already retired.[13]

Realistically, therefore, to increase the participation rate significantly would require moving those with part-time employment (~5,000) to full-time employment, persuading those taking early retirement (~1,000) not to, or persuading those (largely women) who currently look after the home (~3,800) to take employment (full or part time). Reducing the number in full time education (~3,000) is likely to be counterproductive (at least in the long run). If possible, enabling those currently unable to work (~2,000) to take some form of employment would also be helpful.

The fiscal impact of increasing the rate of participation in the economy will be largely on government revenue through increased taxation receipts (personal income tax, corporate profits tax, GST). If those unable to work return to employment, there may also be an expenditure impact if they are currently in receipt of some form of government-funded benefits. There will be a longer-term expenditure impact through increased liability to pay pensions that has not been captured in the expenditure model. As a first approximation the additional contributions could be discounted.

Under the simplifying assumption that movement from part-time to full-time employment takes place at the average income level for the Island, the approximate fiscal impact per 1,000 workers can be calculated. This is set out in Table 4.8.

[13] Jersey Census Report, 2001, Chapter 6.

Table 4.8 Impact of transferring 1,000 workers from part-time to full-time: average for the economy (£)

	2005 economy
Increase in wages	13,500,000
Increase in corporate profits	11,187,500
Personal tax increase	2,025,000
Corporate tax increase	1,118,750
Increase in contributions	1,080,000
Increase in GST	273,375
Total	4,497,125
Total without contributions	3,417,125

Source: Oxera calculations.

Persuading 1,000 non-workers to take up full-time employment will have a similar income (and tax revenue) effect. There will also be a longer-term expenditure impact through increased liability to pay pensions that has not been captured in the expenditure model. As a first approximation, the additional contributions could be discounted. The outcome (set out in Table 4.9) is similar to the transformation from part-time to full-time employment, except that reflecting the progressive nature of income tax, the average personal income tax rate is lower, and reflecting the impact of the ceiling on contributions, the impact on contributions is higher.

Table 4.9 Impact of transferring 1,000 economically inactive to full time employment—average for the economy (£)

	2005 economy
Increase in wages	27,000,000
Increase in corporate profits	22,375,000
Personal tax increase	2,970,000
Corporate tax increase	2,237,500
Increase in contributions	2,700,000
Increase in GST	567,000
Total	8,474,500
Total without contributions	5,774,500

Source: Oxera calculations.

This analysis suggests that the impact on the 2005 economy of raising the economic activity rate by shifting 20% of part-time jobs to full-time, and shifting around 20% of those currently not working because they have already retired or are looking after the home to working full time, would create a net increase in revenues of around £9m, or around 1.5% of total government revenues. Going forward, the impact on the nil net scenario would be about the same—1.5% of revenues—if the same proportionate increase in economic activity could be achieved. Under the inward migration scenarios there is already a strong assumption that the additional working population above the 2005 number is highly economically active. The ability to increase the activity rate even further may, therefore, be harder to achieve.

4.3.2 Increasing the retirement age

Increasing the retirement age can have a number of impacts. One definite impact is to reduce expenditure if the annual pension provision is maintained at the same rate. Increasing

the pensionable age by one year reduces pension liabilities by (almost) one year for each pensioner. Table 4.10 sets out the proportionate and absolute reduction in expenditure from raising the retirement age by one year and two years under the nil net scenario. [14]

Table 4.10 Impact on expenditure of increasing the retirement age to 66 and 67

Nil net	2035	2050	2065
Proportionate reduction in the over working age group: one-year increase to 66 (%)	6	4	5
Absolute savings (£m)	10	6	6
Proportionate reduction in the over working age group: two-year increase to 67 (%)	11	8	10
Absolute savings (£m):	20	12	13

Source: Oxera calculations.

A similar pattern emerges under the 325 and 650 scenarios, but there are slightly higher savings on a higher total expenditures once some of the additional population reaches retirement age. Table 4.11 gives the results for the 325 scenario.

Table 4.11 Impact on expenditure of increasing the retirement age to 66 and 67: 325 scenario

Plus 325	2035	2050	2065
Proportionate reduction in the over working age group: one-year increase to 66 (%)	6	5	5
Absolute savings (£m)	11	10	10
Proportionate reduction in the over working age group: two-year increase to 67 (%)	12	10	11
Absolute savings (£m)	22	19	21

Source: Oxera calculations.

In addition to reducing expenditure, raising the retirement age may also increase tax (and contribution) revenues if the economically active population is increased. This is the same type of impact as increasing the working population by increasing the participation rate. However, raising the retirement age does not *guarantee* that there is any additional participation in the workforce. This will only come about if the lack of the States' pension creates a sufficient incentive to continue with employment. For those with sufficient private pensions, occupational pensions or just private wealth, the increase in the retirement age (ie, the age at which the States' pension is payable) may not induce any additional economically active participation in the economy. Although there is likely to be some effect, it may be prudent to assume that the increase in government revenues from increasing the retirement age is minimal.

4.4 Combinations of approaches

The nil net scenario predicts considerable deficits as a result of the demographic changes in the population. By 2035 the deficit is around 30% of government expenditure, and is more

[14] The reduction in expenditure here is based on all the social security expenditure allocated to the over working age group. This is likely to slightly over estimate the savings that would actually be achieved.

than £130m. Normal economic growth is likely to provide some scope for additional revenue in excess of additional expenditure. The estimate made above suggests that £30m net additional revenue could be available. Shifting the sector balance by redeploying 2,500 workers into the financial services sector could add an additional £26m. Raising the retirement age by one year could save around £10m. However, this would still leave a deficit of around £55m.

Addressing this deficit could be achieved through increased taxation. In order to raise £50m each person over 16 would, on average, have to pay an additional £1,500 per year. More than doubling the GST rate to 7% would achieve this (after normal economic growth is taken into account). Alternatively, reducing personal exemptions and allowances (for example, by not up-rating them in line with inflation) would have a similar effect if inflation was 2–2.5% pa (the value of these exemptions and allowances would have approximately halved by 2035).

The working population could also be grown through inward migration. Under the 325 scenario, the fiscal position in 2035 improves by around £35m compared with nil net. This would leave a remaining deficit of £15m—around £340 per person over the age of 16 on average.

There is, therefore, a potential trade-off between the size of the population and the tax rates.

Clearly, other measures, if achievable, would also help address the impact of the demographic change. Reducing per-head expenditure (eg, by up-rating pensions by RPI and not average earnings) or increasing average productivity — by 2% pa rather than 1%—would also address the remaining deficit.

There is a considerable variety in the combination of measures that could be adopted. However, not all of them may be achievable. A nil net population policy combined with an economy that did not achieve the 1% pa overall productivity improvements, and which kept the same sector balance, would have to address the deficit mainly from increases in taxation, or reductions in expenditure. In both cases there are reductions in average disposable incomes. Under the increased taxation option GST rates would be similar or higher than the UK's, or income tax rates would have to be raised significantly (ie, approximately doubled to over 50% marginal rate and 40% standard rate). Such a radical shift in the taxation structure might be difficult to achieve, at least without going through considerable economic upheaval (which itself may make achievement of this type of outcome more difficult).

Part of the problem would arise if workers attempted to gain compensation for increased taxes through higher wages. The resulting wage inflation would reduce Jersey's international competitiveness, which in turn would be likely to shrink both the financial services sector and the tourism sector. Any shrinking of the financial sector would have a disproportionate impact on tax revenues, requiring higher taxes to balance the budget, exacerbating the economic impact.

Even if there is no direct inflationary flow through into wages, the higher rates of tax could still have an impact on the comparative costs of providing international financial services in Jersey, even if only the highly mobile workers recognise the impact of these tax rates on their disposable income. The Jersey economy is vulnerable to the location decisions taken by multinational institutions and higher costs for these locations (or even just a perception that costs will increase) could result in switching activities to lower-cost locations. Because of the revenue benefits from this sector, a relatively small decline in employment in the sector would result in a more than proportionate fall in tax revenues (the reverse of the benefits that arise from switching 2,500 workers into this sector as set out above).

Reducing expenditure could also address the deficit, but with a deficit of 30% of total government revenues, government-funded output, or money transfers, would be noticeably affected. For those in receipt of such services or transfers (eg, those undergoing hospital

treatment, being educated in state schools, or receiving the States' pension), the impact of reduced expenditure is similar to that of increased taxation.

5 Restrictions on the analysis

5.1 Impacts of changing the working or total population that have not been taken into account: fiscal

Implicit in the analysis set out in this report is a pattern of the costs of providing public services that is essentially proportional to the age cohort, or to total population, and that (in the scenarios with higher populations) additional workers are willing to come to the Island. However, there are a number of public services where this relationship does not, or may not, hold and there are certain conditions that would need to be met if the population flows are to be realised.

- It has been assumed that sufficient additional new housing is built to meet the demand from additional workers. In the absence of additional housing, attempting to grow the workforce through additional inward migration is unlikely to be successful. A more likely outcome is significant house price inflation and limited, if any, additional workers.

- It has been assumed that the provision of water, drainage, waste removal, etc exhibits neither significant economies of scale (in which case the costs under higher populations have been overestimated) nor significant capacity constraints that would require a significantly higher unit cost of addition production—for example, if the demand from the additional population for water could be met by only desalination (in which case costs under high populations have been underestimated).

- It has been assumed that government expenditure on services that see a reduction in demand as a result of demographic changes can be decreased in line with that reduction. This may not always be possible in practice. The result is that the cost savings arising under the nil net scenario as the population declines may be overestimated, so the resulting deficit is underestimated.

- It has been assumed under the nil net scenario that the shrinking of the workforce is even across all sectors. This may not be a likely outcome. In particular:

  - the increased demand for health and similar services by the ageing/retired may mean that more, rather than fewer, public sector workers are required. This would result in the private sector (including the financial services sector) shrinking more rapidly than modelled;

  - the inability to expand the financial services sector could result in its more rapid shrinking than implied by the reduction in working population. This arises because location decisions by service providers may be taken with imperfect information and a perception that the labour constraint is tighter than it actually is. If this occurred the negative fiscal impact of the ageing population under the nil net scenario would be more severe than estimated;

  - providers of financial services may require a critical mass of similar and support activity in Jersey for the sector to remain competitive. If the shrinking working population crosses this critical mass, the fiscal effects are then more severe than estimated under the nil net scenario.

- It has been assumed that the demand for international financial services continues, and that Jersey remains broadly competitive as a location in this market.

5.2 Environmental and other non-fiscal impacts of changing the population level

The analysis set out above has not taken into account the environmental and other non-fiscal implications of the different population scenarios (or, indeed, any impacts arising directly from the demographic changes themselves). In evaluating the different policy options that flow from the analysis set out above, these other impacts should also be considered.

5.3 Changes in the delivery of services

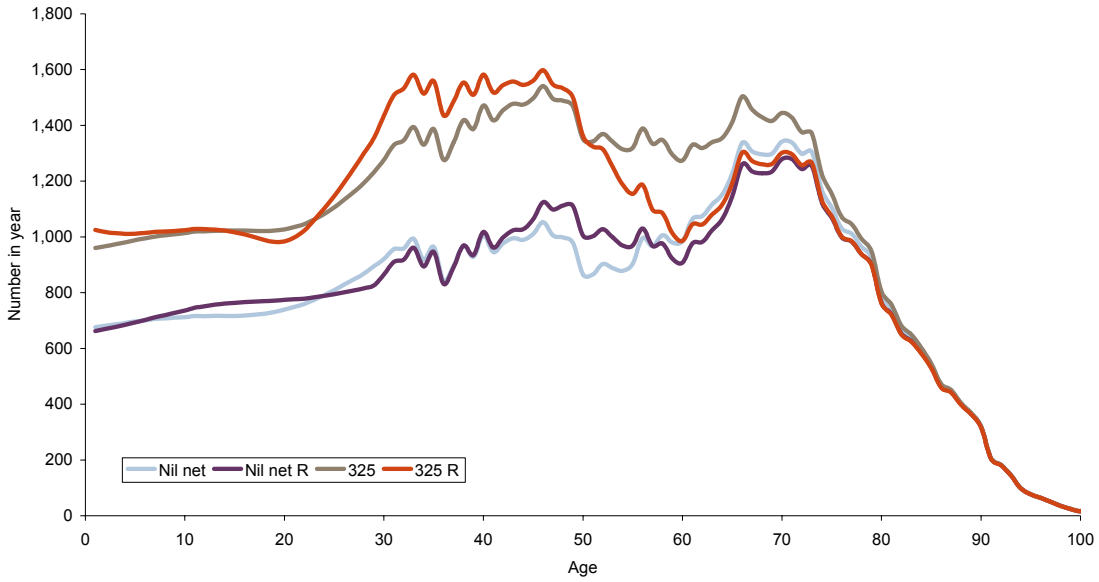
The analysis set out above is based on the delivery of the same level of services per head and by age cohort throughout the prediction period. To the extent that this assumption does not hold and the delivery of additional services is required, the estimates of government expenditures are too low. This is particularly important in areas such as health, where technical change may actually increase the cost per head because more, and better, treatments become available. It may also apply to areas of government expenditure where demand is reduced as a result of demographic changes. For example, the reduction in the school age population under the nil net scenario may not translate into the level of expenditure reduction predicted if it turns out to be unrealistic to reduce the number of schools on the Island. The Department of Education, Sport and Culture has already indicated that the level of expenditure savings that could, in practice, be achieved are below those predicted in the model. The impact of this would be to increase the predicted deficit under the nil net scenario, which would need to be balanced by some other means.

Appendix 1 The impact of recycling the population

This appendix examines the impact of the assumption of recycling the transient and temporary population on demographics. Most of the analysis presented in the main report uses a non-recycling assumption in the population projections.

The historical dynamics of the Jersey population indicate that there are a significant number of inhabitants who are resident for a limited period of time. Typically, for temporary residents, a worker or family will arrive on Jersey, stay for one to ten years and then leave.[15] This worker or family will be replaced by another worker or family, of about the same age as the first worker/family when they arrived. As a result, the resident population does not age, on average, quite as rapidly as individual residents, and the population profile is not quite as it would be if the existing population just aged. Figure A1.1 shows the detailed population profile at 2035 under the nil net scenarios and the 325 scenarios with and without recycling.

Figure A1.1 Detailed age profile at 2035



Source: States of Jersey Statistics Unit, Oxera calculations.

The general results are as follows:

– there are more workers under recycling;
– there are slightly fewer residents over the working age under recycling;
– the impact on the number and distribution of those under 16 is complex.

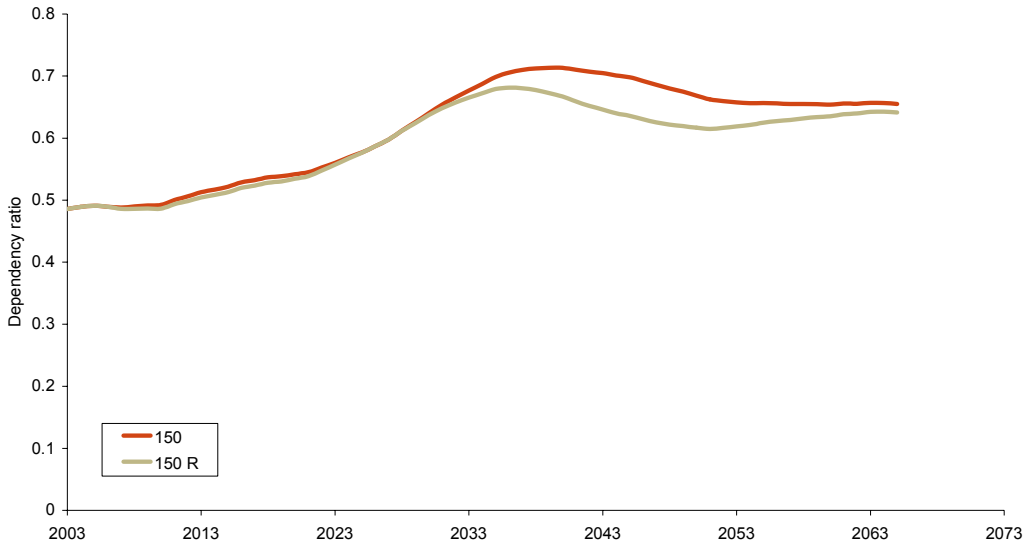
The impact on the fiscal balance is generally positive, reflecting the general improvement in the dependency ratio. However, the impact on the States' expenditure with respect to

[15] For the modelling with recycling, it was assumed that 50% of households entering in the j-category leave the Island after five years, and the other 50% remain permanently, while households entering the Island as non-qualified leave with a specific probability per annum over a ten-year period, such that 20% remain after ten years. During the period for which such eventual leaving j-category and non-qualified households are resident in the Island, all household members are aged and assume the fertility and mortality rates of the resident population.

pensions is complicated as the liability still arises if the worker is no longer resident in Jersey. As a result, the expenditure model may slightly overestimate the benefit from recycling in this respect.

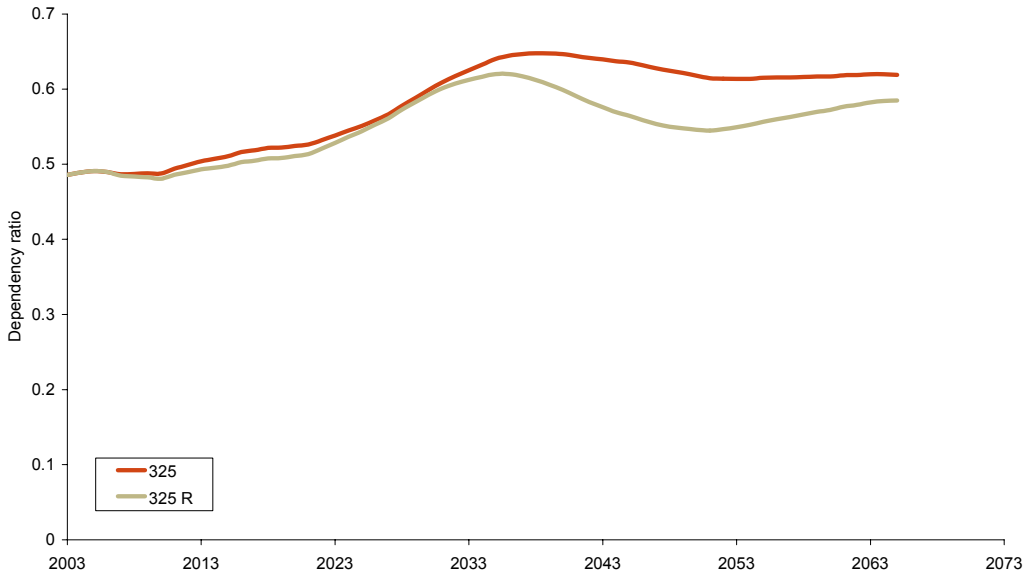
Comparisons of the dependency ratios for 150 and 325 workers per year with and without recycling are presented in Figures A1.2 and A1.3.

Figure A1.2 Evolution of dependency ratios under net 150, with and without recycling



Source: States of Jersey Statistics Unit, Oxera calculations.

Figure A1.3 Evolution of dependency ratios under net 325, with and without recycling



Source: States of Jersey Statistics Unit, Oxera calculations.

Comparisons of the fiscal balance with and without recycling under the 150 and 325 scenarios are presented in Tables A1.1 to A1.4 below.

Table A1.1 Fiscal balance under additional 150 heads of households from 2007, no recycling

Plus 150	2035	2050	2065
Expenditure: total change from 2005 (£m)	112	71	34
Income: total change from 2005 (£m)	–12	–31	–54
Net impact: change from 2005 (£m)	–124	–102	–88
Deficit/surplus as a % of total income	–23	–20	–18
Deficit per head of population (£)	–1,355	–1,168	–1,066

Source: Oxera calculations.

Table A1.2 Fiscal balance under additional 150 heads of households from 2007, with recycling

Plus 150	2035	2050	2065
Expenditure: total change from 2005 (£m)	96	50	33
Income: total change from 2005 (£m)	–16	–25	–49
Net impact: change from 2005 (£m)	–112	–76	–82
Deficit/surplus as a % of total income	–21	–14	–16
Deficit per head of population (£)	–1,231	–871	–985

Source: Oxera calculations.

Table A1.3 Fiscal balance under additional 325 heads of households from 2007, no recycling

Plus 325	2035	2050	2065
Expenditure: total change from 2005 (£m)	182	194	209
Income: total change from 2005 (£m)	85	116	131
Net impact: change from 2005 (£m)	–97	–79	–78
Deficit/surplus as a % of total income	–16	–13	–12
Deficit per head of population (£)	–925	–730	–708

Source: Oxera calculations.

Table A1.4 Fiscal balance under additional 325 heads of households from 2007, with recycling

Plus 325	2035	2050	2065
Expenditure: total change from 2005 (£m)	149	152	198
Income: total change from 2005 (£m)	83	141	161
Net impact: change from 2005 (£m)	–67	–12	–37
Deficit/surplus as a % of total income	–10	–2	–5
Deficit per head of population (£)	–646	–108	–332

Source: Oxera calculations.

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