THE UNIVERSITY OF MELBOURNE

FACULTY OF BUSINESS & ECONOMICS

HILDA PROJECT TECHNICAL PAPER SERIES
No. 1/14, March 2014

Derived Income Variables in the HILDA Survey Data: The HILDA Survey 'Income Model'

Roger Wilkins

The HILDA Project was initiated, and is funded, by the Australian Government Department of Social Services

MELBOURNE INSTITUTE®
of Applied Economic and Social Research

1. Introduction

Each wave, the HILDA Survey collects detailed information from each respondent on annual income received from each of a number of sources. While studies may of course make use of these individual income components, the primary purpose of the collection of this information is to allow estimation of the total personal and household annual income of each sample member. However, to achieve these estimates, steps must be taken to account for limitations of the collected data. First, some income components are not collected, most important of which are some government benefits, which were deliberately not collected on the basis that estimates based on eligibility criteria were likely to be more accurate than respondent recollections of these components. Second, non-response for income components, and indeed the presence of non-respondents in partially-responding households, needs to be accounted for. Finally, respondents mostly report gross or pre-tax income amounts, whereas primary interest is in the post-tax and transfer, or disposable, income of individuals. The HILDA Survey data managers therefore estimate income components not collected and impute missing values of collected income components, and then aggregate the income components to produce derived total personal and household income variables. Furthermore, income tax is estimated for each sample member to produce disposable income estimates at both the personal and household level.

This technical paper describes the methods by which the derived annual income variables are constructed as of Release 12 of the HILDA Survey, which contains data from Waves 1 to 12 (2001 to 2012). In particular, it explains how income components are aggregated and certain government benefits are estimated to produce total income measures, and how taxes are estimated to produce post-tax (disposable) income measures.[1] The methods used to impute missing values, and the extent of missing values, are not discussed in this paper; these are described in Hayes and Watson (2009) and Summerfield et al. (2013).

The methods described in this paper apply to all 12 waves of the HILDA Survey, but not to all of the 12 releases of the HILDA Survey data up to Wave 12. Over time, the sophistication of the methods has improved, such that values of derived income variables in a given wave have changed for at least some individuals from release to release. An overview of the changes over Releases 1 to 12, and their implications, is provided in the Appendix. There is, moreover, another source of changes in income variables in a given wave from release to release, which is that imputed income variables can change from release to release. This is because the imputation methods draw on the longitudinal information to improve the quality of the imputations. For both of these reasons, it is important when comparing across waves to use a single data release, and preferably the most recent release, since this will apply a consistent method for constructing income variables across all waves, with the most recent release providing the most accurate estimates.

The plan of this paper is as follows. Section 2 provides an overview of the income model, describing the income components included in the model (and what cash flows are excluded) and how they are combined to produce income aggregates. Section 3 describes the process by which regular and irregular income components are distinguished, while Section 4 explains the methods for estimating government benefit income components that are not collected by the HIDA Survey. Section 5 explains how income tax is estimated in order to produce disposable income estimates. Concluding comments are presented in Section 6.

2. The income model

Although some information on current (weekly) income is collected by the HILDA Survey—specifically, wages, salaries and government benefits—it is only for the (entire) preceding financial

[1] Some of the information presented in this paper was previously presented in Wilkins (2009), which described the changes made to the tax and benefit model for Release 7.

year that the HILDA Survey attempts to collect complete income information. Correspondingly, the 'income model' is only applied to annual income in the preceding financial year. All of this information is collected by personal interview and is recorded in the Person Questionnaire.

Figures 1 to 3 provide an overview of the HILDA Survey income model, displaying the variable names for the various income components and showing how they are combined together to produce income aggregates at the personal and household level. The following explanation of the HILDA Survey income model primarily focuses on the model as described by Figure 1. This figure restricts to responding persons, and is the most detailed breakdown of income. The enumerated person model presented in Figure 2 includes non-responding people in partially-responding households. It is identical to Figure 1, except that it reports only the income components that are imputed when they are missing. That is, some components of income are only imputed at a more aggregated level—for example, interest, rent, royalties and dividends are not individually imputed, but rather are imputed collectively as 'investment income'. Figure 3 presents the income model at the household level. It has almost the same structure as Figure 2, and all income components are simply aggregations across all members of the household of the components presented in Figure 2. Thus, once the person-level income model is understood, so too is the household-level income model.[2]

Focusing on Figure 1, implementation of the income model involves the following 11 steps:

1. All 29 of the reported personal income components that are listed in the left-most column of Figure 1 need to be identified. Many of these components are directly reported by respondents, but some exceptions arise in respect of wage and salary income (Step 2 below), investment income (Step 3), government benefits (Step 4) and superannuation payments, workers' compensation and related payments and private transfers (Step 5).

2. For most employees, wage and salary income (_wsfes) is simply the amount actually reported (_wsfga or _bifiga). However, some respondents report the 'after-tax' amount of wage and salary income (_wsfna), requiring estimated income tax on those earnings to be added to reported earnings to obtain gross wage and salary income. Estimated tax paid is based on the standard marginal rates (see Table 8 in Section 5.1.1) plus the applicable single-person Medicare Levy (see Section 5.1.3).

3. Investment income (_oifinip - _oifinin) is equal to the sum of reported interest (_oifinta), rent (_oifrnta), royalties (_oifroya), dividends from shares (_oifdiva) and dividends from incorporated businesses (_bifdiva). These components are all reported by respondents, with the exception that dividends from shares exclude imputation credits, which are estimated and added to reported dividends from shares (see Section 5.1.5).

[2] The approach of estimating income tax and benefits at the individual level reflects the nature of the Australian income taxation system, which treats the individual as the tax unit. Note, however, that government family benefits are (naturally) family-based. Consequently, for these benefits, in couple families each member of the couple is assigned half the total family benefit entitlement of the family.

Figure 1: Release 12 annual income model—Responding-person level

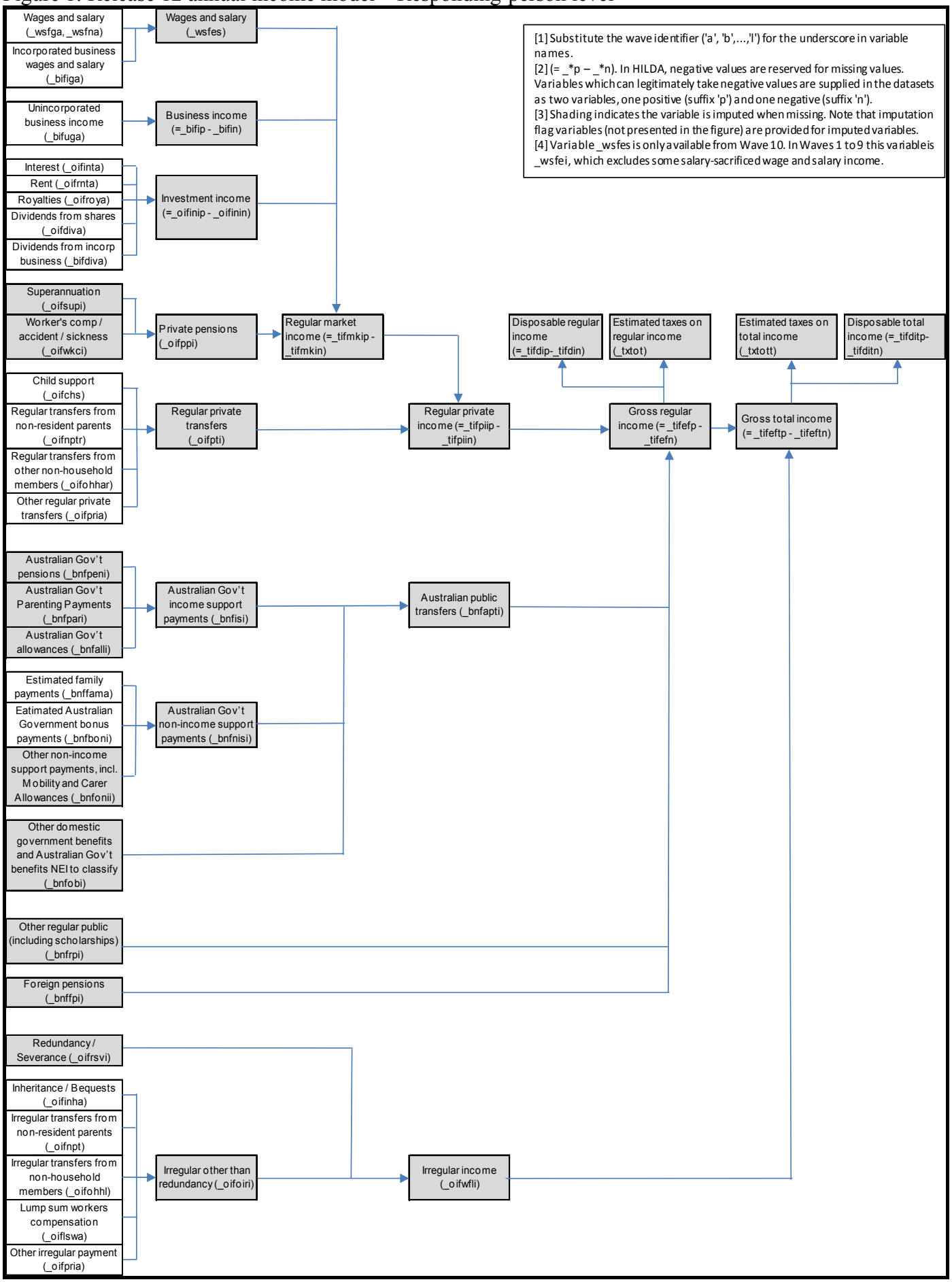


Figure 2: Release 12 annual income model—Enumerated-person level

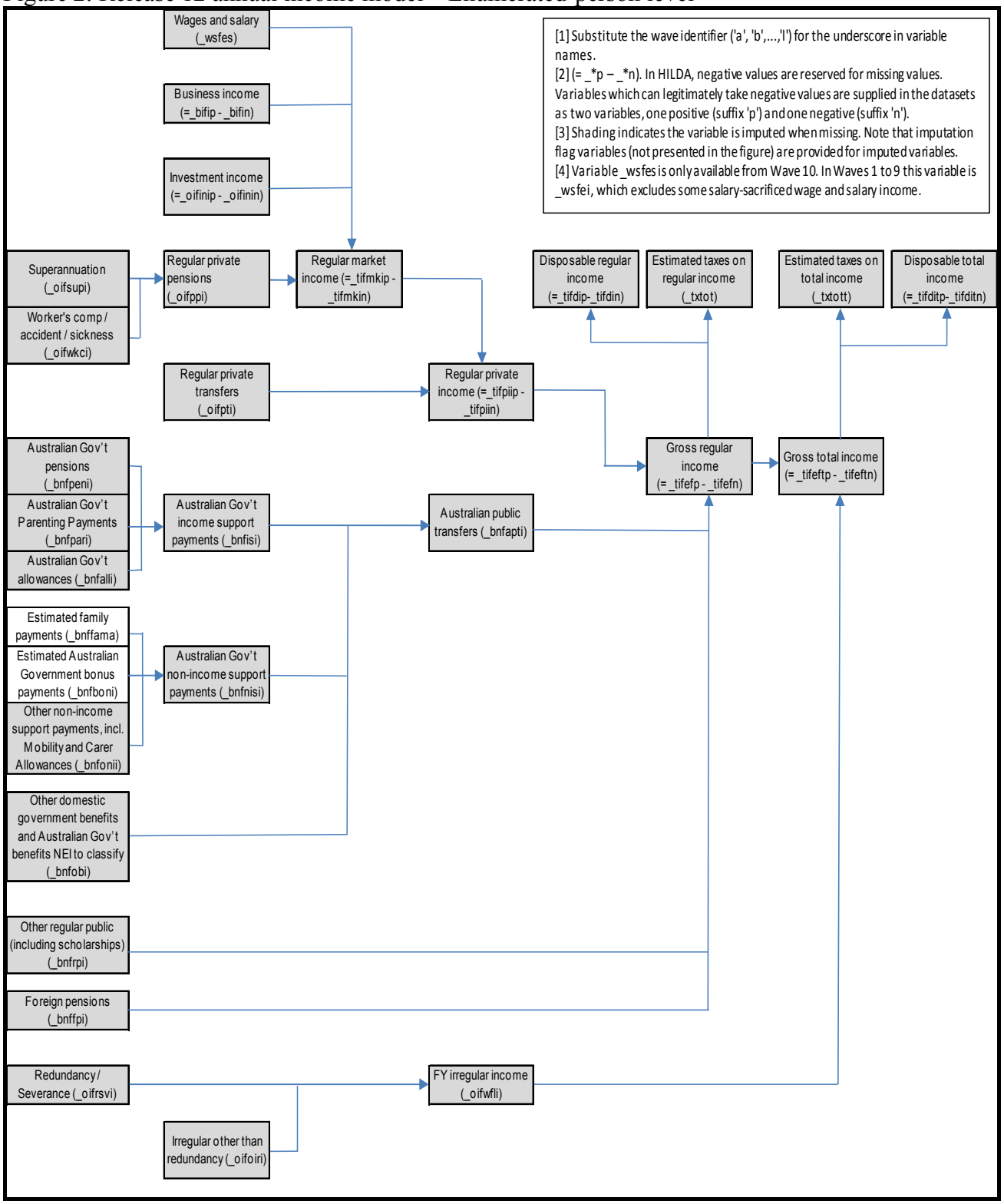
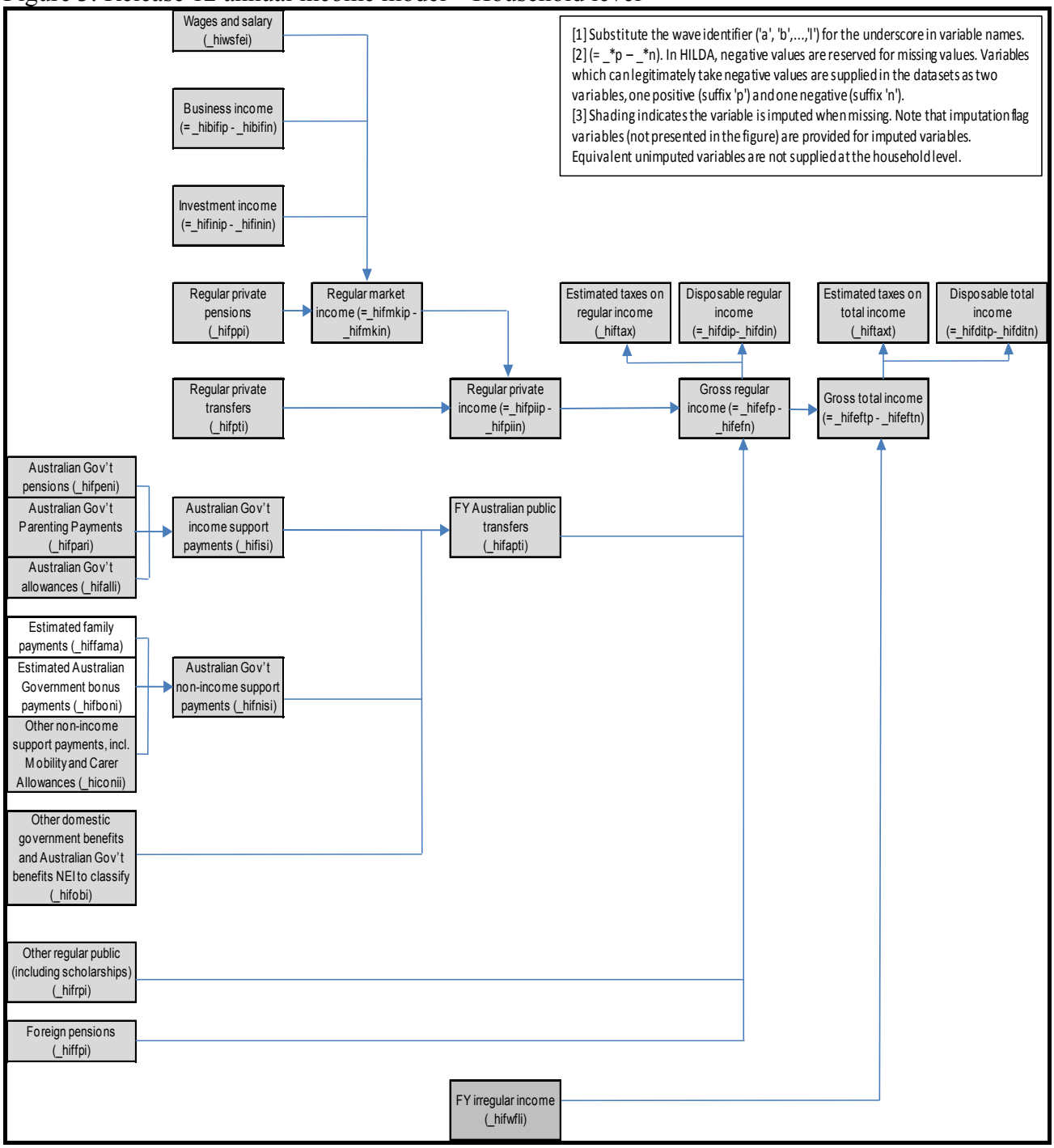


Figure 3: Release 12 annual income model—Household level



4. Seven categories of government welfare benefits are distinguished in Figure 1, each of which is an aggregation of several different government benefits: (1) pensions (_bnfpeni), which primarily comprise Age Pension and Disability Support Pension; (2) parenting payments (_bnfpari), which comprise Parenting Payment Single and Parenting Payment Partnered; (3) allowances (_bnfalli), which primarily comprise Newstart Allowance and Youth Allowance; (4) family payments (_bnffama), which primarily comprise Family Tax Benefit and the Baby Bonus; (5) periodic bonus payments (_bnfboni); (6) other non-income support payments, such as Carer Allowance (_bnfonii); and (7) miscellaneous Australian government payments, including state government payments and payments for which there is not enough information (NEI) to classify (_bnfobi). Family payments and bonus payments are not reported by respondents, but rather are calculated by the HILDA Survey data managers based on eligibility criteria and payment rates. These calculations are discussed in Section 3.

5. The income model distinguishes between regular income components and irregular income components. Correspondingly, the income model contains two measures of both gross (pre-tax) income and disposable (post-tax) income: regular income (_tifefp – _tifefn and _tifdip – _tifdin) and total (regular plus irregular) income (_tifeftp – _tifeftn and _tifditp – _tifditn). The regular income concept is designed to be broadly consistent with current international standards for income measurement in household surveys, as embodied by the Canberra Group (United Nations, 2011). The total income concept is designed to provide a more complete income measure, which is particularly useful in a longitudinal context when researchers want to obtain a more accurate picture of the total income of individuals over extended time-frames. The irregular components comprise:

(1) Redundancy/severance payments (_oifrsvi)
(2) Inheritances/bequests (_oifnha)
(3) Irregular transfers from non-resident parents (_oifnpt)
(4) Irregular transfers from other non-household members (_oifohhl)
(5) Lump-sum workers' compensation payments (_oiflswa)
(6) Other irregular payments (not elsewhere classified) (_oifpria)

As described in the Appendix, the treatment of irregular income components has changed as of Release 12. Previously, these components were excluded from the total income variables, and indeed, so were *regular* transfers from non-resident parents. Payments that continue to be excluded from both regular and total income include payments from resident parents, which are simply within-household transfers, and lump-sum superannuation payments, which are more properly regarded as realising an existing asset (in the same way that proceeds from the sale of a house would not be treated as income).[3]

A consequence of the distinction between regular and irregular income components, and the exclusion of lump-sum superannuation, is that some income components reported by respondents need to be classified as either regular or irregular components—namely, transfers from non-resident parents, transfers from other non-household members, superannuation payments, workers' compensation payments and other payments not elsewhere classified. The determination of the regular and irregular components of these income types is described in Section 4.

6. Missing values for income components are imputed, although some components are first aggregated into broader components before imputation. We thus impute the following 15 personal income components: (1) wages and salary (_wsfes); (2) business income (_bifip – _bifin); (3) investment income (_oifinio – _oifinin); (4) regular superannuation payments (_oifsupi); (5) regular worker's compensation and accident and sickness payments (_oifwkci); (6) regular private transfers

[3] Appropriate treatment of superannuation more generally is difficult. In principle, all payments from superannuation, whether lump sum or not, should be excluded from income, while the investment returns (dividends, interest, etc.) of superannuation holdings should, each year, be added to income as they are earned. This includes earnings of superannuation holdings prior to retirement. However, the collected data do not allow us to identify annual earnings of superannuation holdings.

(_oifpti); (7) Australian Government pensions (_bnfpeni); (8) Australian Government parenting payments (_bnfpari); (9) Australian Government allowances (_bnfalli); (10) non-income support payments other than family and bonus payments (_bnfonii); (11) other domestic government benefits (_bnfobi); (12) other regular public transfers (including scholarships) (_bnfrpi); (13) foreign pensions (_bnffpi); (14) redundancy and severance payments (_oifrsvi); and (15) irregular payments other than redundancy and severance payments (_oifoiri). The 15 components that are imputed where missing are indicated by shaded boxes in Figure 1 (as are all of the variables that are aggregations of variables that are imputed when missing).

At the enumerated-person level (Figure 2), all 15 of these income components are also imputed for non-responding persons in partially-responding households. As noted, details on imputation methods are provided in Hayes and Watson (2009).

7. Personal gross regular income (_tifefp – _tifefn) is calculated as equal to the sum of the regular income components, and personal gross total income (_tifeftp – _tifeftn) is calculated as equal to personal gross regular income plus irregular income (_oifwfli).

8. Personal taxable regular income is obtained by subtracting non-taxable income components and estimated tax deductions from gross regular income. Likewise, personal taxable total income is obtained by subtracting non-taxable income components and estimated tax deductions from gross total income. The identification of non-taxable income components and estimation of tax deductions is explained in Section 5 of this paper.

9. Tax on personal taxable regular income (_txtot) and tax on personal taxable total income (_txtott) are estimated, taking into account income tax rates, the Medicare levy and applicable tax offsets and credits. This step is explained in Section 5.

10. Personal disposable regular income (_tifdip – _tifdin) is calculated as equal to gross regular income less calculated income tax on regular income, and personal disposable total income (_tifditp – _tifditn) is calculated as equal to gross total income less calculated income tax on total income.

11. Household income variables (as itemised in Figure 3) are calculated as summations of the personal income variables over all household members aged 15 and over.

3. Calculation of estimated government benefits

The HILDA Survey income model presented for responding persons in Figure 1 identifies seven components of Australian Government benefits (although each of these components is in fact an aggregation of two or more payment types). Five of these components—pensions, parenting payments, allowances, other non-income support payments and other domestic government benefits—are reported by respondents (or imputed if missing). However, two of the components—family payments and government bonus payments—are not reported by respondents, but rather are calculated by the HILDA Survey data managers based on eligibility criteria, payment rates and information about the family and income circumstances of respondents that is collected by the HILDA Survey. The family payments comprise Family Tax Benefit Part A (FTB A), Family Tax Benefit Part B (FTB B) and maternity payments (known as the Baby Bonus since 2007), while the government 'bonus' payments comprise various one-off payments that were made in 2008-09 and in 2011-12.

The decision to estimate family benefits rather than rely on respondent self-reports primarily reflects the view that, given the clear formulas for determining these benefits, application of these formulas is likely to result in more accurate estimates, and at the same time reduces respondent burden. The implicit assumption, however, is that all eligible persons receive these benefits. While

the actual take-up rate is likely to be very high, it will not be 100%. It is therefore to be expected that the HILDA Survey will slightly over-estimate family benefits and bonus payments received.[4]

In addition to family payments and bonus payments, Commonwealth Rent Assistance (CRA) also needs to be calculated. CRA is not paid as a separate benefit, but as part of another benefit. For FTB A recipients who receive CRA, it is paid as part of FTB A, which indeed means that CRA needs to be estimated in order to determine total FTB A. That is, since CRA is part of FTB A, which respondents are explicitly directed not to report, it is assumed that CRA is not reported by FTB A recipients. For other recipients of CRA—income support recipients without dependent children—CRA is paid as part of the main income support payment received. Since respondents are asked to report income from income support payments, CRA is assumed to be reported by these recipients. Nonetheless, CRA needs to be calculated for all CRA recipients. For FTB A recipients, it is necessary in order to obtain an accurate estimate of FTB A, and hence both gross and disposable income. For other CRA recipients, estimated CRA is not required to obtain an accurate estimate of gross income, but because of the tax exempt status of CRA, it is required to accurately estimate *disposable* income.

In this section, the methods and parameters used to calculate the government benefits that are estimated are described. These methods and parameters are all sourced from various issues of *A Guide to Australian Government Payments*, which has been published quarterly by Centrelink and the Department of Human Services over the entire HILDA Survey sample period.[5]

3.1 FTB A

FTB A was introduced on 1 July 2000, coinciding with the first financial year for which income data were gathered by the HILDA Survey. FTB A depends on the taxable income of the family, the number and the ages of dependent children, and child support payments received. Payment levels are determined by a quite complicated set of rules. The basic formula for determining a family's FTB A entitlement is as follows:

$$\text{FTB A} = \begin{cases} FA_{\max} \quad \text{if } Income \le T_1 \\ \max\left(FA_{base}, FA_{\max} - w_1 * \left(Income - T_1\right)\right) \; if \; T_1 < Income \le T_{2A2} \\ \max\left(0, FA_{base} - w_2 * \left(Income - T_{2A2}\right)\right) \; if \; Income > T_{2A2} \end{cases}$$

$$\begin{aligned} &where: \\ FA_{\max} &= FA_{supp} + R_1 * N^{0-12} + R_2 * N^{13-15} + R_3 * N^{16-17} + R_4 * N^{18-24} \\ &\quad + R_5 * N^{16-19,as} + R_6 * N^{16-17,nas} + R_7 * N^{18-21,nas} \\ FA_{base} &= B_1 * N^{0-17} + B_2 * N^{18-24} + B_3 * N^{18-19,as} + B_4 * N^{18-21,nas} \\ FA_{supp} &= \begin{cases} S_1 * \left(N + 1 - C_1\right) \; if \; N \ge C_1 \\ 0 \; if \; N < C_1 \end{cases} \\ T_{2A2} &= T_2 + \left(N - 1\right) * T_{2A} \end{aligned} \tag{1}$$

[4] We in fact find that population-weighted estimates of total FTB A and FTB B payments derived from the HILDA Survey data are not systematically different from actual payments reported by the Department of Social Services—estimates are sometimes slightly above and sometimes slightly below actual payments. However, total estimated Maternity Payment and Baby Bonus outlays are in most waves lower than actual outlays. This appears to reflect slight under-representation of new births in the HILDA Survey data.

[5] Up until 2004, the publication was called *A Guide to Commonwealth Government Payments*. See http://www.humanservices.gov.au/corporate/publications-and-resources/a-guide-to-australian-government-payments for the most recent issue.

The parameters T_1, T_2, T_{2A2}, w_1, w_2, R_1 to R_7, B_1 to B_4, S_1 and C_1 are as described in Table 1, which presents their values for every wave up to Wave 12. *Income* is, up until 2008-09, the annual taxable income of the resident parents. From 2009-10, it is 'adjusted taxable income', which adds to taxable income salary sacrificed income, net investment losses, tax-exempt foreign income and tax free pensions and benefits other than Family Tax Benefit, and subtracts from taxable income child support paid. For the purposes of the HILDA survey calculations, adjusted taxable income is set equal to estimated taxable income plus net investment losses, salary sacrificed income and non-taxable government benefits other than FTB A and B. N^{x-y} is the number of dependent children aged x to y, while $N^{x-y,as}$ is the number of dependent children in that age range who are at school and $N^{x-y,nas}$ is the number who are *not* at school. N is simply the total number of dependent children.

FA_{supp} is an annual supplement, which is not in fact payable until after the financial year to which it relates. We nonetheless assign it to the year in respect of which it is paid, in much the same way that a tax refund due to overpayment of income taxes is effectively treated.

Note that in 2011-12, because of a change in benefit formulas effective 1 January 2012, FA_{max} and FA_{base} needed to be calculated separately for the two year-halves, with FTB A then the sum of the values in these two halves.

Several factors that impact on FTB A payments are not taken into account in the HILDA calculation, including visa status of those born overseas, the separate income test for child support payments received (which reduces payments above FA_{base} at a rate of 50% once child support exceeds a certain threshold that depends on partner status and the number of dependent children), the income test applied to the child's own income and, since 2011-12, the immunisation status of the child. Also note that the multiple birth allowance, for families with triplets or more, is not included in calculated FTB A.

3.2 FTB B

Like FTB A, FTB B was introduced on 1 July 2000. Up until 30 June 2008, FTB B depended only on the taxable income of the lower-income member of a couple and the age of the youngest child. Lone parent families do not have a secondary income as defined for FTB purposes, such that all lone parent families with FTB-eligible children were entitled to the maximum FTB B up until 2007-08. However, since 1 July 2008, an income test has been added for lone parents and the higher-income earner in couple families: couples in which either member's income exceeds $150,000, and lone parents with an income in excess of $150,000, are not eligible for FTB B.

The general formula for the family's FTB B entitlement is given by:

$$\text{FTB B} = \begin{cases} 0 \text{ if } Income_p > T_3 \\ R_8 \text{ if } Income_p \le T_3 \text{ and } Income_s \le T_4 \ \& \ N^{0-4} \ge 1 \\ R_9 \text{ if } Income_p \le T_3 \text{ and } Income_s \le T_4 \ \& \ N^{0-4} = 0 \ \& \ \left(N^{5-15} \ge 1 \ or \ N^{16-18,as} \ge 1\right) \\ \max\left(0, R_8 - w_4 * \left(Income_s - T_4\right)\right) \text{ if } Income_p \le T_3 \ \& \ Income_s > T_4 \ \& \ N^{0-4} \ge 1 \\ \max\left(0, R_9 - w_4 * \left(Income_s - T_4\right)\right) \text{ if } Income_p \le T_3 \ \& \ Income_s > T_4 \\ \qquad\qquad \& \ N^{0-4} = 0 \ \& \ \left(N^{5-15} \ge 1 \ or \ N^{16-18,as} \ge 1\right) \end{cases} \quad (2)$$

where $Income_p$ is the personal income of the primary (higher) income earner in the family (or the income of the parent in a lone-parent family) and $Income_s$ is the income of the secondary (lower) income earner in the family (and equals zero in lone-parent families). As in Equation (1), income is taxable income up until Wave 2008-09 and is thereafter 'adjusted taxable income'. The variables of the form N^{x-y} are as defined in Equation (1). The parameters w_4, T_3, T_4, R_8 and R_9 are as described in Table 2, which presents the FTB B parameter values for all of Waves 1 to 12.

Table 1: Family Tax Benefit Part A (FTB A) parameters, Waves 1 to 12

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12a	2011-12b
Maximum payment rates per child (including annual supplement) ($)													
Age 0 to 12 (R_1)	3,029.50	3,204.70	3,303.25	3,401.80	4,095.30	4,201.15	4,317.95	4,460.30	4,631.85	4,803.40	4,905.60	5,018.75	5,018.75
Age 13 to 15 (R_2)	3,839.80	4,062.45	4,190.20	4,314.30	5,029.70	5,157.45	5,332.65	5,595.45	5,818.10	6,033.45	6,161.20	6,307.20	6,307.20
Age 16 to 17 (R_3)	974.55	1,029.30	1,062.15	1,095.00	1,733.75	1,777.55	1,828.65	1,890.70	1,945.45	2,018.45	2,062.25	2,098.75	0
Age 18 to 24 (R_4)	1,306.50	1,383.35	1,427.15	1,470.95	2,120.65	2,175.40	2,237.45	2,310.45	2,379.80	2,467.40	2,518.50	2,565.95	0
Age 16 to 19, at school (R_5)	0	0	0	0	0	0	0	0	0	0	0	0	6,307.20
Age 16-17, not at school (R_6)	0	0	0	0	0	0	0	0	0	0	0	0	2,098.75
Age 18-21, not at school (R_7)	0	0	0	0	0	0	0	0	0	0	0	0	2,565.95
Base payment rates per child (including annual supplement) ($)													
Under age 18 (B_1)	974.55	1,029.30	1,062.15	1,095.00	1,733.75	1,777.55	1,828.65	1,890.70	1,945.45	2,018.45	2,062.25	2,098.75	2,098.75
Age 18 to 24 (B_2)	1,306.70	1,383.35	1,427.15	1,470.95	2,120.65	2,175.40	2,237.45	2,310.45	2,379.80	2,467.40	2,518.50	2,565.95	0
Age 18 to 19, at school (B_3)	0	0	0	0	0	0	0	0	0	0	0	0	2,098.75
Age 18-21, not at school (B_4)	0	0	0	0	0	0	0	0	0	0	0	0	2,565.95
Large family supp. per qualifying child (S_1)	208.05	219.00	226.30	233.60	240.90	248.20	255.50	262.80	270.10	270.10	288.35	295.65	295.65
First child to qualify for supp. (C_1)	4	4	4	4	4	4	3	3	3	3	3	3	3
Income Test Thresholds ($)													
Threshold 1 (maximum income for max rate) (T_1)	28,200	29,857	30,806	31,755	32,485	33,361	40,000	41,318	42,559	44,165	45,114	46,355	46,355
Threshold 2 (maximum income for base rate) (T_2)	73,000	77,234	79,643	82,052	84,023	86,213	88,622	91,542	94,316	94,316	94,316	94,316	94,316
Addition per qualifying child after the first (T_{2A})	3,000	3,139	3,212	3,285	3,358	3,431	3,504	3,650	3,796	3,796	3,796	3,796	3,796
Taper Rates													
Withdrawal rate from Threshold 1 (from max rate to base rate) (w_1)	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Withdrawal rate from Threshold 2 (to zero) (w_2)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Source: Centrelink and Department of Human Services.

Table 2: Family Tax Benefit Part B (FTB B) parameters, Waves 1 to 12

	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Payment rates ($)												
Youngest child aged under 5 (R_8)	2,602.45	2,752.10	2,836.05	2,920.00	2,989.35	3,372.60	3,467.50	3,584.30	3,693.80	3,828.85	3,909.15	4,004.05
Youngest child aged 5 to 18, still in school if aged 16 to 18 (R_9)	1,814.05	1,919.90	2,036.70	2,036.70	2,084.15	2,445.50	2,511.20	2,595.15	2,675.45	2,774.00	2,832.40	2,898.10
Income Test Thresholds ($)												
Primary earner (T_3)	None	None	None	None	None	None	None	None	150,000	150,000	150,000	150,000
Secondary earner (T_4)	1,616	1,679	1,752	1,825	4,000	4,088	4,234	4,380	4,526	4,672	4,745	4,891
Taper Rates												
Taper rate on secondary earner (w_4)	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2

Source: Centrelink and Department of Human Services.

The formulas for FTB A and FTB B given by Equations (1) and (2) are for *family* entitlements. Given the HILDA Survey income model assigns all income components to *individuals* in a manner such that the sum of personal incomes across all household members equals household income, these family payments need to appear as components of personal income. This is achieved by assigning all FTB A and FTB B payments to the parent in lone-parent families and dividing them evenly between the two parents in couple families. The implicit assumption in the latter decision rule is that resources are shared equally between partners.

3.3 Commonwealth Rent Assistance

Commonwealth Rent Assistance (CRA) is a non-taxable government cash benefit paid to renters residing in private accommodation (but not public housing tenants, who receive subsidised accommodation rather than CRA). Income support recipients and families receiving more than the base rate of FTB A are eligible for the benefit.

The FTB A formula given by Equation (1) excludes CRA, but the benefit is in fact paid as part of FTB A for FTB A recipients receiving more than the base rate (see Equation (1) and Table 1 for the base rate of FTB A). CRA is therefore calculated by the HILDA Survey data managers and added to FTB A for eligible individuals.

CRA is also received by income support recipients without dependent children who rent privately. It is paid as part of the main benefit, which respondents are asked to report, and therefore does not need to be calculated for non-recipients of FTB A to determine their total (gross) income. However, since CRA is non-taxable, the component of benefit income that is CRA needs to be determined for the purposes of estimating income tax payable and thus disposable income. Consequently, CRA is also calculated for all private renters who are income support recipients but not in receipt of FTB A.

CRA is paid at the 'family' level, where a family comprises a single person or couple together with any dependent children (as defined for FTB purposes). For privately renting recipients of FTB A, it is calculated as:

$$CRA_{FTB} = \max\left[0, \min\left(0.75 * \left(\mathrm{R} - R_{\min}\right), CRA_{\max}\right)\right] \tag{3}$$

where R is the annual rent of the family, $R_{\min}$ is the minimum annual rent payable in order to be eligible for CRA and $CRA_{\max}$ is that maximum level of CRA payable. Both $R_{\min}$ and $CRA_{\max}$ depend on partner status and the number of dependent children.

For privately renting income support recipients not in receipt of FTB A, CRA is calculated as

$$CRA_{IS} = CRA_{FTB} * \left[{}^{W_{IS}}\!/_{52} \right] \tag{4}$$

where W_{IS} is the number of weeks on income support in the previous financial year.

Table 3 presents the CRA parameter values for Waves 1 to 12. Note that the values in the table are based on December quarter values. As with FTB A, for partnered recipients of CRA, it is divided evenly between the two partners for the purposes of determining personal income.

Annual rent (R) of the family (or of the individual in the case of single people) is not measured by the HILDA Survey. However, current rent is obtained for each household, which we use to estimate previous-financial-year annual rent of the family or individual. This is obtained by first deflating the current annualised rent of the household by rent price growth between December of the previous year and September of the current year (ABS 6401.0, Table 7). Then, in the case of households where a single person or couple live with other non-dependent adults, their share of rent is assumed proportional to their share of the number of household members. For example, a family of four living with another unrelated adult is assumed to pay 80% (four-fifths) of the household rent.

As noted, for CRA recipients who do not receive FTB A, CRA is assumed to have been reported as part of the main benefit. For these recipients, estimated CRA is simply used to determine taxable income (by subtracting CRA from gross income). Thus, estimated CRA affects disposable income only via its impact on estimated tax. For CRA recipients also receiving FTB A, estimated CRA is added to both gross income and disposable income (but not taxable income) via incorporation into estimated FTB A.

Table 3: Commonwealth Rent Assistance (CRA) parameters, Waves 1 to 12 ($)

Rent privately and receive FTB Part A at more than the base rate						
	Lone parent			Partnered		
	R_{min}	CRA_{max}		R_{min}	CRA_{max}	
		1 or 2 children	3 or more children		1 or 2 children	3 or more children
2000-01	2,573.25	2,631.65	2,974.75	4,759.60	2,631.65	2,974.75
2001-02	2,726.55	2,737.50	3,095.20	4,759.60	2,737.50	3,095.20
2002-03	2,803.20	2,814.15	3,182.80	4,759.60	2,814.15	3,182.80
2003-04	2,879.85	2,890.80	3,266.75	4,759.60	2,890.80	3,266.75
2004-05	2,952.85	2,963.80	3,350.70	4,759.60	2,963.80	3,350.70
2005-06	3,029.50	3,040.45	3,434.65	4,759.60	3,040.45	3,434.65
2006-07	3,149.95	3,160.90	3,573.35	4,759.60	3,160.90	3,573.35
2007-08	3,215.65	3,226.60	3,650.00	4,759.60	3,226.60	3,650.00
2008-09	3,361.47	3,372.42	3,814.04	4,974.68	3,372.42	3,814.04
2009-10	3,401.61	3,423.51	3,868.79	5,018.48	3,423.51	3,868.79
2010-11	3,514.76	3,525.71	3,985.58	5,200.97	3,525.71	3,985.58
2011-12	3,642.50	3,653.45	4,131.57	5,390.75	3,653.45	4,131.57
Receive income support, rent privately and have no dependent children						
	Single			Partnered		
	R_{min}	CRA_{max}		R_{min}	CRA_{max}	
2000-01	1,955.25	2,252.45		3,185.75	2,116.88	
2001-02	2,069.96	2,335.87		3,373.46	2,200.31	
2002-03	2,127.31	2,398.44		3,467.31	2,262.88	
2003-04	2,184.67	2,461.01		3,561.16	2,325.44	
2004-05	2,242.02	2,523.58		3,655.01	2,382.80	
2005-06	2,299.37	2,586.14		3,743.65	2,440.15	
2006-07	2,393.23	2,690.42		3,894.86	2,539.22	
2007-08	2,445.37	2,747.78		3,978.28	2,591.36	
2008-09	2,554.86	2,872.91		4,160.77	2,706.07	
2009-10	2,575.72	2,914.63		4,197.27	2,747.78	
2010-11	2,669.57	3,003.26		4,348.48	2,831.20	
2011-12	2,768.63	3,112.76		4,504.90	2,935.48	

Source: Centrelink and Department of Human Services.

3.4 Maternity payments

Maternity Allowance was paid on the birth or adoption of a child to all recipients of FTB A up until 30 June 2004. Thus, in Waves 1 to 4, all families with calculated FTB A greater than zero who had a child born in the relevant financial year had the value of the Maternity Allowance added to their calculated FTB A. As Table 4 shows, the payment was $780 until the September quarter of 2002 and was then indexed twice annually to the Consumer Price Index (CPI) up until the June quarter of 2004.[6]

[6] Up until 2011-12, Maternity Immunisation Allowance (MIA) was also payable for fully immunised children aged 18 to 24 months. MIA was $208 from 2000-01 to 2003-04 and was thereafter indexed to the CPI. From 1 January 2009 (but also discontinued as of 1 July 2012), an additional MIA payment of $121.65 (subsequently indexed to the CPI) was introduced for fully immunised children who had turned 5. However, neither of these MIA payments are calculated by the HILDA Survey data managers, since respondents were *not* directed to exclude MIA (as they were with other family payments), and therefore they should have reported MIA payments when received.

Maternity Allowance was replaced from 1 July 2004 with Maternity Payment, a universal tax-exempt lump-sum payment to families on birth or adoption of a child. On 1 July 2007, Maternity Payment was renamed the Baby Bonus and since 1 January 2009 has only been payable to families with incomes less than $75,000 in the six months immediately following birth or adoption of a child. It was also converted from a single lump-sum payment (for almost all families) to 13 instalments paid over 6 months. From 1 January 2013, when the Paid Parental Leave (PPL) Scheme was introduced, Baby Bonus has only been payable if PPL was not received. (PPL is set equal to the national minimum wage and is paid for 18 weeks.) Table 4 presents the Maternity Allowance and Maternity Payment / Baby Bonus payment rates per eligible child up to Wave 12.

As a consequence of the 2009 policy changes, starting in Wave 9, HILDA Survey respondents have been asked to report Baby Bonus income. However, for the purposes of constructing total income measures, payments have continued to be estimated rather than be based on reported Baby Bonus income.

Table 4: Maternity Allowance, Maternity Payment and Baby Bonus Payment rates per child, Waves 1 to 12 ($)

	Quarter 3	Quarter 4	Quarter 1	Quarter 2
Maternity Allowance				
2000-01	780.00	780.00	780.00	780.00
2001-02	780.00	789.36	789.36	798.72
2002-03	798.72	811.44	811.44	822.72
2003-04	822.72	833.52	833.52	842.64
Maternity Payment / Baby Bonus (B)				
2004-05	3,000	3,042	3,042	3,079
2005-06	3,079	3,119	3,119	3,166
2006-07	4,000	4,100	4,100	4,133
2007-08	4,133	4,187	4,187	4,258
2008-09	5,000	5,000	5,000	5,000
2009-10	5,185	5,185	5,185	5,185
2010-11	5,294	5,294	5,294	5,294
2011-12	5,437	5,437	5,437	5,437

Source: Centrelink and Department of Human Services.

Calculation of Maternity Payment / Baby Bonus (Babybon)

Maternity Payment and Baby Bonus are calculated at the family level. As with other family payments, in lone-parent families they are assigned to the personal income of the parent, while in couple families they are split evenly between the parents. The formulas below are for the benefit per eligible child. Total family Maternity/Baby Bonus payments are simply the sum of payments received over all eligible children in the family (noting that in most all cases there is no more than one eligible child per wave).

For Waves 5 to 8, the payment per child is calculated on assumption of 100% take-up and universal access:

$$Babybon = \begin{cases} B^{y,q} \text{ if } bd^{1/7/04 \text{ to } 30/6/08} = 1 \\ 0 \text{ otherwise} \end{cases} \quad (5)$$

where $B^{y,q}$ is the payment rate for a baby born in quarter q of year y, as reported in Table 4, and $bd^{d1 \text{ to } d2}$ is equal to one if the child was born between *d1* and *d2*, and zero otherwise.

In Waves 9 to 12, the payment per child is calculated based on family taxable income, date of birth of the child, payment rate and, from Wave 11, PPL receipt. In Wave 9, the formula for each child is:

$$Babybon_9 = \begin{cases} B^{y,q} \text{ if } bd^{1/7/08 \text{ to } 31/12/08} = 1 \\ B^{y,q} * \left(\mathrm{d}\left[bd, 1/7/09 \right] / 181 \right) \text{ if } bd^{1/1/09 \text{ to } 30/6/09} = 1 \;\&\; \left(Inc_f^{09} + 0.1 * Inc_m^{09} \right) < 150,000 \\ 0 \text{ otherwise} \end{cases} \quad (6)$$

where $B^{y,q}$ and bd^{d1-d2} are as defined previously, $d\left[bd, 1/7/09\right]$ is the number of days between the date of birth (*bd*) and 1/7/09, Inc_f^{09} is the father's annual (2008-09) taxable income (equal to zero if there is no resident father) and Inc_m^{09} is the mother's annual taxable income. As an approximation, for the purposes of determining whether family income exceeds $75,000 in the six months after the birth of the child, it is assumed that only 10% of the mother's annual income is earned after the birth of the child. That is, it is assumed that labour force participation by mothers in the first six months after birth is minimal.

In Waves 10 to 12, the formula for each child is:

$$Babybon_w = \begin{cases} B^{y,q} * \left(\mathrm{d}\left[bd, 30/6/w-1 \right] / 181 \right) \text{ if } bd^{1/1/w-1 \text{ to } 30/6/w-1} = 1 \;\&\; \left(Inc_f^{w-1} + 0.1 * Inc_m^{w-1} \right) < 150,000 \\ B^{y,q} \text{ if } bd^{1/7/w-1 \text{ to } 31/12/w-1} = 1 \;\&\; \left(Inc_f^{w} + 0.1 * Inc_m^{w} \right) < 150,000 \\ B^{y,q} * \left(\mathrm{d}\left[bd, 30/6/w \right] / 181 \right) \text{ if } bd^{1/1/w \text{ to } 30/6/w} = 1 \;\&\; \left(Inc_f^{w} + 0.1 * Inc_m^{w} \right) < 150,0000 \\ 0 \text{ otherwise} \end{cases} \quad (7)$$

where *w* is the wave number (e.g., 10 in Wave 10) and all other variables are as defined above. In Waves 11 and 12, the additional condition is added that the Baby Bonus is set equal to zero for the first child born in the relevant period if PPL was received in that period.

3.5 Bonus payments

Various 'bonus' payments have been made by the Australian Government since 2008-09. All of these payments are non-taxable.

2008-09 stimulus payments

In the 2008-09 financial year, a variety of 'stimulus' payments were made to households:

1. Bonus payment for pensioners, seniors, people with disability, carers and veterans (paid in December 2008)
2. Bonus payment for families (paid in December 2008)
3. Single Income Family Bonus (paid in March 2009)
4. Back to School Bonus (paid in March 2009)
5. Training and Learning Bonus (paid in March 2009)
6. Temporary supplement to the Education Entry Payment (paid in March 2009)
7. Farmers Hardship Bonus (paid in March or April 2009)
8. Tax bonus for Working Australians (paid around April 2009)

In principle, it is possible for an individual to have received any number of these payments (from none to all of them). Payments 1 to 4 and 8 are estimated by applying the eligibility criteria for each payment, while payments 5 to 7 are attributed to the individual only if that individual reported receiving the payment. Calculation of each of the bonus payments is as follows.

Bonus payment 1

If received a pension or veterans' benefit or held a Seniors Card in 2008-09, bonus payment is $1,400 if single and $1,050 (per person) if partnered.

If received Carer Allowance in 2008-09: $1,000 (additional to above payments).

Bonus payment 2

If received FTB A in 2008-09, family bonus payment is $1,000 per dependent child in 2008-09. In couple families, assign 50% to each parent.

Bonus payment 3

If received FTB B in 2008-09, family bonus payment is $900. In couple families, assign 50% to each parent.

Bonus payment 4

If received FTB A in 2008-09, family bonus payment is $950 per dependent child aged 4-18 years on 30 June 2009. In couple families, assign 50% to each parent.

If age on 3 February 2009 < 19 and received Carer Payment or the Disability Support Pension, individual bonus payment is $950.

Bonus payments 5 to 7

$950 for each of these bonus payments that the individual reported receiving.

Bonus payment 8

Bonus payment 8 (BP8) was paid to individuals who paid tax in the 2007-08 financial year and had taxable income in that year less than $100,000:

$$BP8 = \begin{cases} \$250 \text{ if } tax_{08} > 0 \ \& \ \$90,000 < taxinc_{08} < \$100,000 \\ \$600 \text{ if } tax_{08} > 0 \ \& \ \$80,000 < taxinc_{08} \leq \$90,000 \\ \$900 \text{ if } tax_{08} > 0 \ \& \ taxinc_{08} \leq \$80,000 \\ 0 \text{ otherwise} \end{cases} \quad (8)$$

where tax_{08} is tax paid in 2007-08 and $taxinc_{08}$ is taxable income in 2007-08.

2011-12 Clean Energy Advance payments

The Clean Energy Advance is a tax-exempt payment paid as a lump sum to income support recipients and seniors in May and June of 2012. A wide variety of payment rates was implemented—in total, over 100 different situations and associated payment rates are identified in the Centrelink payment guide. However, many of the payment rates are the same, or very similar, across a variety of different circumstances. The payments were therefore able to be simplified to the 15 rates presented in Table 5 with almost no information loss.[7]

[7] Following on from the Clean Energy Advance payments, Clean Energy Supplement payments were progressively phased in between March 2013 and January 2014. These are paid as part of the main benefit and hence should be reported by respondents. They will therefore not need to be calculated (for Wave 13 and subsequent waves). However, in 2012-13 and 2013-14 (and possibly subsequently), recipients of Family Tax Benefit Part B have been eligible for the Single Income Family Supplement to '…help eligible households with any impact from the carbon price on everyday expenses.' This is paid as part of Family Tax Benefit and will therefore need to be calculated.

Table 5: Clean Energy Advance payment rates, 2011-12 ($)

Beneficiaries receive *one* of the following payments:	
Single, received pension	250
Partnered, received pension	190
Aged 65 and over and not on Age Pension	
Single, taxable income in 2011-12 ≤ $50,000	250
Partnered, family taxable income in 2011-12 ≤ $80,000	190
Single, received an allowance, has no dependent children	160
Single, received an allowance, has dependent children	180
Partnered, received an allowance	150
Single, received Parenting Payment	210
FTB recipients *additionally* receive	
If FTB A > base rate	
for each dependent child under 13 years of age	87.55
for each dependent child aged 13-18 years	110.14
for each dependent child aged 19-21 years	44.61
If 0 < FTB A ≤ base rate	
for each dependent child under 19 years of age	36.42
for each dependent child aged 19-21 year of age	44.61
If FTB B > 0	
for each child under 5	69.99
for each child 5-18 years of age	50.63

Source: Department of Human Services.

Schoolkids bonus (SKB)

Commenced in 2011-12, the Schoolkids Bonus is a lump sum payment made to all families receiving FTB A. It was first paid in June 2012, but from 2013, it is paid in January each year. It replaced the Education Tax Refund. Different rates apply to children in primary school and children in high school (see Table 6). The HILDA Survey does not identify (in every wave) whether children are in primary school or high school. Consequently, for Queensland, South Australia and Western Australia, it is assumed that children aged 6 to 13 are in primary school and children aged 14 to 18 are in high school. In the other jurisdictions, it is assumed that children aged 6 to 12 are in primary school and children aged 13 to 18 are in high school. The formula for determining the family's Schoolkids Bonus (SKB) is as follows:

$$SKB = \begin{cases} B_1 * N^{6-13} + B_2 * N^{14-18} & \text{if FTB A} > 0 \;\&\; state = \{\text{Qld, SA, WA}\} \\ B_1 * N^{6-12} + B_2 * N^{13-18} & \text{if FTB A} > 0 \;\&\; state = \{\text{ACT, NSW, NT, Tas, Vic}\} \\ 0 \text{ otherwise} \end{cases} \qquad (9)$$

where N^{a-b} is the number of dependent children in the family aged a to b and the parameters B_1 and B_2 are reported in Table 6. As with other family benefits, in couple families SKB is split evenly between the two parents.

Table 6: Schoolkids Bonus (SKB) payment rates, 2011-12 ($)

SKB per child in primary school (B_1)	SKB per child in high school (B_2)
409	818

Source: Department of Human Services.

4. Determination of irregular and regular components of income

To allow measures of regular income and total (regular plus irregular) income to be produced, several income components reported by respondents need to be classified according to whether they are regular or irregular income flows. These components comprise:

1. Transfers from non-resident parents;
2. Transfers from other non-household members;
3. Superannuation payments;
4. Workers' compensation and accident/sickness payments; and
5. Other payments not elsewhere classified

Note that, consistent with the Canberra Group standards, 'regular' in this context does not necessarily mean that the payment is *recurring*; it is loosely interpreted as income that is not a one-off, is not a capital transfer, and is likely to be used to fund current consumption. In practice, the approach taken by the HILDA Survey data managers is to define irregular income as an income flow that is *both* large in value *and* a one-off / lump sum.

Table 7 presents the thresholds for determining whether an income flow is 'large'. Reported values less than these thresholds are always classified as regular income for these components. For superannuation and workers' compensation payments, the threshold is set equal to the annualised value of average weekly earnings of full-time employees (ABS, Catalogue No. 6302.0), on the basis that a reported value greater than this is more likely to be irregular than not. For other income components, a lower, somewhat arbitrary threshold is adopted, which is equal to $30,000 (for each individual component) in 2011-12. This threshold is, however, indexed to average weekly earnings of full-time employees, and therefore changes over time in the same way as the threshold for superannuation and workers' compensation.

Table 7: Thresholds for determining whether an income component is 'large', Waves 1 to 12

	Average weekly earnings of full-time employees (November) ($)	Threshold for lump-sum superannuation and workers' compensation and accident/sickness payments ($)	Threshold for inter-household transfers (non-resident parents and other non-household members) and payments unable to be classified ($)
2000-01	834.70	43,521	18,009
2001-02	879.60	45,862	18,977
2002-03	924.70	48,214	19,950
2003-04	979.20	51,055	21,126
2004-05	1,017.20	53,037	21,946
2005-06	1,066.00	55,581	22,999
2006-07	1,093.80	57,031	23,599
2007-08	1,151.00	60,013	24,833
2008-09	1,210.80	63,131	26,123
2009-10	1,276.70	66,567	27,545
2010-11	1,328.50	69,268	28,662
2011-12	1,390.50	72,501	30,000

To determine whether a payment is a 'one-off' or lump sum, the HILDA Survey data managers use the longitudinal information in the data. This involves examining whether large income components reported in one wave are also reported in other waves. Note that information is used on both prior waves and, where available, subsequent waves. It is therefore possible that a large income flow initially classified as a lump sum (and therefore classified as irregular income) will be reclassified as regular income in subsequent data releases if, in subsequent waves, similarly large values for the income component are reported by the respondent.

Importantly (and as explained in Section 2), superannuation payments that do not meet the criteria for regular income are not classified as irregular *income*—that is, they are not regarded as income at all.

5. Calculation of income tax paid

Disposable income is equal to gross income minus income tax paid. The HILDA Survey does not ask respondents to report either disposable income or income tax paid. It is therefore necessary to estimate income tax paid to obtain an estimate of disposable income. To do this, insofar as is possible, the tax rules are applied in full to each sample member aged 15 and over. All formulas and parameters described in this section are, unless otherwise stated, sourced from the ATO web site (www.ato.gov.au).

5.1 Tax on regular income

Tax on regular income is calculated as:

$$Taxreg = max\left\{0, \left(Taxreg_o + Taxsuper + Medlevy - Offsets\right)\right\} - IC \tag{10}$$

where:

- ***Taxreg$_o$*** is obtained by applying the standard income tax rates to taxable regular income exclusive of superannuation income;
- ***Taxsuper*** is the tax payable on regular superannuation income;
- ***Medlevy*** is the total of the Medicare Levy (ML) and Medicare Levy Surcharge (MLS) payable on taxable regular income exclusive of superannuation income;
- ***Offsets*** is the total value of applicable tax offsets (such as the low-income tax offset) for the individual given his or her circumstances; and
- ***IC*** is the total value of dividend imputation credits, which are tax credits for 'franked' dividends—that is, share dividends paid out of after-tax profits of companies.

Ignoring dividend imputation credits, total tax payable is greater than or equal to zero—thus, if applicable offsets exceed the sum of Taxreg$_o$, Tax super and Medlevy, tax payable is set equal to zero. It is, however, possible for the income tax paid to be negative (that is, the individual receives income from the ATO) if an individual receives dividend imputation credits.

The calculation of each of the components of Equation (10) is as follows.

5.1.1 Taxreg$_o$

Taxreg$_o$ is obtained by applying the standard income tax rates, presented in Table 8, to taxable regular income exclusive of superannuation income (reginc$_o$). reginc$_o$ is obtained by subtracting non-taxable income, regular superannuation income and applicable deductions from gross regular income, and adding dividend imputation credits, i.e.,

$$\begin{aligned} \text{reginc}_o = {} & \text{Gross regular income} \\ & - \text{Regular superannuation income} \\ & - \text{Tax-exempt government benefits} \\ & - \text{Regular transfers from non-household members (including parents)} \\ & - \text{Salary sacrificed wages and salary} \\ & - \text{Deductions} \end{aligned} \tag{11}$$

where:

- Tax-exempt government benefits comprise Family Tax Benefit, Maternity Payment, Baby Bonus, Commonwealth Rent Assistance, bonus payments, Disability Support Pension, and other regular public income.
- Regular transfers from non-household members comprise child support payments received, regular transfers from non-resident parents, regular transfers from other non-household members, and other regular private transfers.
- Deductions include work related expenses, interest and dividend deductions, gifts or donations, costs of managing tax affairs, and a variety of other deductions.

All of the components of Equation (11) other than deductions, dividend imputation credits (a component of gross regular income) and the government benefits discussed in Section 3 are reported by respondents (or imputed if missing), although salary sacrificed income has only been collected since Wave 10. Salary sacrifice arrangements reduce tax liabilities of wage and salary earners. Since Wave 10, these arrangements have been captured, and show approximately 0.5% of reported wage income is salary sacrificed. Salary sacrificed wage and salary income for Waves 1 to 9 is therefore approximated for all employees as equal to 0.5% of wage and salary income.

The calculation of dividend imputation credits is explained in Section 5.1.5. For deductions, we estimate their total value for each individual by assuming they are a certain percentage of gross regular income, where that percentage depends on the level of the individual's income. Thus, deductions are assumed equal to the relevant deduction rate (D) multiplied by the gross regular income of the individual:

$$Deduction = D * (\_tifefp - \_tifefn) \tag{12}$$

Australian Taxation Office (ATO) data on average deductions as a proportion of income for each of 23 income ranges (16 income ranges prior to Wave 6) are used to determine the applicable percentage *D*. That is, the proportion of gross income that is assumed to be claimed as a tax deduction depends on the income category into which the individual falls. For Waves 1 to 10, the ATO data is obtained from Tables 5B and 5C in the detailed tables of the 'Personal income tax' section of the ATO's *Taxation Statistics* for the relevant tax year (http://www.ato.gov.au/About-ATO/Research-and-statistics/Our-statistics/Taxation-statistics/). For Wave 11 and Wave 12, the ATO data come from Table 8 in the detailed personal income tax tables for 2010-11. The deduction rates derived from the ATO data are reported in Table 9.[8] Average deductions for each income category range from around 13% for those in the lowest income category down to around 4% for those with the highest incomes.

[8] Note that the most recent ATO data available at the time of production of Release 12 was for 2010-11. It was therefore assumed that the deduction rates in this year also held in 2011-12 (Wave 12). In Release 13, the 2011-12 deduction rates will be updated to reflect the 2011-12 ATO data.

Table 8: Main income tax rates, Waves 1 to 12

	Income	Tax Rate
2000-01, 2001-02, 2002-03	$0 - $6,000	Nil
	$6,001 - $20,000	Nil plus 17c for each $ over $6,000
	$20,001 - $50,000	$2,380 plus 30c for each $ over $20,000
	$50,001 - $60,000	$11,380 plus 42c for each $ over $50,000
	$60,001 and over	$15,580 plus 47c for each $ over $60,000
2003-04	$0 - $6,000	Nil
	$6,001 - $21,600	Nil plus 17c for each $ over $6,000
	$21,601 - $52,000	$2,652 plus 30c for each $ over $21,600
	$52,001 - $62,500	$11,772 plus 42c for each $ over $52,000
	$62,501 and over	$16,182 plus 47c for each $ over $62,500
2004-05	$0 - $6,000	Nil
	$6,001 - $21,600	Nil plus 17c for each $ over $6,000
	$21,601 - $58,000	$2,652 plus 30c for each $ over $21,600
	$58,001 - $70,000	$13,572 plus 42c for each $ over $58,000
	$70,001 and over	$18,612 plus 47c for each $ over $70,000
2005-06	$0 - $6,000	Nil
	$6,001 - $21,600	Nil plus 15c for each $ over $6,000
	$21,601 - $63,000	$2,340 plus 30c for each $ over $21,600
	$63,001 - $95,000	$14,760 plus 42c for each $ over $63,000
	$95,001 and over	$28,200 plus 47c for each $ over $95,000
2006-07	$0 - $6,000	Nil
	$6,001 - $25,000	Nil plus 15c for each $ over $6,000
	$25,001 - $75,000	$2,850 plus 30c for each $ over $25,000
	$75,001 - $150,000	$17,850 plus 40c for each $ over $75,000
	$150,001 and over	$47,850 plus 45c for each $ over $150,000
2007-08	$0 - $6,000	Nil
	$6,001 - $30,000	Nil plus 15c for each $ over $6,000
	$30,001 - $75,000	$3,600 plus 30c for each $ over $30,000
	$75,001 - $150,000	$17,100 plus 40c for each $ over $75,000
	$150,001 and over	$47,100 plus 45c for each $ over $150,000
2008-09	$0 - $6,000	Nil
	$6,001 - $34,000	Nil plus 15c for each $ over $6,000
	$34,001 - $80,000	$4,200 plus 30c for each $ over $34,000
	$80,001 - $180,000	$180,00 plus 40c for each $ over $80,000
	$180,001 and over	$58,000 plus 45c for each $ over $180,000
2009-10	$0 - $6,000	Nil
	$6,001 - $35,000	Nil plus 15c for each $ over $6,000
	$35,001 - $80,000	$4,350 plus 30c for each $ over $35,000
	$80,001 - $180,000	$17,850 plus 38c for each $ over $80,000
	$180,001 and over	$55,850 plus 45c for each $ over $180,000
2010-11	$0 - $6,000	Nil
	$6,001 - $37,000	Nil plus 15c for each $ over $6,000
	$37,001 - $80,000	$4,650 plus 30c for each $ over $37,000
	$80,001 - $180,000	$17,550 plus 37c for each $ over $80,000
	$180,001 and over	$54,550 plus 45c for each $ over $180,000
2011-12	$0 - $6,000	Nil
	$6,001 - $37,000	Nil plus 15c for each $ over $6,000
	$37,001 - $50,000	$4,650 plus 30c for each $ over $37,000
	$50,001 - $80,000	$8,550 plus 30.5c for each $ over $50,000
	$80,001 - $100,000	$17,700 plus 37.5c for each $ over $80,000
	$100,001 - $180,000	$25,200 plus 38c for each $ over $100,000
	$180,001 and over	$55,600 plus 46c for each $ over $180,000

Note: Included in the 2011-12 tax rates is an additional 'flood levy', equal to 0.5% of income between $50,000 and $100,000 plus 1% of income in excess of $100,000. *Source*: ATO (www.ato.gov.au).

Table 9: Deductions as a proportion of gross regular income (D), Waves 1 to 12

Gross regular income	2000-01	2001-02	2002-03	2003-04	2004-05	
Less than $6,001	0.126	0.137	0.138	0.142	0.134	
$6,001–$9,999	0.063	0.068	0.069	0.071	0.067	
$10,000–$14,999	0.055	0.060	0.060	0.062	0.061	
$15,000–$20,000	0.051	0.056	0.057	0.059	0.060	
$20,001–$24,999	0.047	0.052	0.054	0.058	0.062	
$25,000–$29,999	0.041	0.045	0.047	0.050	0.053	
$30,000–$34,999	0.039	0.042	0.043	0.046	0.048	
$35,000–$39,999	0.038	0.041	0.042	0.044	0.046	
$40,000–$50,000	0.039	0.041	0.041	0.043	0.045	
$50,001–$60,000	0.039	0.041	0.042	0.043	0.045	
$60,001–$79,999	0.039	0.040	0.041	0.042	0.044	
$80,000–$99,999	0.040	0.041	0.041	0.042	0.043	
$100,000–$199,999	0.041	0.042	0.043	0.044	0.046	
$200,000–$499,999	0.041	0.042	0.043	0.044	0.047	
$500,000–$999,999	0.042	0.041	0.044	0.044	0.046	
$1,000,000 or more	0.039	0.044	0.038	0.045	0.037	
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11, 2011-12
Less than $6,001	0.160	0.213	0.165	0.190	0.125	0.118
$6,001 to $10,000	0.080	0.107	0.082	0.095	0.063	0.059
$10,001 to $15,000	0.070	0.083	0.084	0.085	0.065	0.049
$15,001 to $20,000	0.069	0.078	0.074	0.072	0.070	0.059
$20,001 to $25,000	0.072	0.087	0.069	0.066	0.063	0.056
$25,001 to $30,000	0.061	0.077	0.072	0.063	0.059	0.054
$30,001 to $35,000	0.053	0.062	0.061	0.063	0.055	0.053
$35,001 to $40,000	0.050	0.057	0.054	0.056	0.051	0.051
$40,001 to $45,000	0.049	0.055	0.051	0.050	0.048	0.048
$45,001 to $50,000	0.048	0.053	0.050	0.049	0.048	0.048
$50,001 to $55,000	0.048	0.053	0.050	0.049	0.048	0.047
$55,001 to $60,000	0.049	0.053	0.050	0.049	0.047	0.047
$60,001 to $70,000	0.050	0.052	0.050	0.049	0.047	0.047
$70,001 to $80,000	0.047	0.060	0.055	0.052	0.047	0.047
$80,001 to $90,000	0.048	0.053	0.050	0.050	0.046	0.046
$90,001 to $100,000	0.049	0.054	0.049	0.047	0.044	0.043
$100,001 to $150,000	0.051	0.058	0.051	0.047	0.043	0.042
$150,001 to $180,000	0.057	0.068	0.057	0.051	0.043	0.042
$180,001 to $250,000	0.057	0.069	0.058	0.053	0.046	0.042
$250,001 to $500,000	0.058	0.071	0.058	0.056	0.044	0.042
$500,001 to $1,000,000	0.056	0.067	0.056	0.052	0.044	0.036
$1,000,000 or more	0.048	0.048	0.058	0.044	0.032	0.029

Source: For Waves 1 to 10, Tables 5B and 5C in the detailed tables of the 'Personal income tax' section of the ATO's *Taxation Statistics* (tax-years 2000-01 to 2009-10); for Waves 11 and 12, Table 8 in the detailed tables of the 'Personal income tax' section of the ATO's *Taxation Statistics* (tax-year 2010-11). (See www.ato.gov.au/About-ATO/Research-and-statistics/Our-statistics/Taxation-statistics/)

5.1.2 Tax on regular superannuation benefits (taxsuper)

Tax on superannuation benefits is determined by complex and constantly changing rules. For the purposes of estimating tax payable on regular superannuation income, the HILDA Survey employs the following approximation:

- If the tax rate according to Table 10 is t = 0, *taxsuper* = 0.
- If the tax rate according to Table 10 is t = 'marginal rate minus 15%', *taxsuper* = tax on 'taxable income inclusive of regular superannuation income' minus tax on 'taxable income exclusive of regular superannuation income' minus 0.15*'regular superannuation income'.
- If tax rate according to Table 10 is t = 'marginal rate', *taxsuper* = tax on 'taxable income inclusive of regular superannuation income' minus tax on 'taxable income exclusive of regular superannuation income'.

Taxsuper cannot be negative and so is set equal to zero if the calculated value is less than zero.

This approach is an approximation, primarily because it (necessarily) assumes that all superannuation benefits are 'taxed', which means that taxes were paid on the contributions (during the accumulation phase).

Table 10: Tax rates applying to regular superannuation benefits, Waves 1 to 12

	Preservation age (Age_p)	Tax rate (t) if age ≥ 60	Tax rate (t) if $Age_p \leq$ age < 60	Tax rate (t) if age < Age_p
2000-01	55	Marginal tax rate minus 15%	Marginal tax rate minus 15%	Marginal rate
2001-02	55	Marginal tax rate minus 15%	Marginal tax rate minus 15%	Marginal rate
2002-03	55	Marginal tax rate minus 15%	Marginal tax rate minus 15%	Marginal rate
2003-04	55	Marginal tax rate minus 15%	Marginal tax rate minus 15%	Marginal rate
2004-05	55	Marginal tax rate minus 15%	Marginal tax rate minus 15%	Marginal rate
2005-06	55	Marginal tax rate minus 15%	Marginal tax rate minus 15%	Marginal rate
2006-07	55	Marginal tax rate minus 15%	Marginal tax rate minus 15%	Marginal rate
2007-08	55	0	Marginal tax rate minus 15%	Marginal rate
2008-09	55	0	Marginal tax rate minus 15%	Marginal rate
2009-10	55	0	Marginal tax rate minus 15%	Marginal rate
2010-11	55	0	Marginal tax rate minus 15%	Marginal rate
2011-12	55	0	Marginal tax rate minus 15%	Marginal rate

Source: ATO (www.ato.gov.au).

5.1.3 Medicare Levy and Medicare Levy Surcharge (Medlevy)

Medlevy is equal to the total of the Medicare Levy (ML) plus the Medicare Levy Surcharge (MLS).

Medicare Levy

The Medicare Levy (ML) is estimated as applicable in the relevant financial year and added to income tax estimated above. For single persons, it is equal to:

$$ML_I = \begin{cases} 0 \text{ if } Inc^I \leq Inc_L^I \\ t_1^{ML} * \left(Inc^I - Inc_L^I \right) \text{ if } Inc_L^I < Inc^I \leq Inc_H^I \\ 0.015 * Inc^I \text{ if } Inc^I > Inc_H^I \end{cases} \quad (13)$$

where the parameter values are provided in Table 11.

Thus, the Medicare Levy is: zero if taxable income of the individual, Inc^I, is less than threshold Inc_L^I; a fraction t_1^{ML} (equal to 0.2 up until 2005-06 and 0.1 from 2006-07) of the difference between Inc^I and Inc_L^I if Inc^I is between lower threshold Inc_L^I and upper threshold Inc_H^I (the individual phase-in limit); and 1.5% of taxable income if Inc^I exceeds threshold Inc_H^I.

The single-person formula also applies to persons in lone-parent or couple families, but is augmented by a formula based on family income. Expressed in terms of the Medicare Levy payable by the individual (rather than the family), the family income formula is given by:

$$ML_F = \begin{cases} 0 \text{ if } Inc^F \leq Inc_L^F \\ t_1^{ML} * \left(Inc^F - Inc_L^F \right) * \left(Inc^I \Big/ Inc^F \right) \text{ if } Inc_L^F < Inc^F \leq Inc_H^F \\ 0.015 * Inc^I \text{ if } Inc^F > Inc_H^F \end{cases} \quad (14)$$

where Inc^F is the taxable income of the family (as defined for FTB purposes) and the parameter values are reported in Table 11. The individual's Medicare Levy is then the lesser of ML_I and ML_F.

The thresholds Inc_L^I, Inc_H^I, Inc_L^F and Inc_H^F depend on the year (increasing in most years), whether the individual is a pensioner (including Parenting Payment Single recipient), and whether the individual is above the age of eligibility for the Age Pension.[9] The family thresholds additionally depend on the number of dependent children in the family.

Table 11: Medicare Levy parameters, Waves 1 to 12

	Personal income below which no Medicare levy payable $\left(Inc_L^I\right)$ ($)	Family income below which no Medicare levy payable $\left(Inc_L^F\right)$ ($)		Individual phase-in limit $\left(Inc_H^I\right)$ ($)	Family phase-in limit $\left(Inc_H^F\right)$ ($)		Phase-in rate $\left(t_1^{ML}\right)$
		Base	Addition to base per dependent child		Base	Addition to base per dependent child	
Non-pensioners							
2000-01	14,539	24,534	2,253	15,718	26,523	2,436	0.2
2001-02	14,539	24,534	2,253	15,718	26,523	2,436	0.2
2002-03	15,062	25,417	2,334	16,283	27,478	2,523	0.2
2003-04	15,529	26,205	2,406	16,788	28,330	2,601	0.2
2004-05	15,902	26,834	2,464	17,191	29,010	2,664	0.2
2005-06	16,284	27,478	2,523	17,604	29,706	2,728	0.2
2006-07	16,740	28,247	2,594	19,695	33,233	3,052	0.1
2007-08	17,309	29,207	2,682	20,364	34,362	3,155	0.1
2008-09	17,794	30,025	2,757	20,935	35,324	3,244	0.1
2009-10	18,488	31,195	2,864	21,751	36,701	3,369	0.1
2010-11	18,839	31,789	2,919	22,164	37,400	3,434	0.1
2011-12	19,404	38,521	3,538	22,829	45,320	4,162	0.1
Pensioners below Age Pension age (including Parenting Payment Single recipients)							
2000-01	15,970	24,534	2,253	17,265	26,523	2,436	0.2
2001-02	16,570	24,534	2,253	17,914	26,523	2,436	0.2
2002-03	17,164	25,417	2,334	18,556	27,478	2,523	0.2
2003-04	18,141	26,205	2,406	19,612	28,330	2,601	0.2
2004-05	19,252	26,834	2,464	20,813	29,010	2,664	0.2
2005-06	19,583	27,478	2,523	21,171	29,706	2,728	0.2
2006-07	21,637	28,247	2,594	25,456	33,233	3,052	0.1
2007-08	22,922	29,207	2,682	26,968	34,362	3,155	0.1
2008-09	25,299	30,025	2,757	29,764	35,324	3,244	0.1
2009-10	27,697	31,195	2,864	32,586	36,701	3,369	0.1
2010-11	30,439	31,789	2,919	35,811	37,400	3,434	0.1
2011-12	30,451	38,521	3,538	35,826	45,320	4,162	0.1
Seniors (above Age Pension age but not receiving the Age Pension)							
2000-01	20,000	31,729	2,253	21,622	34,302	2,436	0.2
2001-02	20,000	31,729	2,253	21,622	34,302	2,436	0.2
2002-03	20,000	31,729	2,334	21,622	34,302	2,523	0.2
2003-04	20,500	33,612	2,406	22,162	36,337	2,601	0.2
2004-05	20,500	33,612	2,464	22,162	36,337	2,664	0.2
2005-06	21,968	36,494	2,523	23,749	39,453	2,728	0.2
2006-07	24,867	33,500	2,594	29,256	39,413	3,052	0.1
2007-08	25,867	37,950	2,682	30,433	44,648	3,155	0.1
2008-09	28,867	42,000	2,757	33,962	49,413	3,244	0.1
2009-10	29,867	43,499	2,864	35,139	51,177	3,369	0.1
2010-11	30,685	44,500	2,919	36,101	52,354	3,434	0.1
2011-12	30,685	52,352	3,538	36,101	61,592	4,162	0.1

Source: ATO (www.ato.gov.au).

[9] The Age Pension age is 65 for males. For females, it was 61.5 in 2000 and 2001, and increased by half a year every two years until 2014, when it reached (as of 1 January) the male age of 65.

Medicare Levy Surcharge

Between 1997-98 and 2011-12, persons without private health insurance hospital cover faced a Medicare Levy Surcharge (MLS) of 1% of taxable income if family income exceeded a specified threshold. The HILDA Survey did not collect full-year private health insurance (PHI) status until Wave 12, and so the surcharge is assumed to be zero for all respondents in Waves 1 to 11. Aggregate ATO data indicates that the MLS averages 0.06% of taxable income and is therefore not a substantial component of taxation—although, of course, it will be 1% of the taxable income of affected individuals.

In Wave 12, a question on PHI coverage was introduced, facilitating calculation of the MLS. Thus, for those without PHI (for the entire financial year), the MLS is equal to 1% of taxable income if, in the case of singles without dependent children, taxable income in 2011-12 was in excess of $80,000, or, in the case of individuals with dependent children, family income was in excess of $160,000 plus $1,500 for each dependent child.[10]

5.1.4 Offsets

A variety of tax offsets exist which act to reduce the income tax liability of the taxpayer. All offsets together amount to approximately 4% of taxable income. As shown in Equation (10), these are subtracted from the income tax liability to arrive at income tax payable (down to a minimum of zero) prior to subtracting dividend imputation credits.

For Release 12, five of these offsets are calculated based on the criteria that apply to each: the Low Income Tax Offset (LITO), the Senior Australians Tax Offset (SATO), the Pensioner Tax Offset (PETO), the Mature Age Workers' Tax Offset (MATO) and the Dependent Spouse Tax Offset (SPOUTO).[11]

Low income tax offset (LITO)

LITO accrues to persons with low personal taxable incomes. It is calculated as:

$$LITO = \begin{cases} LITO_{\max} \text{ if } Inc \le Inc_L^{LI} \\ LITO_{\max} - 0.04 * \left(Inc - Inc_L^{LI} \right) \text{ if } Inc_L^{LI} < Inc < Inc_H^{LI} \\ 0 \text{ if } Inc \ge Inc_H^{LI} \end{cases} \quad (15)$$

where *Inc* is the personal taxable income of the individual and the description of the parameters $\left(LITO_{\max}, \; Inc_L^{LI} \text{ and } Inc_H^{LI} \right)$ and their values for each wave are reported in Table 12.[12]

[10] In 2012-13, the MLS was changed such that three different rates apply—1%, 1.25% or 1.5%—depending on the level of taxable income. For example, the 1.5% rate applies to singles with income in excess of $130,000 and families with incomes in excess of $260,000 (plus $1,500 for each dependent child). Indeed, it was in anticipation of these new higher rates that it was decided that PHI status needed to be collected in order to calculate the MLS.

[11] From 2012-13, SATO and PETO have been combined into a single offset, the Senior Australians and Pensioner Tax Offset (SAPTO). Also note that the Beneficiary Tax Offset (BTO), applicable to recipients of government Allowances, is to be calculated in Release 13 (and in future releases).

[12] From 2012-13, the rate at which LITO reduces once taxable income exceeds Inc_L^{LI} has decreased from 0.04 to 0.015, and is scheduled to further decrease to 0.01 from 2015-16.

Table 12: LITO parameter values, Waves 1 to 12 ($)

	Maximum offset $\left(LITO_{\max}\right)$	Maximum taxable income before offset starts reducing $\left(Inc_L^{LI}\right)$	Lowest taxable income at which offset is reduced to zero $\left(Inc_H^{LI}\right)$
2000-01	150	20,700	24,450
2001-02	150	20,700	24,450
2002-03	150	20,700	24,450
2003-04	235	21,600	27,475
2004-05	235	21,600	27,475
2005-06	235	21,600	27,475
2006-07	600	25,000	40,000
2007-08	750	30,000	48,750
2008-09	1,200	30,000	60,000
2009-10	1,350	30,000	63,750
2010-11	1,500	30,000	67,500
2011-12	1,500	30,000	67,500

Source: ATO (www.ato.gov.au).

Senior Australians Tax Offset (SATO)

SATO applies only to persons over the Age Pension age. It is applied in addition to LITO and is calculated in the same manner as LITO, based on personal taxable income:

$$SATO = \begin{cases} SATO_{\max} \text{ if } Inc \le Inc_L^{SA} \\ SATO_{\max} - 0.0125 * \left(Inc - Inc_L^{SA}\right) \text{ if } Inc_L^{SA} < Inc < Inc_H^{SA} \\ 0 \text{ if } Inc \ge Inc_H^{SA} \end{cases} \quad (16)$$

where the values of the parameters $\left(SATO_{\max}, Inc_L^{SA} \text{ and } Inc_H^{SA}\right)$ for each wave are reported in Table 13. The maximum offset, $SATO_{\max}$, and the maximum taxable income before the offset starts reducing, Inc_L^{SA}, both depend on whether the individual is living with a partner.

Table 13: SATO parameter values, Waves 1 to 12 ($)

	Maximum offset $(SATO_{\max})$	Maximum taxable income before offset starts reducing (Inc_L^{SA})	Lowest taxable income at which offset is reduced to zero (Inc_H^{SA})
Singles			
2000-01	2,230	20,000	37,840
2001-02	2,230	20,000	37,840
2002-03	2,230	20,000	37,840
2003-04	2,230	20,500	38,340
2004-05	2,230	20,500	38,340
2005-06	2,230	21,968	39,808
2006-07	2,230	24,867	42,707
2007-08	2,230	25,867	43,707
2008-09	2,230	28,867	46,707
2009-10	2,230	29,867	47,707
2010-11	2,230	30,685	48,525
2011-12	2,230	30,685	48,525
Each member of a couple			
2000-01	1,602	16,306	29,122
2001-02	1,602	16,306	29,122
2002-03	1,602	16,306	29,122
2003-04	1,602	16,806	29,622
2004-05	1,602	16,806	29,622
2005-06	1,602	18,247	31,063
2006-07	1,602	20,680	33,496
2007-08	1,602	21,680	34,496
2008-09	1,602	24,680	37,496
2009-10	1,602	25,680	38,496
2010-11	1,602	26,680	39,496
2011-12	1,602	26,680	39,496

Source: ATO (www.ato.gov.au).

Pensioner Tax Offset (PETO)

PETO was payable between 2000-01 and 2011-12 to persons below the minimum age of eligibility for the Age Pension who received a pension other than the Disability Support Pension or received Parenting Payment Single. The formula for PETO is the same as for SATO, although the maximum offset differs somewhat, as does the income threshold at which the offset begins to reduce. As with SATO, it accrues in addition to LITO.

$$SATO = \begin{cases} PETO_{\max} \text{ if } Inc \le Inc_L^{PE} \\ PETO_{\max} - 0.0125 * \left(Inc - Inc_L^{PE} \right) \text{ if } Inc_L^{PE} < Inc < Inc_H^{PE} \\ 0 \text{ if } Inc \ge Inc_H^{PE} \end{cases} \quad (17)$$

where the values of the parameters $\left(PETO_{\max}, \; Inc_L^{PE} \text{ and } Inc_H^{PE} \right)$ for each wave are reported in Table 14. As with SATO, the maximum offset, $PETO_{\max}$, and the maximum taxable income before the offset starts reducing, Inc_L^{PE}, both depend on whether the individual is living with a partner.

Table 14: PETO parameter values, Waves 1 to 12 ($)

	Maximum offset $(PETO_{\max})$	Maximum taxable income before offset starts reducing (Inc_L^{PE})	Lowest taxable income at which offset is reduced to zero (Inc_H^{PE})
Singles			
2000-01	1,608	15,459	28,323
2001-02	1,710	16,059	29,739
2002-03	1,811	16,653	31,141
2003-04	1,928	17,342	32,766
2004-05	2,117	18,453	35,389
2005-06	1,909	18,727	33,999
2006-07	2,018	19,454	35,598
2007-08	2,129	20,194	37,226
2008-09	2,240	20,934	38,854
2009-10	2,518	22,787	42,931
2010-11	2,732	24,214	46,070
2011-12	2,859	25,060	47,932
Each member of a couple			
2000-01	1,155	12,795	22,035
2001-02	1,245	13,324	23,284
2002-03	1,324	13,789	24,381
2003-04	1,424	14,377	25,769
2004-05	1,585	15,324	28,004
2005-06	1,428	15,520	26,944
2006-07	1,522	16,147	28,323
2007-08	1,610	16,734	29,614
2008-09	1,699	17,327	30,919
2009-10	1,781	17,874	32,122
2010-11	1,905	18,700	33,940
2011-12	2,005	19,367	35,407

Source: ATO (www.ato.gov.au).

Mature Age Workers' Tax Offset (MATO)

Introduced in 2004-05 (and discontinued from 2012-13 for persons born after 30 June 1957), MATO applies to employed persons aged 55 years and over and is in addition to any other offsets applicable. It is equal to 5% of wage and salary income net of deductions, up to a maximum of $500. It is reduced for wage and salary income net of deductions in excess of a threshold ($48,000 in 2004-05 and $53,000 thereafter) at a rate of 5%. That is,

$$\text{MATO} = \begin{cases} 0.05 * Earn \text{ if } Earn < \$10,000 \\ \$500 \text{ if } \$10,000 \le Earn < Earn_L \\ \$500 - 0.05 * (Earn - Earn_L) \text{ if } Earn_L < Earn < Earn_H \\ 0 \text{ if } Earn \ge Earn_H \end{cases} \tag{18}$$

where $Earn_L$ was $48,000 in 2004-05 and $53,000 thereafter, and $Earn_H$ was $58,000 in 2004-05 and $63,000 thereafter.

Dependent Spouse Tax Offset (SPOUTO)

Payable to persons with a dependent spouse and no dependent children, SPOUTO is accrued in addition to any other offsets to which the taxpayer is eligible:

$$SPOUTO = \begin{cases} SPOUTO_{\max} \text{ if } SPInc \le SPInc_L \\ SPOUTO_{\max} - 0.25 * \left(SPInc - SPInc_L\right) \text{ if } SPInc_L < SPInc < SPInc_H \\ 0 \text{ if } SPInc \ge SPInc_H \end{cases} \tag{19}$$

where *SPInc* is the taxable income of the taxpayer's spouse and the parameter descriptions and values are presented in Table 15.

From 2007-08 (Wave 8), an additional condition for eligibility for SPOUTO was introduced, which is that personal taxable income cannot exceed $150,000. Further, from 1 July 2011 (Wave 12 onwards), taxpayers with a dependent spouse born on or after 1 July 1971 are no longer entitled to claim the dependent spouse tax offset.[13]

Table 15: SPOUTO parameter values, Waves 1 to 12

	Maximum offset ($SPOUTO_{\max}$) ($)	Maximum taxable income of *spouse* before offset starts reducing ($SPInc_L$) ($)	Lowest taxable income of *spouse* at which offset is reduced to zero ($SPInc_H$) ($)	Maximum taxable income of *self* before become ineligible for SPOUTO ($)	Minimum age of spouse at start of financial year (years)
2000-01	1,365	286	5,741	No maximum	No minimum
2001-02	1,437	282	6,030	No maximum	No minimum
2002-03	1,489	282	6,238	No maximum	No minimum
2003-04	1,535	282	6,422	No maximum	No minimum
2004-05	1,572	282	6,570	No maximum	No minimum
2005-06	1,610	282	6,722	No maximum	No minimum
2006-07	1,655	282	6,902	No maximum	No minimum
2007-08	2,100	282	8,681	150,000	No minimum
2008-09	2,159	282	8,918	150,000	No minimum
2009-10	2,243	282	9,254	150,000	No minimum
2010-11	2,286	282	9,426	150,000	No minimum
2011-12	2,355	282	9,702	150,000	40

Source: ATO (www.ato.gov.au).

Other offsets (Othoff)

A number of other offsets cannot be reliably estimated given the information collected by the HILDA Survey. These comprise, in approximate order of magnitude:

- Super contributions tax offset
- Medical expenses tax offset
- Child care tax rebate
- Baby bonus tax offset credit
- Zone or overseas forces tax offset
- Private health insurance tax offset
- Commonwealth benefits and payments tax offset
- Entrepreneurs' tax offset
- Income averaging tax offset
- Spouse superannuation contributions tax offset
- Parent/parent-in-law/invalid relative tax offset
- Other tax offsets
- Life assurance bonus tax offset
- Landcare and water tax offset

[13] Taxpayers who maintain an invalid or permanently disabled spouse, support a carer or who are eligible for the zone, overseas forces or the overseas civilian tax offsets are exempt from the new age limit and are still able to claim the value of the dependent spouse tax offset as an expanded invalid spouse, zone, overseas forces or overseas civilian offset. This exemption is not implemented in the HILDA Survey tax model.

We estimate the total value of these offsets for each individual based on aggregate ATO data on the total value of these offsets as a proportion of taxable income, by level of taxable income:

$$Othoff = S_{Inc} * Inc \tag{20}$$

where *Inc* is the taxable income of the individual. The values of S_{Inc} are reported in Table 16, which shows that the value of other offsets generally ranges between 0.5% and 1% of taxable income, although this percentage tends to be higher for higher-income individuals.

Table 16: Other offsets share of taxable income by level of taxable income $\left(S_{Inc}\right)$, Waves 1 to 12

	2000-01	2001-02	2002-03	2003-04	2004-05		
Less than $6,001	0.002	0.002	0.003	0.003	0.003		
$6,001–$9,999	0.003	0.003	0.005	0.005	0.005		
$10,000–$14,999	0.005	0.005	0.006	0.007	0.007		
$15,000–$20,000	0.004	0.004	0.005	0.006	0.006		
$20,001–$24,999	0.006	0.006	0.006	0.006	0.007		
$25,000–$29,999	0.005	0.005	0.006	0.006	0.006		
$30,000–$34,999	0.005	0.005	0.005	0.005	0.006		
$35,000–$39,999	0.005	0.005	0.005	0.005	0.005		
$40,000–$50,000	0.004	0.004	0.004	0.004	0.005		
$50,001–$60,000	0.005	0.005	0.005	0.004	0.004		
$60,001–$79,999	0.009	0.009	0.008	0.006	0.006		
$80,000–$99,999	0.014	0.014	0.012	0.010	0.009		
$100,000–$199,999	0.025	0.025	0.023	0.021	0.021		
$200,000–$499,999	0.019	0.019	0.019	0.017	0.019		
$500,000–$999,999	0.012	0.012	0.012	0.011	0.010		
$1,000,000 or more	0.009	0.008	0.008	0.005	0.005		
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12
Less than $6,001	0.004	0.004	0.056	0.014	0.003	0.075	0.003
$6,001 to $10,000	0.004	0.002	0.002	0.006	0.002	0.011	0.002
$10,001 to $15,000	0.008	0.004	0.003	0.004	0.002	0.015	0.002
$15,001 to $20,000	0.008	0.007	0.005	0.006	0.006	0.010	0.006
$20,001 to $25,000	0.009	0.007	0.005	0.007	0.007	0.008	0.007
$25,001 to $30,000	0.009	0.009	0.005	0.006	0.006	0.008	0.006
$30,001 to $35,000	0.008	0.008	0.005	0.006	0.007	0.007	0.007
$35,001 to $40,000	0.007	0.007	0.005	0.006	0.006	0.006	0.006
$40,001 to $45,000	0.006	0.007	0.004	0.005	0.006	0.006	0.006
$45,001 to $50,000	0.006	0.006	0.004	0.005	0.005	0.005	0.005
$50,001 to $55,000	0.006	0.006	0.004	0.004	0.005	0.005	0.005
$55,001 to $60,000	0.005	0.006	0.004	0.004	0.004	0.004	0.004
$60,001 to $70,000	0.005	0.006	0.003	0.004	0.004	0.004	0.004
$70,001 to $80,000	0.007	0.006	0.003	0.004	0.004	0.004	0.004
$80,001 to $90,000	0.008	0.007	0.004	0.004	0.004	0.004	0.004
$90,001 to $100,000	0.009	0.008	0.005	0.005	0.004	0.004	0.004
$100,001 to $150,000	0.016	0.011	0.006	0.006	0.005	0.005	0.005
$150,001 to $200,000	0.031	–	–	–	–	–	–
$150,001 - $180,000	–	0.021	0.010	0.008	0.006	0.006	0.006
$200,001 to $250,000	0.025	–	–	–	–	–	–
$180,001 - $250,000	–	0.017	0.011	0.010	0.009	0.008	0.008
$250,001 to $500,000	0.017	0.011	0.008	0.009	0.008	0.008	0.008
$500,001 to $1,000,000	0.010	0.006	0.004	0.005	0.005	0.005	0.005
$1,000,000 or more	0.005	0.002	0.002	0.002	0.002	0.002	0.002

Source: For Waves 1 to 10, Tables 5B and 5C in the detailed tables of the 'Personal income tax' section of the ATO's *Taxation Statistics* (tax-years 2000-01 to 2009-10); for Waves 11 and 12, Table 8 in the detailed tables of the 'Personal income tax' section of the ATO's *Taxation Statistics* (tax-year 2010-11). (See www.ato.gov.au/About-ATO/Research-and-statistics/Our-statistics/Taxation-statistics/)

5.1.5 Dividend imputation credits

Introduced in 1987, dividend imputation credits are tax credits received by share-dividend recipients for company taxes paid on profits. Thus, the personal tax liability of a share-dividend recipient is reduced by the 'imputed' amount of tax paid by the company on the profits from which the dividends derived. Since 2000, it has been possible to have a *negative* total income tax liability due to dividend imputation credits.

For tax purposes, the imputation credit is in fact part of the gross income of the tax-payer—that is, dividend income is 'grossed up' to include the imputed company tax paid on the profits from which the dividends derived. As a consequence, as Equation (11) shows, to calculate the income tax liability of the dividend recipient, the imputation credits are added to regular gross income. Indeed—in keeping with ABS practice since 2003—imputation credits are included in the HILDA income variables, forming part of dividends on shares (_oifdiva) and hence investment income (_oifinip - _oifinin).

Aggregate ATO data on dividend income and imputation credits shows that dividend imputation credits over the HILDA Survey sample period are 41% of share-dividend income. Consequently, in all waves, dividend imputation credits of each individual are set equal to 41% of reported share-dividend income (_oifdiva). However, since share dividends are not imputed, for sample members who do not report share dividends (for example, because they do not know the value), imputation credits are estimated as equal to 15% of imputed investment income (derived as 41% of the average fraction of investment income that is share dividends, according the HILDA Survey over Waves 1 to 12). That is,

$$IC = \begin{cases} 0.41 * \_oifdiva \text{ if } \_oifdiva \text{ is not missing} \\ 0.15 * \_oifinip \text{ otherwise} \end{cases} \tag{21}$$

5.2 Tax on total income

Most sources of irregular income are typically non-taxable, the notable exception being redundancy or termination payments. Income tax payable on total (regular plus irregular) income is therefore simply calculated as the tax on regular income plus the tax on redundancy income.

5.2.1 Tax on redundancy payments (redtax)

The rules for determining income tax payable on redundancy payments are complicated and depend on years of service and age. They have also changed considerably over time. The HILDA Survey tax model therefore approximates the tax, using the following formula:

$$redtax = \begin{cases} 0 \text{ if } R \le C_1 \\ t_1^r * \left(R - C_1\right) \text{ if } C_1 < R \le C_2 \\ t_1^r * \left(C_2 - C_1\right) + t_2^r * \left(R - C_2\right) \text{ if } R > C_2 \end{cases} \tag{22}$$

where R is the redundancy payment and the parameter descriptions and values are presented in Table 17.

Table 17: Parameter values for redundancy tax (*redtax*), Waves 1 to 12

	Cap 1 (C_1) ($)	Cap 2 (C_2) ($)	Tax rate on redundancy payments above Cap 1 and less than Cap 2 (t_1^r) (%)		Tax rate on redundancy payments above Cap 2 (t_2^r) (%)	Preservation age (PA) (years)
			Age < PA	Age ≥ PA		
2000-01	0	0	–	–	31.5	55
2001-02	0	0	–	–	31.5	55
2002-03	0	0	–	–	31.5	55
2003-04	5,882 + (*Y**2,941)	117,576	31.5	16.5	31.5	55
2004-05	6,194 + (*Y**3,097)	123,808	31.5	16.5	31.5	55
2005-06	6,488 + (*Y**3,244)	129,699	31.5	16.5	31.5	55
2006-07	6,783 + (*Y**3,392)	135,590	31.5	16.5	31.5	55
2007-08	7,020 + (*Y**3,511)	140,000	31.5	16.5	46.5	55
2008-09	7,350 + (*Y**3,676)	145,000	31.5	16.5	46.5	55
2009-10	7,732 + (*Y**3,867)	150,000	31.5	16.5	46.5	55
2010-11	8,126 + (*Y**4,064)	160,000	31.5	16.5	46.5	55
2011-12	8,435 + (*Y**4,218)	165,000	31.5	16.5	46.5	55

Note: *Y* is years of employment in the job from which made redundant and is approximated as equal to 0.5*(age – 20).
Source: ATO (www.ato.gov.au).

6. Conclusion

Changes to the HILDA Survey income model over time (as documented in the Appendix) mean that income data are not strictly comparable across data releases. However, within a given data release, the income variables are, for the most part, constructed in the same way for all waves of data. A few minor exceptions arise in respect of components requiring information that was not collected in earlier waves. In particular, salary sacrificed wage and salary income was not collected prior to Wave 10, and the Medicare Levy Surcharge cannot be calculated until Wave 12, when full-year private health insurance cover was first collected. These are, however, minor components of income. The Medicare Levy Surcharge amounts to only 0.06% of taxable income according to ATO Taxation Statistics, while Kecmanovic and Wilkins (2012) show that the effects of accounting for salary-sacrificed income, while larger, are still nonetheless a relatively small source of inconsistency between waves prior to Wave 10 and subsequent waves.

The intention is that the HILDA Survey income model will remain relatively stable over coming data releases—although, as changes are made to the tax and transfer system over coming years, so too will changes need to be made to the HILDA Survey tax model, and possibly the broader income model as well. There are also potential improvements or further developments to the income model that may be made in future. For example, the HILDA Survey income model does not take into account all types of income. First, it excludes in-kind income, be it from private or public sources. This includes non-cash benefits provided by employers to their employees, as well as the free or subsidised health, education, housing and other services provided by government. Second, the current model of disposable (that is, after-tax) income does not remove the tax component of consumption expenditures, which it arguably should. And finally, also missing from the income model is capital gains income, be it accrued or realised. It is likely, however, that any broader income measures produced in future that attempt to capture these income components will be provided to users as *additional* income variables rather than as replacements for the cash-income variables currently provided.

References

Australian Bureau of Statistics (ABS) (2013) *Information Paper: Survey of Income and Housing, User Guide, Australia*, ABS Catalogue No. 6553.0, ABS: Canberra.

Headey. Bruce (2003a) 'How Best To Impute Taxes And Measure Public Transfers?', HILDA Project Discussion Paper Series No. 2/03, Melbourne Institute of Applied Economic and Social Research, University of Melbourne.

Headey, Bruce (2003b) 'Income and Wealth – Facilitating Multiple Approaches To Measurement and Permitting Different Levels of Aggregation', HILDA Project Discussion Paper Series No. 3/03, Melbourne Institute of Applied Economic and Social Research, University of Melbourne.

Hayes, Clinton and Nicole Watson (2009) 'HILDA Imputation Methods', HILDA Project Technical Paper Series No. 2/09, Melbourne Institute of Applied Economic and Social Research, University of Melbourne.

Kecmanovic, Milica, and Roger Wilkins (2012) 'Accounting for Salary Sacrificed Components of Wage and Salary Income', HILDA Project Discussion Paper Series No. 3/11, Melbourne Institute of Applied Economic and Social Research, University of Melbourne.

Wilkins, Roger (2009) 'Updates and Revisions to Estimates of Income Tax and Government Benefits', HILDA Project Technical Paper Series No. 1/09, Melbourne Institute of Applied Economic and Social Research, University of Melbourne.

United Nations (2011) *Canberra Group Handbook on Household Income Statistics*, 2nd Edition, United Nations, New York and Geneva.

Appendix: Changes to the income model in each data release

This appendix provides a brief overview of the changes to the income model that have occurred in each data release. Note that changes to applicable tax rates, benefit rates and the various tax and benefit income thresholds are not itemised here.

Release 1

Headey (2003a) describes the Release 1 income model, while Headey (2003b) describes the Release 1 tax and benefit model. The key features of the income model were that it distinguished five broad income concepts: market income, private income (market income plus private transfers), public transfer income, gross income and disposable income. The model also identified several distinct components of market income, private transfers and public transfers. Much of this broad structure of the model has remained in place across all 12 releases of the HILDA Survey data.

The tax model, however, was very simple in Release 1, and has been extensively modified over subsequent data releases. In Release 1, only the four main income tax rates plus the Medicare Levy were applied to total income, with no allowance for offsets, deductions, non-taxable components or concessionally taxed components. This resulted in considerable overestimation of income tax.

Releases 2 to 4

As canvassed in Headey (2003b), the tax model was progressively refined and improved in each of Releases 2, 3 and 4. However, rather than attempt to apply the tax rules to each sample member's individual circumstances, the approach emphasised matching population-weighted HILDA Survey estimates of deductions, offsets, taxes paid, and so on, to ATO taxation statistics aggregates.

Child Care Benefit was added to government benefit income in Release 2, but then removed in Release 4, and has not been included in income in all subsequent data releases. The rationale for its exclusion is that it is a social transfer in kind rather than a component of cash income. Also note that the Child Care Benefit variables were removed from the data set in Release 12, on the basis that the benefit is substantially under-reported. This is because many people who receive this benefit do so via a reduction in child care fees, and in fact may not know they receive the benefit.

Release 7

Substantial changes were made to the tax and benefit model, with the emphasis switching to applying the tax rules applicable to each individual sample member's circumstances rather than attempting to match ATO aggregates. Full details on the changes are provided in Wilkins (2009). Key changes included improved estimation of government benefits, direct estimation of a number of tax offsets, and more complete and accurate identification of non-taxable income components.

Release 8

The income model was modified in respect of the classification of government benefits, and the associated derived income variables were changed. Prior to Release 8, all government benefits other than family payments (Family Tax Benefit, Maternity Payment and the Baby Bonus) appeared in the income model as a single income component, 'Australian pensions and benefits'. The new model classified benefits into seven categories: three groups of income support payments (pensions, parenting payments and allowances); two groups of non-income support payments (family payments and other non-income support payments); other domestic government payments; and other regular public payments.

Release 10

Salary sacrificed wage and salary income was measured for the first time in Wave 10, and since Wave 10 has been taken into account in the income model and tax model. Kecmanovic and Wilkins (2012) provide full details on the changes and their implications for income measures.

Release 12

Gross income

Dividend imputation credits were now estimated for all waves based on reported dividends on shares or, in the case of missing data on dividends on shares, imputed investment income. Estimated dividend imputation credits are a component of share dividend income and hence are part of investment income.

Taxes

Estimated dividend imputation credits were now subtracted from total tax.

The Medicare Levy Surcharge was now calculated, but only for Wave 12 (and future waves).

Prior to Release 12, low tax rates were applied to retired people based on the observed average tax rates of elderly people in ATO aggregate data. In Release 12, this practice was discontinued, with concessional tax rates for superannuation income applied directly to superannuation income and other income taxed in the same manner as for non-retired people.

Irregular (or 'Windfall') income

Prior to Release 12, several types of annual cash receipts collected by the HILDA Survey were classified as 'windfall' income and actually excluded from the total income measures. For personal income, these comprised:

(1) Inheritances/bequests
(2) Redundancy/severance payments
(3) Payments from non-resident parents
(4) Lump sum superannuation payments
(5) Payments from other non-household members
(6) Other irregular payments (not elsewhere classified)
(7) Payments from resident parents
(8) Lump sum workers' compensation payments

These were imputed as a whole, but not individually. The household income model similarly contained 'windfall' income, although this excluded Item 7 (payments from resident parents), since these are simply within-household transfers. As with personal income, 'windfall' income was excluded from total household income variables.

The rationale for exclusion of these components is not entirely clear, although Australian Bureau of Statistics (ABS) practice at the time the HILDA Survey commenced is likely to have been an important consideration.

As of March 2014, the ABS (see ABS, 2013) does not include Items 1, 4, 6 and 7, and puts an upper limit on Items 2 and 8 (redundancy/severance payments and lump sum workers compensation payments) of three months earnings (or 12 months at average weekly earnings if not employed). 'Regular' components of Items 3 and 5 are treated as income. The ABS approach is consistent with the Canberra Group Handbook on Household Income Statistics, Second Edition (United Nations, 2011), which is the outcome of several international meetings of national statistical agencies, government departments and research agencies in the 1990s, plus a dedicated international 'task force' that was in place from 2001 to 2010. In particular, the Canberra Group Handbook recommends

that "...windfall gains and other such irregular and one-time lump sum receipts are excluded from the definition of income."(p.16).

However, conceptually, following a Haig-Simons notion of income (income equals consumption plus the change in net wealth), all items other than (4) and (7) should be classified as income. (Lump-sum superannuation payments (4) ought to be excluded because they are more properly regarded as realising an existing asset (in the same way that proceeds from the sale of a house would not be treated as income). Payments from resident parents are within-household transfers, and cannot be regarded as household income. They could conceivably be treated as personal income, but a more consistent approach is to exclude them, since this ensures that household income is equal to the sum of household members' personal incomes.)

These two alternative conceptions of income (Canberra Group and Haig-Simons) form the basis for the provision of two sets of income variables in the HILDA Survey data. Thus, two main changes were made with respect to the income variables in Release 12:

(1) The existing annual income variables were relabelled 'regular' income, with the 'regular' components of Items 3 and 5 added to the existing variables. This is positioned as consistent with the international standards for household cash income measurement (as described in the Canberra Group Handbook) and thus also consistent with current ABS practice.

(2) 'Irregular income' variables were created, with total irregular income equal to the sum of Items' 1, 2, 6 and 8 and the 'irregular' components of Items 3 and 5. Lump-sum superannuation payments are excluded from the income model. A new set of total income variables was correspondingly created, equal to regular income plus irregular income. The new total income variables are positioned as more consistent with a Haig-Simons notion of income and as more conceptually appropriate measures of (cash) income in the context of a longitudinal study interested in both income dynamics and total income over multiple years.

Implications of the revisions

There are effects on both regular income and total income. The regular income variables have only very slight changes from the previous total income variables (regular inter-household transfers are added). However, the new total income variables are considerably different from the previous total income variables for a significant number of individuals and households.

Using Wave 10 as an example (since this is unaffected by the Wave-11 sample top-up), Table A1 presents statistics summarising the components that were classified as windfall income that are assigned to either regular or irregular income. The table shows that most individuals do not report any of the irregular components. In Wave 10, 5.9 per cent of respondents reported a positive value for one or more of the components; and 9.9 per cent of responding households had a positive value for one or more components. However, for those reporting one or more of these components, the effect on income is substantial: the mean value among responding individuals was $31,513, and the mean among responding households was $34,547. The overall effect on mean incomes is therefore not insignificant: evaluated over all responding individuals, the mean value of the components was $1,857 (compared with a mean for other income of $44,185); and over all households it was $3,433 (compared with a mean for other income of $85,198).

Table A1: Components of 'windfall' income in Wave 10 (Release 11)

	Among all responding persons		Among persons reporting the component ($)					
	% > 0	Mean ($)	Mean	Median	Minimum	10th percentile	90th percentile	Maximum
Responding person level								
1. Inheritances	1.41	1,094	77,451	27,000	30	3,000	215,000	900,000
2. Redundancy	1.09	291	26,738	9,000	200	1,100	64,000	700,000
3. Non-resident parents	2.62	223	8,510	2,000	50	300	20,000	179,278
5. Non-h/hold members	0.44	63	14,347	400	30	50	10,000	354,599
6. Other irregular	0.48	55	11,426	1,000	50	100	18,339	150,000
8. LS workers' compensation	0.02	132	594,000	174,000	108,000	108,000	1.5m	1.5m
Total	5.89	1,857	31,513	5,000	30	350	90,000	1.5m
Total personal income	–	44,185	–	–	–	–	–	–
Household level – responding persons only								
1. Inheritances	2.53	2,023	79,963	29,000	30	3,000	230,000	1.08m
2. Redundancy	1.98	537	27,107	9,000	200	1,100	80,000	700,000
3. Non-resident parents	4.39	413	9,411	2,500	50	400	20,000	179,278
5. Non-h/hold members	0.79	116	14,594	450	30	50	10,000	354,599
6. Other irregular	0.83	102	12,176	1,240	50	150	17,000	300,000
8. LS workers' compensation	0.04	244	594,000	174,000	108,000	108,000	1.5m	1.5m
Total	9.94	3,433	34,547	5,000	30	400	97,000	1.5m
Total household income	–	85,198	–	–	–	–	–	–

Note: Includes imputed values of missing components, including, for household income, incomes of non-responding members of partially responding households.