



Australian Government  
Productivity Commission

Modelling immigrants'  
fiscal impacts – Part 1

Migrant Intake into Australia  
*Technical Supplement D*

April 2016

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# Modelling immigrants' fiscal impacts

## — Part 1

Chapter 9 of the Productivity Commission's final inquiry report on *Migrant Intake into Australia* presents data on the net fiscal impacts of different types of immigrants (section 9.4). These estimates are derived using a model, developed by the Commission for the inquiry, which projects fiscal impacts (government revenues net of expenditures) for broad types of immigrants, based on the average characteristics of each type of immigrant. This technical supplement provides details of the modelling undertaken to obtain the fiscal impacts presented in the inquiry report.

The results in chapter 9 are estimated lifetime fiscal impacts, based on a single (one year's) '*representative intake*' of immigrants. Those results do not include the impact of subsequent intakes, nor of immigrants' descendants. The intake is characterised as net overseas migration (NOM) and the lifetime impacts are presented in the form of net present values (NPVs). This supplement details NPV results for three separate specifications of the model (each with a different specification of government expenditures and revenues). In addition, the model can derive results for the representative intake in aggregate and for the cumulative fiscal impacts of subsequent NOM intakes over time (including the impact of immigrants' descendants). Results for these projections are detailed in a separate document accompanying the release of the model itself.

These additional projections use some inputs from the business-as-usual scenario as summarised in technical supplement B on the economywide impacts of migration. This scenario is illustrative of the implications of NOM assuming it converges over a ten year period to an historical average of the ratio of net migration to population (0.6 per cent) and remains at that proportion over the projection period.

The technical supplement begins by outlining the objectives of the model (section D.1). An overview of the model is provided in section D.2 followed by a description of the data sources (section D.3). The model's framework, assumptions and limitations are discussed in section D.4. Section D.5 concludes with a discussion of the results for three specifications of the model.

### **D.1 Objectives of the model**

The model was developed to enhance the evidence base for migration policy. It has been designed to highlight the fiscal impacts of differences in immigrants' characteristics (such as visa category, age on arrival and labour force characteristics). As noted in the overview,

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although fiscal outcomes are not the only driver of immigration policy, it is important to recognise that any additional fiscal outlays that immigration induces requires either raising additional taxes or forgoing government expenditure in other areas.

Furthermore, characteristics of the migrant intake are ultimately either directly controlled or indirectly influenced by policy. Over the long term, choices regarding the composition and size of NOM are therefore likely to have material implications for the consumption possibilities of both the Australian community (existing Australian citizens and permanent residents) and immigrants themselves. Estimates of the lifetime fiscal impacts of different immigrants are an important input into weighing the merits of different immigration policies against other priorities, in addition to accounting for any broader economic, social and environmental effects.

The model was also built to analyse the fiscal impacts of immigrants in more detail than could be specified in the two other modelling frameworks used for the inquiry — the economywide modelling and the partial equilibrium (PE) modelling of the impacts of different visa charging scenarios. While both frameworks allow for the analysis of the fiscal impacts of immigration under different frameworks and assumptions, they are limited in their ability to provide detailed information about the direct impacts of different categories of immigrants.

- The economywide impacts of migration are analysed with a computable general equilibrium (CGE) model (technical supplement B). While this allows for certain assumptions to be made about the average characteristics of immigrants in aggregate, it does not shed light on the different impacts (fiscal or otherwise) of different types of immigrants (e.g. skill vs. family stream immigrants).
- The PE framework was designed to analyse the impacts of hypothetical visa charging scenarios on the immigration decisions of a single-year intake of *permanent* immigrants (technical supplement C). Fiscal impacts are calculated post-simulation, based on aggregated estimates of relevant fiscal variables.

The parametrisation of the model and its assumptions are largely consistent with the economic and demographic assumptions included in the economywide and PE frameworks. Differences in the models' assumptions are detailed in attachment 4 of this technical supplement.

The model has been designed to estimate different immigrants' fiscal impacts from a lifetime perspective. This differs from existing Australian studies, such as the '*Migrants' Fiscal Impact Model*' developed by Deloitte Access Economics (forthcoming), which considers the impact of immigration on the Australian Government budget over a 50 year timeframe. The Commission's modelling is based on a longer projection period of 100 years. It therefore captures a period later in immigrants' lives when they are not working and tend to incur large health and social security expenses.

The fiscal model can also account for the fiscal impacts of changes to immigration policy settings, including changes in policies regarding eligibility for and waiting periods to

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access, government-funded services and benefits. It can also be used to model the effects of changing the composition of the migrant intake.

## D.2 Model overview

The model was initially designed to estimate the net fiscal impacts of NOM *in aggregate*, including all subsequent NOM over the projection period. For the inquiry, the model has been adapted to estimate *average per person* net fiscal impacts (in NPVs) for different types of permanent immigrants. Although the model therefore includes features to estimate the aggregate fiscal impacts of NOM (which are described below), the presentation of results in section D.5 is concentrated on the NPV estimates.

Broadly, the model estimates the annual revenues and expenditures attributable to immigrants, accounting for differences in their demographic and labour market characteristics (age, gender, visa type, labour force participation and unemployment). The difference between annual revenues and expenditures for each type of immigrant yields annual estimates of net fiscal impacts for a single cohort of immigrants (referred to as the ‘representative intake’ which is characterised as NOM). The model projects over a 100 year period (2015 to 2114).<sup>1</sup> Projections for the representative intake can be used to:

- estimate immigrants’ average lifetime net fiscal impacts (presented in chapter 9)
- estimate the revenues, expenditures and net fiscal impacts of all future cohorts of NOM over the projection and their descendants (referred to the ‘cumulative intake’), by assuming that the per person revenues and expenditures generated by the representative intake apply to all future intakes.

Inputs to the model include population projections for the purpose of projecting NOM, as well as mortality and fertility rates (with rates of growth held constant out to 2114).

### The scope of government expenditures and revenues

The model can be calibrated according to three different model specifications, each looking at a different scope of government expenditures and revenues.

- Specification 1: includes key revenues and expenditures attributable to immigrants at the level of the Australian Government only.
- Specification 2: includes key revenues and expenditures attributable to immigrants at both the Australian Government and state and territory government levels. This specification underpins the results presented in chapter 9.
- Specification 3: includes all revenues and expenditures related to immigrants at all levels of government, including local government.

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<sup>1</sup> All years, unless otherwise indicated, are in financial years, ending 30 June of the year quoted.

Per person expenditures for the first and second specifications of the model are defined in PC (2013) (updated to 2014 dollars) and include the following expenditure types:

- health (Pharmaceutical Benefits Scheme (PBS), s85 only), Medicare, hospitals, the Private Health Insurance (PHI) rebate and other health expenditures)
- education (pre-school, primary and secondary schooling, university, tertiary and further education (TAFE) and other education expenditures)
- transfers (aged care, Disability Support Pension (DSP), Age Pension, Family Tax Benefit parts A and B (FTB (A+B)) and unemployment benefits).

The expenditure and revenue items modelled in each specification are in table D.1 below.

**Table D.1 Expenditure and revenue items in each specification<sup>a</sup>**

	<i>Specification 1 (Partial, Australian Government only)</i>	<i>Specification 2 (Partial, Australian and state and territory governments)</i>	<i>Specification 3 (Comprehensive, whole-of-government)</i>
<b>Expenditures</b>	Health (Pharmaceutical Benefits Scheme, Medicare, PHI rebate, hospitals, other), Education (pre-school, primary and Secondary, university, TAFE, other) and Transfers (FTB (A+B), unemployment benefits, DSP, aged care, Age Pension).	State and territory health (hospitals and other) State and territory education (pre-school, primary and secondary, university, TAFE, other).	<i>Australian Government:</i> Defence, government administration, debt servicing, other welfare (parenting payments, child care). <i>State, territory and local governments:</i> Government administration, debt servicing, public order and safety, housing services, welfare, transport and communication.
<b>Revenues</b>	Labour income tax, company tax and excises and levies (not GST revenue as this is redistributed to the states and territories).	GST revenue.	<i>Australian Government:</i> Taxes on non-residents, superannuation guarantee levies and taxes on international trade. <i>State, territory and local governments:</i> Payroll, property taxes (land tax, municipal rates, stamp duties on conveyancing), other indirect taxes (e.g. gambling and vehicle taxes).

<sup>a</sup> Cells represent additional inclusions. Exclusions from each specification are therefore all items to the right of that specification. Items listed in Specification 3 are the main items only.

Specifications 1 and 2 attribute per person revenues and expenditures to immigrants that are deemed to vary by age and/or gender (as well as some that are assumed not to depend on age or gender, such as unemployment benefits). In the third specification, the additional

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revenues and expenditures are attributed to immigrants on a per person basis (discussed further in section D.5).

Specification 2 includes state and territory components of hospital expenditures, other health expenditures and education expenditures. Additional costs included in specification 3 are derived by mapping the cost coverage in PC (2013) to the Australian Bureau of Statistics' (ABS) Government Finance Statistics (2015b). Australian Government taxes included in the model are labour income tax, company tax and excises and levies. State and territory taxes are limited to the goods and services tax (GST).<sup>2</sup>

The model projects expenditures and revenues associated with NOM for the remainder of immigrants' assumed stay in the country.<sup>3</sup> The model is limited to projecting new immigrants' *net contributions* to the fiscal position, rather than what the fiscal position itself would look like under different NOM settings. The model does not account for the costs and revenues for the existing population or the existing population of immigrants.

## Types of migrants covered

As the model is based on NOM, the model accounts for all types of migrant flows, including permanent immigrants in Australia's Migration Programme (skill and family streams), permanent humanitarian immigrants, temporary immigrants (skilled, students, working holiday makers and visitors), New Zealand citizens and Australian citizen flows.<sup>4</sup> Furthermore, immigrants in the permanent skill stream are broken down into primary and secondary applicants. The immigrant categories used in the model are detailed in attachment 1 to this technical supplement.

This approach is distinct from projections based on visa grants, or the pre-existing number of immigrants in the country, and will produce different results to those alternative approaches. Among those who are granted permanent visas offshore, for example, many choose not to come to Australia, or may delay their entry. Accounting for pre-existing immigrants is complicated by the fact that many immigrants become citizens. The focus on future NOM relates to the necessity to analyse the fiscal implications of future immigration policy settings, rather than retrospective policy changes affecting existing visa holders.

The model can be calibrated assuming NOM is set at a fixed level, or one where it is set at a ratio of the population. Age- and gender-specific participation and unemployment rates form the basis of the revenue side of the model, and of claims for unemployment benefits.

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<sup>2</sup> While the GST is levied by the Australian Government, it is treated as a state and territory revenue source since it is redistributed to the states and territories through general revenue assistance.

<sup>3</sup> For many permanent immigrants, the remainder of their stay in the country will be the remainder of their lives, while for many temporary immigrants, this will simply be the duration of their stay in Australia.

<sup>4</sup> The model also accounts for the Special Eligibility category in the Migration Programme, as well as 'Other' categories within the temporary and permanent streams of NOM. While results for these categories are generally not presented separately, they are included in totals where appropriate.

## D.3 Data sources

The primary data sources used in the model are summarised in table D.2 below.

Table D.2 Primary data sources<sup>a</sup>

Variable	Source	Notes
<i>NOM flow data by visa category</i>	ABS (Migration, Cat. no. 3 412.0). Inquiry concordances for permanent immigrants.	Data are four year averages (2010 to 2014). NOM flows are disaggregated by both permanent and temporary visa groupings.
<i>Demographic and labour market characteristics of permanent immigrants</i>	ABS (Australian Census and Migrants Integrated Dataset (ACMID), Cat. no. 3 417.0).	Data relate to recent migrants within the scope of ACMID (generally calendar years 2 010 to 2 011). Covers age and gender distributions, labour force participation and unemployment.
<i>Demographic and labour market characteristics of temporary immigrants</i>	ABS (Characteristics of Recent Migrants (CORM), Cat. no. 6 250.0), Census of Population and Housing, and administrative data from DIBP.	CORM data are for calendar year 2 013, Census for 2 011 and DIBP data are averaged across recent years to 2 013. Covers age and gender distributions, labour force participation and unemployment.
<i>Per person costs for Australian, state and territory governments</i>	PC (2 013): <i>An Ageing Australia: Preparing for the Future</i> .	Data are for 2 012, and are indexed to 2 014 dollars for the purposes of this supplement.
<i>Median income tax revenues</i>	Personal Income Tax and Migrants Integrated Dataset (PITMID) and the Australian Taxation Office (ATO) one per cent sample.	PITMID data relate to 2 011 and ATO data are for the general population at 2 010.
<i>Other expenditure items</i>	ABS (Government Finance Statistics, Cat. no. 5 512.0).	Data are for 2 014. Per person estimates only.
<i>Other revenue items</i>	ABS (Taxation Revenue, Cat. no. 5 506.0).	Data are for 2 014. Per person estimates only.

<sup>a</sup> There are a number of additional data sources used to calculate immigrants' uptake rates for government-funded services and benefits (appendix B).

Sources: (ABS 2013a, 2014b, 2014c, 2015b, 2015c, 2015d, 2015e); (PC 2013); (ATO 2015).

## D.4 Model framework, assumptions and limitations

### Model framework

This section describes the framework underlying the model in terms of its four primary components: an immigrant flows and demographics module, an expenditure module, a labour market module, and a module to derive the NPVs of immigrants' lifetime net fiscal impacts.



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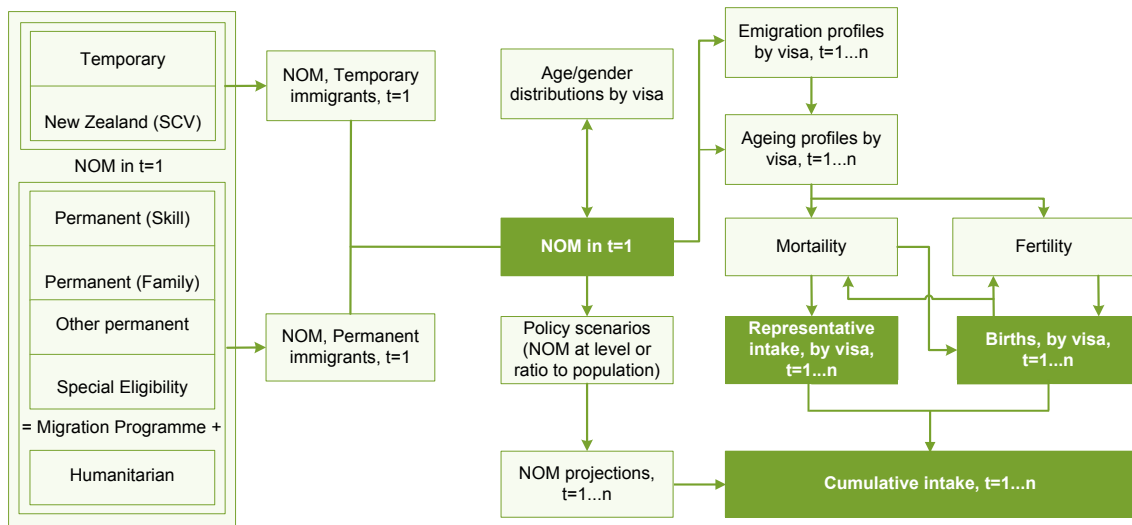
## Module 1: Immigrant flows and demographics

Module 1 covers the inward and outward flows of immigrants, demographic assumptions, and how the model derives the projection of NOM under different policy scenarios (figure D.1).

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**Figure D.1 Immigrant flows and demographics**

Derivation of the representative and cumulative intake of immigrants



NOM flow data by visa category represent net additions (or subtractions) to the population for both temporary and permanent immigrants. These visa categories are consistent with the inquiry's visa groupings for permanent visa holders and have been mapped to ABS migration flow data to provide a detailed decomposition of NOM (attachment 1 in this technical supplement).

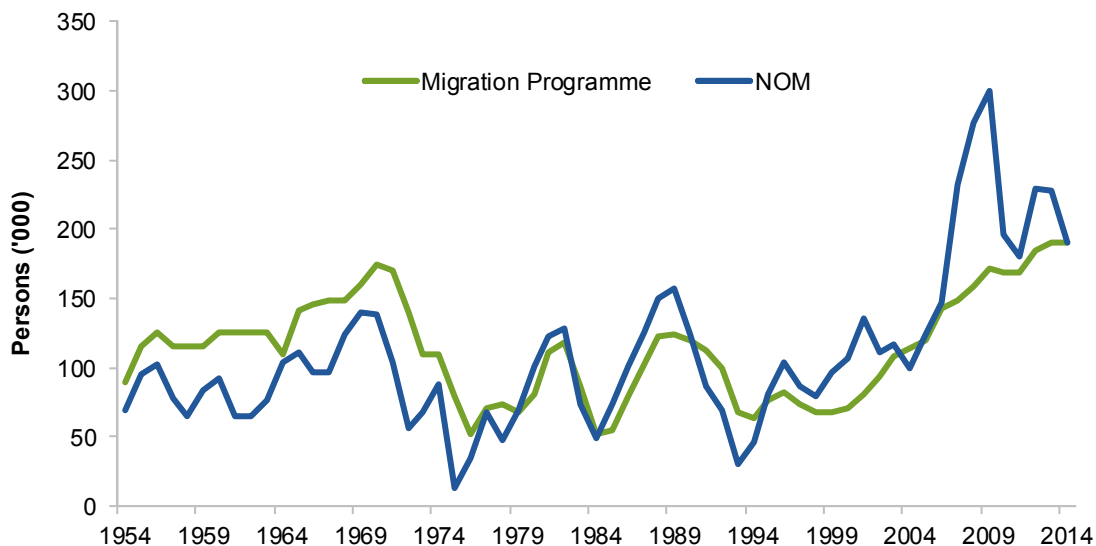
Age and gender distributions are applied to each visa category based on observed data. For permanent immigrants, it is assumed that the age and gender distributions of *recent* immigrants within the scope of the ACMID are representative of those in a given NOM intake. Age and gender distributions for temporary immigrants are based on administrative data sourced from the Department of Immigration and Border Protection (DIBP). The composition of NOM itself is calibrated on an average of NOM flows over recent years.

Immigration policy *directly* controls the number of permanent visa grants through the Migration Programme, but does not directly control temporary migration. Therefore, incorporating temporary migrants in a model based on NOM requires assumptions about the relationship between the policy concept of the NOM (visa grants in the permanent streams) and the accounting concept of NOM (overseas arrivals less departures capturing only those who have stayed for at least 12 months over a 16 month period — the

12/16 month rule).<sup>5</sup> Note that this will not capture temporary migrants not identified by this rule, i.e. short-term immigrants who stay for less than 12 months over a 16 month period.

Historically, there has been a close relationship between the Migration Programme and observed NOM (figure D.2). The model therefore assumes NOM flows across *all* visa categories are a function of policy decisions on the Migration Programme. NOM flows in each visa category are projected according to the aggregate NOM growth rate implied by the policy scenarios.

**Figure D.2 Historical NOM flows and the Migration Programme<sup>a</sup>**  
Financial year estimates



<sup>a</sup> There is a break in the NOM series — prior to 1982 they are based on historical figures and from 1982 they are based on demographic statistics.

Sources: DIBP Historical Migration Statistics (1953-54 to 2013-14) for data on the Migration Programme (DIBP 2015a); ABS Australian Historical Population Statistics for historical NOM data (ABS 2014a); and ABS Australian Demographic Statistics for recent NOM (ABS 2015a).

NOM flows within the visa categories that are part of the Migration Programme are *indicative* of the successful offshore applicants within the program. On this basis, a significant number of visa grants in the Migration Programme are to onshore applicants. However, the model does not explicitly define how onshore temporary immigrants transition to the permanent Migration Programme and so these onshore applicants are not modelled (in any case, this would be inconsistent with modelling the fiscal impacts of NOM, as opposed to visa grants).

<sup>5</sup> The ABS' rule used to estimate NOM (ABS 2013c).

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Outward migrant flows occur through either emigration or mortality. The model assumes separate emigration profiles for each visa category (attachment 2 in this technical supplement). Emigration rates are imposed at the level of the visa category and so the model makes no assumptions about the age or gender of emigrants.<sup>6</sup> Of those who remain in the country, age- and gender-specific mortality rates are applied to the intake (with the exception of temporary immigrants who depart through emigration only).

Accounting for immigrants' ageing, mortality and emigration rates leaves a '*representative intake*' for a given year's NOM which tells us how many immigrants reside in the country, over what period, by age and gender. This representative intake shrinks in size over the projection period due to emigration or mortality. Annual growth in the representative intake for each visa category is then applied to each successive NOM intake in the projection period to derive estimates of the '*cumulative intake*' of immigrants over the projection period.

The model also uses projected fertility rates (females aged 15–49) from the economywide modelling to derive descendants of permanent immigrants and New Zealand citizens (but not temporary immigrants). Birth-to-NOM ratios across the projection period for the representative intake are then used to calculate births for the cumulative intake. This method of calculating ratios to the representative intake is mirrored in expenditure and revenue calculations.

## Module 2: Expenditure

Module 2 covers the calculation of government expenditures for the representative and cumulative intakes (figure D.3). Expenditures are calculated on a per person basis and are aggregated to form expenditures allocated to particular visa types.

The model derives the number of individuals within each visa category, by age and gender, who are eligible to consume government-funded services or benefits. This is a function of:

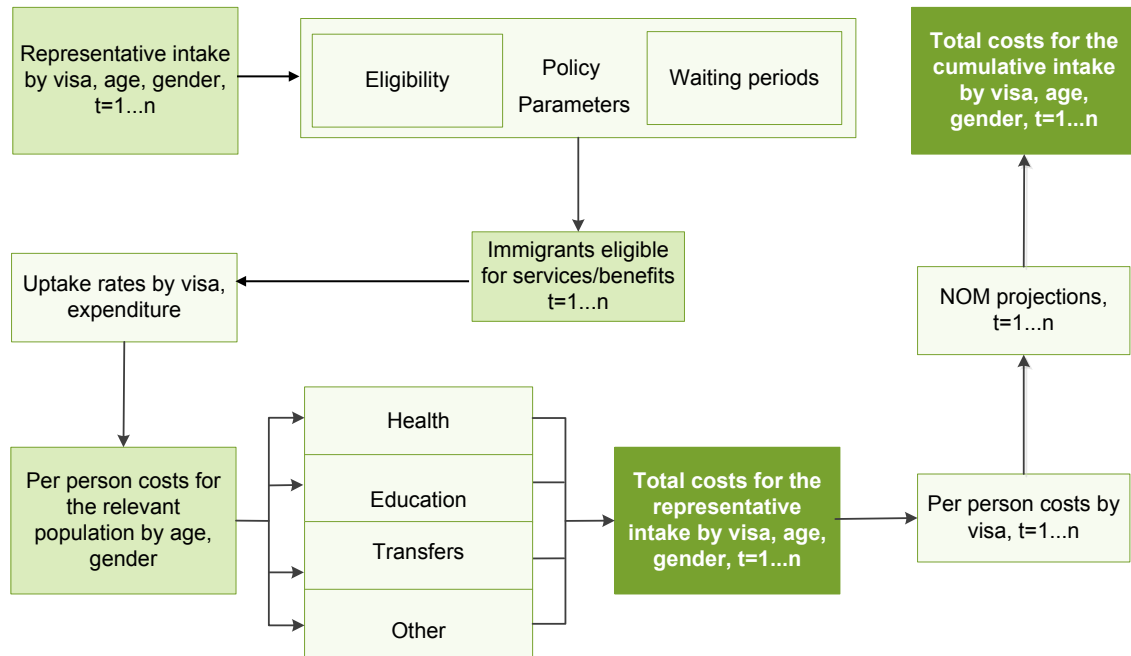
- policy parameters (eligibility and waiting periods for government-funded services and benefits)
- visa-specific uptake rates for those services and benefits (attachment 3 in this technical supplement)
- an assumption about how long it takes for immigrants to 'converge' to the average Australian uptake rates (the model assumes this is uniformly 10 years across all expenditure items and visa categories).

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<sup>6</sup> It may be that immigrants' propensities to emigrate differ by age and gender, however data are not available to quantify this. An aggregate emigration rate for each visa category is likely to be a reasonable proxy. For example, if a primary applicant emigrates, they will likely take their spouse and children with them.

**Figure D.3 Expenditure**

Derives expenditures for immigrants by visa, age and gender.



In addition to uptake rates, different propensities to consume services or receive benefits are reflected in the per person cost, which applies to certain age categories and is zero otherwise (for example, the Family Tax Benefit is associated with children only), or changes with age (for example, higher education costs), or both.

**Policy parameters**

The model is calibrated according to current policy settings. This means all permanent immigrants and New Zealand Special Category visa holders have access to government-funded health, education and transfer expenditures conditional on relevant waiting periods. All non-humanitarian permanent immigrants and New Zealand citizens are subject to a 10 year waiting period to access the Disability Support Pension and the Age Pension. To access unemployment benefits, all non-humanitarian permanent immigrants are subject to a two year waiting period, whereas New Zealand Special Category visa holders are subject to a 10 year waiting period. By contrast, all other temporary immigrants are assumed to be ineligible for any form of direct expenditure. This reflects several factors.

- *Health*: temporary immigrants are generally ineligible for government-funded health services and are either required to hold private health insurance (for example, students), or pay in full if not covered by a private health insurance policy (for example, visitors). Expenses associated with reciprocal health care agreements are not accounted for.

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- *Education*: while children on some temporary visas do have access to public schooling (namely secondary applicants in the skill stream) they are assumed not to impose a cost on government. Most temporary immigrants are ineligible for both Commonwealth Supported Places and government student loans for university and/or TAFE — in other words, they are included as full fee-paying students.
  - *Transfers*: visa conditions mean that temporary immigrants are ineligible for transfers.

Total costs for the representative intake are derived by multiplying the number of individuals consuming each government-funded service or benefit by the applicable per person cost. Total costs are then expressed as per person averages and applied to subsequent intakes of NOM over the projection period (the cumulative intake).

An equivalent process is undertaken for immigrants' descendants, who are assumed to have unrestricted access to government-funded services and benefits and are therefore allocated the same eligibility and uptake rates as Australian citizens. All costs undergo indexation across the projection period, producing values in terms of 2014 dollars.

### Module 3: Labour market

Module 3 covers the labour market, the revenues and costs which depend on immigrants' labour market characteristics and other revenues (figure D.4).

Immigrants' labour market characteristics (labour force participation and unemployment rates by age, gender and visa category) are used to derive employment and unemployment estimates (persons), which are used to calculate income tax revenue and unemployment benefits, respectively.

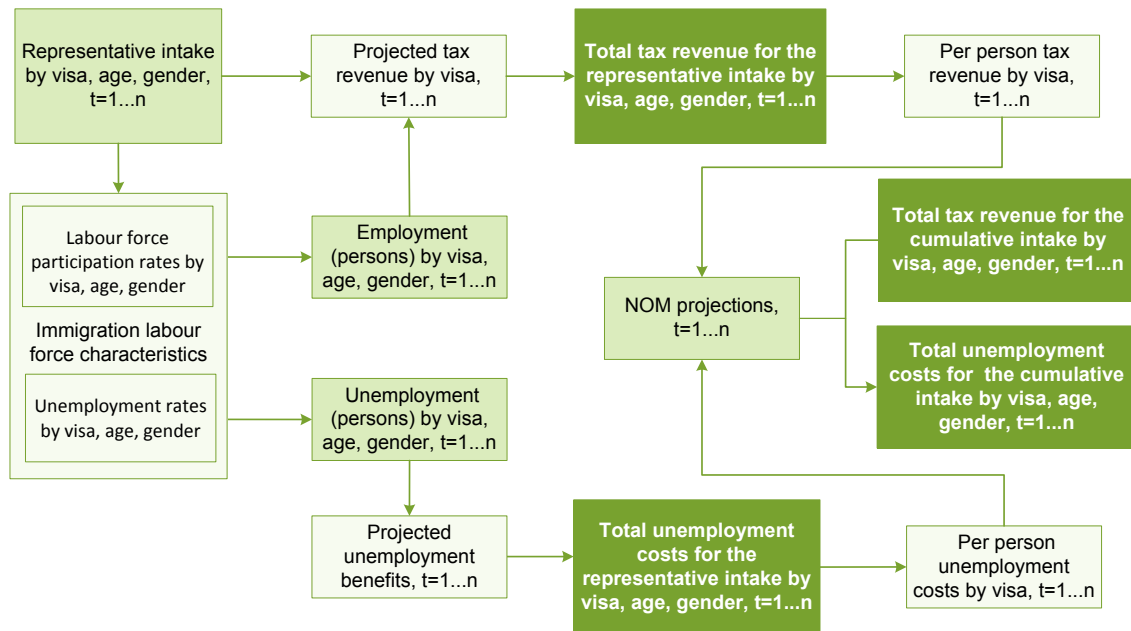
The model specifies labour force participation rates and unemployment rates by single age year (based on ACMID and Census for permanent immigrants and CORM for temporary immigrants). Labour force characteristics for permanent immigrants and New Zealand citizens are assumed to converge linearly to the Australian averages by age group.<sup>7</sup> For temporary immigrants, participation and unemployment rates are assumed to remain constant for the duration of their stay.

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<sup>7</sup> Over the projection period, Australian characteristics change as the population ages.

**Figure D.4 Labour market**

Immigrants' labour force characteristics, employment and unemployment and labour income tax revenues and unemployment costs



This framework implies that uptake rates for unemployment benefits vary according to age, gender and visa category. The treatment of uptake rates for unemployment benefits is consistent with the treatment in other cohort-based projections (such as those used in the Intergenerational Report and in other Commission modelling). In contrast, uptake rates for the other government-funded services and benefits in the model are assumed to be constant across age and gender.

A consequence of this approach is that the definition of uptake of unemployment benefits for immigrants is different from that applied in the case of other forms of expenditure (which apply to the population, rather than the labour force). However, eligibility parameters, waiting periods and the number of years for immigrants' convergence to the Australian average can still be altered. To calculate total unemployment expenditures, estimates of unemployed persons are multiplied by average unemployment benefits.

Aggregate income tax revenue projections are derived by multiplying visa-, age- and gender-specific employment estimates by median income tax revenues obtained from PITMID and the ATO's one per cent sample (adjusted to 2014 dollars). Median income tax revenues are projected by holding their ratio to projected gross domestic product (GDP) constant.<sup>8</sup> As earnings are not explicitly modelled in this module, a limitation of the model

<sup>8</sup> The income tax schedules that underlie the estimates of median income tax revenue are for 2010. The model implicitly assumes that the tax schedules are indexed annually to growth and fiscal drag is implicitly compensated for over the projection period. Relative to current policy settings, the 2010 income tax estimates are likely to overestimate revenue due to the subsequent increase of the income tax

is that median income tax revenue for temporary immigrants, New Zealand immigrants, and immigrants' descendants is assumed to be the same as that for the average Australian. Other revenue items are applied on a per person basis, and are assumed to grow at the same rate as GDP.

Note that growth in labour income tax revenue arising from growth in immigrants' incomes is not modelled explicitly, but is captured as immigrants' age, with immigrants assumed to experience rising (and subsequently decreasing) incomes as they shift into (and subsequently out of) the productive working age of their lives.

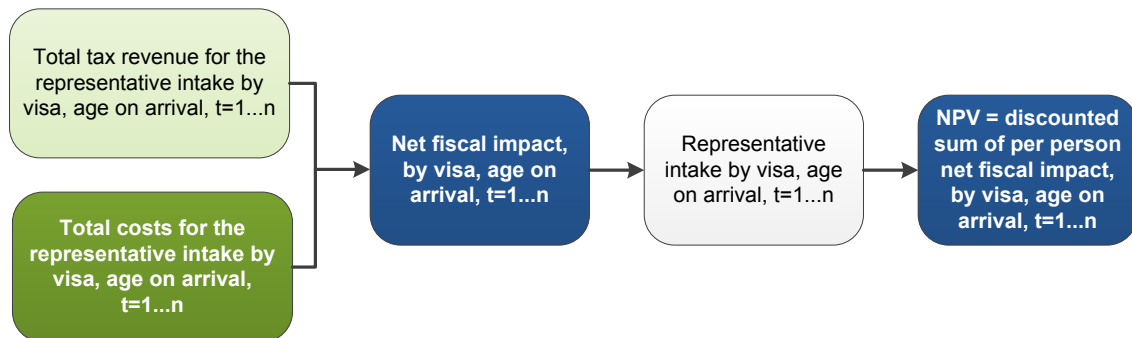
Reflecting the approach taken in the expenditure module, total revenues are then expressed as a ratio to the population of NOM in the representative intake and these revenues are applied to all subsequent intakes of NOM over the projection period (the cumulative intake). An equivalent process is undertaken for immigrants' descendants, who are assumed to have the same labour market characteristics as the average Australian.

#### Module 4: Net present values

Module 4 calculates the NPV of immigrants' net fiscal impacts, by age on arrival, for the representative intake only. This NPV is the discounted sum of annual revenues less costs for an average immigrant (as modelled in modules 2 and 3) (figure D.5).<sup>9</sup> Values are discounted with a real social discount rate of 3 per cent, consistent with the PE modelling.

**Figure D.5 Net present values**

Calculation of the NPV of immigrants' net fiscal impacts by age on arrival.



An NPV framework is useful for comparing the fiscal impacts of different types of *permanent* immigrants, who are likely to spend the rest of their lives in Australia. An NPV framework is less useful for comparing the fiscal impacts of temporary immigrants, since

free threshold and other adjustments to the schedule. Conversely, income tax may be underestimated if the implicit assumption regarding indexation of the tax schedules is not accurate.

<sup>9</sup> There are more years in the projection period (100) than there are single year age categories in the model (96), which has required the 95+ age category to be 'unpacked' using mortality rates.

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they only spend a short time in Australia. In addition, on average, temporary immigrants generate a positive net fiscal impact, reflecting that they typically do not directly draw on most government-funded services and benefits. As such, temporary immigrants' NPV results are not presented in section D.5.

## Assumptions and limitations

This section summarises the main assumptions and limitations of the model.

The main assumptions include the following.

- The fiscal calculations and the NPV calculations of lifetime net fiscal impacts assume that current fiscal policy settings are maintained over the projection period. Results are best used to illustrate the relative patterns of lifetime fiscal impacts across immigrant groups. Changes to the tax system or to the provision of government-funded services or benefits are unlikely to change these relative patterns (unless government policies were changed to target specific visa types).
- Demographic and labour market characteristics of permanent immigrants are based on ACMID. For temporary immigrants, these characteristics are based on CORM, the Census, and departmental administrative data. Median income tax revenues are based on PITMID and ATO data.
- Tax revenues are held constant as a share of GDP (consistent with the Intergenerational Report). All sources of revenue that are not associated with labour income are applied on a per person basis.
- Per person government expenditures are based on PC (2013). Immigrants' uptake of health, education and social security services differ by visa category. Temporary immigrants are assumed not to impose any costs on government budgets.
- Immigrants' uptake of government-funded services and benefits is assumed to converge linearly to Australian averages after 10 years. Immigrants' labour force participation and unemployment rates are assumed to converge at different rates according to visa types to reflect their varied human capital and the speed to which they integrate into the Australian labour market (as described in chapter 5).
  - For example, in the skill stream, primary applicants' characteristics are assumed to converge (down) to Australian averages after 30 years while secondary applicants converge (up) after 10 years. Family stream immigrants' characteristics are assumed to converge (up) after 15 years while humanitarian arrivals converge (up) after 20 years.
- Emigration rates (the proportion of NOM leaving Australia each year) differ by visa category, but for permanent immigrants, they are assumed to be uniformly 1 per cent per year over the projection period.



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- In line with other Commission modelling for this inquiry, the real discount rate is set at 3 per cent. Government revenues and expenditures are deflated, with NPVs expressed in 2014 dollars.

The main limitations include the following.

- The main model specification in the report (specification 2) includes most Australian, state and territory government revenues and expenditures that can be directly attributed to immigrants. It does not include relatively small items of government revenue and expenditure (such as visa charges and settlement services) or items that cannot be easily attributed to immigrants (such as property and payroll taxes, public infrastructure costs and defence spending). Local government revenues and expenditures are also excluded.
- The labour market module does not account explicitly for differences in hours worked and earnings of immigrants, or differences in occupation or skill level. However, these are reflected implicitly in estimates of median income tax revenue which vary by age, gender and visa category.
- General equilibrium considerations are not accounted for in the model. There is no interaction between immigration and capacity utilisation in the labour market, productivity or output growth. The model does not provide any information about the economywide and demographic impacts of immigration. Modelling using a broader general equilibrium framework is detailed in chapter 10.

## D.5 Results

Model results for immigrants' estimated lifetime net fiscal impacts are presented below for three separate specifications, covering the different scope of government accounts described in table D.1.

The limited coverage of revenue and expenditure items in the first and second specifications, and the way in which additional revenues and costs (that do not vary by age) have been modelled means that the results are highly stylised. Nonetheless, they are illustrative of the average net fiscal impact of different types of immigrants, based on the assumptions made. In reality, the additional costs and revenues are likely to exhibit some nonlinearity with age and gender, and may also be different across immigrant types.

Results across all specifications highlight the role of age on arrival, skill level and the composition of the migrant intake in determining immigrants' fiscal impacts. This is the case irrespective of the absolute value of immigrants' fiscal impacts.

To simplify the results, permanent immigrants have been grouped at the stream level, namely skill stream immigrants (broken down into primary and secondary applicants) and family stream immigrants.

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## Specification 1: Australian Government only

The first specification includes primary revenues and expenditures attributable to immigrants at the level of the Australian Government only. By value these items account for around 50 per cent of aggregate Australian Government expenditure and 90 per cent of aggregate Australian Government revenues (excluding GST).

In this specification, the NPVs are positive if the immigrant arrives at a young age (figure D.6). Arriving early in working life maximises the time spent paying tax.

This result also reflects the assumption that immigrants' outcomes converge to the outcomes of the general population. If immigrants arrive as children, they are assumed to have similar labour market outcomes to those of the general population by the time they enter the labour market. If immigrants arrive as adults, their fiscal impacts differ initially based on their various labour force characteristics, as well as the rates at which they are assumed to have access to and use government-funded services and benefits.

Lower NPVs for family stream immigrants at a young age are consistent with the majority of applicants in the partner visa category (which comprises around 80 per cent of the family stream) being female. Female partner visa holders have relatively poor initial labour market characteristics and earnings, which reduces their fiscal contributions through income tax in the early period after arrival.

The lifetime NPVs of immigrants' net fiscal impacts below working age on arrival (aged 0 to 15) are roughly similar. This is due to a number of factors (and is partly a byproduct of using present value calculations). Over the projection period, the present value of young immigrants' combined lifetime education and health costs, from the *Australian Government's* perspective, are roughly equivalent. State and territory governments incur the majority portion of these expenses (pre-school, primary and secondary school, and hospital costs), and therefore, the net fiscal impact on the *Australian Government* budget is dominated by the present value weight given to per person revenues from these children (which is equal across all age groups).<sup>10</sup>

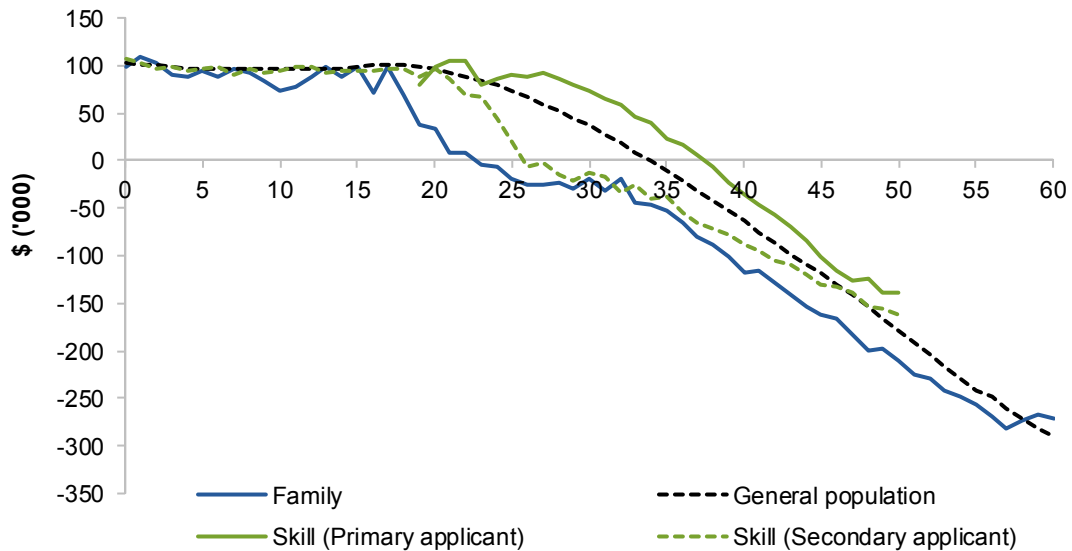
Note also that the NPVs for migrants who arrive after age 60 'bottom out', rather than continue to decline. This reflects that the older an immigrant is, the less time they are likely to have to draw on health and transfers expenses through the remainder of their lives, especially when accounting for the effect of any waiting periods.

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<sup>10</sup> A more nuanced treatment of revenues may yield a steeper gradient of the curve at this age group, but it is unlikely to change the relativities between different immigrant categories.

Figure D.6 **Specification 1 — Estimated lifetime fiscal impacts by age on arrival<sup>a,b</sup>**

NPV estimates of Australian Government fiscal impacts per average permanent immigrant, net overseas migrant intake, 2014 dollars.



<sup>a</sup> The line labelled 'General population' relates to the expenditures and revenues attributed to an Australian citizen that would enter Australia at the corresponding age of arrival. <sup>b</sup> The limited coverage of Australian Government costs and revenues as described in the text means that these curves will only shift vertically if other items are included (as in other specifications). As such, the ages at which the curves cross the x-axis should not be interpreted as 'breakeven ages'.

Source: Productivity Commission estimates.

## Specification 2: Australian, state and territory governments

The second specification includes primary revenues and expenditures attributable to immigrants at both the Australian and state and territory levels of government, including state health and education expenditure and GST revenue. This specification underpins the results presented in chapter 9. By value these items account for around 50 per cent of aggregate Australian and state and territory governments expenditure and 75 per cent of aggregate Australian and state and territory governments revenues (including GST). Overall, state expenditures on health and education represent around 50 per cent of total state expenditure and GST represents around 55 per cent of their revenues.

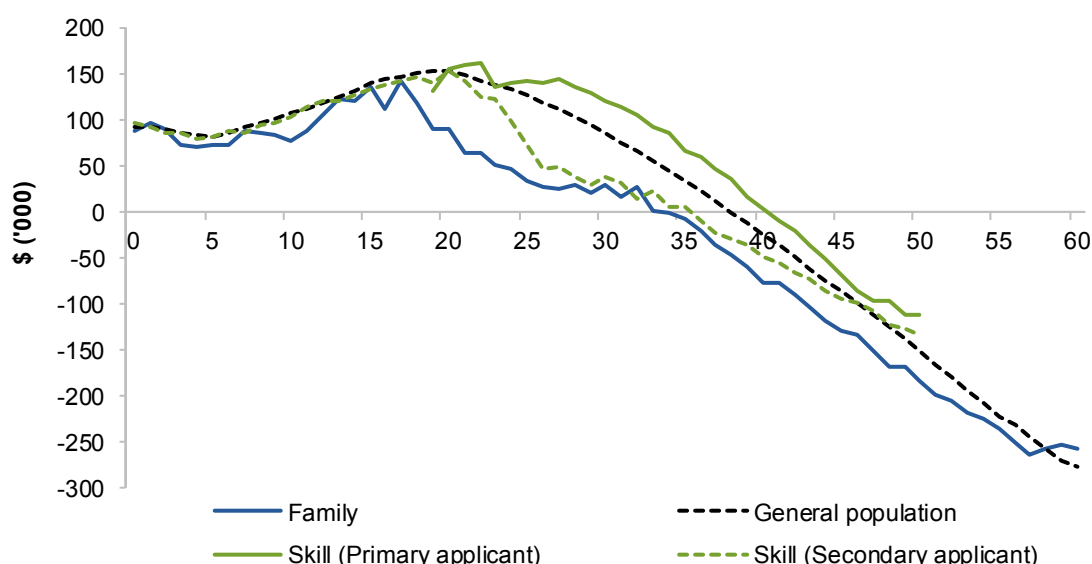
Including Australian and state and territory levels of government in the model lifts the NPVs across most ages, as the additional items included have differential impacts by age (figure D.6 relative to figure D.7). The curves shift down, however, for those age groups that incur higher state costs — namely, children going through school, and those who are

older and draw on hospital expenses. For everyone else, the lifetime stream of GST offsets what health costs they will incur later in life.<sup>11</sup>

For an average Australian who spends their entire life in the country, the model implies that the GST revenue they generate does *not* completely offset their lifetime health and education costs. However, the impact for immigrants depends on the age distribution of the visa category in question. Generally, the results reinforce the policy implication that young educated immigrants are more favourable from a fiscal point of view and this argument is likely to apply to state and territory government budgets as well.

**Figure D.7 Specification 2 — Estimated lifetime fiscal impacts by age on arrival<sup>a,b</sup>**

NPV estimates of fiscal impacts on Australian, state and territory governments per average permanent immigrant, net overseas migrant intake, 2014 dollars.



<sup>a</sup> The line labelled 'General population' relates to the expenditures and revenues attributed to an Australian citizen that would enter Australia at the corresponding age of arrival. <sup>b</sup> The limited coverage of Australian and state and territory governments costs and revenues as described in the text means that these curves will only shift vertically if other items are included (as in other specifications). As such, the ages at which the curves cross the x-axis should not be interpreted as 'breakeven ages'.

Source: Productivity Commission estimates.

<sup>11</sup> The modelling of GST revenue on a per person basis may overstate GST revenues, particularly for older age cohorts due to changes in income and consumption behaviour which is not taken into account. NPVs of fiscal impacts for older immigrants should therefore be interpreted as an 'upper' bound.

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### Specification 3: Whole-of-government

As noted in chapter 9, there are additional revenues and expenditures that are difficult to directly attribute to immigrants. These additional items are not captured in specifications 1 and 2 which focus on estimating the *relative* fiscal impacts between different immigrants. This is partly due to limited data availability. Data are generally not publicly available on immigrants' relative contributions to these additional revenues and expenditures. Additional expenditures also relate to government-provided goods and services which may exhibit public good qualities. It is debatable as to how these costs should be attributed to the existing Australian population, let alone different types of immigrants (for example, congestible infrastructure such as roads and rail, or the provision of defence forces). While beyond the scope of this supplement, these additional revenues and expenditures are highly relevant to governments, particularly insofar as immigration policy is, in effect, a default population policy.

Given data limitations, this specification augments the revenue and cost structure in the model to include per person estimates of the aggregate revenues and costs *not* captured in specification 2.<sup>12</sup> While this is a simplistic approach, it does enable an *illustrative* projection of immigrants' lifetime fiscal impacts in absolute terms.<sup>13</sup>

This specification indicates that the NPV of immigrants' net fiscal impacts are negative regardless of age on arrival (figure D.8). This is also true for a hypothetical Australian citizen arriving in the country. Notwithstanding uniformly negative NPVs, the *relative* fiscal impacts of immigrants remain unchanged, with younger skilled immigrants in early working age having better fiscal impacts than for the general population.

This does not imply that the immigration system necessarily generates a worse outcome from the perspective of the Australian community. Immigrants with relatively better net fiscal impacts than the average Australian (for example, temporary immigrants, skill stream primary immigrants) will deliver a fiscal gain (regardless of whether their net fiscal impacts are positive or negative in absolute terms) because, while they add to the population, they minimise any reduction in *average* consumption that may occur under a future rise in taxes or reduction in government spending.<sup>14</sup>

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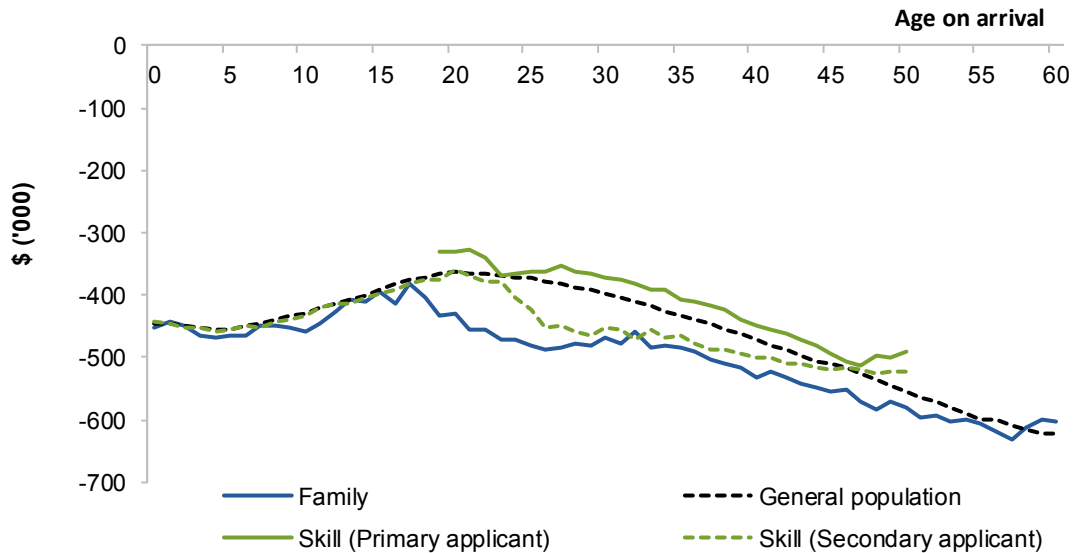
<sup>12</sup> The positive gross operating surplus at the local government level implied in ABS (2013) has been simplistically modelled as a reduction in aggregate expenditure given vertical fiscal imbalance.

<sup>13</sup> This approach assumes that these additional revenues and expenditures are roughly constant as a proportion of GDP and that the primary impact of immigration on GDP growth is through population growth, as opposed to growth in aggregate participation or productivity.

<sup>14</sup> This does not account for environmental or social considerations for population growth and assumes that such a future tax is non-distortionary in nature.

**Figure D.8 Specification 3 — Estimated lifetime fiscal impacts by age on arrival<sup>a</sup>**

NPV estimates of whole-of-government fiscal impacts per average permanent immigrant, net overseas migrant intake, 2014 dollars.



<sup>a</sup> The line labelled 'General population' relates to the expenditures and revenues attributed to an Australian citizen that would enter Australia at the corresponding age of arrival.

Source: Productivity Commission estimates.

The absolute values of these estimates rest crucially on the assumption of current policy settings being maintained over the projection period — any changes to policy will affect these estimates. As such, these projections are highly stylised and merely indicative. In addition to any future policy change, better estimates of immigrants' absolute net fiscal impacts would rest on undertaking additional work on how best to apportion immigrants' shares of government expenditures such as public infrastructure and better data on immigrants' use of additional government-funded services and benefits and contributions to additional government revenues over their lifetimes.

## Attachment 1 Migrant categories in the model

The categories of NOM included in the model are consistent with the inquiry concordance for permanent immigrants (which breaks down the permanent family and skill streams into a number of subcategories) and includes all other temporary immigrants, New Zealand citizens and Australian citizens. This concordance has been mapped to ABS migration statistics to derive a detailed decomposition of NOM (table 1.1). Permanent skill stream immigrants have separate distributions for primary and secondary applicants.

**Table 1.1 Migrant categories, age and gender distributions<sup>a,b</sup>**  
For the categories of NOM included in the model

<i>Category of NOM</i>	<i>Age distribution (single age)</i>	<i>Gender distribution</i>	<i>Modelled NOM (persons, four year average annual flow)</i>
Temporary (Student)	Distribution of 'Students' in DIBP administrative data, averaged.	Age-specific, implied in DIBP administrative data.	39,300
Temporary (Skilled)	Distribution of 'Skilled' in DIBP administrative data, averaged.	Age-specific, implied in DIBP administrative data.	23,775
Temporary (Visitor)	Aggregate NOM age distribution from PC's <i>An Ageing Australia</i> (2 013).	Age-specific, implied in PC's <i>An Ageing Australia</i> (2 013).	27,823
Temporary (Working Holiday Maker)	Distribution of 'Working Holiday Maker' in DIBP administrative data, averaged.	Age-specific, implied in DIBP administrative data.	30,903
Temporary (Other)	Distribution of 'Skilled' in DIBP administrative data, averaged.	Age-specific, implied in DIBP administrative data.	-13,603
New Zealand citizens (Special Category visas)	Distribution in Census (filtering year of arrival, country of origin and citizenship).	Age-specific, implied in Census.	33,950
Permanent Skill (Points Tested)	Distribution in ACMID, defined at subclass level (filtering year of arrival). Separate distributions for primary and secondary applicants.	Age-specific, implied in ACMID.	19,241
Permanent Skill (Employer Sponsored)	Distribution in ACMID, defined at subclass level (filtering year of arrival). Separate distributions for primary and secondary applicants.	Age-specific, implied in ACMID.	8,548

(continued next page)

**Table 1.1** (continued)

<i>Category of NOM</i>	<i>Age distribution (single age)</i>	<i>Gender distribution</i>	<i>Modelled NOM flow (persons, four year average annual flow)</i>
Permanent Skill (Business Innovation and Investment)	Distribution in ACMID, defined at subclass level (filtering year of arrival). Separate distributions for primary and secondary applicants.	Age-specific, implied in ACMID.	1,853
Permanent Skill (Other)	Same as Permanent Skill (Business Innovation and Investment). Separate distributions for primary and secondary applicants.	Age-specific, implied in ACMID. Same as Permanent Skill (Business Innovation and Investment).	594
Permanent Family (Partner)	Distribution in ACMID, defined at subclass level (filtering year of arrival).	Age-specific, implied in ACMID.	24,028
Permanent Family (Parent)	Distribution in ACMID, defined at subclass level (filtering year of arrival).	Age-specific, implied in ACMID.	752
Permanent Family (Dependent Child)	Distribution in ACMID, defined at subclass level (filtering year of arrival).	Age-specific, implied in ACMID.	1,557
Permanent Family (Contributory Parent)	Distribution in ACMID, defined at subclass level (filtering year of arrival).	Age-specific, implied in ACMID.	1,558
Permanent Family (Other)	Distribution in ACMID, defined at subclass level (filtering year of arrival).	Age-specific, implied in ACMID.	1,499
Permanent (Humanitarian)	Distribution in ACMID, defined at subclass level (filtering year of arrival).	Age-specific, implied in ACMID.	8,715
Permanent (Special Eligibility)	Not modelled.	Not modelled.	N/A
Permanent (Other)	Same as Permanent Family (Other).	Same as Permanent Family (Other).	4,533
Australian citizens	Aggregate NOM age distribution from PC's An Ageing Australia (2 013).	Age-specific, implied in PC's An Ageing Australia (2 013).	N/A

**a** DIBP data on temporary immigrants have been adjusted for unknown and zero observations.

**b** Permanent skill immigrants are broken down into primary and secondary applicants for the purposes of estimating expenditures and revenues.

Sources: DIBP (ABS 2014c) (PC 2013).



## Attachment 2 Assumed emigration profiles

Emigration profiles for each visa type are detailed in table 2.1 below.

**Table 2.1 Assumed immigrant emigration profiles**  
Proportion of NOM intake emigrating per year

<i>Migrant category</i>	<i>Emigration rates</i>
Temporary (Student)	Increases linearly to 100 per cent over five years. This reflects that course lengths differ in duration and are subject to course structure, the choice of course load, the extent of failure and early dropout.
Temporary (Skilled)	Increases linearly to 100 per cent over ten years. This reflects the general ability to rollover these visas.
Temporary (Visitor)	100 per cent after one year reflecting visa condition of a 12-month stay.
Temporary (Working Holiday Maker)	76 per cent after the first year and 100 per cent thereafter. Calibrated according to DIBP estimates of the proportion of immigrants on Working Holiday visas (subclass 417) and the proportion applying for a second year.
Temporary (Other)	Imputed as 100 per cent given the NOM flow in this category has historically been negative.
New Zealand citizens (Special Category visas)	Decreases linearly over ten years reflecting an assumption that one third of NZ immigrants that leave NZ return after a period of roughly a decade. 1 per cent per year thereafter over the remainder of the projection period.
Permanent Skill (Points Tested)	1 per cent per year over the projection period.
Permanent Skill (Employer Sponsored)	1 per cent per year over the projection period.
Permanent Skill (Business Innovation and Investment)	1 per cent per year over the projection period.
Permanent Skill (Other)	1 per cent per year over the projection period.
Permanent Family (Partner)	1 per cent per year over the projection period.
Permanent Family (Parent)	1 per cent per year over the projection period.
Permanent Family (Dependent Child)	1 per cent per year over the projection period.
Permanent Family (Contributory Parent)	1 per cent per year over the projection period.
Permanent Family (Other)	1 per cent per year over the projection period.
Permanent (Humanitarian)	1 per cent per year over the projection period.
Permanent (Special Eligibility)	N/A – not modelled.
Permanent (Other)	1 per cent per year over the projection period.
Australian citizens	Imputed as 100 per cent given the NOM flow in this category has historically been negative.

*Sources:* Productivity Commission estimates. The emigration profile for New Zealand citizens has been informed by NZ Ministry of Business, Innovation and Employment (2012). Emigration rates for temporary Working Holiday Maker visa holders is based on (DIBP 2015b).

## Attachment 3 Migrants' uptake rates

Uptake rates for government-funded services and benefits are summarised in table 3.1.

**Table 3.1 Uptake rates of government-funded services and benefits**  
Uptake rates are expressed as a proportion of the relevant age population

	Health				Education					Transfers			
	PBS (\$85)	Medicare	Hospitals	PHIR	Pre-school	Primary and Secondary	University	TAFE	Education n.e.c.	Aged care	DSP	Age Pension	FTB (A+B)
<i>Temporary (Student)</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Temporary (Skilled)</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Temporary (Visitor)</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Temporary (Working Holiday Maker)</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>Temporary (Other)</i>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<i>New Zealand citizens</i>	1.00	1.00	0.46	0.57	0.15	0.63	0.14	0.05	0.63	0.23	0.06	0.71	0.61
<i>Permanent Skill (Points Tested)</i>	1.00	1.00	0.46	0.57	0.15	0.65	0.31	0.14	0.65	0.21	0.01	0.71	0.61
<i>Permanent Skill (Employer Sponsored)</i>	1.00	1.00	0.46	0.57	0.15	0.65	0.31	0.14	0.65	0.21	0.01	0.71	0.61
<i>Permanent Skill (Business Innovation and Investment)</i>	1.00	1.00	0.46	0.57	0.15	0.65	0.31	0.14	0.65	0.21	0.01	0.71	0.61
<i>Permanent Skill (Other)</i>	1.00	1.00	0.46	0.57	0.15	0.65	0.31	0.14	0.65	0.21	0.01	0.71	0.61
<i>Permanent Family (Partner)</i>	1.00	1.00	0.46	0.57	0.17	0.74	0.18	0.22	0.74	0.24	0.02	0.71	0.61
<i>Permanent Family (Parent)</i>	1.00	1.00	0.46	0.57	0.17	0.74	0.18	0.22	0.74	0.24	0.02	0.71	0.61
<i>Permanent Family (Dependent Child)</i>	1.00	1.00	0.46	0.57	0.17	0.74	0.18	0.22	0.74	0.24	0.02	0.71	0.61
<i>Permanent Family (Contributory Parent)</i>	1.00	1.00	0.46	0.57	0.17	0.74	0.18	0.22	0.74	0.24	0.02	0.71	0.61
<i>Permanent Family (Other)</i>	1.00	1.00	0.46	0.57	0.17	0.74	0.18	0.22	0.74	0.24	0.02	0.71	0.61
<i>Permanent (Humanitarian)</i>	1.00	1.00	0.46	0.57	0.18	0.77	0.17	0.34	0.77	0.70	0.12	0.71	0.61
<i>Permanent (Special Eligibility)</i>	1.00	1.00	0.46	0.57	0.18	0.77	0.17	0.34	0.77	0.70	0.12	0.71	0.61
<i>Permanent (Other)</i>	1.00	1.00	0.46	0.57	0.17	0.74	0.18	0.22	0.74	0.24	0.02	0.71	0.61
<i>Australian citizens</i>	1.00	1.00	0.52	0.57	0.15	0.63	0.14	0.05	0.63	0.23	0.06	0.71	0.61

Source: Productivity Commission estimates. Sources vary, see text below.

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The methodology employed to calculate uptake rates differs between expenditure items. Data cataloguing different immigrants' use of various government-funded services and benefits are generally not available. As such, the approach has been to estimate the uptake rate for an average Australian and make adjustments based on whether and to what extent immigrants' uptake rates should differ from this. Uptake rates are assumed to converge to the value of the average Australian uptake rate over a period of 10 years.

The remainder of this appendix overviews the different approaches used to estimate different uptake rates.

#### *Pharmaceutical Benefits Scheme and Medicare*

The PBS is generally available to all Australian residents who hold a Medicare card, or are a Medicare beneficiary. Therefore it is assumed that 100 per cent of the eligible population will use Medicare. New Zealand citizens have access to Medicare and PBS under a reciprocal health care agreement and permanent immigrants are also fully eligible. Uptake rates for these items are uniformly 100 per cent across all immigrants.

#### *Hospitals and the Private Health Insurance Rebate*

The proportion of Australian citizens receiving the PHI rebate is derived from the ABS' *Australian Health Survey* (ABS 2013b) and is expressed as the proportion of respondents reporting having purchased PHI. The proportion of Australian citizens incurring hospitals expenditure is based on the same PHI coverage rate, but makes an adjustment for the proportion of PHI policies which do not include hospitals cover (i.e. ancillary/extras cover). The better initial health outcomes for immigrants (the 'healthy immigrant effect' discussed in chapter 9) is reflected in an assumed 10 per cent lower hospitals uptake rate for immigrants. No interplay with the PHI rebate is assumed based on this effect.

#### *Pre-school and primary and secondary education*

Australian average uptake rates are based on the aggregate (age-weighted) coverage rates implied in *An Ageing Australia* (PC 2013). Ratios of relative consumption of government schooling among permanent immigrants from ACMID are then used to estimate the uptake rates for skill, family and humanitarian immigrants. New Zealanders are assumed to have the same uptake rates as Australians. Uptake rates for 'Education n.e.c.' are assumed to be the same as the uptake rate for primary and secondary education.

#### *University and TAFE*

Australian average uptake rates are based on the aggregate (age-weighted) coverage rates implied in *An Ageing Australia* (PC 2013). New Zealanders are assumed to have the same uptake rates as Australians. Implied coverage ratios from ACMID are used to estimate uptake rates.

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### *Aged care and the Disability Support Pension*

The uptake rates for aged care rely on estimates of aged care recipients across Home and Community Care, Veterans' Packages, Community packages and Residential Care (PC 2011). These are used to derive total recipients by age group, which are then weighted by age cohort. Australian uptake rates for DSP are the DSP population (DSS 2014a) over the eligible age population. For both aged care and DSP, uptake rates for immigrants are scaled to the Australian uptake rate by their relative need for assistance with core activities implied in the Census and ACMID.

### *Age Pension and the Family Tax Benefit (Parts A and B)*

Uptake rates for the Australian population are simply the number of recipients, over the eligible population based on data on income support customers (DSS 2014b). This is assumed to be constant across eligible immigrant categories.

### *Unemployment benefits*

Uptake rates for unemployment benefits are not specified at the aggregate level but by age- and gender-specific labour force participation and unemployment rates, described in section D.4.

### *Other expenditure items*

Uptake rates for the additional expenditure items included in specification 3 of the model are equal to 100 per cent and are constant across immigrants. This is a necessary simplification reflecting the model's structure. In reality the uptake rates for the subcomponents of these additional aggregate per person costs are likely to be less than one to varying degrees and may differ between immigrant categories.

## Attachment 4 Key assumptions in the CGE, PE and fiscal models

The key assumptions are outlined in table 4.1. This table is limited to assumptions shared across modelling frameworks and excludes assumptions specific to each framework.

Table 4.1 **Assumptions in the different modelling frameworks**

<i>Assumptions</i>	<i>CGE (Business-as-usual scenario)</i>	<i>PE (Central case)</i>	<i>Fiscal model (Specification 3)</i>
<b>Economic</b>	GDP and real national consumer wage projections based on VURM-MI.	N/A.	GDP projections based on VURM-MI.
<b>Demographic</b>	Population projections, mortality and fertility rates based on VURM-MI (single year age).	Population not modelled. Mortality based on average life expectancy.	Population projections, mortality and fertility rates based on VURM-MI (single year age).
<b>NOM</b>	Converges to the annual historical average of 0.6 per cent of the population by 2 025 and remains at that proportion.	N/A. Migrant intake defined as permanent migrants in the Migration Programme.	Converges to the annual historical average of 0.6 per cent of the population by 2 025 and remains at that proportion.
<b>Expenditure</b>	Per person expenditures for health, aged care and education from PC (2 013). <i>Coverage:</i> Australian and state and territory governments health, aged care, education and other (e.g. government administration). <i>Growth:</i> Real per person health and education costs are constant over the projection and aged care costs decline in line with improvements in mortality rates. Other expenditures grow in line with real household consumption. Age Pension payments are indexed to the population over 65 years and the projected wage index. For other transfers see Adams et al. (2 015).	Per person expenditures from PC (2 013). <i>Coverage:</i> Australian and state and territory government health (no disaggregation), education (no disaggregation), and transfers (Age Pension, DSP, disability employment services, aged care), and other (e.g. government administration). <i>Growth:</i> Real per person costs held constant.	All per person expenditures from PC (2 013). <i>Coverage:</i> Australian and state and territory government health (PBS, Medicare, hospitals, PHI rebate, other), education (pre-school, primary and secondary, university, TAFE, and other), transfers (DSP, aged care, Age Pension, unemployment, FTB) and other (e.g. government administration). <i>Growth:</i> Real per person health and aged care costs are consistent with CGE. Age Pension payments are indexed to the projected wage index. Education and other transfers costs are indexed to the VURM-MI government price index and the CPI, respectively. <sup>a</sup>
<b>Revenue</b>	<i>Coverage:</i> All major taxes. <i>Growth:</i> Discussed in Adams et al. (2 015).	<i>Coverage:</i> Income tax, GST, migration fees and charges. <i>Growth:</i> Real per person revenues held constant.	<i>Coverage:</i> All taxes. <i>Growth:</i> Real per person revenues grow by GDP growth.
<b>Discount rate</b>	N/A.	3 per cent real social discount rate.	3 per cent real social discount rate.

<sup>a</sup> The approach of indexing expenditures is consistent with previous Commission fiscal projection methodologies (PC 2013) and is similar to that in Australian Government Intergenerational Reports.

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