

Final Report

Reliance on Income Support in Australia: A Dynamic “Income-Based” Analysis Using Payments’ Administration Data

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Final report prepared for the Australian Government Department of
Employment and Workplace Relations under the Social Policy Research
Services Agreement

Revised version, November 2006



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MELBOURNE



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of Applied Economic and Social Research

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Executive summary

- This study draws on administrative data on income support recipients to investigate income support reliance in Australia using measures based on the ‘TPI’ (proportion of income from welfare) concept of reliance. The data comprise fortnightly payment records over the period January 1995 to June 2004 for a 10% random sample of income support recipients over this period.
- Key issues considered by the study include how the TPI measure of reliance evolves over time for individuals and the determinants of different TPI patterns. Previous Australian research has largely focused on either the rate of take-up of income support or the extent of individual reliance at a point in time. This study therefore builds on existing research by adopting a dynamic framework and examining income-based measures of reliance.
- The TPI measure on which we focus is an “average fortnightly TPI” measure, obtained by taking the average of an individual’s fortnightly TPIs over a pre-specified interval of time. The fortnightly TPI is equal to income support payments received divided by total income in that fortnight (but excluding non-income support payments).

Contextual information

- We begin the report by providing contextual information on likely changes in the composition of recipients over the sample period, which is important to the interpretation of our findings on changes in reliance over the period.
- Over the sample period as a whole, there was a substantial decline in the proportion of the population aged 15-64 years receiving income support at some stage of the year. The annual rate of receipt declined from 24.6% to 20% for males, and from 27.4% to 24.8% for females. However, compositional change towards longer-term payment types – Parenting Payment Single (PPS) and other pensions – led to increased average durations on payments. As a consequence, the proportion of the population on income support at any one point in time only declined from 16.3% to 14.5% for males, and actually increased slightly for females from 19.7% to 19.9%.
- This evidence of compositional change towards longer-term recipients with inferior employment prospects is also consistent with anticipated effects of changes in macroeconomic conditions and tax and welfare policy changes over the sample period.

Descriptive analysis of TPI

- Annual average fortnightly TPI estimates show that the extent of reliance among recipients in each year increased between 1995 and 2003. For males, the mean fortnightly TPI over a one-year interval was, on average, 59% in 1995 and 64% in 2003; for females, the corresponding figures are 61% and 66%. This has been driven by an increase in the proportion with annual average fortnightly TPIs above 90% and a decrease in the proportion with annual average fortnightly TPIs in the 20-90% range.
- Examination of changes in individuals' reliance over time reveals that, for approximately half the recipients of income support in one year, reliance will be no lower in the next year. Lengthening the time-frame over which changes in individuals' reliance are examined increases the proportion for whom the annual average TPI decreases.
- More detailed examination of changes in reliance over time shows that the extent of reliance in the end year is strongly ordered by the extent of reliance in the initial (base) year, irrespective of the length of the interval between base and end years. However, there is nonetheless a fair degree of fluidity in reliance 'intensity' from one time period to another, especially as the interval is widened. That is, significant proportions of recipients substantially change their level of reliance over time.
- Levels and movements in reliance disaggregated by demographic characteristics are also examined:
 - *Age*: Reliance among recipients is strongly ordered by age group, being lowest for 15-19 year olds and highest for 60-64 year olds. Changes between 1995 and 2003 are not uniform, however, decreasing for young recipients between 1997 and 2000 and tending to increase for most other recipients, particularly after 2000. TPI transitions over time differ markedly for 50-64 year olds compared with other age groups, 50-64 year olds being much more likely to move to, or remain at, a high level of reliance, and much less likely to move off payments altogether.
 - *Family type*: For both males and females, reliance is higher among sole parents and partnered persons *without* children. Three-year TPI transitions disaggregated by family type show that differences in *movements* in reliance over time are consistent with differences in *levels* of reliance: the family types with the highest reliance levels in a given year are also the most likely to move to or remain at high reliance levels from one year to a subsequent year.

- *Payment type*: Unsurprisingly, allowance recipients have the lowest annual average TPIs, generally hovering around 50%, while pension recipients have the highest average annual TPIs, which average in the mid-80s. PPS recipients are almost exactly midway between the other two groups of recipients. Somewhat remarkable is the relative stability of average annual TPIs of the three payment type groups over the 1995 to 2003 period. Differences in transitions follow the same pattern as differences in levels of reliance. For example, conditional on base-year reliance level, pension recipients are the least likely to move off payments and are the most likely to remain at or move to a high level of reliance.

Panel models of reliance

- We model a causal relationship between average fortnightly TPI over a six-month interval and recipients' characteristics during the period 1995 to 2004. Key results include:
 - An almost linear positive relationship between six-monthly TPI level and age is found for males. A similar relationship is found for females over the 35-64 years age range, with females aged 15-44 years having similar reliance levels, all else equal.
 - Australian-born persons with a non-indigenous background have a better TPI profile than all other groups except foreign-born persons from the main English-speaking countries. All else equal indigenous persons have the highest reliance conditional on going on to income support, with this demographic characteristic acting to increase our TPI measure by 6 percentage points for males, and by 11 percentage points for females, compared with other native-born persons.
 - Compared to people with otherwise identical socio-demographic characteristics, both males and females recipients are less reliant if they live in a major city.
 - People who rent public housing are clearly in a disadvantaged position compared to people who live in other types of dwellings, with renters in the private market experiencing the next-worst outcomes. These findings are consistent with disincentive effects of government rent subsidies – whether in public housing or in the private rental market – playing a role in affecting welfare reliance, although there are other potential explanations.
 - Having a partner decreases reliance if that partner is not also on income support, by 14 percentage points for males and by 7.5 percentage points for females. Having a partner who is on income support substantially reduces this effect for males, and actually

reverses it for females, for whom having a partner on income support increases reliance by 1 percentage point compared with being single.

- Reliance is increasing in the number of dependent children, but decreasing in the age of the youngest child. This is evident for both males and females, although the magnitude of effects is greater for females.
- Comparisons across payment types show that individuals with the strongest attachment to labour force – by virtue of being on unemployment benefits and required to engage in active job search – have the lowest reliance. At the other end of the spectrum, DSP receipt is associated with the highest levels of reliance.
- Persistence effects of reliance are to some extent captured by the inclusion of a variable for duration on income support. Increased duration on income support is associated with increasing TPI levels, each month on income support associated with a 0.2 percentage point increase in TPI. This duration dependence holds for all payment types, but is strongest for allowances and weakest for DSP. The implication is that greater duration on welfare is of itself a contributor to welfare reliance and that this ‘path dependence’ is more important for allowance recipients than DSP recipients. However, inferences in this regard are particularly susceptible to effects of unobserved characteristics, which may be driving both duration on income support and current reliance.
- Local labour market conditions faced by the individual are proxied by the unemployment rate in the ABS labour force statistical region in which the individual resides. Holding all else constant, each percentage point increase in the local unemployment rate increases the TPI within the first six months of the increase by approximately 0.5 percentage points.
- Dummy variables for year effects imply an almost monotonic decrease in reliance from 1995 to 2002, with this decrease then maintained in 2003 and 2004. Holding all else constant, being on income support in 2004 decreases the TPI by 6 percentage points compared with being on income support in 1995. This is consistent with tightening of eligibility criteria over the period and, for pensions and PPS, the increased capacity to combine income support receipt with earnings. This trend is not apparent in the descriptive analysis because the composition of recipients has changed over the sample period, which the econometric analysis is able to control for.
- There are indications that the July 2000 tax and welfare reforms acted to decrease the TPI of persons on unemployment benefits, but not persons on other payment types.

Indeed, the estimates imply the reforms acted to increase reliance among PPS recipients and female recipients of other pensions and allowances other than unemployment benefits.

The effects of earnings while on income support

- We examine associations between earnings while on income support in one year and reliance on income support in subsequent years by regressing average annual TPI in one year on a measure of earnings in an earlier (base) year for all persons observed on income support in the base year. Our earnings variable is mean fortnightly earnings while on income support in the base year, which succinctly summarises the extent to which an individual combined income support with earnings while on income support. Specific interest is in whether, and to what extent, earnings while on income support represent a ‘stepping stone’ to reduced reliance on income support versus a ‘top-up’ promoting longer-term reliance. We estimate two models, one examining the implications of earnings for reliance one year subsequent to the base year and the other examining reliance three years after the base year.
- Estimates obtained imply that combining income support with earnings is associated with lower future reliance for most individuals. For our ‘default’ individual, each \$100 increase in mean fortnightly earnings while on income support is associated with a reduction in TPI one year later of 8 percentage points for both males and females. Effects are less strong on TPI three years later, with each \$100 increase associated with a 5.5 percentage point reduction for males and a 4.2 percentage point reduction for females. Effects are also less strong the lower the proportion of time the individual was on income support in the base year. For example, for an individual who was on payments less than half of the base year, each \$100 increase in mean earnings reduces the expected TPI one year later by a little over 2 percentage points.

1. Introduction

Despite strong macroeconomic performance since the early 1990s, and a succession of policy reforms aimed at encouraging income support recipients to obtain employment, welfare reliance among working age persons continues to be a significant issue in Australia. The total number of working age income support recipients has in recent years remained relatively static, at around 2.3 million people (excluding payments to full-time students), a level regarded by many people as too high. In this context, understanding the various facets of welfare reliance and their determining factors is critical to the formulation of appropriate policies with respect to welfare recipients. Indeed, beliefs about the extent of welfare reliance may themselves be incorrect if they are based simply on observation of the total stock of recipients. Accurate assessments of the extent of income support reliance in the Australian community require consideration not only of the number of recipients, but also the extent to which recipients depend on income support for their incomes, which may change over time even without any change in total recipient numbers.

Grounded in the notion that the extent of welfare reliance of income support recipients can vary across time and across recipients, this study draws on administrative data on income support recipients to investigate income support reliance in Australia using measures based on the ‘TPI’ (proportion of income from welfare payments) concept of reliance. Key issues considered by the study include how the TPI measure of reliance evolves over time for individuals and the determinants of different TPI patterns. The administrative data set we use contains information on both benefit income and income from other sources for all income support recipients, and this combined with its high-frequency panel structure allows us to adopt an income-based study of welfare reliance within a dynamic framework. By contrast, previous Australian research has largely focused on either the rate of take-up of welfare or the extent of individual reliance at a point in time. A dynamic approach using administrative data permits identification of patterns of reliance, as captured by TPI measures, over substantial time-frames, as well as investigation of the factors associated with different patterns.

The analysis incorporates both descriptive and econometric components. The descriptive analysis reports how TPI measures have changed over the period 1995 to 2004, how they vary by socio-demographic characteristics, payment type and payment duration, and how individual reliance changes over time. The econometric analysis examines the effects of individual, family, payment-specific and location characteristics, as well as macroeconomic conditions and policy changes, on the TPI measure of welfare reliance. In addition, the

implications of earnings while on income support for reliance on income support are investigated by estimating models of future TPI as a function of current earnings behaviour and other characteristics. A specific question investigated by this aspect of the analysis is whether, and to what extent, earnings while on income support represent a ‘stepping stone’ to reduced reliance on income support versus a ‘top-up’ promoting longer-term reliance.

The nature of the sample we use means that all inferences from this study apply to persons who at some stage received income support in the period January 1995 to June 2004. Clearly, this represents no restriction on descriptions of reliance patterns, which only arise for those who at some stage end up on income support. However, the sample selection process does impact on inferences that can be made with respect to the factors associated with different patterns of reliance. In particular, the econometric analysis is informative on the effects of characteristics on TPI conditional on an individual becoming an income support recipient. For example, we cannot identify the association between age and reliance, but rather the association between age and reliance given an individual has gone on to income support.

The plan of the report is as follows. In the following section we briefly review previous research, while in Section 3 we provide a sketch of the conceptual framework that guides our approach and discuss the measure of reliance that we adopt. Section 4 discusses the data, definitional issues with respect to welfare income and non-welfare income, and the sample selection issues that arise from use of the data. Section 5 provides contextual information on welfare receipt and the macroeconomic and policy environments in the period we study. Section 6 presents a range of descriptive statistics on reliance and on patterns of individual reliance over time, while in Section 7 we turn to econometric analysis of the determinants of reliance. Section 8 then focuses on the implications of earnings while on income support for reliance, modelling future reliance as a function of current earnings for income support recipients. Section 9 concludes.

2. Previous literature on welfare reliance

The issue of welfare dependency is an important one and has been the subject of a substantial amount of research internationally. Australian research has, until recently, been somewhat limited by a dearth of suitable unit record data, but has accelerated in recent years with increased researcher access to administrative payment records. Wilkins (2006) identifies no fewer than 33 separate studies published since 2000 that use administrative payment records to investigate issues relating to welfare receipt. All of these studies interpret welfare receipt in

Australia as receipt of income support payments, thereby excluding persons who receive only non-income support payments. Most studies focus on particular groups of income support recipients, such as unemployment benefit recipients, Disability Support Pension recipients or Parenting Payment Single recipients.

Of the studies that focus on specific groups of recipients, issues examined include the length of stay on payments (e.g., Barrett, 2002, Black et al, 2005, Cai, 2003, 2004, Stromback and Dockery, 2001), the origins and destinations of recipients (e.g. Cai and Gregory, 2005, Cai et al, 2005) and the effects of policy interventions on exit from payments (e.g., Borland and Tseng, 2003, 2004, Barrett and Cobb-Clark, 2001, Breunig et al, 2003).

Studies that consider the income support recipient population as a whole, which therefore have more in common with the current study, include Dawkins et al (2000), Harris and Kalb (2005), Landt and Pech (2000), Tseng and Wilkins (2003), Tseng et al (2004) and Whiteford and Angenent (2002). Most examine the extent and nature of reliance as measured by time on income support, rather than as measured by the proportion of income from welfare.¹ The exception is Landt and Pech (2000), who focus on the combining of work with welfare, showing a trend increase in the proportion of income support recipients in paid employment between 1982 and 1996. Landt and Pech also present descriptive statistics for the period April 1996 to March 1999 that suggest shorter-duration recipients are more likely to have higher levels of private income than longer-duration recipients. Landt and Pech do not, however, explicitly examine reliance on income support as measured by the proportion of income from welfare.

The contribution of this study compared with the existing studies primarily derives from its use of administrative data, its focus on the TPI measure of reliance, and its emphasis on the dynamics of welfare reliance. Tseng and Wilkins (2003) investigate TPI using survey data, providing a reasonably comprehensive picture of the association between characteristics and the extent of reliance as measured by TPI. They did not, however, formally investigate the determinants of TPI, and – more importantly – did not investigate the dynamic properties of TPI. Tseng and Wilkins did employ administrative data to consider dynamic properties of reliance using the *TTO* (proportion of time on payments) measure, which will to some extent correspond with findings from our TPI measure. However, econometric modelling of individual reliance on income support over time was not attempted by Tseng and Wilkins.

¹ See Wilkins (2006) for a summary of the findings of Australian studies using administrative payment records.

A further contribution of the study is its explicit formal investigation of the implications for reliance of earnings while on income support, which proxy for labour market activity of welfare recipients while on welfare. Landt and Pech (2000) present evidence that short-duration recipients are more likely to combine income support receipt with earnings than long-duration recipients. We take further steps along this line of inquiry by attempting to establish the causal effect of earnings on reliance, modelling future reliance as a function of current earnings of current income support recipients. As part of this analysis, we also investigate in some detail how effects associated with earnings differ by personal characteristics of recipients.

A study by Mavromaras et al (2006), still in progress at the time of production of this report, is providing complementary information to that provided by this study. As part of their study, Mavromaras et al (2006) make use of the HILDA Survey to undertake a dynamic analysis of TPI using three waves of data. The quite different nature of the data sources used in this study and in Mavromaras et al (2006), and therefore the quite different approaches taken in the two studies, mean that each study contributes different information. The HILDA Survey has information on a representative sample of the entire population, and therefore has information on persons not on welfare as well as information on welfare recipients before and/or after they leave welfare. It also contains a rich array of potential covariates. These features facilitate inferences that cannot be reached with administrative data, for example with respect to the effects on reliance of changes in characteristics than can only be identified if individuals are observed when off payments. The administrative data does, however, have its own significant advantages, including the high (fortnightly) frequency of the panel, the very large sample size, and the comparatively long time-frame of nearly 10 years. For example, the investigation of the implications of earnings while on income support for future reliance undertaken using the administrative data is not feasible using the HILDA data.

3. Conceptual framework and measure of reliance

3.1 Conceptual framework

The behavioural model underpinning this study is one of individuals attempting to maximise their utility over time subject to labour market and welfare eligibility constraints deriving from personal characteristics, labour market conditions and government policy. In the context of studying welfare reliance, utility can be represented as depending on two main quantities: hours of work and income. Outcomes in terms of welfare reliance are then essentially a by-

product of the solution to each individual's maximisation problem. Heterogeneities in individual preferences and circumstances produce heterogeneity in the solution to this problem, and therefore heterogeneity in observed outcomes. The solution will also in general be time-varying for a given individual, even in the absence of changes in policy and economic conditions, because of lifecycle factors and other sources of changes over time in personal characteristics, because of preference changes, and because of various 'path dependencies'. Path dependencies incorporate, among other things, notions such as welfare traps, accumulation and atrophy of human capital and stigma effects.

Given this framework, we seek to investigate the implications for welfare reliance of characteristics of recipients that are observable in the data at our disposal. This includes considering the effects of lifecycle stage, family circumstances, living arrangements, location and local labour market conditions. It also includes using indirect information on caring responsibilities, health and disability available from payment type categories of recipients. We furthermore attempt to investigate some elements of path dependencies. This includes investigation of the implications of reliance in one period for reliance in future periods, and how earnings while on income support affect subsequent receipt. While the nature of the data available – payment records for recipients – is an important constraint on this line of inquiry, we can nonetheless go some way to answering questions about path dependencies. In particular, the role of earnings while on income support is a key path dependency issue that can be explored with this data source, and we therefore devote a significant amount of time to its investigation. Specifically, we consider the questions 'Do earnings while on income support promote exit from income support, promote staying on income support, or is earnings not a determining factor of subsequent reliance?' and 'How does this differ across individuals with different characteristics?'

3.2 Measure of reliance

As discussed in Tseng and Wilkins (2003), there are two primary dimensions to the extent of an individual's welfare reliance: the amount of income from welfare; and the amount of time spent on welfare. Almost all measures of individual reliance employed by studies of welfare reliance internationally are, in one form or another, combinations of these two dimensions, but there is substantial variation across measures in the weight accorded to each.² Previous

² Another dimension of reliance, not typically considered by studies of welfare reliance, is the extent of 'churning' within the tax-transfer system, which occurs when an individual or household pays tax that is then returned as welfare. This can be conceived as part of the broader issue that measures of welfare reliance will in general be sensitive to the labels assigned to government taxes and benefits. A 'pure' approach to measuring

Australian studies using administrative data have employed reliance measures that are dominated by the second dimension, examining quantities such as the proportion of individuals on income support, the duration of spells on income support and the proportion of a given interval of time spent on income support. The income dimension to welfare reliance has only entered these studies implicitly via the requirement that an individual be in receipt of income support, which, given eligibility rules, will in most cases mean welfare is the main source of income for the individual.

In this study, significantly more emphasis is given to the amount of income from welfare dimension, employing measures based on the *Total Proportion of Income* (TPI) from welfare concept due to Gottschalk and Moffitt (1994). Measures based on this concept are somewhat self-explanatory, expressing welfare income (however defined) as a proportion of total income. Such measures have strong intuitive appeal and are readily interpreted. However, it should perhaps be acknowledged that for some purposes they do not produce the quantity of interest. In some circumstances, it is enough to know the private income of the individual (for example, to measure the living standard that an individual's own financial resources can support); in other circumstances, it might be more appropriate to measure private income relative to maximum *potential* benefit entitlement (to measure the 'self-sufficiency' of an individual relative to that income the government has implicitly, by specification of maximum payment rates, deemed the amount required to meet basic living expenses); and in other circumstances again, the simple value of welfare payments to the individual is of interest (for example, in establishing the cost to government of supporting the individual). Nonetheless, the TPI measure is an internationally adopted standard and would seem to be a better all-round measure of welfare reliance than the alternatives.

The nature of the data used plays a significant role in shaping the specific measures examined. By construction, administrative records do not contain information on incomes of sample members in periods when they are not on income support. While it is known that income support payments are zero in those periods, other income is not known. As a response to this feature of the data, rather than simply examine TPI in those fortnights in which an individual is on income support, we construct "average fortnightly TPI" measures. An average fortnightly TPI is obtained by calculating the TPI of an individual in each fortnight of a pre-specified interval of time and taking the average over those fortnights. The TPI in a fortnight

reliance would involve identifying the values of all cash and non-cash transfers between the state and the individual to establish the 'net position' of the individual with respect to the state, a task that is not practicable.

in which the individual is on income support is between zero and one, while the TPI in a fortnight in which the individual is not on income support is zero. For example, the average fortnightly TPI of individual i over a one-year period containing 26 fortnights is given by:

$$\overline{TPI}_i = \frac{\sum_{t=1}^{26} TPI_{i,t}}{26} \quad (1)$$

This is in fact a measure based on both the TPI and TTO concepts of reliance, since it is determined by both the proportion of income from welfare (when on welfare) and the proportion of time spent on welfare.³ This is consequently a somewhat different measure to the TPI measure employed by Tseng and Wilkins (2003), who use survey data to produce weekly and annual TPI estimates with complete information on both welfare and non-welfare income over the relevant period. For example, annual TPI estimates produced by Tseng and Wilkins are equal to welfare income divided by all income received during the year. Even when restricting to income support recipients, one suspects these estimates will on average be lower than estimates produced by our TPI measure evaluated over the same interval of time, since an individual's total income is likely to be higher when off income support.

Our descriptive analysis focuses on average TPIs over one-year intervals. The econometric models of the effects of earnings on future reliance (Section 8) also examine average annual TPIs. The rationale is that the average annual TPI measure is a good measure of an individual's overall reliance on welfare, combining both the proportion of income and proportion of time on welfare dimensions in a relatively balanced manner.

For the panel econometric models, we adopt a six-month interval for the TPI measure, and thus our models seek to explain the determinants of six-monthly reliance. The nature of the models is such that, in addition to estimating the effects of personal characteristics on reliance, they investigate the determinants of the evolution of reliance over time. For this purpose, a shorter interval might be desirable, and in principle it is possible to estimate models of fortnightly TPI. However, in practice, there are problems in doing so that derive from not observing the characteristics of individuals when the fortnightly TPI is zero. Since we are unlikely to be able to adequately model this selection process, inferred effects of characteristics and past patterns of receipt will be seriously biased.

³ We nonetheless henceforth refer to our measure as a TPI measure, which helps to emphasise the key differentiating characteristics of this study vis-à-vis previous Australian studies.

The use of a six-month interval mitigates – although does not eliminate – this problem, since the TPI in a six-month period will embody both the extent of reliance on income support while on payments and the proportion of the six-month period the individual was on payments. Thus, to a significant extent, changes in TPI driven by movements off payments will be captured, which could not be captured if a fortnightly interval was adopted. Nonetheless, the essential problem remains, since if TPI in a six-month interval is zero, we do not observe the individual. Furthermore, for those who exit payments, we do not observe their characteristics after they go off payments. This is a significant limitation, because it may often be changes in characteristics that drive exit from payments, which we simply will not be able to pick up.⁴

Note also that employing six-monthly observations reduces the measurement error that may be present in high frequency data, and our analysis has further found that the variation in individuals' TPIs within any given six-month period is generally not substantial, implying such aggregation results in little loss of information.

4. Data

4.1 Sample

The empirical analysis uses data drawn from the FaCS Longitudinal Data Warehouse (LDW) spanning the period January 1995 to June 2004. Our data set comprises all fortnightly payment records over the period January 1995 to June 2004 of a 10% random sample of individuals who received an income support payment at some stage in that period.⁵ A separate record is generated for an individual in every fortnight in the period in which an income support payment was received.⁶

The sample we examine comprises individuals of “working age”, which we define to be people over the age of 15 years and below the minimum age of eligibility for the Age Pension. A person only enters the sample for that part of the period January 1995 to June 2004 when he or she is in this age range. For males, this corresponds to an age range of 15-64 years. For females, progressive increases in the minimum age of eligibility for the Age

⁴ Sample selection issues are discussed more fully and generally in Section 4.

⁵ In addition to containing payment records of all individuals who at some stage in the period after January 1995 received an income support payment, from 29th June 2001 the LDW also contains all payment records for individuals who received a non-income support payment only (that is, did not receive an income support payment). These individuals are not included in the 10% sample supplied for this study.

⁶ From June 2001, a separate record is generated for an individual in every fortnight in the period in which an income support payment and/or a non-income support payment was received – that is, fortnights in which the individual received only non-income support payments are also observed.

Pension, from 60 years in 1995 to 62.5 years in 2004, mean that the age range for inclusion in the sample depends on the sample year.⁷

4.2 *Definition of welfare and non-welfare income*

Income components used to construct TPI estimates are derived from administrative records on benefit entitlement, earned income and unearned income. Given the long time-span of the data set, inconsistencies related to changes over time in administrative and data extraction processes need to be addressed. First, there are changes over time in the information available on benefit income. For the fortnights up to and including 15 June 2001, in most cases only the recipient's 'Priority Benefit' is recorded, so that income from other benefits is not known. Examination of the data suggests this is not a substantial problem, provided we restrict our definition of welfare income to income support payments. Specifically, estimates of income from income support payments in the period after June 2001 are not very sensitive to the restriction to 'Priority Benefit' payments.

A further inconsistency is that only from 29 June 2001 is partner income from benefits, earnings and other sources recorded in the customer/partner file (and therefore known). We therefore restrict our focus to personal income from welfare and other sources, rather than examine family welfare reliance. That is, our unit of analysis is in general the individual, in contrast to Tseng and Wilkins (2003), who employ the 'income unit' (family) as the unit of analysis. For many purposes, family reliance on income support is more appropriately examined, and our inability to examine this is therefore a limitation of the analysis that is imposed by the data.

In light of these issues, we define welfare income to be the recipient's 'Basic Entitlement' from main benefit, and total income to comprise this plus the recipient's personal earned and unearned income. Thus, individual i 's TPI in fortnight t is given by:

$$TPI_{i,t} = \frac{(\text{Main benefit entitlement}_{i,t})}{(\text{Main benefit entitlement}_{i,t} + \text{Earned income}_{i,t} + \text{Unearned income}_{i,t})}$$

Non-income support payments are excluded from our analysis, for both conceptual and practical reasons. Perhaps most compelling is the practical constraint that we don't observe non-income support payments for income support recipients prior to June 2001. Furthermore,

⁷ Sample selection rules based on age actually vary depending on the analysis, but the rule governing all decisions is that an individual be less than the minimum age of eligibility for the Age Pension for the entire period being examined. For example, when examining reliance over a three year period, the individual must be less than the Age pension age at the end of the three-year period to be included in the sample.

in the sample available for this study, for no part of the sample period do we observe non-income support payments for persons who never go on to income support.

While the data available preclude inclusion of non-income support payments, this need not necessarily be considered a limitation on the value of the analysis. Non-income support payments are, to a significant extent, invariant with respect to labour market behaviour for income support recipients at the margin of exiting receipt. Most people with dependent children who exit income support and take up full-time employment, for example, would still be regarded as partially reliant on welfare if non-income support payments were included as welfare income. This would then not be consistent with the established view that income support payments are really what is meant by the term 'welfare' in the Australian context. On the other hand, counting non-income support payments as part of total income, but not as part of welfare income, would understate reliance of individuals when they are on welfare, implying labour market attachment where none exists. That is, particularly for persons with dependent children, the TPI would be less than 100% even when the individual is not working and has no non-welfare income other than from non-income support payments. Exclusion of non-income support payments from both welfare income and total income therefore seems appropriate in terms of producing the most meaningful TPI measure. Hence, as indicated by the project title, this study is most accurately characterised as a study of reliance on income support.⁸

This approach to non-income support payments does, however, suffer from problems associated with sensitivity to the labels assigned to various government payments to individuals. At any one point in time, for some income support recipients, some types of payments are treated as part of the main benefit entitlement (and hence form part of the income support payment), while for other recipients they are paid as part of a non-income support payment. This creates problems for comparisons across different groups of recipients. There may also be some changes over time in this regard, with components originally forming part of the main benefit entitlement becoming components of non-income support

⁸ In constructing their TPI estimates, Tseng and Wilkins (2003) include non-income support payments as welfare income for income support recipients only. The absence of dynamic analysis of TPI meant that this inconsistency in treatment of non-income support payments did not cause problems for their analysis, as it would for our dynamic analysis.

payments, and vice versa. This creates problems for inferences on changes in reliance over time, including differences in changes across different groups of recipients.⁹

Perhaps the most important ‘income support versus non-income support’ issue is our treatment of rent assistance. For income support recipients with a dependent child under 16 years of age, this is paid as part of Family Tax Benefit (FTB), a non-income support payment, but it is incorporated into the main benefit entitlement for other persons. This suggests that differences in reliance by housing situation and family circumstances need to be interpreted carefully, and that controlling for housing situation and family circumstances is important for inferences on reliance.

In addition to excluding non-income support payments, we also treat payments to full-time students as non-welfare income. This is achieved by dropping from our sample fortnights in which an individual was receiving Youth Allowance (full-time study) or Austudy, and has the effect of treating such fortnights as periods off all income support payments. Exclusion of payments to full-time students is out of necessity, since such payments are not observed in the data prior to May 1998. It is arguable that welfare receipt associated with full-time study is of a quite different nature to other welfare receipt, in that payments are supporting an activity likely to facilitate eventual movement off welfare. As such, a case can be made for exclusion of payments to full-time students in a study concerned with welfare reliance and its persistence. However, the validity of this argument is questionable, and thus the primary reason for the exclusion of full-time students is in truth data availability.

A final comment on our construction of a TPI measure from administrative data is that, while benefit income is likely to be accurate, potential exists for under-reporting of private income. All benefits are subject to income tests, creating an incentive for under-reporting. The extent to which under-reporting actually occurs is, by definition, unknown, although one suspects failure to report income is largely confined to untaxed earnings in the ‘informal’ economy. The implication of this feature of the data is that reliance estimates will be upwardly biased. Particularly problematic is that the extent of this bias is likely to be a function of recipient characteristics, creating the potential for spurious inferences on the associations between characteristics and reliance. That is, associations found between reliance and characteristics

⁹ Even with the inclusion of non-income support payments, problems associated with the labels assigned to government benefits would arise. In addition to delivery as cash payments, government benefits can also be delivered via reductions in income tax liabilities (e.g., low income tax offsets) and as non-cash benefits (e.g., concession cards). Differences across recipients and changes over time in the relative importance of these components of government benefits will similarly confound analyses of welfare reliance that do not incorporate these types of benefits.

may to some extent reflect differences in propensities to report income rather than real differences in reliance. We therefore need to be cognisant of this potential problem in interpreting our results.

4.3 Sample selection issues

There are significant sample selection issues associated with the restriction of our analysis to those who (at some stage) receive income support, and with obtaining information on these individuals only when in receipt of income support. Considering first the implications of restricting to persons who at some stage receive income support, while this does not invalidate the analysis, it does fundamentally affect its information content. Any inferences on the effects of individual characteristics on reliance on income support, or the effects of current patterns of receipt on subsequent reliance, necessarily apply only to persons who actually end up on welfare. That is, all inferences are conditional on an individual going on to income support in the first place. For example, a finding that reliance is increasing in age does not imply that older people are more likely to rely on income support. Rather, this should be interpreted as a finding that, given entry on to income support has taken place, reliance is increasing in age. It may well be that the likelihood of entering income support receipt is decreasing in age. Aside from presenting some statistics on rates of income support receipt by sex and age in Section 5, we do not investigate in this study the associations between characteristics and take-up of welfare, but rather refer the reader to Tseng and Wilkins (2003) for analysis focused on this issue.

Although the restriction of the sample to income support recipients is a constraint on the analysis, it does not preclude us from producing policy-relevant information. Specifically, this dimension of sample selection does not restrict study of the factors associated with different patterns of income support receipt, including exit and re-entry to income support receipt.¹⁰

Nonetheless, we do need to be wary of *changes* in selection into welfare receipt over time, which lead to compositional changes in the recipient population over time. Economic, social and government policy changes can cause the extent and nature of reliance, and the relationship between individual characteristics and reliance on income support, to also change. For example, improved macroeconomic conditions may cause the stock of recipients to comprise relatively fewer people with the ability to obtain paid employment, which might

¹⁰ It is of course also of policy interest to know the predictors of entry to income support, but this is certainly not possible without information on non-recipients. This is a line of inquiry that can be taken up using the HILDA data, as Mavromaras et al (2006) do.

manifest as a reduction in Newstart Allowance recipients and growth in the proportion of recipients on the Disability Support Pension. While the improved economic conditions may mean that earnings while on income support are less frequently observed, this does not of itself mean that the scope for combining employment with income support has reduced, nor that its effects on future reliance on income support have changed. The issue is essentially that the composition of income support recipients is likely to have changed over the period 1995 to 2004, which is of itself likely to alter both the composition of observed patterns of receipt and their associations with characteristics of recipients.

The presence of such compositional changes over time does not render inferences invalid, but it is important for us to be cognisant of potential changes in interpreting our findings. For this reason, it is useful to examine changes over time in rates of receipt by sex, age and payment type, and also potential sources of change in composition, matters which are taken up in Section 5.

More problematic than selection into the sample is what might be termed ‘recipient selection out of the sample’: we do not observe recipients when they are not on income support. This is primarily a problem for the econometric analysis, where we attempt to make inferences on the effects of characteristics on reliance. When individuals are off payments, while we know they have a TPI equal to zero, we do not know most of their characteristics. The default approach to this censoring problem is to simply exclude periods we do not observe. The problem is that excluding periods in which TPI equals zero means that we will in general obtain biased estimates of the effects of characteristics. That is, we ‘miss out’ on changes in TPI to zero and the associated changes in characteristics (that might have helped precipitate the move to zero reliance). Only in very special circumstances will the exclusion of periods when TPI equals zero not be important to accurately identifying the effects of characteristics on TPI. Furthermore, unlike the case for selection on the basis of ever receiving income support, there is no interpretation of the estimates we obtain that is valuable to policy-makers unless we can be confident that bias from this censoring is small.

There are several potential strategies to address this problem, although none is completely satisfactory. One option is to infer characteristics when off payments; but this is akin to ‘making up’ the results (or would leave us with very few covariates: cumulative income support history, age, sex, place of birth and indigenous status, only the first two of which are time-varying). Alternatively, we could try to model the selection process out of income support receipt; but there is unlikely to be a variable we could use to instrument for this, since

anything that affects exit is likely to affect TPI (and therefore could not be excluded from the TPI equation).

Instead, as discussed in Section 3, we attempt to mitigate this source of selection bias by our use of a six-monthly TPI measure. While our models estimate the effects of characteristics on TPI *given TPI is greater than zero* (i.e., given the individual receives income support), movements on and off income support will to a significant extent be captured, because they will impact on the TPI measure. For example, if a person exits income support half-way through the six-month period, this will have a substantial negative impact on the six-monthly TPI compared with the situation where the individual remained on income support for the entire six-month period. Bias from sample selection problems with respect to recipients nonetheless remains a significant caveat for the interpretation of the findings from this study. Some of the sources of resulting biases will be time-invariant and, as with selection into the recipient sample, changes over time are also important. The contextual information provided by the rates of income support receipt and potential sources of compositional changes in income support recipients canvassed in the following section is therefore also important for the insights it offers into the effects of this source of bias.

5. Placing the analysis in its broader context

Table 1 presents annual rates of receipt by sex and age group. This provides a broader perspective within which the findings of this study fit, as well as providing some first-stage indications of the nature of the selection process into the sample, and changes in this over the sample period. The table is derived from our LDW sample in combination with Australian Bureau of Statistics (ABS) population estimates (Catalogue Number 3201.0). Each statistic represents the proportion of persons in the relevant population group who received income support in at least one fortnight of the year. Note, therefore, that these estimates will be higher than the proportion of persons receiving income support at any one point in time in the year.

Table 1: Proportion of working-age persons receiving income support payments in each year – By age (%)

	15-19	20-24	25-34	35-44	45-49	50-54	55-59	60-64	15-64
	Males								
1995	20.8	32.4	24.9	20.1	17.7	21.3	30.8	41.5	24.6
1996	20.2	32.6	25.2	20.3	18.0	21.2	30.2	42.4	24.6
1997	18.3	31.4	24.6	20.0	18.0	20.4	29.5	41.7	23.9
1998	18.7	31.1	23.8	19.7	17.9	19.6	27.7	39.8	23.3
1999	17.1	30.0	23.6	19.6	18.0	19.2	26.9	38.3	22.8
2000	16.0	28.2	22.7	19.3	18.0	18.7	26.2	36.8	22.0
2001	15.8	28.4	22.8	19.5	18.1	18.7	25.6	36.4	22.1
2002	14.9	26.7	21.4	18.4	17.3	18.0	24.8	35.6	21.0
2003	14.5	24.5	19.7	17.5	16.7	17.7	23.4	34.5	20.0
2004	10.1	18.2	15.8	14.8	14.7	15.9	20.1	30.6	16.5
	Females								
1995	21.5	33.5	28.4	24.6	22.1	28.2	39.3	0.0	27.4
1996	20.6	33.9	29.5	25.5	21.8	27.6	42.9	2.1	27.8
1997	18.8	33.0	29.3	25.7	21.7	26.7	41.3	2.5	27.3
1998	19.3	33.1	28.5	25.6	21.4	26.0	39.1	24.4	27.0
1999	17.8	32.8	28.5	25.9	21.4	25.4	37.6	23.7	26.7
2000	16.9	31.0	27.6	25.7	21.2	24.1	36.4	32.1	26.1
2001	16.3	30.5	27.6	26.0	21.3	23.5	35.6	31.8	25.9
2002	16.2	29.9	26.9	25.5	21.0	22.7	34.4	35.1	25.5
2003	16.1	28.3	25.7	25.0	20.7	22.0	33.0	34.6	24.8
2004	11.7	23.1	22.6	22.9	19.2	20.0	29.6	32.7	22.0

Note: Estimates are for those below the minimum age of eligibility for the Age Pension. For females, the minimum age of eligibility was 60 in 1995, 60.5 in 1996 and 1997, 61 in 1998 and 1999, 61.5 in 2000 and 2001, 62 in 2002 and 2003 and 62.5 in 2004.

The table shows the pattern familiar from Tseng and Wilkins (2003) of higher rates of receipt for younger and older persons. Annual rates of receipt are lower for males than females, with the gap in the rate of receipt growing from approximately 3 percentage points in 1995 to almost 5 percentage points in 2003. There has generally been a decline in rates of receipt since 1996, when the aggregate rate of receipt peaked at 24.6% for males and 27.8% for females. In the last full year of the sample period (2003), 20% of working-age males and 24.8% of working-age females received income support.¹¹ Changes in rates of receipt are not uniform across age groups. Declines are greatest for younger and older age groups, although most of these age groups began the period with greater scope for decline by virtue of higher initial rates of receipt. Thus, the age profile of income support recipients has become ‘flatter’ between 1995 and 2004.

Table 2 provides some further insights into compositional changes, presenting the proportion on each of five groups of income support payments: unemployment benefits (UB), other allowances (including Parenting Payment Partnered (PPP)), Disability Support Pension

¹¹ Estimates for 2004 are not comparable to estimates for other years because the data only runs up until June of 2004.

(DSP), Parenting Payment Single (PPS) and other pensions.¹² The upper panel presents annual rates of receipt, while the lower panel presents the average point-in-time rates of receipt in each year, obtained by calculating the rate of receipt in each fortnight of the year, and then taking the average over all fortnights in the year.¹³ For males, the unemployment benefit is the dominant type of income support payment, although its average shorter spell duration means that this dominance is less pronounced for point-in-time rates of receipt than annual rates of receipt. Females are more evenly distributed across the payment types, having lower rates of unemployment benefit receipt and higher rates of receipt of other allowances, PPS and other pensions.

Significantly, the importance of allowances (UB and other allowances) has reduced over the sample period, brought about by an absolute decline in recipient numbers and an increase in numbers receiving DSP. There has also been growth in female receipt of PPS. Reflecting this compositional change towards longer-term payment types, point-in-time rates of receipt have not declined to the same extent as annual rates of receipt. Indeed, between 1995 and 2003, the proportion of females aged 15-64 years on income support at any one point in time actually increased from 19.7% to 19.9%, compared with a decrease in the annual rate of receipt from 27.4% to 24.8%. For males, over the same period, the point-in-time rate of receipt declined from 16.3% to 14.5%, compared with a decline in the annual rate of receipt from 24.6% to 20%.

The relative growth in pensions and decline in allowances is consistent with compositional change towards recipients with less capacity to participate in the labour market. All else remaining equal, we would therefore perhaps expect the extent of reliance on income support among income support recipients to have increased between 1995 and 2004. This would primarily derive from longer average spell durations. Earnings while on income support might also be lower for pension recipients, but the more generous income tests for pensions suggest some ambiguity in this regard.

¹² PPS includes the Sole Parent Pension. 'Other pensions' primarily comprise 'female' payments such as Widow Pension and Wife Pension.

¹³ For annual rates of receipt, individuals are classified according to the first payment type received in the calendar year.

Table 2: Proportion of working-age persons receiving income support payments in each year – By payment type (%)

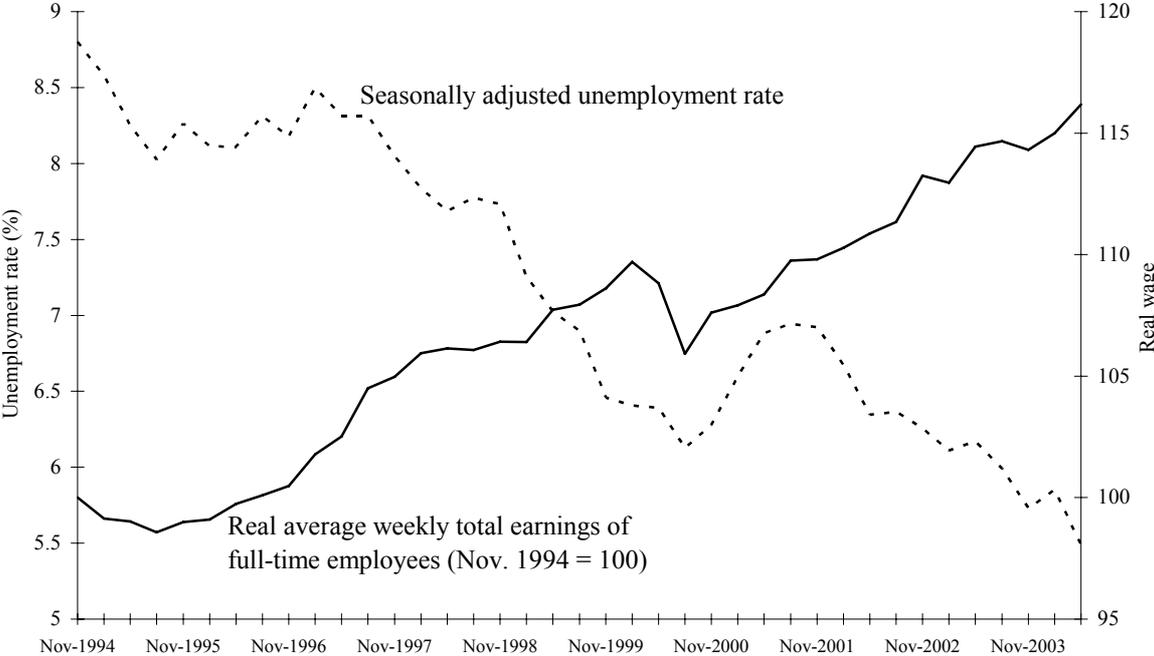
	Males					Females				
	UB	Other allowances	DSP	PPS	Other pensions	UB	Other allowances	DSP	PPS	Other pensions
<i>Annual rates of receipt</i>										
1995	17.8	0.9	5.3	0.4	0.2	8.4	6.6	2.5	6.3	3.5
1996	17.8	0.8	5.4	0.4	0.2	8.5	7.0	2.8	6.3	3.2
1997	16.8	0.8	5.6	0.4	0.2	8.0	7.0	3.0	6.5	2.9
1998	16.1	0.7	5.7	0.5	0.3	7.9	6.5	3.2	6.6	2.7
1999	15.4	0.7	5.9	0.5	0.3	7.6	6.3	3.4	6.9	2.5
2000	14.4	0.8	6.0	0.5	0.3	7.1	5.9	3.6	7.0	2.5
2001	14.2	0.9	6.0	0.6	0.4	6.9	5.8	3.7	7.2	2.4
2002	13.1	0.8	6.1	0.6	0.4	6.7	5.4	4.0	7.2	2.3
2003	11.9	0.9	6.1	0.6	0.4	6.4	4.9	4.0	7.1	2.3
2004	8.9	0.7	5.9	0.6	0.4	4.9	4.1	4.1	6.7	2.2
<i>Average fortnightly rates of receipt</i>										
1995	10.2	0.5	5.1	0.3	0.2	4.5	4.2	2.4	5.1	3.5
1996	10.5	0.5	5.4	0.3	0.2	4.7	5.1	2.7	5.5	3.3
1997	10.2	0.5	5.5	0.4	0.2	4.6	5.1	2.9	5.6	2.9
1998	9.9	0.5	5.6	0.4	0.2	4.5	5.0	3.1	5.7	2.8
1999	9.2	0.5	5.7	0.4	0.3	4.1	4.7	3.3	5.9	2.5
2000	8.3	0.5	5.8	0.4	0.3	3.7	4.6	3.5	6.1	2.5
2001	8.2	0.6	5.9	0.5	0.3	3.6	4.4	3.7	6.3	2.3
2002	7.6	0.6	6.0	0.5	0.4	3.5	4.2	3.9	6.2	2.3
2003	7.0	0.6	6.0	0.5	0.4	3.4	4.0	4.0	6.3	2.2
2004	6.5	0.6	6.0	0.5	0.4	3.5	3.8	4.1	6.3	2.2

Notes: *UB* – unemployment benefits; *DSP* – Disability Support Pension; *PPS* – Parenting Payment Single. Estimates are for those below the minimum age of eligibility for the Age Pension. For females, the minimum age of eligibility was 60 in 1995, 60.5 in 1996 and 1997, 61 in 1998 and 1999, 61.5 in 2000 and 2001, 62 in 2002 and 2003 and 62.5 in 2004.

In addition to the evidence presented in Tables 1 and 2, it is useful to outline some of the more important potential sources of change in the composition of income support recipients and their likely impacts. First, and perhaps foremost, are the changes in macroeconomic conditions over the period. Figure 1 characterises these changes as measured by the unemployment rate and average real wages of full-time employees. Unemployment exhibits a trend decline over most of the period, the exceptions being an increase from late 2000 to late 2001, and a very slight increase in 1996. Real wage growth has also been a feature of much of the 1995 to 2004 period, with real average weekly total earnings of full-time employees growing by 16%. Both of these changes would tend to reduce income support receipt associated with inability to secure employment, which is consistent with the observed pattern of reduced rates of receipt of allowances evident in Table 2. In this respect, improvements in macroeconomic conditions would actually act to reduce the proportion of income support recipients participating in employment. While remaining income support recipients may also be observed to increase participation in employment, the descriptive analysis will nonetheless understate the extent to which improvements in economic conditions have increased

employment participation by income support recipients, because we do not observe individuals who would have received income support had it not been for the improvement.

Figure 1: Unemployment and real wages (quarterly)



Source: ABS Catalogue No.s 6202.0 and 6302.0.

Changes to government income support and income tax policies over the period will also potentially affect the composition of recipients. Broadly speaking, there are two types of potential effects of policy changes in these domains. First, they can change the ‘coverage’ of income support payments, and therefore alter the composition of recipients without any change in behaviour of individuals. For example, a reduction in taper rates will lead to some employed individuals becoming eligible for income support payments without any change in their employment activity, simply because the private income level at which income support payments cease will increase.

Second, by changing individuals’ incentives, tax and transfer policy changes can have impacts on the *behaviour* of individuals, which in turn affects the composition of recipients. Most important in this regard are the effects of policy on the net income of individuals at different levels of labour supply, taking into account earnings, income tax and welfare entitlements. This net income position with respect to each level of labour supply varies across individuals substantially, depending primarily on family circumstances, payment-type eligibility, and wage rates on offer. Incentive effects on take-up of welfare and employment are best captured

by effective marginal tax rates (EMTRs) throughout an individual's range of potential hours worked, although EMTRs vary across individuals and are therefore difficult to characterise succinctly. It is even more difficult to characterise *changes* in EMTRs succinctly. Instead, key aspects of changes in this regard are captured by Figures 2-4, which summarise the changes in payment rates and income tests of income support payments. These figures also allow us to draw inferences on changes in 'coverage'.

Since 1995, the real value of pensions and PPS (excluding extra payments for dependent children) has increased by approximately 13%, compared with less than 2% for allowances. This gap in growth began opening up from 1998, when pensions and PPS were indexed to male average weekly total earnings and allowances remained indexed to the Consumer Price Index. Up until January 1998, the single adult maximum rate of payment for allowances was 93% of the pension rate; by June 2004, this had fallen to 84%. Figures 3 and 4 furthermore show that the income test for pensions and PPS has become significantly more generous (permitted more earnings), while for allowances the income test has, since June 1995 (when the upper taper rate was reduced from 100% to 70%), in fact become less generous.¹⁴ These changes would tend to increase relative coverage of pensions and PPS and encourage movement on to these payments at the expense of allowances. Such compositional change may to some extent be illusory, in that relative growth in pension and PPS receipt would not actually reflect change to the composition of income support recipients in the aggregate.¹⁵

¹⁴ The pension and PPS income test was, to begin with, significantly more generous than the allowance income test, such that differences by the end of the sample period are large. In 2004, the 'free area' for pensions and PPS was approximately twice that for allowances, and the taper rate was substantially higher for allowances, especially once fortnightly earnings exceeded \$142, when the allowance taper rate was 70% and the pension and PPS taper rate was 40%.

¹⁵ However, given the more generous income tests for these payments, this may still manifest as increased employment by income support recipients, because persons who would otherwise have been on allowances are on payment types that are more accommodating of combining employment with income support receipt. Since we condition on payment type in the econometric analysis, we may therefore find reduced reliance among pension and PPS recipients over time due to this effect.

Figure 2: Real value of single adult maximum rate of payment - Indexed to 100 in January 1995

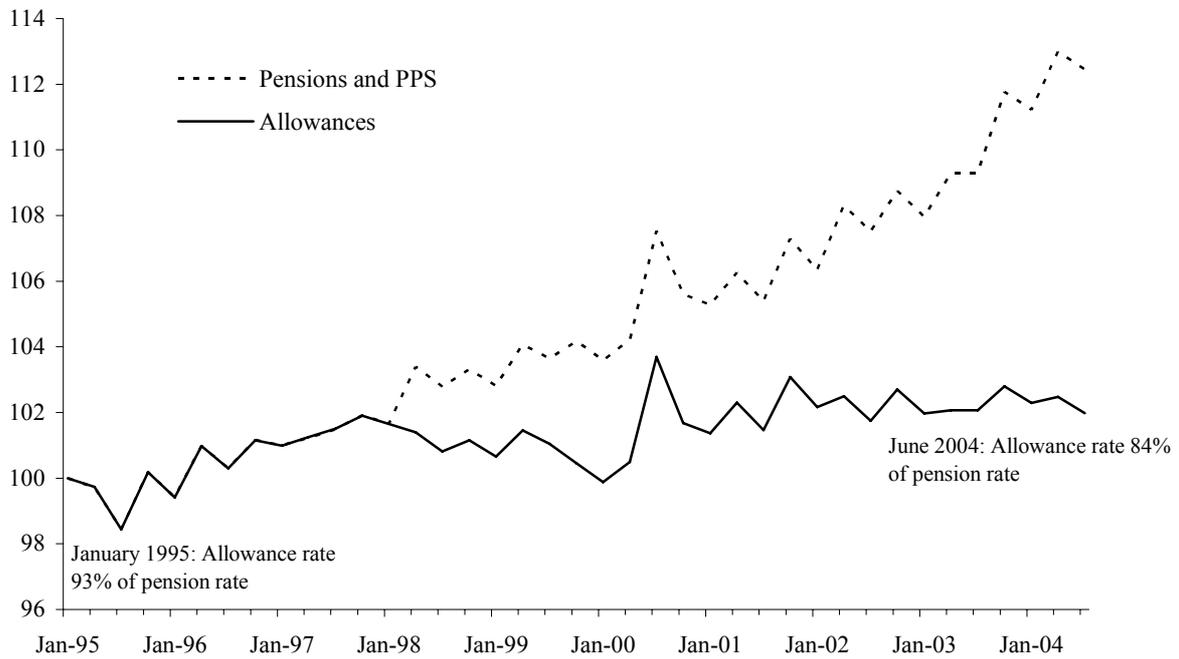


Figure 3: Real value of annual income test free area - Pensions and Parenting Payment Single - Single person - June 2004 prices

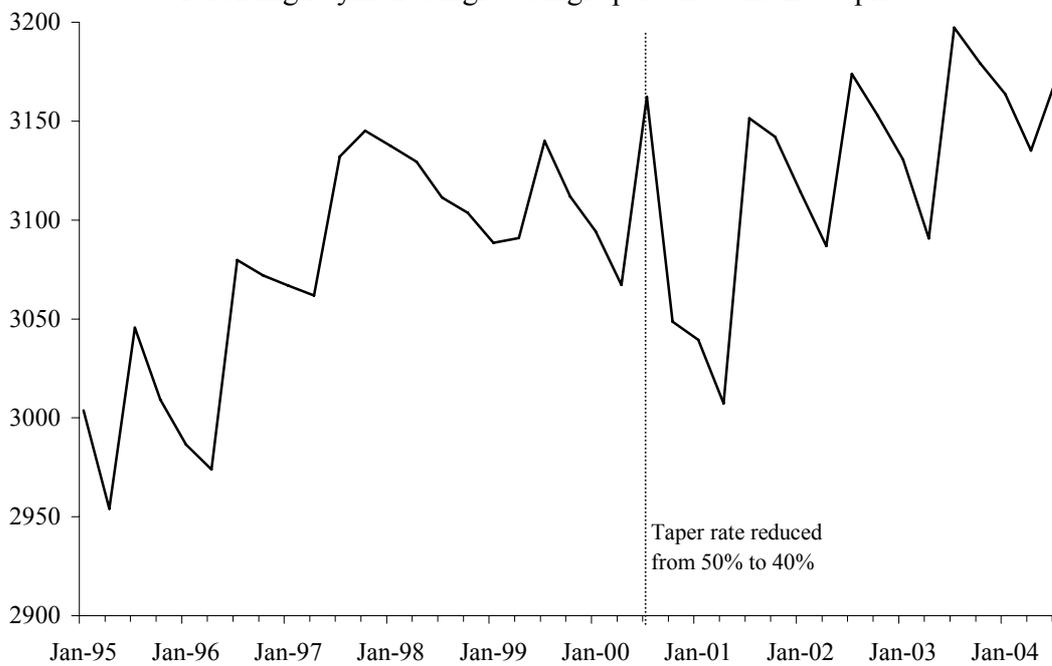
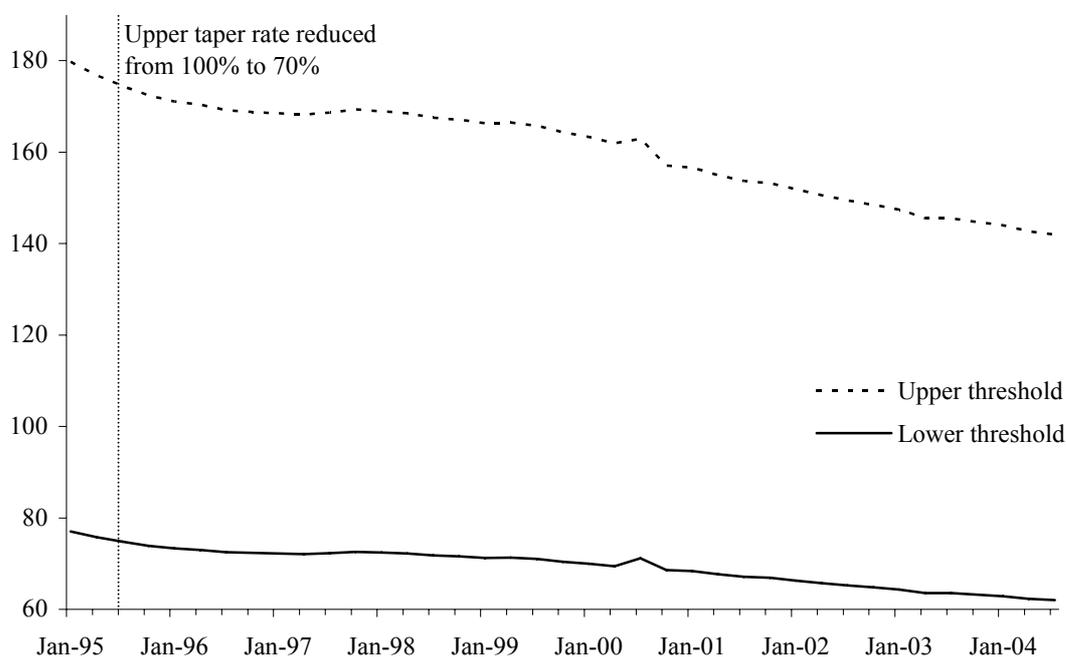


Figure 4: Real value of fortnightly income thresholds of lower and upper taper rates of Allowances - Single adult - June 2004 prices



Note: Lower threshold is the income test free area; upper threshold is the income level at which the taper rate increases from 50% to the higher taper rate (70% after June 1995).

A further potential effect of the payment rate and income test changes, which would involve actual changes to the composition of recipients, arises from the relative decline in attractiveness of allowances versus ‘substantive’ employment. The decrease in income test generosity and the decline in the allowance rate relative to wages would act to increase employment at the expense of allowance receipt, thereby tending to reduce the average ‘employability’ of the stock of allowance recipients over time.

Aspects of income tests not captured by Figures 2-4 are changes with respect to the treatment of partner income. These include, firstly, the change in July 1995 from a joint to a sequential income test where neither partner is a pensioner; and secondly, the introduction in July 1995 of Parenting Allowance (subsequently Parenting Payment Partnered), which contained a component that did not depend on partner income. In addition, in July 2000, the component of Parenting Payment Partnered not subject to a partner income test was moved to FTB Part B. These changes are likely to have had particularly important effects on partnered allowance recipients. In terms of composition effects, the July 1995 changes would have acted to ‘draw in’ new partnered allowance recipients, while the July 2000 changes would have had an effect in the opposite direction. The effects of these compositional changes on the extent of reliance of recipients are somewhat ambiguous, but it seems likely that the July 1995 changes would

have tended to lower aggregate reliance of the stock of recipients, while the July 2000 changes would have had the reverse effect.

Also warranting note are policy changes with respect to eligibility criteria other than income tests. These can be characterised as generally making eligibility conditions more stringent, especially for unemployment benefits, for which ‘activity test’ requirements have increased. This trend would tend to reinforce the coverage and incentive effects of the relative decline in the benefit level and non-welfare income permitted for allowances in acting to decrease receipt of income support by those best able to engage in the labour market.

Further policy changes not captured by Figures 2-4 are the lowering of income tax rates in July 2000 and changes to non-income support payments for families with dependent children.¹⁶ While the income tax changes would have encouraged participation in employment, the extent to which this manifests as reduced income support receipt versus increased employment of recipients is ambiguous. In any event, one would not expect effects to be large, since the tax cuts for low income persons were relatively minor. With regard to the introduction of FTB in July 2000, work by Kalb et al (2005) suggests that it is likely to have had little net effect on employment of income support recipients. However, the trend increase in payments to families with dependent children over the totality of the period between 1995 and 2004 would be expected to have had a small depressing effect on employment of income support recipients due to an income effect on labour supply: increased income increases demand for ‘leisure’, the corollary of which is reduced employment.

The abolition of ‘Earnings Credit’ in March 1997 is also noted as a policy change likely to have impacted on both the composition of recipients and their level of reliance. Reliance of persons who remained on income support, as measured by TPI, is likely to have decreased, but effects on the composition of recipients are somewhat ambiguous. The introduction of ‘Working Credit’ in September 2003 would likewise have had similar kinds of effects, but in the reverse direction – although these are unlikely to have been realised to any significant extent prior to the end of 2003, the endpoint of most of our analysis.

Aside from macroeconomic conditions and government welfare and tax policy, other factors that could have impacted on the composition of income support recipients over the period 1995 to 2004 include structural changes to the economy, social changes and changes to the population structure. Evidence on the potential effects of structural changes on the

¹⁶ Kalb et al (2002) examine the labour supply effects of the July 2000 reforms to income tax and family payments for all persons. Here we focus on income support recipients and potential recipients.

composition of income support recipients is difficult to find, and putting forward possible effects would be unduly speculative. Social changes can impact on the recipient composition in any number of ways, but perhaps the most obvious potential manifestations of social change that could impact on receipt are changes in rates of sole parenthood and employment of mothers. With regard to population structure changes, the ageing of the baby boom cohort may tend to produce a corresponding ageing of the income support population.

Attempting to characterise all of the above-mentioned changes collectively risks oversimplification of the many ways in which the composition of income support recipients has potentially changed. It is also difficult to disentangle the various conflicting effects. Nonetheless, the broader context within which our analysis is undertaken can reasonably be represented as one of a decreasing rate of receipt of income support and a relative shift in recipient composition towards longer-term and less employable recipients. This is important for us to remain aware of, particularly when interpreting changes observed over the sample period. Also important is the increased proportion of recipients with greater scope for combining income support with earnings on a long-term basis (i.e., greater scope for “being comfortable on income support”), reflected in the decline in the proportion on allowances and the increased generosity of income tests for other payment types.

Having surveyed this broader context, the question remains of what this implies for the analysis. This is easier to answer for the descriptive analysis than the econometric analysis. We might expect to see greater reliance among recipients, and more persistence in reliance, but perhaps also more combining of receipt with earnings (so perhaps an increase in very high TPIs, but a decrease in TPIs equal to one). For the econometric analysis, the implications of the implied changes in selection into the sample for the relationship between characteristics and reliance are not clear. To the extent that the changes in selection are on observed characteristics, implications are fewer, since we control for/examine the effects of these observed characteristics and our six-monthly TPI will to a significant extent capture movements off payments. Changes in terms of unobserved characteristics are more problematic, since it is difficult to predict how these will be correlated with observed characteristics and therefore how biases will be affected.

6. Descriptive analysis

6.1 *Aggregate reliance of income support recipients*

We consider first the income support recipient population as a whole. As a prelude to describing reliance using our TPI measure, Table 3 presents information on the composition of the sample. It contains means of variables for demographic characteristics and payment type. Time-varying characteristics are evaluated in the last fortnight in the year that the individual was on income support. For example, an individual is assigned to the age group to which she belongs when she is last observed on income support in the relevant year.

The age distribution of the recipient population is at first glance somewhat surprising, with the proportion aged 25-44 years quite high for both males and females: over 40% of male recipients and 46% of female recipients are in this age range. Annual rates of receipt can, however, be quite misleading, in that the average duration on income support differs quite significantly by age (see, for example, Tseng et al, 2003). The place of birth composition of recipients appears to have been quite stable over the sample period, but the proportion indigenous has increased, from 3.4% to 5.2% of male recipients, and from 3.7% to 4.8% of female recipients. This may in part reflect administrative improvements in identifying indigenous persons, as well as an increased propensity for individuals to identify themselves as indigenous.

The dominant payment type for males is the unemployment benefit, although – consistent with the findings from Table 2 – its dominance has diminished between 1995 and 2003, accounting for 72% of recipients in 1995 and 59% in 2003. Females are more evenly distributed across payment types, although the figures for 1995 and 1999 suggest that the unemployment benefit was still the single most common payment type in the 1990s. PPS and other allowances, primarily comprising Parenting Payment Partnered, are important payment types for females. PPS has, furthermore, grown in importance between 1995 and 2003, accounting for 23% of female income support recipients in 1995 and 29% in 2003.

Approximately 60% of recipients are single. For most recipients who are partnered, the partner is also on income support. However, the proportion partnered with another income support recipient has declined markedly over the sample period, from 37% to 28% for males and from 31% to 24% for females. For males, this reflects increases in both the proportion of recipients single and the proportion partnered with someone who is not on income support; for females, it primarily reflects an increase in the proportion single. In terms of family type,

the most notable change has been the rise in the proportion of female recipients who are sole parents, rising from 24% in 1995 to 30% in 2003. For males, there has been growth in the proportion single, both with and without dependent children. Also significant is the substantial drop after 1999 in the proportions of both male and female recipients partnered with dependent children. This may in part derive from the income tax and family payment reforms in July 2000, such as the removal of the basic component of Parenting Payment and its incorporation into FTB Part B, thereby reducing receipt of Parenting Payment.

Table 3: Demographic characteristics of the sample – Selected years

	1995		1999		2003	
	Males	Females	Males	Females	Males	Females
<i>Age Group (%)</i>						
15-19	8.2	7.7	7.2	6.4	7.0	6.1
20-24	15.8	15.3	13.5	12.9	12.7	11.8
25-34	23.8	26.2	23.5	25.6	21.3	23.2
35-44	18.7	22.3	19.8	24.1	19.4	23.8
45-49	7.6	8.9	8.3	8.9	8.7	9.4
50-54	7.0	8.5	8.1	9.4	8.7	9.0
55-59	8.2	11.1	8.6	10.3	9.9	11.6
60-64*	10.7	0.0	11.1	2.4	12.4	5.2
<i>Place of Birth / Indigenous status (%)</i>						
Indigenous	3.4	3.7	4.1	4.0	5.2	4.8
Other Australian-born	69.0	70.2	69.2	69.8	69.4	69.3
ESB	9.2	8.3	8.9	8.0	8.1	7.6
NESB	18.5	17.9	17.8	18.2	17.3	18.3
<i>Benefit type (Main) (%)</i>						
Unemployment benefits	71.6	30.5	66.5	27.8	58.7	25.3
Other allowances	3.5	24.0	3.2	23.5	4.5	19.7
DSP	22.4	9.7	26.7	13.2	31.5	16.9
Other Pensions	0.9	12.7	1.4	9.6	2.3	9.3
PPS	1.7	23.1	2.2	25.9	3.1	28.9
<i>Partner status (%)</i>						
No Partner	59.4	59.7	62.6	61.9	66.0	65.9
Has Partner, not on IS	3.7	9.0	5.5	11.4	6.0	10.5
Has Partner, on IS	36.8	31.3	31.9	26.8	27.9	23.6
<i>Home Owner status (%)</i>						
Home Owner	38.4	38.8	32.9	33.6	36.4	34.6
Private Rent	48.1	43.1	48.0	43.9	45.1	42.3
Government Rent	5.8	10.9	7.2	11.0	8.0	11.0
Other	7.7	7.2	11.9	11.5	10.4	12.1
<i>Location of residence (%)</i>						
Major City	57.5	58.0	56.3	57.8	55.5	57.5
Other	42.5	42.0	43.7	42.2	44.5	42.5
<i>Family type (%)</i>						
Single, no children	57.6	35.8	59.9	34.7	62.2	35.9
Single, with children	1.9	23.8	2.7	27.2	3.8	30.0
Partnered, no children	21.1	19.0	19.2	16.8	19.4	17.5
Partnered, with children	19.5	21.4	18.2	21.3	14.6	16.6
No. persons	149,290	153,899	144,725	160,120	133,766	158,570

Notes: Equal weighting given to each individual who at some stage received income support in the relevant year. Characteristics are evaluated in the last fortnight an individual is observed on IS payments in the year. *For females, the age category 60-64 is actually 60-‘Minimum age of eligibility for the Age Pension’, which is 60 in 1995, 60.5 in 1996 and 1997, 61 in 1998 and 1999, 61.5 in 2000 and 2001, 62 in 2002 and 2003 and 62.5 in 2004.

Table 4 presents information on the distribution of *fortnightly* TPI in each year, firstly to identify observations that are treated as if the individual was not observed at all, and secondly to provide an indication of the extent of reliance on income support of recipients when on payments. The upper panel presents the proportion of fortnightly payment records for which the TPI is greater than zero (that is benefit income is recorded), zero and missing. If income support payments are zero in a given fortnight and non-welfare income is positive, so that TPI is zero, we drop that fortnight so that the individual is treated in a manner consistent with other individuals with a TPI equal to zero in that fortnight. That is, we may introduce biases by including some observations when TPI equals zero when in most cases an individual is not observable when TPI is zero. TPI is missing if it is undefined because of the absence of both income support and non-welfare income, or if benefit income is missing from the payment record. We also treat these individuals as being off income support. Between 2% and 6% of fortnightly payment records are excluded on this basis in each year.

Table 4: Properties of fortnightly TPI in each sample year

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
All persons on income support										
<i>Males</i>										
TPI > 0 (%)	97.7	96.2	94.4	93.8	96.7	96.3	96.4	96.6	97.0	97.1
TPI = 0 (%)	1.8	2.2	2.9	3.1	2.4	2.5	2.8	3.1	2.7	2.6
TPI missing (%)	0.4	1.6	2.8	3.1	0.9	1.2	0.8	0.4	0.4	0.3
No. of obs. ('000)	2,579	2,709	2,718	2,719	2,752	2,565	2,620	2,583	2,525	1,140
<i>Females</i>										
TPI > 0 (%)	98.4	97.8	97.1	95.5	96.3	96.5	97.4	98.1	98.1	97.6
TPI = 0 (%)	1.0	1.3	1.6	2.4	2.0	2.1	1.7	1.6	1.6	1.9
TPI missing (%)	0.6	0.9	1.3	2.2	1.7	1.5	0.9	0.4	0.4	0.5
No. of obs. ('000)	2,875	3,170	3,188	3,257	3,342	3,244	3,274	3,320	3,308	1,559
Persons in the sample (i.e., TPI > 0)										
<i>Males</i>										
TPI = 1 (%)	67.0	70.2	64.6	64.8	65.0	63.8	64.0	63.9	63.2	62.1
Mean TPI	0.924	0.927	0.922	0.919	0.924	0.920	0.922	0.923	0.923	0.918
<i>Females</i>										
TPI = 1 (%)	64.8	65.7	60.2	60.2	60.3	59.4	58.6	58.3	57.9	57.1
Mean TPI	0.896	0.892	0.888	0.887	0.888	0.886	0.880	0.877	0.875	0.875

The lower panel of Table 4 presents, for the sample comprising payment records with a TPI greater than zero, proportion in each year with no declared earned or unearned income – that is, the proportion of fortnightly payment records (‘person-fortnights’) for which the individual’s only source of personal income was welfare – along with the mean TPI. In 1995, 67% of male fortnightly payment records and 65% of female fortnightly payment records involved no earned or unearned income, the corollary of which is that for 33% and 35% of

male and female records respectively at least some non-welfare income was reported. The fraction reporting only welfare income increased in 1996, and then dropped markedly in 1997, to approximately 65% for males and 60% for females. From 1999 to 2003, there was a small but reasonably steady decline in the proportion of person-fortnights with a TPI equal to one, such that in 2003 person-fortnights with non-welfare income was 38% for males and 43% for females.

The mean TPI is notable for its stability across the sample period, not ever moving from 92% for males and ranging between 88% and 89% for females. Thus, while the fall in the proportion with TPIs equal to one that is sustained from 1997 onwards would suggest the extent of reliance among recipients has declined over the sample period as a whole, this has in fact largely failed to translate into a decline in the mean extent of reliance among recipients when on payments.

Table 5 and Figure 5 present aggregate information on trends in our measure of reliance, presenting the average annual TPI and the distribution of TPI among income support recipients in each year. Equal weighting is given to each individual who received income support in the year indicated. An annual average TPI less than 100% potentially reflects the effects of both non-welfare income when on income support and periods off income support altogether. For example, an annual average TPI of 50% could derive from obtaining 50% of income from income support in every fortnight of the year; from obtaining 100% of income from income support in 50% of the fortnights in the year (and being off income support for the other 50% of fortnights); or from some combination of receiving non-welfare income when on income support and having some fortnights off payments.

The estimates presented in Table 5 show that, for both males and females, in all years the mean annual average TPI is between 59% and 68%. That is, among persons to receive income support in a given year, the mean fortnightly proportion of income from income support is approximately three-fifths to two-thirds. The striking finding from Table 5 is that, according to our TPI measure, reliance on income support has steadily increased between 1995 and 2003. Between 1995 and 2003, the mean fortnightly proportion of income from income support increases from 59% to 63.9% for males and from 65.7% to 72% for females. This is consistent with the predicted effect in Section 5 of compositional change towards income support recipients with longer durations on income support and less capacity for employment. It is also consistent with the predicted effects of the real decline in generosity of the income

test for allowances (a result of fixed nominal income thresholds for the lower and upper taper rates).

Table 5: Trends in aggregate reliance of income support recipients – Annual average TPI

Year	Males	Females	All Persons
1995	0.590	0.624	0.607
1996	0.604	0.656	0.631
1997	0.603	0.656	0.630
1998	0.607	0.652	0.630
1999	0.619	0.651	0.636
2000	0.607	0.659	0.635
2001	0.613	0.661	0.638
2002	0.627	0.670	0.650
2003	0.639	0.679	0.660

Figure 5 provides more detail on the nature of, and changes in, the distribution of annual average TPI, presenting the proportion of individuals in each of 10 equal-width TPI intervals in 1995, 1998, 2001 and 2003. Across all years, there is a high concentration of individuals with TPIs in the 90-100% range, with approximately 30% to 50% of individuals in this category in each year. There is also a relatively higher concentration of individuals with annual average TPIs in the 0-20% range, creating a muted ‘U’-shaped distribution. Comparing across years, the panels show that the increase in aggregate reliance between 1995 and 2003 has been primarily driven by a ‘hollowing out’ of the TPI distribution. There has been little change in the proportion of income support recipients in each year with TPIs below 20%, but a substantial increase in the proportion with TPIs above 90%, coming at the expense of intermediate TPI levels.

Figure 5a – Distribution of TPI – Male income support recipients

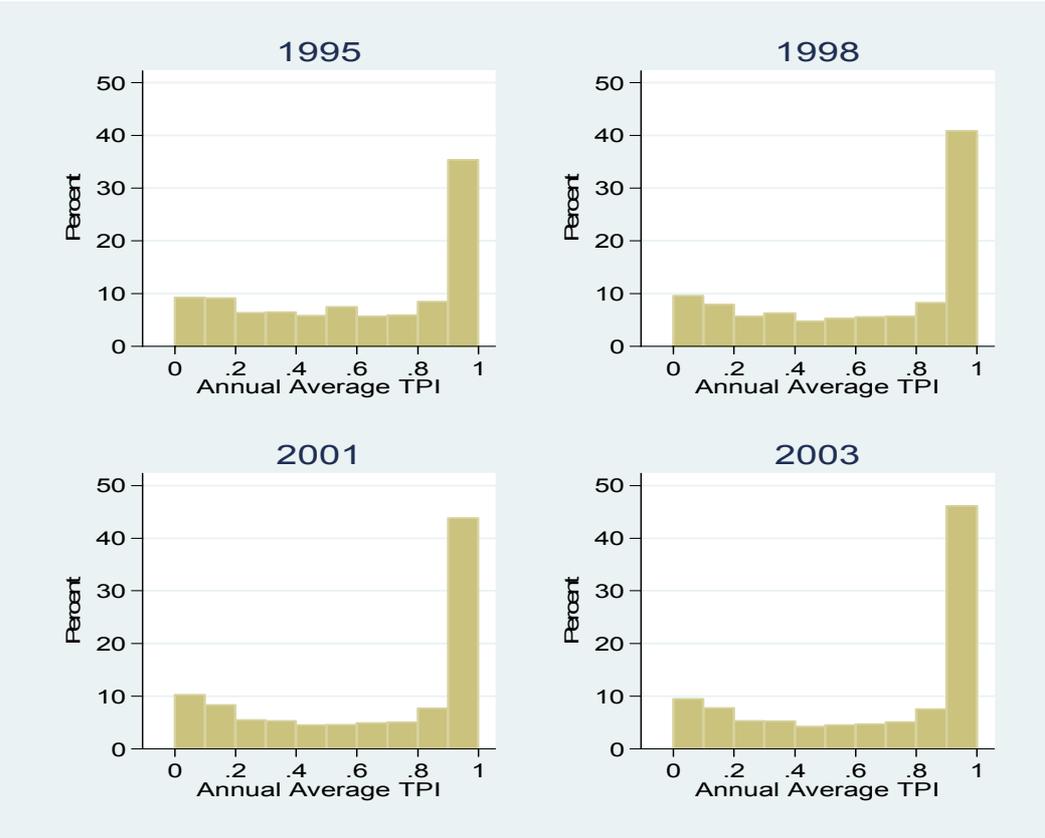
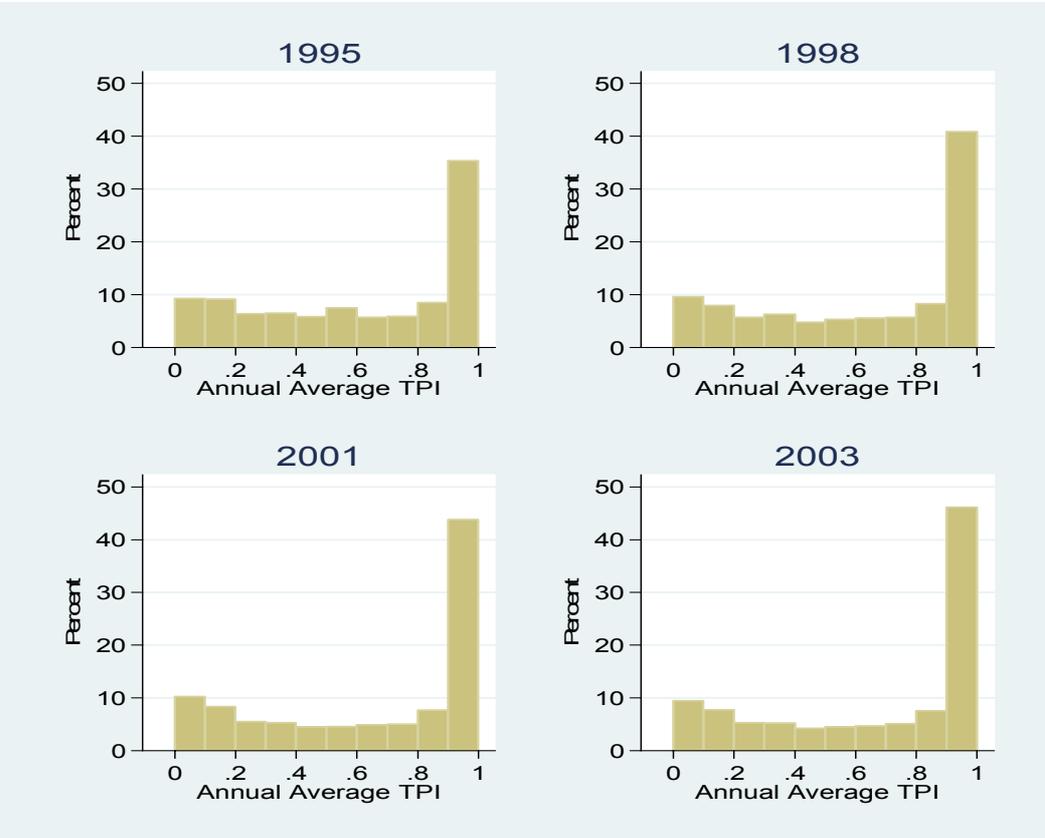


Figure 5b – Distribution of TPI – Female income support recipients



6.2 *Dynamic properties of individual reliance*

A key question for this study is how reliance evolves over time for individuals and how this differs across individuals. For example, we are interested in the nature of the association between different levels of reliance in one year and reliance in subsequent years. To this end, we present two sets of tables. Tables 6-8 present the proportions for whom reliance decreases, and for whom it does not decrease, between two years. The emphasis here is on comparisons across individuals with different demographic and payment type characteristics, which are evaluated in the last fortnight the individual was on income support in the base year. Table 6 considers a one-year interval, Table 7 a three-year interval and Table 8 a five-year interval. The second set of tables – Tables 9-11 – focuses on the associations between the extent of reliance in one interval of time and the extent of reliance in subsequent intervals of time.

Table 6 shows that, for approximately half the recipients of income support in one year, reliance will be no lower in the next year. The proportion of recipients in one year for whom reliance decreases in the next year is generally higher for males than females. It is also decreasing in age beyond the 20-24 years age category. Non-indigenous natives and immigrants from English speaking countries are more likely to experience a decrease in reliance than other persons, with indigenous persons having the lowest incidence of decreasing TPI. Differences by payment type are consistent with expectations, allowances having the highest rates of decrease in reliance and pensions the lowest. Males and females have the same proportions exhibiting a decrease in TPI for unemployment benefits, other pensions and PPS, but the proportions of recipients of DSP and other allowances decreasing reliance from one year to the next is higher for males than females.

Table 6: Change in annual average TPI by personal characteristics – One-year interval

Characteristics (Base year)	Males		Females	
	Increased/ Same	Decreased	Increased/ Same	Decreased
<i>Age Group</i>				
15-19	44.6	55.4	50.3	49.8
20-24	39.2	60.8	45.1	54.9
25-34	42.4	57.6	50.6	49.5
35-44	48.9	51.1	52.3	47.8
45-49	55.0	45.0	57.0	43.0
50-54	60.7	39.3	64.1	35.9
55-59*	64.7	35.3	68.4	31.6
60-64*	69.1	30.9	72.7	27.3
<i>Place of Birth / Indigenous status</i>				
Indigenous	54.5	45.6	61.9	38.1
Other Australian-born	49.3	50.7	52.5	47.5
ESB	49.5	50.5	51.7	48.3
NESB	53.7	46.3	59.7	40.3
<i>Benefit type (Main)</i>				
Unemployment benefits	40.9	59.1	39.8	60.2
Other allowances	43.1	57.0	50.0	50.0
DSP	75.1	24.9	77.8	22.2
Other Pensions	67.5	32.5	69.4	30.6
PPS	56.8	43.2	56.3	43.7
<i>Partner status</i>				
No Partner	49.8	50.3	53.7	46.3
Has Partner, not on IS	38.8	61.2	42.6	57.4
Has Partner, on IS	53.2	46.8	60.2	39.8
<i>Home Owner status</i>				
Home Owner	51.9	48.1	53.8	46.2
Private Rent	48.2	51.8	52.4	47.6
Government Rent	66.9	33.1	68.5	31.5
Other	44.2	55.9	47.6	52.4
<i>Location of residence</i>				
Major City	49.1	50.9	53.9	46.1
Other	51.8	48.2	54.4	45.6
<i>Family type</i>				
Single, no children	49.4	50.6	51.1	48.9
Single, with children	58.2	41.8	57.1	42.9
Partnered, no children	58.5	41.5	60.4	39.6
Partnered, with children	43.6	56.4	49.2	50.8
All	50.3	49.7	54.1	45.9

Notes: Equal weighting given to each individual who at some stage received income support in the base year. Base years comprise 1995-2002. Characteristics are evaluated in the last fortnight an individual is observed on IS payments in the year. *Only persons aged less than the minimum age of eligibility for the Age Pension at the conclusion of the end-year are included. This excludes males aged over 64 at the end of the base year. For females, the base-year age restriction depends on the timing of the base year because of the progressive increase in the minimum age of eligibility (60 in 1995, 60.5 in 1996 and 1997, 61 in 1998 and 1999, 61.5 in 2000 and 2001 and 62 in 2002 and 2003). The female maximum age at the end of the base year is 59.5 in 1995 and 1996, 60 in 1997 and 1998, 60.5 in 1999 and 2000 and 61 in 2001 and 2002.

Table 7: Change in annual average TPI by personal characteristics – Three-year interval

Characteristics (Base year)	Males		Females	
	Increased/ Same	Decreased	Increased/ Same	Decreased
<i>Age Group</i>				
15-19	31.2	68.8	39.0	61.0
20-24	25.4	74.6	32.3	67.7
25-34	30.1	69.9	38.4	61.6
35-44	37.6	62.4	40.5	59.5
45-49	45.7	54.3	48.8	51.2
50-54	52.6	47.4	58.4	41.6
55-59*	59.5	40.5	64.8	35.2
60-64*	63.7	36.3		
<i>Place of Birth / Indigenous status</i>				
Indigenous	44.9	55.1	54.4	45.6
Other Australian-born	37.3	62.7	40.9	59.1
ESB	37.2	62.8	39.8	60.2
NESB	41.7	58.3	49.6	50.4
<i>Benefit type (Main)</i>				
Unemployment benefits	29.0	71.0	28.9	71.1
Other allowances	25.2	74.8	38.2	61.8
DSP	68.5	31.5	71.9	28.1
Other Pensions	56.8	43.2	63.1	36.9
PPS	42.6	57.4	44.2	55.8
<i>Partner status</i>				
No Partner	38.0	62.0	42.2	57.8
Has Partner, not on IS	22.7	77.3	29.8	70.3
Has Partner, on IS	41.6	58.4	50.9	49.1
<i>Home Owner status</i>				
Home Owner	39.2	60.8	42.0	58.0
Private Rent	36.7	63.3	41.2	58.8
Government Rent	57.7	42.3	59.6	40.4
Other	32.0	68.0	35.2	64.8
<i>Location of residence</i>				
Major City	36.9	63.1	42.6	57.4
Other	40.2	59.8	43.3	56.7
<i>Family type</i>				
Single, no children	37.8	62.3	40.0	60.0
Single, with children	44.5	55.5	45.0	55.1
Partnered, no children	48.4	51.6	51.3	48.8
Partnered, with children	30.9	69.1	37.5	62.6
All	38.3	61.7	42.9	57.1

Notes: Equal weighting given to each individual who at some stage received income support in the base year. Base years comprise 1995-2000. Characteristics are evaluated in the last fortnight an individual is observed on IS payments in the year. *Only persons aged less than the minimum age of eligibility for the Age Pension at the conclusion of the end-year are included. This excludes males aged over 62 at the end of the base year. For females, the base-year age restriction depends on the timing of the base year because of the progressive increase in the minimum age of eligibility (60 in 1995, 60.5 in 1996 and 1997, 61 in 1998 and 1999, 61.5 in 2000 and 2001 and 62 in 2002 and 2003). The female maximum age at the end of the base year is 58 in 1995 and 1996, 58.5 in 1997 and 1998, and 59 in 1999 and 2000.

Table 8: Change in annual average TPI by personal characteristics – Five-year interval

Characteristics (Base year)	Males		Females	
	Increased/ Same	Decreased	Increased/ Same	Decreased
<i>Age Group</i>				
15-19	24.0	76.0	32.9	67.1
20-24	19.1	80.9	26.8	73.2
25-34	24.6	75.4	32.2	67.8
35-44	32.3	67.7	34.2	65.8
45-49	40.8	59.2	45.3	54.7
50-54	48.9	51.1	56.3	43.7
55-59*	55.9	44.1	61.8	38.2
<i>Place of Birth / Indigenous status</i>				
Indigenous	39.4	60.6	50.3	49.7
Other Australian-born	30.7	69.3	34.5	65.5
ESB	30.0	70.0	33.0	67.0
NESB	34.5	65.5	43.4	56.6
<i>Benefit type (Main)</i>				
Unemployment benefits	23.5	76.5	24.7	75.3
Other allowances	18.0	82.1	32.1	67.9
DSP	63.2	36.8	66.8	33.2
Other Pensions	51.4	48.6	58.5	41.5
PPS	35.2	64.8	37.1	62.9
<i>Partner status</i>				
No Partner	31.4	68.6	35.8	64.2
Has Partner, not on IS	16.1	83.9	23.4	76.6
Has Partner, on IS	34.6	65.4	44.9	55.1
<i>Home Owner status</i>				
Home Owner	30.8	69.2	34.3	65.7
Private Rent	30.4	69.6	35.2	64.8
Government Rent	51.6	48.4	53.5	46.5
Other	28.6	71.4	31.7	68.3
<i>Location of residence</i>				
Major City	30.1	69.9	36.2	63.8
Other	33.7	66.3	37.1	62.9
<i>Family type</i>				
Single, no children	31.2	68.8	34.2	65.8
Single, with children	37.3	62.7	37.9	62.1
Partnered, no children	41.0	59.1	44.8	55.2
Partnered, with children	25.6	74.4	31.0	69.0
All	31.6	68.4	36.5	63.5

Notes: Equal weighting given to each individual who at some stage received income support in the base year. Base years comprise 1995-1998. Characteristics are evaluated in the last fortnight an individual is observed on IS payments in the year. *Only persons aged less than the minimum age of eligibility for the Age Pension at the conclusion of the end-year are included. This excludes males aged over 60 at the end of the base year. For females, the base-year age restriction depends on the timing of the base year because of the progressive increase in the minimum age of eligibility (60 in 1995, 60.5 in 1996 and 1997, 61 in 1998 and 1999, 61.5 in 2000 and 2001 and 62 in 2002 and 2003). The female maximum age at the end of the base year is 56.5 in 1995 and 1996, and 57 in 1997 and 1998.

Persons who in the base year have a partner who is not on income support are on average significantly more likely to have lower reliance in the next year than single people or persons partnered with an income support recipient. For males, 61% of those with a partner not on income support had a decrease in reliance, compared with 50% for single males and 47% for males with a partner on income support in the base year. For females, 57% of those with a

partner not on income support had a decrease in reliance, compared with 46% for single females and 40% for females with a partner on income support. Also notable is that, for both males and females, those in the ‘partnered with dependent children’ family type are the most likely to decrease reliance from one year to the next, while sole parents are the least likely to decrease reliance.¹⁷ Occupying public housing is associated with a lower proportion decreasing reliance, which may of course simply reflect other systematic differences between individuals in this housing situation and individuals in other housing situations. With respect to location of residence, persons residing outside the major cities are slightly less likely to decrease reliance from one year to the next than persons residing in one of these cities.

As might be expected, lengthening the interval between the base year and the end year (Tables 7 and 8) increases the proportion for whom the annual average TPI decreases. Moving to the three-year interval increases this proportion to 62% for males and 57% for females; moving to a five-year interval increases it still further, to 68% for males and 64% for females. Differences across individuals by demographic and payment type characteristics evident for the one-year interval are largely preserved in moving to longer intervals. Although there are some quantitative differences in these relativities when comparing across the three interval lengths, these are generally small.

Tables 9-11 consider changes in individual TPIs from one period to the next for all recipients collectively, but delineated by TPI ‘intensity’ in both the base period and subsequent period. Individuals who received income support in the base year are classified according to whether the base-year TPI is low ($0 < \text{TPI} < 0.5$), medium ($0.5 \leq \text{TPI} < 0.9$) or high ($\text{TPI} \geq 0.9$). For each of these base-year groups, the tables present the proportion in each of the TPI levels in the end year as well as the proportion off payments altogether in the end year.

¹⁷ The results in Table 3 suggest the pattern with respect to couples with dependent children primarily derives from movements in the 1999 to 2003 period.

Table 9: TPI transitions – One-year interval

TPI Intensity (Base year)	TPI Intensity (Base year + 1)			
	Zero (TPI = 0)	Low (0 < TPI < 0.50)	Medium (0.50 ≤ TPI < 0.90)	High (0.90 ≤ TPI ≤ 1.0)
<i>Males</i>				
Low (0 < TPI < 0.50)	41.8	34.5	16.0	7.7
Medium (0.50 ≤ TPI < 0.90)	11.7	23.5	41.1	23.7
High (0.90 ≤ TPI ≤ 1.0)	0.6	6.7	13.8	79.0
<i>Females</i>				
Low (0 < TPI < 0.50)	37.2	38.0	15.3	9.6
Medium (0.50 ≤ TPI < 0.90)	9.2	21.5	41.4	27.9
High (0.90 ≤ TPI ≤ 1.0)	0.4	5.5	12.8	81.3

Note: Analysis is conditional on being on income support in the base year, where base year can be from 1995 to 2002.

Table 10: TPI transitions – Three-year interval

TPI Intensity (Base year)	TPI Intensity (Base year + 3)			
	Zero (TPI = 0)	Low (0 < TPI < 0.50)	Medium (0.50 ≤ TPI < 0.90)	High (0.90 ≤ TPI ≤ 1.0)
<i>Males</i>				
Low (0 < TPI < 0.50)	69.0	12.7	9.5	8.8
Medium (0.50 ≤ TPI < 0.90)	35.7	13.9	24.9	25.6
High (0.90 ≤ TPI ≤ 1.0)	12.4	6.8	13.3	67.6
<i>Females</i>				
Low (0 < TPI < 0.50)	62.9	15.7	9.7	11.7
Medium (0.50 ≤ TPI < 0.90)	29.5	15.0	25.5	30.0
High (0.90 ≤ TPI ≤ 1.0)	9.9	7.3	13.6	69.2

Note: Analysis is conditional on being on income support in the base year, where base year can be from 1995 to 2000.

Table 11: TPI transitions – Five-year interval

TPI Intensity (Base year)	TPI Intensity (Base year + 5)			
	Zero (TPI = 0)	Low (0 < TPI < 0.50)	Medium (0.50 ≤ TPI < 0.90)	High (0.90 ≤ TPI ≤ 1.0)
<i>Males</i>				
Low (0 < TPI < 0.50)	78.9	6.8	6.2	8.1
Medium (0.50 ≤ TPI < 0.90)	49.9	9.3	16.9	23.9
High (0.90 ≤ TPI ≤ 1.0)	21.7	5.7	11.8	60.8
<i>Females</i>				
Low (0 < TPI < 0.50)	73.3	9.0	6.8	10.9
Medium (0.50 ≤ TPI < 0.90)	42.6	10.9	18.0	28.5
High (0.90 ≤ TPI ≤ 1.0)	18.4	6.9	12.7	62.0

Note: Analysis is conditional on being on income support in the base year, where base year can be from 1995 to 1998.

TPI intensity in the end year is strongly ordered by TPI intensity in the base year, irrespective of the interval between base and end years. For the one-year interval, 79% of males and 81% of females in the high TPI category in the base year are still in the high TPI category in the next year. With a five-year interval, 61% of males and 62% of females in the high TPI category in the base year are in this high category in the end year. By contrast, 8% of males and 10% of females in the low TPI category in the base year are in the high TPI category one year later. Five years after the base year, 8% of males and 11% of females in the low TPI

category in the base year have moved into the high TPI category. Consistent with this ordering, those in the low TPI category also have the highest rate of movement to the zero TPI category.

Despite this strong ordering by initial TPI reliance, there is nonetheless a fair degree of fluidity in TPI intensity from one time period to another, especially as the interval is widened. Only 7% of males in the low TPI category and 9% of females in the low TPI category are in that same category five years later. Similarly, only 17% of males and 18% of females in the medium TPI category in the base year are in that same category five years later. Even for those in the high TPI category, 39% of males and 38% of females are no longer in that category five years later. For the most part, the decline in the proportion in the same TPI category as the interval increases reflects growth in the proportion completely off income support in the end year. Five years after the base year, the proportion off payments altogether is 79% for males in the low TPI category, 50% for males in the medium TPI category and 22% for males in the high TPI category. The corresponding figures for females are 73, 43 and 18.

A further notable feature evident from the three tables is that, while the proportion in the high TPI category in the end year decreases as the interval width increases for those in the high TPI category in the base year, for those in the low and medium categories in the base year, the proportion in the high category in the end year does *not* decrease as the interval width increases. That is, the growth in the proportion completely off income support as the interval widens is not even partially due to a decline in the proportion in the high TPI category for these groups of recipients.

Indicative information on changes over time in TPI transitions is presented in Table 12, which examines one-year transitions for base years 1995-1998 and 2000-2002 separately. The end years of these periods (1996 to 1999 for the first sub-period, and 2001 to 2003 for the second sub-period) are either side of the July 2000 tax and welfare policy changes. Little change is evident, with the exception that, in the latter sub-period, those in the high TPI category were slightly more likely to remain in that category in the subsequent year. In the 1995-1998 period, 78% of males in the high TPI category remained in the high TPI category in the subsequent year, compared with 81% for the 2000-2002 period. Similarly, for females, 80% remained in the high TPI category in the earlier period, compared with 83% in the later period.

Table 12: TPI transitions – One-year interval – By sub-period

TPI Intensity (Base year)	TPI Intensity (Base year + 1)			
	Zero (TPI = 0)	Low (0 < TPI < 0.50)	Medium (0.50 ≤ TPI < 0.90)	High (0.90 ≤ TPI ≤ 1.0)
<i>Males</i>				
1995-1999				
Low (0 < TPI < 0.50)	41.3	34.3	16.7	7.8
Medium (0.50 ≤ TPI < 0.90)	11.6	23.9	41.0	23.4
High (0.90 ≤ TPI ≤ 1.0)	0.6	7.2	14.7	77.5
2000-2003				
Low (0 < TPI < 0.50)	42.8	34.7	14.8	7.7
Medium (0.50 ≤ TPI < 0.90)	11.9	22.7	41.2	24.3
High (0.90 ≤ TPI ≤ 1.0)	0.5	5.9	12.2	81.4
<i>Females</i>				
1995-1999				
Low (0 < TPI < 0.50)	37.4	36.9	16.0	9.7
Medium (0.50 ≤ TPI < 0.90)	9.3	21.9	41.0	27.8
High (0.90 ≤ TPI ≤ 1.0)	0.4	5.9	13.5	80.2
2000-2003				
Low (0 < TPI < 0.50)	36.8	40.0	14.1	9.2
Medium (0.50 ≤ TPI < 0.90)	9.0	20.9	42.1	28.0
High (0.90 ≤ TPI ≤ 1.0)	0.4	4.9	11.8	82.9

Note: Analysis is conditional on being on income support in the base year, where base year can be from 1995 to 1998 for the first sub-period and 2000 to 2002 for the second sub-period.

6.3 Earnings and income support receipt

The TPI measure of reliance on which we focus is a product of two dimensions: the proportion of time on income support; and the proportion of income from income support when on payments, which is in turn largely determined by the extent to which the individual receives earned income while on welfare. Table 13 takes some steps towards dissecting the annual average TPI measure by presenting the proportion of recipients in each of four categories based on these two dimensions. Specifically, it presents the proportion of recipients in each year with and without earnings while on income support, further broken down by whether on payments for the entire year or not.

In 1995, approximately 30% of recipients had earned income, a fraction that remained largely unchanged over the sample period for males, but which increased slightly for females to 32% by 2003. Most of those with earned income while on welfare are not on payments all year, but there has been a marked shift over the period, with 5% of males and 9% of females in the ‘had earned income and on payments all year’ category in 1995, compared with 9% of males and 14% of females in this category in 2003. This primarily appears to reflect an overall increase in the proportion on payments for the entire year, which in total increased from 31% to 46% for males and from 39% to 57% for females. That is, with the exception of an increase

between 1995 and 1996, the proportion of those on payments all year with earned income (column 2 as a fraction of columns 2 and 4) did not change substantially over the period. Consequently, the major change over the period appears to be a compositional shift towards longer-term recipients, a finding consistent with both the findings from Table 5 and Figure 5 and the anticipated changes documented in Section 5.¹⁸

Table 13: Earnings and time on income support – Proportion in each ‘reliance type’ category (%)

	Earned income		No earned income	
	Not on payment all year	On payment all year	Not on payment all year	On payment all year
	<i>Males</i>			
1995	25.6	5.3	43.8	25.4
1996	23.8	6.8	40.6	28.8
1997	21.7	8.7	36.7	32.9
1998	19.9	9.0	35.9	35.2
1999	20.1	8.4	36.9	34.7
2000	20.3	8.3	37.1	34.3
2001	21.2	8.7	36.2	33.9
2002	21.2	9.2	34.1	35.5
2003	20.6	9.0	33.4	37.0
	<i>Females</i>			
1995	20.0	8.8	41.0	30.2
1996	19.2	11.8	32.9	36.1
1997	18.5	13.0	30.7	37.8
1998	17.1	13.8	28.5	40.6
1999	17.1	13.3	28.8	40.9
2000	16.2	13.7	27.6	42.6
2001	17.5	13.6	27.4	41.5
2002	18.4	13.6	26.6	41.4
2003	18.0	14.0	25.5	42.6

Note: Each row sums to 100%.

There is little evidence of changes propensity to combine income support with paid employment. Note, however, that Table 13 gives equal weight to each individual who received income support in the relevant year. Since the proportion of persons with earned income who are on payments all year has increased, Table 13 does not rule out the possibility that, at any given point in time, the proportion of recipients with earnings has changed. For example, if earners generally have earnings in most fortnights they are on income support, then the compositional change towards longer-term recipients would act to increase the

¹⁸ For females, the compositional change towards longer-term receipt is most pronounced between 1995 and 1996, which may in part reflect the July 1995 Working Nation changes. These involved the introduction of Parenting Allowance and sequential income testing, and the relaxation of the income test for some payment types.

proportion of recipients with earnings at any one point in time. Indeed, Table 4 supports this scenario, showing the proportion with earnings at any one point in time increasing between 1995 and 2003 from 33% to 37% for males, and from 35% to 42% for females.

6.4 Reliance among population sub-groups

The extent of, and changes in, reliance as measured by our annual average TPI measure will in general differ across groups defined by demographic characteristics. While the econometric analysis by its nature is better able to investigate these differences, we provide preliminary descriptive information here on levels and movements of reliance, and reliance transitions, of recipients disaggregated by age, family type and payment type.

Age

Figure 6 displays annual average TPIs over the sample period for each of eight age groups. For both males and females, reliance among recipients is strongly ordered by age group, being lowest for 15-19 year olds and highest for 60-64 year olds. Changes between 1995 and 2003 are not uniform, however, decreasing for young recipients between 1997 and 2000 and tending to increase for most other recipients, particularly after 2000. Differences by age are more pronounced for males, as are the changes over the sample period.

Figure 6: Annual average TPI by age group

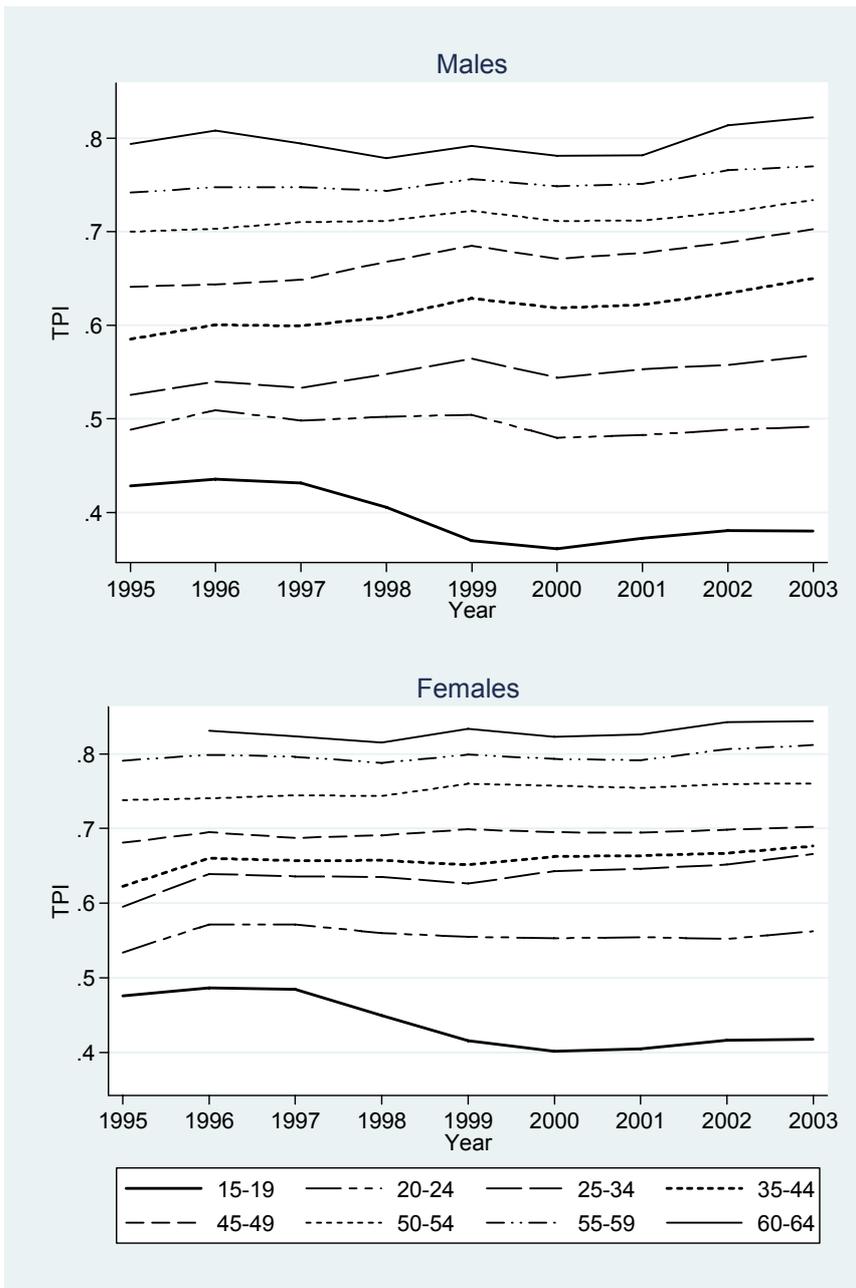


Table 14 considers TPI transitions over a three-year interval for each of three age groups: 15-24 years, 25-49 years and 50-64 years. Persons aged 50-64 years differ markedly from the other two age groups. Conditional on level of reliance in the base year, they are much more likely to move to, or remain at, a high level of reliance, and much less likely to move off payments altogether. While persons aged 25-49 years are more likely to move to or remain at high levels of reliance than 15-24 year olds, differences are generally slight. It is 50-64 year olds who stand out from the other age groups. For example, among those with a low level of reliance in the base year, 17% of males and 20% of females aged 50-64 years have a high

level of reliance three years later, compared with 7-8% of younger males, and 11% of younger females.

Table 14: TPI transitions by Age – Three-year interval

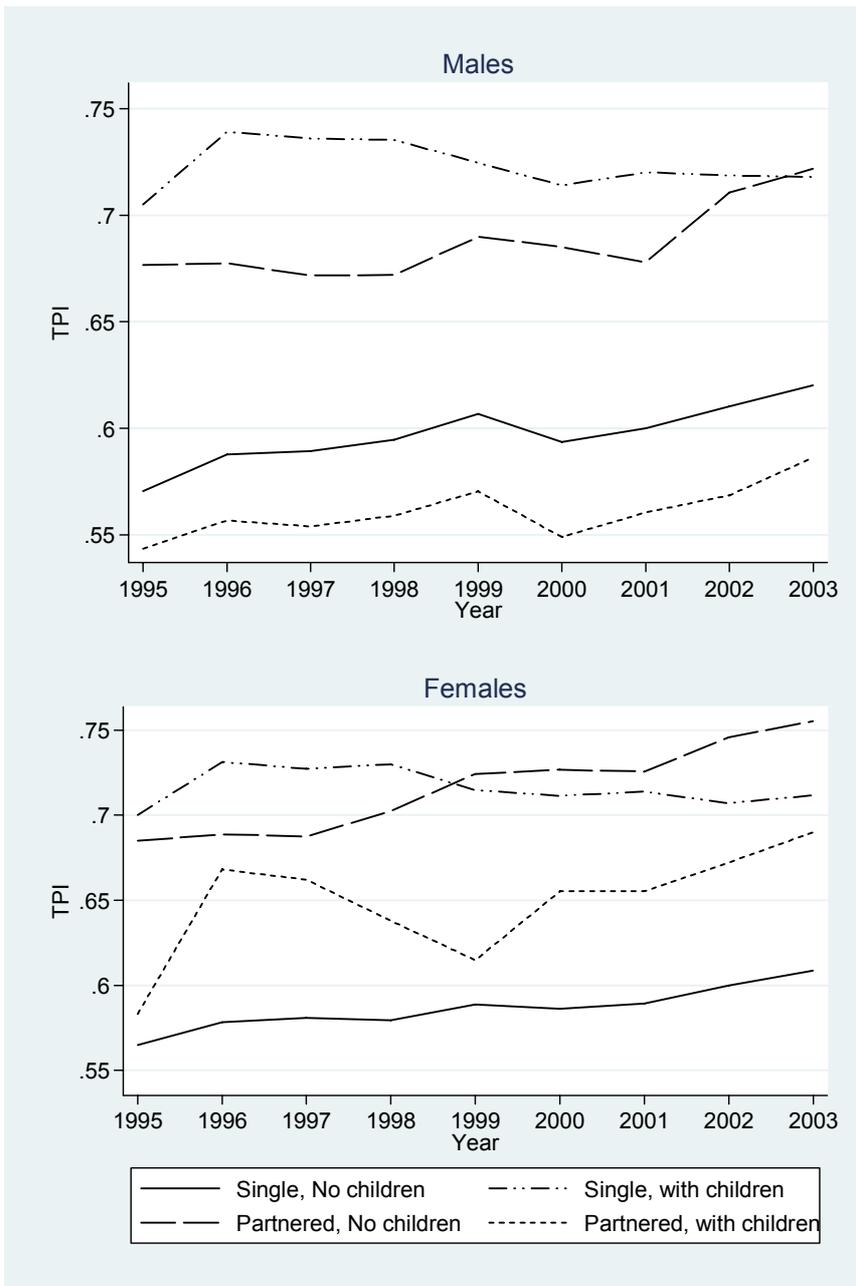
TPI Intensity (Base year)	TPI Intensity (Base year + 3)			
	Zero (TPI = 0)	Low (0 < TPI < 0.50)	Medium (0.50 ≤ TPI < 0.90)	High (0.90 ≤ TPI ≤ 1.0)
<i>Males, Aged 15-24</i>				
Low (0 < TPI < 0.50)	71.3	12.2	9.8	6.8
Medium (0.50 ≤ TPI < 0.90)	41.4	17.3	21.0	20.3
High (0.90 ≤ TPI ≤ 1.0)	19.3	12.9	20.7	47.1
<i>Males, Aged 25-49</i>				
Low (0 < TPI < 0.50)	71.5	12.2	8.2	8.1
Medium (0.50 ≤ TPI < 0.90)	39.1	14.8	21.7	24.5
High (0.90 ≤ TPI ≤ 1.0)	14.1	7.8	13.5	64.5
<i>Males, Aged 50-64</i>				
Low (0 < TPI < 0.50)	51.5	16.2	15.1	17.3
Medium (0.50 ≤ TPI < 0.90)	20.0	7.7	37.6	34.8
High (0.90 ≤ TPI ≤ 1.0)	7.2	2.9	10.2	79.8
<i>Females, Aged 15-24</i>				
Low (0 < TPI < 0.50)	69.8	10.9	8.3	11.0
Medium (0.50 ≤ TPI < 0.90)	35.9	15.2	18.1	30.8
High (0.90 ≤ TPI ≤ 1.0)	12.4	10.3	16.9	60.5
<i>Females, Aged 25-49</i>				
Low (0 < TPI < 0.50)	62.5	17.6	9.2	10.8
Medium (0.50 ≤ TPI < 0.90)	31.6	17.2	23.4	27.7
High (0.90 ≤ TPI ≤ 1.0)	11.4	8.4	14.2	66.0
<i>Females, Aged 50-64</i>				
Low (0 < TPI < 0.50)	44.1	19.0	17.3	19.6
Medium (0.50 ≤ TPI < 0.90)	14.5	7.3	41.4	36.9
High (0.90 ≤ TPI ≤ 1.0)	4.6	2.4	10.2	82.9

Note: Analysis is conditional on being on income support in the base year, where base year can be from 1995 to 2000.

Family type

Differences in reliance of recipients by family type are presented in Figure 7. There are substantial differences across family types, which are not altogether anticipated. For both males and females, reliance is higher among sole parents and partnered persons *without* children, substantially so for males. The family type with the lowest levels of reliance among recipients is ‘couple with children’ for males and ‘single’ for females. Aside from the finding for sole parents, the reasons for these differences by family type are not clear. It is likely that family type is strongly correlated with other characteristics of recipients, such as age, which could help explain the differences. The econometric analysis will therefore be much more informative on the association between family type and reliance.

Figure 7: Annual average TPI by family type



Three-year TPI transitions disaggregated by family type (Table 15) show differences in *movements* in reliance over time are consistent with differences in *levels* of reliance evident in Figure 7. In general, conditional on initial level of reliance, sole parents and partnered persons without children are the most likely to remain at or move to high levels of reliance, and the least likely to move off payments. As with levels of reliance, these differences may to some extent reflect differences in other characteristics.

Table 15: TPI transitions by Family Type – Three-year interval

TPI Intensity (Base year)	TPI Intensity (Base year + 3)			
	Zero (TPI = 0)	Low (0 < TPI < 0.50)	Medium (0.50 ≤ TPI < 0.90)	High (0.90 ≤ TPI ≤ 1.0)
<i>Males, Single with No Children</i>				
Low (0 < TPI < 0.50)	69.3	12.4	9.7	8.7
Medium (0.50 ≤ TPI < 0.90)	37.4	14.5	23.4	24.8
High (0.90 ≤ TPI ≤ 1.0)	13.0	7.1	13.1	66.9
<i>Males, Single with Children</i>				
Low (0 < TPI < 0.50)	55.7	18.4	11.7	14.3
Medium (0.50 ≤ TPI < 0.90)	27.9	16.6	25.2	30.2
High (0.90 ≤ TPI ≤ 1.0)	11.3	9.3	14.8	64.6
<i>Males, Partnered with No Children</i>				
Low (0 < TPI < 0.50)	60.9	14.8	12.3	12.0
Medium (0.50 ≤ TPI < 0.90)	23.2	9.5	36.2	31.1
High (0.90 ≤ TPI ≤ 1.0)	7.5	3.6	12.5	76.4
<i>Males, Partnered with Children</i>				
Low (0 < TPI < 0.50)	74.1	11.8	7.3	6.9
Medium (0.50 ≤ TPI < 0.90)	41.9	15.6	19.7	22.8
High (0.90 ≤ TPI ≤ 1.0)	16.1	8.8	14.5	60.6
<i>Females, Single with No Children</i>				
Low (0 < TPI < 0.50)	71.5	11.2	7.8	9.5
Medium (0.50 ≤ TPI < 0.90)	35.0	12.8	23.9	28.4
High (0.90 ≤ TPI ≤ 1.0)	9.2	5.2	10.9	74.7
<i>Females, Single with Children</i>				
Low (0 < TPI < 0.50)	47.5	27.8	12.1	12.6
Medium (0.50 ≤ TPI < 0.90)	22.1	21.8	26.1	29.9
High (0.90 ≤ TPI ≤ 1.0)	9.2	10.0	16.6	64.3
<i>Females, Partnered with No Children</i>				
Low (0 < TPI < 0.50)	53.7	16.3	13.3	16.7
Medium (0.50 ≤ TPI < 0.90)	21.7	9.9	33.8	34.6
High (0.90 ≤ TPI ≤ 1.0)	7.9	4.6	12.0	75.5
<i>Females, Partnered with Children</i>				
Low (0 < TPI < 0.50)	66.1	13.0	8.8	12.0
Medium (0.50 ≤ TPI < 0.90)	38.4	14.5	18.9	28.2
High (0.90 ≤ TPI ≤ 1.0)	14.8	8.6	14.5	62.2

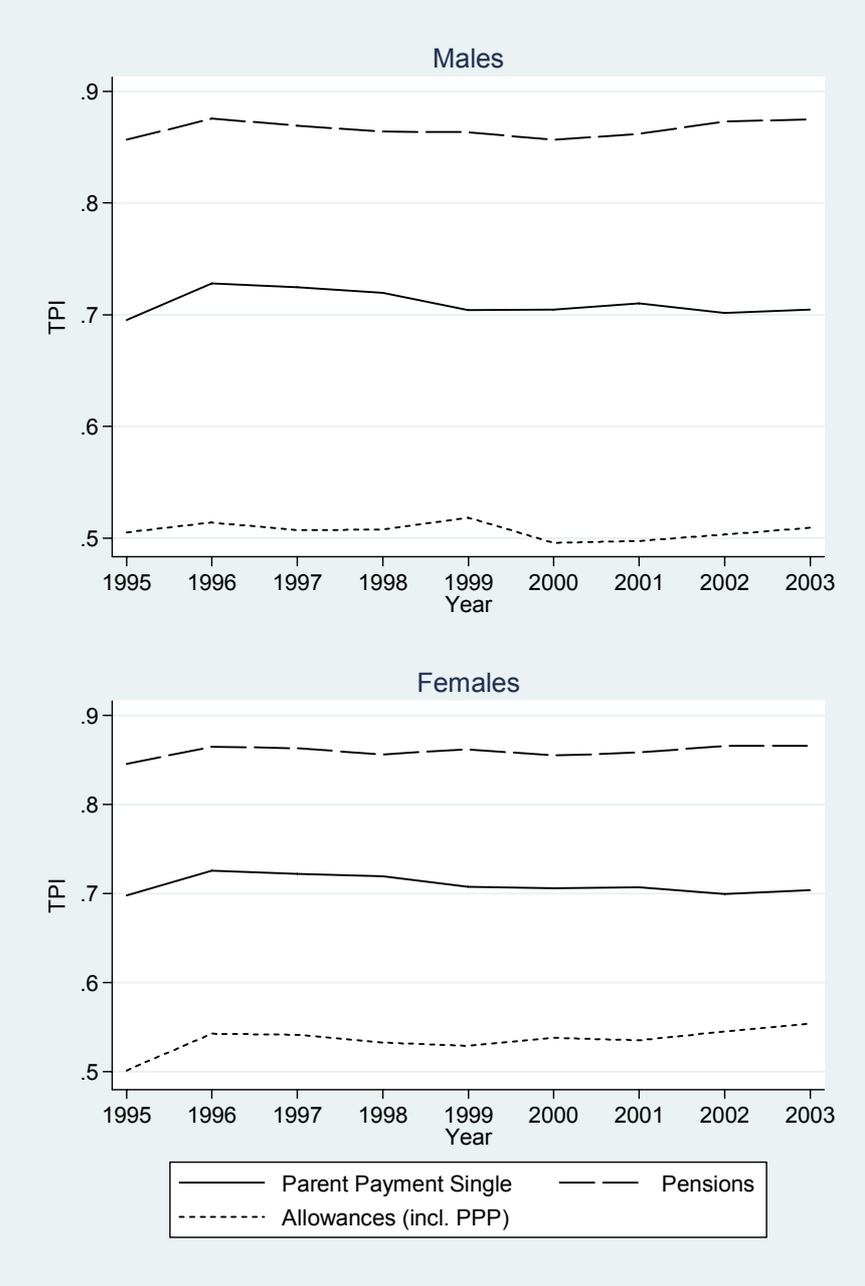
Note: Analysis is conditional on being on income support in the base year, where base year can be from 1995 to 2000.

Payment type

Figure 8 shows reliance among recipients broken down by three payment-type categories: PPS, other pensions and allowances. Unsurprisingly, allowance recipients have the lowest annual average TPIs, generally hovering around 50%. Also unsurprising is that pension recipients, most of whom are DSP recipients, have the highest average annual TPIs, which average in the mid-80s. PPS recipients are almost exactly midway between the other two groups of recipients. Somewhat remarkable is the relative stability of average annual TPIs of

the three payment-type groups over the 1995 to 2003 period. Changes over time are markedly greater in aggregate and when recipients are disaggregated by other characteristics, suggesting that much of the change in reliance identified in these cases has come via changes in the payment type compositions of the groups.

Figure 8: Annual average TPI by payment type



Note: Persons are classified by payment type at year end.

Table 16 presents three-year TPI transitions for each of the three payment-type categories. As with age and family type, differences in transitions follow the same pattern as differences in levels of reliance. Conditional on base-year reliance level, pension recipients are the least

likely to move off payments and are the most likely to remain at or move to a high level of reliance. At the other end of the spectrum are allowance recipients. Comparing males and females, patterns for PPS and pensions are very similar, but, given reliance level in the base year, female allowance recipients are somewhat more likely to move to or remain at a high level of reliance than male allowance recipients. For example, 50% of male allowance recipients with a high level of reliance in the base year have a high level of reliance three years later, compared with 59% of female allowance recipients with a high level of reliance in the base year.

Table 16: TPI transitions by Payment Type – Three-year interval

TPI Intensity (Base year)	TPI Intensity (Base year + 3)			
	Zero (TPI = 0)	Low (0 < TPI < 0.50)	Medium (0.50 ≤ TPI < 0.90)	High (0.90 ≤ TPI ≤ 1.0)
<i>Males, Allowances (including PPP)</i>				
Low (0 < TPI < 0.50)	71.3	11.7	9.0	8.1
Medium (0.50 ≤ TPI < 0.90)	41.3	15.4	20.1	23.2
High (0.90 ≤ TPI ≤ 1.0)	20.5	11.2	18.1	50.1
<i>Males, Parent Payment Single</i>				
Low (0 < TPI < 0.50)	56.0	18.3	11.5	14.2
Medium (0.50 ≤ TPI < 0.90)	28.1	17.4	24.4	30.1
High (0.90 ≤ TPI ≤ 1.0)	11.7	10.2	15.5	62.5
<i>Males, Other pensions</i>				
Low (0 < TPI < 0.50)	31.7	28.8	19.0	20.5
Medium (0.50 ≤ TPI < 0.90)	11.8	6.7	46.1	35.4
High (0.90 ≤ TPI ≤ 1.0)	5.2	2.6	8.8	83.3
<i>Females, Allowances (including PPP)</i>				
Low (0 < TPI < 0.50)	69.8	11.0	8.4	10.9
Medium (0.50 ≤ TPI < 0.90)	38.9	13.9	18.7	28.5
High (0.90 ≤ TPI ≤ 1.0)	16.8	9.4	15.3	58.6
<i>Females, Parent Payment Single</i>				
Low (0 < TPI < 0.50)	47.9	27.7	12.0	12.4
Medium (0.50 ≤ TPI < 0.90)	22.7	21.9	25.9	29.5
High (0.90 ≤ TPI ≤ 1.0)	9.4	10.3	17.0	63.4
<i>Females, Other pensions</i>				
Low (0 < TPI < 0.50)	28.3	33.1	18.4	20.3
Medium (0.50 ≤ TPI < 0.90)	9.2	7.6	47.4	35.9
High (0.90 ≤ TPI ≤ 1.0)	3.7	2.5	9.0	84.8

Note: Analysis is conditional on being on income support in the base year, where base year can be from 1995 to 2000.

Table 17 further examines reliance for payment-type groups by reproducing Table 13 for each of the three groups. The primary motivation is a suspicion that the observed changes in reliance patterns in terms of earnings while on payments and length of time on payments identified in Table 13 largely reflect changes to the payment type composition of recipients. As expected, within payment types, changes in this regard are generally much smaller than is evident in the aggregate.

Nonetheless, there are still some changes, with growth in the proportion combining income support with earnings evident, especially for male pension recipients.

Table 17a: Reliance types by payment type – Males (%)

	Earned income		No earned income	
	Not on payment all year	On payment all year	Not on payment all year	On payment all year
		<i>Parent Payment Single</i>		
1995	19.4	11.5	35.1	34.0
1996	16.9	15.1	27.6	40.4
1997	17.3	14.8	28.1	39.8
1998	16.3	16.1	25.6	42.0
1999	15.9	14.2	27.6	42.2
2000	14.6	13.4	28.5	43.5
2001	16.2	12.9	27.7	43.2
2002	18.7	12.4	28.1	40.8
2003	17.7	12.4	27.0	42.9
		<i>Other pensions</i>		
1995	1.8	6.4	17.3	74.5
1996	1.6	7.2	13.0	78.2
1997	1.8	7.9	12.0	78.3
1998	1.9	8.5	11.0	78.7
1999	2.1	8.4	12.3	77.3
2000	2.3	8.7	12.7	76.3
2001	2.6	9.5	12.7	75.3
2002	2.4	10.1	12.4	75.1
2003	2.5	10.6	11.9	75.1
		<i>Allowances</i>		
1995	33.2	4.8	52.1	9.9
1996	31.1	6.5	49.8	12.6
1997	28.8	8.9	45.5	16.9
1998	26.8	9.0	45.5	18.8
1999	27.5	8.2	47.0	17.3
2000	28.3	8.0	47.9	15.8
2001	29.7	8.2	47.1	15.1
2002	30.5	8.7	45.0	15.9
2003	30.5	8.0	45.1	16.5

Note: Persons are classified according to their payment type category at year end.

Table 17b: Reliance types by payment type – Females (%)

	Earned income		No earned income	
	Not on payment all year	On payment all year	Not on payment all year	On payment all year
		<i>Parent Payment</i>	<i>Single</i>	
1995	18.3	19.7	28.6	33.4
1996	16.1	23.8	20.9	39.2
1997	16.2	23.8	20.0	39.9
1998	15.4	25.0	17.8	41.9
1999	15.7	24.3	17.5	42.5
2000	15.0	24.7	16.5	43.7
2001	17.0	23.5	16.5	43.1
2002	19.4	22.7	17.5	40.5
2003	18.2	23.8	16.5	41.4
		<i>Other pensions</i>		
1995	3.2	11.2	14.0	71.7
1996	1.9	12.2	9.6	76.2
1997	2.4	12.3	9.8	75.6
1998	2.3	12.4	9.5	75.9
1999	2.4	12.0	9.8	75.7
2000	2.8	12.1	10.5	74.6
2001	3.1	12.4	11.1	73.4
2002	3.0	12.7	10.9	73.3
2003	3.0	13.0	11.0	73.1
		<i>Allowances</i>		
1995	27.6	3.3	57.4	11.8
1996	27.5	6.6	47.4	18.6
1997	26.1	8.4	44.1	21.5
1998	24.4	9.1	41.8	24.8
1999	24.3	8.3	42.9	24.5
2000	23.4	8.4	42.0	26.2
2001	25.1	8.4	41.9	24.6
2002	26.1	8.5	40.7	24.7
2003	26.5	8.3	39.6	25.7

Note: Persons are classified according to their payment type category at year end.

7. Econometric models of reliance

In this section we model a causal relationship between TPI and recipients' characteristics and macroeconomic conditions during the period 1995 to 2004. Specifically, we aim to investigate the following research questions:

- Are there any socio-demographic characteristics that significantly affect an individual's welfare reliance?
- Is reliance affected by duration on payments and the type of payment?
- Does welfare reliance react to macroeconomic conditions and policy changes?
- How does TPI evolve over time?

The panel structure of the administrative data set we use provides us with several advantages for these lines of inquiry. First, TPI behaviour can be modelled over time and across

individuals, simultaneously. For example, according to Table 3, in 1995, 72% of male welfare recipients collected unemployment benefit as the main benefit. Without data from other years, it would not be clear if this finding implies that on average 70% of male recipients collect unemployment benefits in every year or that this finding is specific to 1995.

Second, time invariant characteristics that are not observed in the data and that potentially affect TPI can be accounted for. A very important advantage of using panel data models is their ability to control for “unobserved heterogeneity” that reflects the combined effects of omitted (or unobserved) variables that vary across individuals but stay constant over time. These factors may be absent from the sample either because of data limitations (for example we do not observe the initial welfare status for the recipients who were on welfare before 1995) or simply because they are not amenable to measurement (e.g., abilities and preferences). As will be discussed shortly, the administrative data set gives us an opportunity to control for these unobserved characteristics.

A third advantage is that the time persistence of welfare reliance can be estimated, by virtue of the longitudinal information available for each individual. However, given the particular nature of the data and currently available econometric estimators, we find that we are limited in what we are able to estimate in this regard. Nonetheless, we do estimate models that consider this issue.

7.1 Econometric methodology

Our econometric strategy is to exploit the panel structure of the administrative data set while at the same time ensuring that the results are not driven by assumptions that are required by the particular estimation techniques we employ. We also pay particular attention to data-related shortcomings. In this section we discuss various models, the problems related to TPI estimation, and the solutions proposed by these models.

We model individual i 's TPI level in any six-monthly period t using following model:

$$TPI_{it} = \beta X_{it} + \eta_i + \varepsilon_{it} \quad (2)$$

where X_{it} represents characteristics of the individual, type of main benefit and duration on income support interacted with benefit type, the local unemployment rate and annual time dummy variables. ε_{it} is a normally distributed random error term, while η_i is an individual-specific effect that can be assumed to produce a fixed effects or a random effects model.

Fixed Effects Model

A fixed effects model may be represented by an equation of the form:

$$y_{it} = \beta X_{it} + \eta_i \alpha + \varepsilon_{it} \quad (3)$$

where y_{it} is an individual's TPI level in period t , ε_{it} is a random normally distributed error term, and η_i contains a constant term and a set of individual-specific dummy variables that capture individual fixed effects. The main advantage of fixed effects models is that unobserved effects do not need to be assumed uncorrelated with observed characteristics captured by X_{it} . For example, it can be argued that unobserved characteristics such as individual beliefs will be a major determinant of family structure, which in turn may affect welfare reliance. However, the relaxation of this assumption comes at a price – namely, we cannot include any observed time-constant characteristics (such as place of birth) in our analysis. Fixed effects estimation does not ignore the effect of time constant variables, since the estimate of β is conditional on time-invariant characteristics, but it does not produce estimates of their effects.

In practice, with a large data set containing many individuals, it is not computationally feasible to estimate the effect of each η_i . The usual approach, which we take, is to use the Least Squares Dummy Variable (LSDV) method, which eliminates all fixed effects from the model before the estimation of the parameters of interest β . This approach essentially ‘wipes out’ the η_i by transforming the model such that each variable represents the deviation from individual means, i.e.:

$$y_{it} - \bar{y}_i = \beta (X_{it} - \bar{X}_i) + \varepsilon_{it} - \bar{\varepsilon}_i \quad (4)$$

where \bar{X}_i represents the average time variant characteristics of an individual recipient:

$$\bar{X}_i = \frac{1}{T} \sum_{t=1}^T X_{it} \quad (5)$$

Ordinary least squares (OLS) regression of the transformed model produces the fixed effects estimates. On the assumption that unobserved individual effects do not vary over time, the

model identifies the effects of characteristics X on TPI, given an individual receives income support at some stage of the six-month interval.¹⁹

Random Effects Model

If we assume that unobserved individual-specific terms are distributed randomly across individual recipients, random effects models may be estimated. This assumption may be appropriate for our analysis, since the data set is a 10% sample drawn randomly from the entire population of Australian income support recipients.

The model can be represented as

$$y_{it} = \beta X_{it} + \eta_i + \varepsilon_{it} \quad (6)$$

In this model, individual-specific effect η_i and error term ε_{it} are assumed to follow Normal distributions with means zero and variances σ_η^2 and σ_ε^2 respectively.

Under the assumption of homoskedasticity, that is, constant variances σ_η^2 and σ_ε^2 , the model parameters β can be estimated by Generalised Least Squares (GLS). The GLS approach requires a two-step strategy, where in the first step consistent estimates of the variances are obtained by OLS estimation from pooled data. The second stage produces the estimated parameters.

In random effects models the marginal effects of time-invariant characteristics are separately identifiable. Therefore, unlike fixed effects models, we can quantify the effect of variables such as place of birth and make inferences about them. However, if the assumption of zero correlation between observed and unobserved traits is not correct, the random effects model produces biased estimates for both time-invariant *and* time-varying variables (Wooldridge, 2002).

7.2 Panel data model regression results

Table 18 reports coefficient estimates from random effects panel models. Causal effects can be attributed to the explanatory variables if the assumptions of the random effects model hold. The dependent variable is six-monthly average fortnightly TPI and explanatory variables are included for age, place of birth, state, housing situation, partner status, dependent children,

¹⁹ See Chapter 10 of Wooldridge (2002) for further details on panel models and the conditions under which valid estimates of the effects of the observed explanatory variables are obtained.

local labour market conditions, payment type, duration on income support and year. All time-varying variables are evaluated at commencement of the six-month interval.

The year dummies capture the combined effects of macroeconomic conditions and policy changes. Interactions between a ‘post-July 2000’ dummy and variables for payment type, partner status, dependent children status and private rent status are also included to allow for differences in time effects across recipients. In principle, each year dummy could be interacted with the other variables, but this would produce an excessive number of parameter estimates that would be difficult to interpret. The pre- and post-July 2000 distinction was chosen because it is approximately the midpoint of the sample period and also coincides with the July 2000 tax and welfare reforms, which are the most substantial policy changes in the sample period that are likely to have (identifiably) impacted on income support reliance. The specific variables chosen for the interactions are those thought most likely to capture any differences in effects across recipient types (based on the nature of the changes, as documented in Section 3).²⁰

The duration on income support variable provides a measure of persistence effects. In addition to the baseline model, a specification is reported that interacts duration on income support with payment type variables, allowing effects to differ across five payment type categories: unemployment benefits, other allowances, DSP, other pensions and PPS.

For males, consistent with Figure 6, the coefficients on the age category variables suggest an almost linear relationship between six-monthly TPI level and age. After controlling for other characteristics, the youngest male recipients have the lowest reliance, while the oldest recipients have the highest reliance.²¹ However, effects are smaller than implied by Figure 6. For example, Figure 6 showed males aged 60-64 years with TPI levels approximately 40 percentage points higher than males aged 15-19 years. By contrast, the estimates in Table 15 imply that, all else equal, the difference between these two age groups is approximately 20 percentage points. For females, recipients aged 15-44 years have very similar TPI levels, all else equal. It is only as age increases beyond the 35-44 years age range that a positive association with reliance is evident for females. Differences in female reliance by age over the 15-44 years age-range evident in Figure 6 therefore reflect differences in characteristics other than age, rather than age effects per se.

²⁰ Other potentially important welfare policy changes for which differences in effects across individuals are not investigated occurred in July 1995, March 1997 and September 2003. The July 1995 changes are likely to have been particularly important, but occur too early in the sample period for their effects to be credibly identified.

²¹ Note that the omitted (base) category is persons aged 35-44 years.

Table 18: Panel data random effects models

	Males (I)		Males (II)		Females (I)		Females (II)	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
<i>Age (35-44 omitted)</i>								
15-19	-7.159	0.110	-7.093	0.110	0.113 [#]	0.111	0.177 [#]	0.111
20-24	-3.432	0.092	-3.282	0.091	0.556	0.088	0.657	0.087
25-34	-2.562	0.074	-2.458	0.073	-0.314	0.064	-0.233	0.064
45-49	2.471	0.085	2.342	0.085	2.984	0.077	2.925	0.077
50-54	5.473	0.101	5.208	0.101	6.903	0.096	6.774	0.096
55-59	7.752	0.109	7.317	0.109	10.776	0.111	10.593	0.111
60-64	12.636	0.118	12.118	0.117	13.728	0.166	13.477	0.166
<i>Place of birth/Indigenous status (Other Aus-born omitted)</i>								
Indigenous	6.232	0.201	6.245	0.199	11.333	0.222	11.303	0.220
Foreign-born (ESB)	-0.857	0.130	-0.742	0.128	-0.485	0.145	-0.437	0.144
Foreign-born (NESB)	4.501	0.101	4.501	0.100	7.579	0.108	7.563	0.107
Major city	-1.400	0.063	-1.378	0.062	-1.171	0.063	-1.165	0.063
<i>State (NSW omitted)</i>								
ACT	-0.461	0.257	-0.469 [#]	0.255	-3.239	0.259	-3.262	0.258
Victoria	-0.573	0.088	-0.563	0.088	-0.657	0.092	-0.663	0.091
Queensland	-2.401	0.087	-2.352	0.086	-2.075	0.090	-2.061	0.090
South Australia	0.072 [#]	0.125	0.040 [#]	0.124	-0.503	0.133	-0.534	0.132
Western Australia	-3.305	0.120	-3.247	0.119	-2.787	0.127	-2.754	0.126
Tasmania	1.107	0.190	1.059	0.188	0.003 [#]	0.200	-0.031 [#]	0.199
Northern Territory	-4.130	0.253	-4.046	0.251	-5.114	0.273	-5.086	0.273
<i>Residence (Government rent omitted)</i>								
Home owner	-6.736	0.105	-6.652	0.104	-7.993	0.088	-8.039	0.087
Private rent	-2.203	0.104	-2.158	0.104	-3.739	0.084	-3.795	0.084
Other living	-6.917	0.113	-6.835	0.113	-9.294	0.095	-9.325	0.095
<i>Partner (single omitted)</i>								
Partner not on IS	-14.210	0.134	-14.351	0.134	-7.458	0.113	-7.509	0.113
Partner on IS	-2.377	0.092	-2.336	0.091	1.049	0.094	1.092	0.094
<i>Dependent children (No children omitted)</i>								
Youngest child less than 5	1.438	0.144	1.429	0.144	4.057	0.116	4.015	0.116
Youngest child 5-15	1.151	0.142	1.121	0.141	2.778	0.116	2.734	0.116
Youngest child 15 or older	-0.347 ⁺	0.197	-0.370 [#]	0.197	-2.605	0.153	-2.651	0.153
Number of children	0.519	0.048	0.504	0.048	1.659	0.034	1.631	0.034
<i>Benefit type (UB with high search req's omitted)</i>								
UB with low search req's	7.353	0.073	6.955	0.074	8.505	0.105	8.174	0.107
UB with no search req's	10.786	0.087	10.595	0.087	13.218	0.108	13.092	0.108
Other allowances	6.464	0.158	6.264	0.159	10.111	0.110	10.081	0.110
DSP	22.581	0.084	24.328	0.087	26.393	0.112	27.685	0.116
Other pensions	17.004	0.267	17.789	0.273	19.860	0.127	20.494	0.130
PPS	10.063	0.215	10.319	0.219	13.864	0.116	14.378	0.117
Duration on IS (months)	0.191	0.001			0.165	0.001		
UB x IS duration			0.246	0.001			0.212	0.002
Other allow. x IS duration			0.332	0.006			0.227	0.002
DSP x IS duration			0.081	0.002			0.091	0.002
Other pensions x IS duration			0.157	0.007			0.134	0.003
PPS x IS duration			0.214	0.006			0.140	0.002
Local unemployment rate	0.533	0.011	0.534	0.011	0.445	0.010	0.447	0.010
2 nd half of year	0.334	0.035	0.328	0.035	-0.119	0.032	-0.123	0.032
1996	0.183	0.069	0.098 [#]	0.069	1.490	0.064	1.461	0.064
1997	-1.659	0.070	-1.842	0.070	0.277	0.065	0.187	0.065
1998	-2.624	0.072	-2.864	0.072	-1.374	0.066	-1.505	0.066
1999	-2.199	0.075	-2.434	0.075	-2.119	0.069	-2.269	0.069
2000	-3.673	0.094	-3.899	0.094	-3.008	0.086	-3.166	0.086
2001	-3.496	0.129	-3.741	0.129	-4.126	0.117	-4.299	0.117
2002	-4.009	0.132	-4.183	0.132	-4.964	0.120	-5.113	0.120
2003	-3.837	0.134	-3.824	0.134	-5.082	0.123	-5.172	0.123
2004	-3.838	0.151	-3.732	0.151	-4.840	0.138	-4.897	0.138

Table 18 continued: Panel data random effects models

	Males (I)		Males (II)		Females (I)		Females (II)	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Post July 2000	-1.583	0.120	-2.198	0.120	-1.208	0.119	-1.696	0.121
Post July 2000 x private rent	-0.897	0.076	-0.887	0.076	-0.453	0.068	-0.412	0.068
Post July 2000 x dep. child	-2.455	0.122	-2.445	0.122	-4.103	0.119	-4.038	0.119
Post July 2000 x partner not on IS	3.518	0.183	3.848	0.183	5.708	0.150	5.740	0.150
Post July 2000 x partner on IS	0.785	0.102	0.663	0.101	0.551	0.113	0.569	0.113
Post July 2000 x other allowances	1.423	0.208	0.488 ⁺	0.218	5.662	0.147	5.040	0.153
Post July 2000 x DSP	0.108 [#]	0.083	2.301	0.089	1.243	0.111	2.709	0.117
Post July 2000 x other pensions	0.794	0.298	2.083	0.328	2.605	0.139	3.456	0.147
Post July 2000 x PPS	2.392	0.265	2.565	0.285	3.301	0.149	4.228	0.154
Constant	57.006	0.183	56.835	0.182	51.028	0.173	50.903	0.172
R-squared								
within		0.036		0.036		0.044		0.044
between		0.383		0.391		0.359		0.364
overall		0.221		0.230		0.179		0.183
Number of observations			2,335,043				2,673,385	
Number of individuals			319,971				319,731	

Notes: ⁺ indicates coefficient statistically significant at 5% level; [#] indicates coefficient not statistically significant at 5% level. All other coefficients are statistically significant at 1% level. ‘R squared within’ is the proportion of the within-individual variation in TPI ‘explained’ by within-individual variation in the independent variables. ‘R squared between’ is the proportion of the across-individual variation in TPI ‘explained’ by across-individual variation in the independent variables. ‘R squared overall’ is the proportion of all variation in TPI ‘explained’ by the variation in the independent variables across and within individuals.

Australian-born persons with a non-indigenous background have a better TPI profile than all other groups except foreign-born persons from the main English-speaking countries. All else equal indigenous persons have the highest reliance conditional on going on to income support, with this demographic characteristic acting to increase our TPI measure by 6 percentage points for males, and by 11 percentage points for females, compared with other native-born persons.

With regard to location of residence, our results suggest that, compared to people with otherwise identical socio-demographic characteristics, both males and females have smaller reliance levels if they live in one of the major cities. There are also significant differences in reliance across the states and territories, with the Northern Territory, Western Australia and Queensland associated with lower levels of reliance than other states and the ACT.

In terms of living arrangements, people who rent public housing are clearly in a disadvantaged position compared to people who live in other types of dwellings. Owning one’s own home is associated with lower TPI levels than renting, whether this be public housing or private sector accommodation. The effect of owning one’s home compared with renting is similar to the effect of having no rent or board to pay, which might suggest that disincentive effects of government rent subsidies – whether in public housing or in the private rental market – play a role in affecting welfare reliance. However, this is not necessarily the

case for renters in the private sector. At least part of the negative effect of private renting is likely to be due to rent assistance, which will increase income support payments for those not in receipt of FTB, and therefore act to increase six-monthly TPI relative to other income support recipients.

Family status would be expected to affect welfare reliance because of the effects of the structures of the welfare and income tax systems on the ‘optimal solution’ to the labour supply-welfare take-up decision and because of the effects of family status on preferences, for example deriving from the existence of caring responsibilities. However, family status may also be correlated with unobserved beliefs, as well as other unobserved characteristics of individuals, which may confound causal inferences. A further problem for this study is that modelling the effects of family status on welfare reliance is more appropriately considered in a model of *family* reliance on income support. However, as noted earlier, this is not viable with the data available. We therefore proceed to consider family status effects on individual reliance, but exercise caution in the inferences we feel able to make.

Variables capturing the effects of family status comprise those for partner status and dependent children, and also the PPS payment type dummy, which essentially allows for the effects of dependent children to differ by partner status. Considering first the effects of partner status, having a partner decreases reliance if that partner is not also on income support, by 14 percentage points for males and by 7.5 percentage points for females, compared with being single. Having a partner who is on income support substantially reduces this effect for males, and actually reverses it for females, for whom having a partner on income support increases reliance by 1 percentage point compared with being single. The differences by partner income support status are not surprising given welfare eligibility criteria and the family-level nature of decisions about welfare take-up and labour supply. Nonetheless, we can infer for males that partnering reduces welfare reliance, since all partner coefficient estimates are negative. For females, the effect of partnering is ambiguous.

The effects of dependent children depend on both the age of the youngest child and the number of children. For both males and females, reliance is increasing in the number of dependent children and decreasing in the age of the youngest child. However, the magnitudes of the effects are greater for females. For example, each dependent child beyond the first acts to increase the female predicted TPI by 1.6 percentage points, and to increase the male predicted TPI by 0.5 percentage points. These effects are consistent with increases in both care requirements and the generosity of the pension and PPS income test as the number of

children increases. Also consistent with inferred care requirements of dependent children is that reliance is decreasing in the age of the youngest child. Significantly, a youngest child over 15 years of age actually acts to decrease reliance, to some extent offsetting the reliance-increasing effects deriving from the ‘number of dependent children’ variable. Indeed, for females, the magnitude of the effect is such that a female with only one dependent child will, all else equal, be less reliant than a female without dependent children. This reliance-lowering effect associated with the youngest child being over 15 years of age may in part reflect loss of eligibility for PPS for sole parents once the youngest child reaches 16 years of age, precipitating a move to a lower-level payment (allowance) or, indeed, a movement off income support altogether.²²

The average aggregate effect of dependent children for single persons – or, equivalently, the effect of being single for a person who is the primary carer of dependent children – is captured by the PPS coefficient. As expected, being on PPS has a large positive effect on reliance, acting to increase TPI by 10 percentage points for males and by approximately 14 percentage points for females compared with being on unemployment benefits (and being required to search for employment).

The payment type variables other than PPS are also informative as to the circumstances of the individual. The omitted category for these variables is an unemployment benefit recipient required to engage in active job search. Two other categories of unemployment benefit recipient are distinguished: those with low or no job search requirements because of reasons such as study, training or part-time work; and those with no job search requirements because of work incapacity, most usually resulting from illness. Dummy variables are also included for those on DSP, those on other pensions, and those on allowances other than unemployment benefits, the last two of which apply more commonly to females than males. For example, other allowances include Parenting Payment Partnered and other pensions include Carer Payment, both of which are female-dominated.

While some caution is warranted in making inferences on the characteristics of individuals based on their payment type, and therefore attributing causal effects of these inferred characteristics on reliance, attempting to do so is nonetheless likely to contribute to our understanding of the determinants of reliance. As mentioned, PPS largely reflects the effects of being both single and with dependent children. DSP may be interpreted as capturing the

²² Recall, however, that all inferences are conditional on receipt of income support at some stage in the six-month interval over which TPI is evaluated.

effects of disability that precludes full-time employment (to be precise, 30 hours or more per week at award wages), on the assumption that programme administrators' assessments of work capacity are generally accurate. Being on unemployment benefits with no search requirements may be interpreted as capturing the effects of (temporarily) poor health, while being on unemployment benefits with low search requirements may reflect longer-term difficulties in the labour market that are unrelated to health. Other payment-type categories are less informative, but we would generally expect pension recipients to have higher reliance than allowance recipients.

As we might expect, individuals with the strongest attachment to labour force – by virtue of being on unemployment benefits and required to engage in active job search – have the lowest reliance. Similarly, DSP receipt is associated with the highest levels of reliance, which is consistent with the fact that recipients have essentially been assessed by programme administrators to be incapable of being non-reliant for at least two years. Reliance is also ordered for unemployment benefit recipients by level of activity-test requirements. Those in the 'low search requirements' category have predicted TPIs 7-8 percentage points higher than those in the 'high search requirements' category, while those in the 'no search requirements' category have predicted TPIs 11-13 percentage points higher.

Persistence effects of reliance are to some extent captured by the inclusion of a variable for (continuous) duration on income support, which is a data item supplied in the administrative data set. Estimated coefficients imply that increased duration on income support (evaluated at the time of commencement of the six-month interval) is associated with increasing TPI levels, with each month on income support associated with a 0.2 percentage point increase in TPI. Interactions between duration and payment type (the second specification) show that this duration dependence holds for all payment types, but it is strongest for allowances and weakest for DSP. The implication is that greater duration on welfare is of itself a contributor to welfare reliance and that this 'path dependence' is more important for allowance recipients than DSP recipients. However, inferences in this regard are particularly susceptible to effects of unobserved characteristics, which may be driving both duration on income support and current reliance.

Local labour market conditions faced by the individual are proxied by the unemployment rate in the ABS labour force statistical region in which the individual resides. There are 63 of these regions in Australia, and the variable may also capture 'neighbourhood' effects to the extent that it is correlated with other characteristics of the region. The coefficient estimates

imply that, holding all else constant, each percentage point increase in the local unemployment rate increases the TPI within the first six months of the increase by approximately 0.5 percentage points. While this is quantitatively quite small, it is statistically significant and potentially valuable information for policy-makers.²³

Dummy variables for year effects imply an almost monotonic decrease in reliance from 1995 to 2002, with this decrease then maintained in 2003 and 2004. Holding all else constant (and taking into account the post-July 2000 dummy coefficient estimate), being on income support in 2004 decreases the TPI by approximately 6 percentage points compared with being on income support in 1995.²⁴ This is consistent with tightening of eligibility criteria over the period and, for pensions and PPS, the increased capacity to combine income support receipt with earnings. The absence of the appearance of this trend in the descriptive analysis (for example, Table 5) is because the composition of recipients has changed over the sample period, which the econometric analysis is able to control for.

The ‘post-July 2000’ dummy can be interpreted as capturing the average effects of the July 2000 reforms, although it will also reflect average differences between the pre- and post-July 2000 periods in other factors impacting on six-monthly TPI of recipients. If we interpret it as capturing policy-change effects, the coefficient estimate implies that the policy changes on their own acted to decrease the TPI of persons in the ‘default’ category – single, on unemployment benefits, and not renting in the private market – by 1-2 percentage points. It should perhaps be noted that, unlike most other income support recipients, this group did not benefit from increased payment rates or income test liberalisation as part of the July 2000 welfare reforms. This implies that the decrease in reliance derives from changes to income tax rates and/or effects of other factors.

Effects associated with the post-July 2000 period are not uniformly positive (i.e., of a reliance-reducing nature). Interaction term coefficient estimates imply that the post-July 2000 effect is, all else equal, weaker for payment types other than unemployment benefits. Indeed, the post-July 2000 period is associated with an increase in reliance for PPS recipients and female recipients of ‘other pensions’ and ‘other allowances’. The post-July 2000 period is also associated with significantly greater reliance among recipients with a partner not on income support, even if the individual is on unemployment benefits. These effects might

²³ On the basis that the local unemployment rate may not immediately alter welfare status, we experimented with past values of the local unemployment rate, but none of these variables was significant.

²⁴ Because of the inclusion of interactions between the post-July 2000 dummy with other variables, these effects in fact refer to a single person on unemployment benefits who does not rent in the private market.

reflect reductions in taper rates (which would tend to increase reliance among pension and PPS recipients in the absence of behavioural responses) and changes to partner income tests (which could perhaps explain both the ‘partner not on income support’ effect and the divergence, for females, between unemployment benefits and other allowances, the latter of which include Parenting Payment Partnered).

Also evident from the interaction terms is that private renting and dependent children are associated with reductions in reliance in the post-July 2000 period. These might to some extent reflect changes with respect to family payments. For example, it may be that there was an increase in the proportion of income support recipients receiving more than the minimum rate of FTB, and thereby receiving rent assistance as a non-income support payment rather than as part of an income support payment. The decrease in income support payments associated with such a re-labelling of rent assistance would then decrease measured reliance of some renters with dependent children.²⁵

Table 19 reports results from fixed effects models of six-monthly average fortnightly TPI. Note that, since fixed effects models do not include time-constant variables, the estimates can be treated as the marginal effect of an immediate change in the socio-demographic characteristics.²⁶ The fixed effects estimates generally agree with the random effect estimates, implying that our results are generally robust to the assumption of no correlation between unobserved effects and the characteristics we have included in our model. However, coefficient estimates are in general quantitatively smaller than obtained from the random effects models, implying a tendency of the random effects models to overstate the magnitude of effects. There are, nonetheless, some coefficient estimates that are larger in magnitude: beneficial effects of residing in a major city are greater, effects associated with dependent children are greater in magnitude, and the post-July 2000 interaction effects are stronger for the private renting and dependent children variables.

There are also differences between the random effects and fixed effects specifications in the signs of some coefficient estimates. In particular, all of the age-of-youngest-child variables

²⁵ Note that the interaction term estimates imply that, in the post-July 2000 period, the coefficients on the (uninteracted) variables ‘private rent’ and the dependent children variables are smaller (or more negative) than reported in the table; while the estimates for partner status and payment types other than unemployment benefits are larger (or more positive).

²⁶ Recall that the fixed effects models in fact identify the effects of time-varying characteristics via within-individual changes in characteristics. Although age is time-varying, the use of age categories mean that the variables are only time-varying in a limited way, and are furthermore highly collinear with the variables included for time (year, half of year and post-July 2000 dummies). We therefore exclude the age dummies from the fixed effects specification.

have significant positive coefficient estimates for males in the fixed effects models, whereas in the random effects specification the estimate for the ‘youngest aged 15 or older’ was negative. Additionally, for females, partnering with a male who is an income support recipient is shown to slightly decrease the individual’s TPI. The significant increase in TPI deriving from such partnering found by the random effects model is, therefore, spurious.

Table 19: Panel data fixed effects models

	Males (I)		Males (II)		Females (I)		Females (II)	
	Coef.	Std. Err.						
Major city	-1.888	0.089	-1.887	0.089	-1.394	0.084	-1.395	0.084
<i>State (NSW omitted)</i>								
ACT	1.265	0.383	1.256	0.383	-1.482	0.371	-1.503	0.371
Victoria	0.026 [#]	0.179	0.017 [#]	0.179	-0.111 [#]	0.177	-0.123 [#]	0.177
Queensland	-0.793	0.146	-0.795	0.146	-0.265 [#]	0.142	-0.279 [#]	0.142
South Australia	0.911	0.249	0.914	0.249	1.108	0.253	1.100	0.253
Western Australia	-2.160	0.247	-2.162	0.247	-2.064	0.251	-2.067	0.251
Tasmania	1.802	0.349	1.785	0.349	1.440	0.338	1.417	0.338
Northern Territory	-3.786	0.353	-3.786	0.353	-5.279	0.367	-5.307	0.367
<i>Residence (Government rent omitted)</i>								
Home owner	-1.989	0.122	-1.983	0.122	-3.273	0.101	-3.324	0.101
Private rent	0.994	0.116	0.988	0.116	-0.799	0.091	-0.850	0.091
Other living	-1.768	0.128	-1.768	0.128	-4.349	0.106	-4.393	0.106
<i>Partner (single omitted)</i>								
Partner not on IS	-10.076	0.155	-10.129	0.155	-7.449	0.124	-7.441	0.124
Partner on IS	-1.278	0.115	-1.252	0.115	-0.408	0.107	-0.393	0.107
<i>Dependent children (No children omitted)</i>								
Youngest child less than 5	3.476	0.162	3.479	0.162	6.318	0.125	6.333	0.125
Youngest child 5-15	3.147	0.160	3.128	0.160	5.536	0.126	5.528	0.126
Youngest child 15 or older	1.391	0.209	1.364	0.208	-0.433	0.159	-0.468	0.159
Number of children	0.333	0.056	0.324	0.056	1.310	0.038	1.304	0.038
<i>Benefit type (UB with high search req's omitted)</i>								
UB with low search req's	4.545	0.074	4.480	0.074	5.594	0.107	5.508	0.108
UB with no search req's	8.206	0.091	8.181	0.091	10.626	0.113	10.602	0.113
Other allowances	3.828	0.182	3.516	0.183	7.312	0.119	7.204	0.120
DSP	15.419	0.109	16.045	0.117	18.068	0.133	18.353	0.140
Other pensions	13.578	0.297	14.010	0.307	13.065	0.151	12.828	0.156
PPS	7.658	0.236	7.794	0.241	10.251	0.127	10.583	0.128
Duration on IS (months)	0.144	0.001			0.142	0.001		
UB x IS duration			0.154	0.002			0.154	0.002
Other allow. x IS duration			0.247	0.006			0.174	0.002
DSP x IS duration			0.117	0.002			0.129	0.003
Other pensions x IS duration			0.115	0.008			0.170	0.004
PPS x IS duration			0.145	0.006			0.111	0.002
Local unemployment rate	0.414	0.013	0.415	0.013	0.290	0.012	0.290	0.012
2 nd half of year	0.492	0.035	0.488	0.035	-0.113	0.032	-0.115	0.032
1996	0.415	0.069	0.384	0.070	1.415	0.064	1.406	0.064
1997	-0.836	0.071	-0.900	0.071	0.491	0.066	0.461	0.066
1998	-1.272	0.073	-1.356	0.074	-0.982	0.067	-1.025	0.067
1999	-0.002 [#]	0.078	-0.093 [#]	0.078	-1.400	0.070	-1.448	0.071
2000	-0.869	0.097	-0.966	0.097	-2.024	0.087	-2.074	0.087
2001	0.163 [#]	0.131	0.056 [#]	0.131	-2.607	0.117	-2.668	0.117
2002	0.209 [#]	0.134	0.112 [#]	0.134	-3.017	0.121	-3.073	0.121
2003	0.818	0.137	0.758	0.137	-2.830	0.124	-2.868	0.124
2004	1.687	0.156	1.640	0.156	-1.964	0.140	-1.996	0.140

Table 19 continued: Panel data fixed effects models

	Males (I)		Males (II)		Females (I)		Females (II)	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Post July 2000	-0.888	0.121	-0.975	0.122	0.057 [#]	0.122	-0.096 [#]	0.124
Post July 2000 x private rent	-1.701	0.080	-1.704	0.080	-0.983	0.070	-0.951	0.070
Post July 2000 x dep. child	-4.517	0.127	-4.526	0.127	-6.220	0.119	-6.187	0.119
Post July 2000 x partner not on IS	4.198	0.198	4.278	0.198	5.431	0.156	5.434	0.156
Post July 2000 x partner on IS	1.748	0.106	1.672	0.106	0.820	0.116	0.879	0.117
Post July 2000 x other allowance	-0.116 [#]	0.226	-1.270	0.239	5.144	0.152	4.623	0.160
Post July 2000 x DSP	0.006 [#]	0.086	0.475	0.092	1.940	0.115	2.231	0.122
Post July 2000 x other pensions	0.988	0.307	1.700	0.342	3.745	0.144	3.586	0.152
Post July 2000 PPS	3.642	0.273	3.727	0.296	3.352	0.153	4.043	0.159
Constant	62.343	0.209	62.241	0.209	61.635	0.191	61.629	0.191
R-squared								
within	0.038		0.038		0.045		0.046	
between	0.338		0.341		0.287		0.288	
overall	0.197		0.202		0.133		0.134	
Number of observations		2,335,043				2,673,385		
Number of individuals		319,971				319,731		

Notes: ⁺ indicates coefficient statistically significant at 5% level; [#] indicates coefficient not statistically significant at 5% level. All other coefficients are statistically significant at 1% level. ‘R squared within’ is the proportion of the within-individual variation in TPI ‘explained’ by within-individual variation in the independent variables. ‘R squared between’ is the proportion of the across-individual variation in TPI ‘explained’ by across-individual variation in the independent variables. ‘R squared overall’ is the proportion of all variation in TPI ‘explained’ by the variation in the independent variables across and within individuals.

7.3 Dynamic models

The static models that have been discussed so far are built on the assumption that unexpected socio-economic shocks do not have persistent effects on an individual’s welfare reliance. However, it can be argued that factors such as policy changes may alter economic conditions beyond the current period and hence may have prolonged effects on TPI. Dynamic panel data models can potentially answer questions regarding the persistence of TPI behaviour over time. They involve estimation of models of the form:

$$y_{it} = \gamma y_{it-1} + x'_{it}\beta + \eta'_i\alpha + \varepsilon_{it} \quad (7)$$

The lagged dependent variable y_{it-1} captures persistence effects. Its inclusion also has benefits with respect to inferences on the effects of contemporaneous variables. Since, with y_{it-1} included, TPI in previous periods is thereby included in the ‘information set’ of the model, all the factors that potentially impact on an individual’s TPI level up until $t-1$ are controlled for, whether or not the information is actually observed in the data. Since many of the factors impacting on TPI will be time-invariant, or will be highly serially correlated, this inspires greater confidence in estimated impacts of the characteristics observed in the data.

The most common estimation technique for dynamic panel data estimation is Generalised Method of Moments (GMM) estimation introduced by Arellano and Bond (1991).

Unfortunately, estimation of these models is computationally intensive. In work undertaken, we have been unable to estimate models of this form because of their excessive computational requirements, despite attempting a variety of specifications and limiting estimation to subsamples. This has consequently limited the extent to which persistence has been investigated in this study. We have also, therefore, not been able to investigate the robustness of our findings reported in Section 7.2 to controlling for persistence.

7.4 Binary models: Complete reliance versus other levels of reliance

In Section 6.3, Table 13 showed that in any given year, between 25% and 42% of recipients did not have any private income throughout the year and were on payments the entire year. It is also our observation that this group of recipients exhibits strong persistence in this behaviour throughout the sample period. From a policy perspective, it may be beneficial to explicitly investigate the socio-economic characteristics that we observe in our data that are associated with a six-monthly TPI equal to one. In addition, one can argue that long-term recipients who consistently have no private earnings may be fundamentally different to intermittent recipients and recipients who combine private earnings with their welfare income, and therefore that they should be separately analysed. From an econometric modelling standpoint, this issue can be positioned as a concern that there may be non-linearities or discontinuities in the effects of covariates on reliance in the move from a TPI less than one to a TPI equal to one. For all these reasons, in this section we attempt to identify the characteristics associated with complete reliance by modelling the probability individual i has a TPI equal to one in six-month period t :

$$\Pr(TPI_{it} = 1 | TPI_{it} > 0) = X_{it}\beta + \varepsilon_{it} \quad (8)$$

which we estimate via Probit regression under the assumption that ε_{it} is normally distributed. Note that this is a model conditional on TPI exceeding zero.

Table 20 reports marginal effects of explanatory variables on the probability TPI is equal to one, evaluated at mean values of the explanatory variables. A number of the results are in fact consistent with the findings from the continuous TPI models, but there are also a number of notable findings that would not be predicted from the continuous models. First, marginal effects for the age variables imply males in the age range 50-54 years and females in the 15-24 years age range are, all else equal, the most likely to be in the complete reliance (TPI = 1) category. The models estimated in Section 7.2, by contrast, implied reliance was highest in the oldest age groups for both males and females. Second, residing in a major city is either not

a statistically significant predictor of complete reliance (for males) or has a positive effect on the probability of this outcome (for females), which is at odds with the reliance-decreasing effects found in the continuous TPI model. Also notable is that the Northern Territory is associated with a comparatively high probability of a TPI equal to one, despite it being associated with a decrease in six-monthly TPI.

With regard to payment type, most notable is that female PPS receipt is not associated with a much higher probability of a TPI equal to one than female receipt of allowances other than unemployment benefits with an activity type of job search. Models of six-monthly TPI showed female PPS receipt to increase TPI compared with allowance receipt. This no doubt reflects the fact that, while PPS tends to be a long-term payment, there is a relatively high incidence of earnings among PPS recipients.

A further notable difference of the binary models is that year effects are not of the monotonically decreasing form found for the continuous models. That is, there is no clear indication that the probability of a TPI equal to one has progressively decreased over the sample period, even though overall reliance, as measured by average fortnightly TPI, has been decreasing over the sample period. Nonetheless, a significant negative effect of the post-July 2000 period on the probability an unemployment benefit recipient has a TPI equal to one is found, which is consistent with the six-monthly TPI model results.

Table 20: Probit marginal effects estimates on the probability of having a TPI equal to one

	Males		Females	
	Marginal Effect	Std. Err.	Marginal Effect	Std. Err.
<i>Age (35-44 omitted)</i>				
15-19	-0.071	0.002	0.074	0.003
20-24	-0.056	0.002	0.062	0.002
25-34	-0.032	0.002	0.024	0.002
45-49	0.021	0.002	0.041	0.003
50-54	0.028	0.003	0.033	0.003
55-59	-0.017	0.003	-0.024	0.003
60-64	-0.046	0.003	-0.066	0.004
<i>Place of birth/Indigenous status (Other Aus-born omitted)</i>				
Indigenous	0.096	0.003	0.140	0.004
Foreign-born (ESB)	-0.005 [#]	0.003	-0.009	0.003
Foreign-born (NESB)	0.055	0.002	0.086	0.002
Major city	-0.001 [#]	0.002	0.006	0.002
<i>State (NSW omitted)</i>				
ACT	-0.011	0.006	-0.046	0.006
Victoria	-0.007	0.002	-0.007	0.002
Queensland	-0.031	0.002	-0.041	0.002
South Australia	-0.017	0.003	-0.034	0.003
Western Australia	-0.041	0.003	-0.053	0.003
Tasmania	0.008 [#]	0.004	-0.006 [#]	0.005
Northern Territory	0.050	0.006	0.016	0.006
<i>Residence (Private rent omitted)</i>				
Home owner	-0.231	0.002	-0.295	0.002
Private rent	-0.115	0.003	-0.158	0.002
Other living	-0.152	0.002	-0.223	0.002
<i>Partner (single omitted)</i>				
Partner not on IS	-0.175	0.002	-0.122	0.003
Partner on IS	-0.074	0.003	-0.013	0.003
<i>Dependent children (No children omitted)</i>				
Youngest child less than 5	0.037	0.004	0.096	0.004
Youngest child 5-15	0.048	0.004	0.050	0.004
Youngest child 15 or older	0.019	0.005	-0.021	0.004
Number of children	0.010	0.001	0.030	0.001
<i>Benefit type (UB with high search req's omitted)</i>				
UB with low search req's	0.126	0.002	0.179	0.003
UB with no search req's	0.167	0.002	0.215	0.003
Other allowances	0.133	0.005	0.202	0.004
DSP	0.379	0.003	0.498	0.003
Other pensions	0.341	0.009	0.381	0.004
PPS	0.158	0.007	0.203	0.004
UB x IS duration	0.004	0.000	0.004	0.000
Other allow. x IS duration	0.004	0.000	0.002	0.000
DSP x IS duration	0.000	0.000	-0.00008 [#]	0.000
Other pensions x IS duration	0.001	0.000	0.000	0.000
PPS x IS duration	0.003	0.000	0.001	0.000
Local unemployment rate	0.007	0.000	0.009	0.000
1996	-0.003	0.001	0.023	0.001
1997	-0.014	0.001	0.002 [#]	0.001
1998	-0.074	0.001	-0.026	0.001
1999	-0.020	0.001	0.0003 [#]	0.002
2000	-0.024	0.002	0.007	0.002
2001	-0.021	0.002	0.001 [#]	0.002
2002	-0.025	0.002	-0.007	0.002
2003	-0.015	0.002	0.003 [#]	0.002
2004	-0.016	0.003	0.008	0.003
2 nd half of year	0.031	0.001	0.024	0.000

Table 20 continued: Probit marginal effects estimates

	Males		Females	
	Marginal Effect	Std. Err.	Marginal Effect	Std. Err.
Post July 2000	-0.057	0.002	-0.056	0.003
Post July 2000 x private rent	-0.003 [#]	0.002	0.003 [#]	0.002
Post July 2000 x dependent child	0.014	0.003	-0.037	0.003
Post July 2000 x partner not on IS	0.006	0.005	0.019	0.004
Post July 2000 x partner on IS	-0.019 [#]	0.003	-0.025	0.003
Post July 2000 x other allowance	0.004 [#]	0.005	0.089	0.005
Post July 2000 x DSP	0.057	0.002	0.052	0.004
Post July 2000 x other pensions	0.038	0.009	0.084	0.005
Post July 2000 x PPS	0.026	0.007	0.084	0.005
Number of observations	2,335,043		2,673,385	
Pseudo R-squared	0.1449		0.1250	

Notes: Standard errors are adjusted for within-person correlations. ⁺ indicates coefficient statistically significant at 5% level; [#] indicates coefficient not statistically significant at 5% level. All other coefficients are statistically significant at 1% level.

7.5 *Econometric issues*

There are several features of the data and econometric methods we have used that give rise to issues concerning the validity of the inferences we make on the determinants of welfare reliance. Most important of these are issues concerning sample selection bias, the use of a fractional dependent variable and the potential for serial correlation in the error term resulting from omitted variables. We address each of these in turn.

Sample selection bias

As has been canvassed earlier in this report, an important shortcoming of the administrative data is that information about a recipient is recorded only when the individual is on welfare. Therefore, the effects of time-varying characteristics (such as employment and income related measures, family status and location of residence) cannot be fully incorporated into the econometric analysis. More importantly, regression estimates can be distorted if an individual's decision to be a welfare recipient is not a random process. This problem is analogous to the problem encountered in wage equations whereby an individual's wage can only be observed for those who "choose to work" at their current market wage.

The unobserved selection process caused by failure to observe off-payment behaviours can be viewed as a problem of 'omitted variables bias'. In cross sectional models, the sample selection bias problem is traditionally addressed by explicitly modelling the selection process and jointly (or sequentially) estimating the model of interest along with the model describing the probability of observing an individual. The selection process is assumed to be a function of characteristics that are always observed (both when on and when off payments). The

selectivity bias for panel data can be handled in similar ways.²⁷ Unfortunately, all existing techniques require information on the characteristics of recipients during periods that they are not observed in the administrative data.

Since we cannot model the selection process, we are required to assume it is either random or affects TPI levels only through observed characteristics. Under this assumption, classical estimation techniques provide consistent estimates. We can, however, test this assumption using the ‘variable addition test’ (Verbeek and Nijman 1992), which tests for the existence of selectivity bias in our results. The test is implemented by assuming there is an unknown function that determines whether an individual is going to leave the income support system. We do not know the reason of his departure, but we do observe a dummy variable s_i that takes the value one when the individual is on payments and zero otherwise. The selection bias test is derived from the consistency assumption required by the random effects model, which requires the following hypothesis to hold:

$$H_o : E\{\eta_i + \varepsilon_{it} | s_i\} = 0 \quad (9)$$

This states that the omitted selection process does not systematically affect the TPI level of an individual, and therefore the obtained estimates are unbiased. A simple variable addition test can be constructed to test the above hypothesis by including the number of six-monthly periods an individual is observed as an additional regressor. If the new variable is statistically significant we reject the hypothesis of no selection bias.

The results of the variable addition test for the existence of selection bias in our six-monthly data are reported in Table A2 in the Appendix. The number of times that we observe an individual in the sample period is added to each of our random effect models as an explanatory variable, which is labelled ‘TT’ in the table. The significance test for this variable is treated as a test for selection bias. The results suggest that the selection process may play important role in TPI levels and therefore our panel data estimates should be treated with caution.

Fractional dependent variable

The TPI variable employed as our dependent variable in the linear models, by construction, can only take values in the (0,1] interval. A problem with using a fractional dependent

²⁷ See Woodridge (1995) and Vella & Verbeek (1999), for the available techniques.

variable such as this is that linear regression models do not guarantee predictions will lie in [0,1] interval. This problem is analogous to linear probability model estimation of binary data. Fortunately, we have a computationally feasible solution to this problem. An obvious choice to ensure that the predicted values from our regression will be in the unit interval is to convert the TPI measure by using a logit transformation – that is, assuming that the population regression model generating TPI is of the following form:

$$TPI = \frac{1}{1 + \exp(-X\beta)}$$

Hence, the logit transformation of TPI will produce following

$$TPI^* = \ln\left(\frac{TPI}{1-TPI}\right) = X\beta \quad (10)$$

This conversion ensures that TPI^* can take any value on the real line despite the fact that TPI is between 0 and 1. A problem remains with this approach for our purposes because, from equation (10), TPI^* is not defined for those who did not have private income through out the period (i.e. $TPI = 1$). However, this issue can be addressed by using quasi-maximum likelihood (QML) Bernoulli regression, proposed by Woodridge et al (1996), where the above transformation is used while allowing TPI to be equal to one. Note that although estimates from QML regression are not directly comparable to our panel data estimates, they nevertheless would point out any problems we may face with regard to statistical significance levels.

We estimated QML models to ascertain whether the potential for linear TPI models to produce predictions outside the [0,1] interval was in fact a problem. We did not find any differences in the statistical significance of the explanatory variables and are therefore confident that this is not a problem for inferences from the models estimated in Section 7.2. For this reason, only the results of the linear models are reported.

Omitted variables and serial correlation

Important variables likely to affect welfare reliance, such as labour force participation, education and health status, are not observed or not observed completely, and are therefore not included in the TPI regressions. Omission of these variables may have a serious side effect. Since, after omission, the effect of time-varying variables is absorbed by the error term ε_{it} , our panel data models may be subject to a serial correlation problem, whereby the

standard errors reported in Tables 18 and 19 may be biased. This may result in over-estimation of the statistical significance of coefficient estimates. A panel data model where the ‘no serial correlation’ assumption is relaxed can be introduced as follows:

$$\begin{aligned}
 TPI_{it} &= \beta X_{it} + \eta_i + \varepsilon_{it} \\
 \varepsilon_{it} &= \rho \varepsilon_{it-1} + v_{it} \\
 v_{it} &\sim i.i.d(0, \sigma_v^2)
 \end{aligned}
 \tag{11}$$

where $|\rho| < 1$, and v_{it} is independent and identically distributed with mean 0 and variance σ_v^2 .

Panel data models with serially correlated errors can be consistently estimated if the autoregressive parameter ρ is known and the model is corrected accordingly. Since ρ will be generally unknown, a consistent estimate of it is used. The technique first eliminates η_i as in Equation (4). Second $y_{it} - \bar{y}_{it}$ is regressed on $y_{it-1} - \bar{y}_{i,t-1}$ and $X_{it} - \bar{X}_i$ in order to obtain the estimate $\hat{\rho}$. Finally $\hat{\rho}$ is plugged back in to model to estimate the regression free of serial correlation. Implementation of this technique indicated that allowing for serial correlation in fixed or random effects models did not change our results. Hence, we retain the specifications reported in Section 7.2.

8. The role of earnings while on income support

An issue of interest to policy-makers is the implications of earnings while on income support for future reliance, and how these implications vary across different types of individuals. For example, a specific question is whether, in what circumstances and for whom earnings represent a stepping stone to exit versus a position of entrenched reliance because of the more ‘comfortable’ income situation of the recipient compared with a situation of no earnings. We therefore now turn to this issue by examining the associations between earnings while on income support in one year and reliance on income support in subsequent years. We do this by regressing average annual TPI in one year on a measure of earnings in an earlier (base) year for all persons observed on income support in the base year. Our earnings variable is mean fortnightly earnings while on income support in the base year, which succinctly summarises the extent to which an individual combined income support with earnings while on income support.

An issue for this approach is the potential for confounding effects of correlations between earnings and different levels of reliance in the base year. For example, persons with higher

earnings in the base year may tend to be less reliant in that period, and may therefore be less reliant in subsequent periods – not because of the higher earnings, but because they were simply less reliant to begin with, for reasons such as better health and greater ability to share caring responsibilities. We address this problem by distinguishing between three groups of recipients in terms of their base-year level of reliance. That is, the effects of earnings in the base year are separately identified for each of these groups by interacting the earnings variable with indicator variables for these three groups. The three groups are defined in terms of the proportion of time on income support in the base year, i.e., the TTO measure. This measure is used rather than TPI because TPI is in part determined by earnings while on income support and will therefore pick up some of the effect our earnings variable is intended to capture. The three TTO categories are high ($TTO = 1$), medium ($0.5 \leq TTO < 1$) and low ($TTO < 0.5$), denoted TTO_H , TTO_M and TTO_L , respectively.²⁸

To investigate how the implications of earnings while on income support for future reliance differ across individuals, we further interact the earnings variable and its interactions with the TTO dummies with variables for demographic and payment type characteristics of the individual in the base year. Given the large number of interactions this entails, we restrict the demographic characteristics examined to age, place of birth, indigenous status, partner status, dependent children status and location of residence. We furthermore combine payment types into three categories: allowances, parenting payment single and pensions. We also allow for the effects of earnings on future reliance to change over time by interacting earnings with a dummy equal to one if the base year was 2000 or later, corresponding to the period after the introduction of the July 2000 tax and welfare reforms.

Many characteristics of individuals do of course change over time, but base-year characteristics in fact provide the pertinent information.²⁹ For policy-makers with an eye on reducing future reliance on income support, the relevant questions concern the association between the role of earnings for future reliance and the characteristics of recipients *at the time that earnings and income support are being combined*. For example, this approach potentially tells us which of the recipients at a given point in time who have earnings are on the ‘stepping stone’ route and which of these recipients are on the ‘entrenched reliance’ route. A further key advantage of this approach is that no sample selection issues arise. All persons on income

²⁸ A further step in this direction would be to control for income support history prior to the base year, for example, by including variables for TTO in the three years prior to the base year. This might capture effects otherwise attributed to earnings that in fact derive from other characteristics of the individual, such as health.

²⁹ Time-varying characteristics are evaluated in the last fortnight the individual was on income support in the base year.

support in the base year – the population of interest for this line of inquiry – are observed, along with all of their base-year characteristics; and reliance in the end-year is similarly observed for all sample members. Unlike the panel models of six-monthly TPI, a TPI in our sample equal to zero is possible for these models.

We estimate two models, one examining the implications of earnings for reliance one year subsequent to the base year (one-year model) and the other examining reliance three years after the base year (three-year model). Estimation is on the entire sample of income support recipients, with an individual contributing an observation in each base year in which that person received income support. Thus, for the one-year model, an individual contributes an observation for each year from 1995 to 2002 that the individual was on income support (that is, up to eight observations). For the three-year model, each individual can contribute up to six observations, with 2000 the last base year for which reliance three years later is observable.³⁰

The results are reported in Table 21. The dependent variable is average annual TPI in the end-year – either one or three years after the base year – and ranges between 0 and 100 (per cent). The earnings variable is adjusted for inflation using the Consumer Price Index and is expressed in units of \$100 at June 2003 prices. It is interacted with the base-year TTO dummies and with these dummies interacted with the variables for demographic and payment type characteristics. The interpretation of the coefficient on the uninteracted earnings variable is the effect on the end-year TPI of a \$100 increase in mean earnings while on payments in the base year for a single, childless, non-indigenous native-born person aged 35-44 years, residing outside of a major city, receiving an allowance when on payments and who spent the entire base year on income support (the ‘default’ individual). The interaction between earnings and TTO_M gives the same effect, but for a person with a base-year TTO between 50 and 100% (and strictly less than 100%). Similarly, TTO_L gives the same effect, but for a person on income support less than half the fortnights in the base year. Interactions between all three of these variables and the demographic and payment type variables identify how the effects of earnings on end-year reliance differ by personal and payment type characteristics for each of the three TTO groups.

³⁰ We include base year dummies to control for year effects and also cluster on individuals to account for within-individual correlations in the error term.

Table 21: Effects on reliance associated with earnings while on income support

	Males				Females			
	1 year interval		3 year interval		1 year interval		3 year interval	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Constant	81.962**	0.175	78.102**	0.209	74.917**	0.228	71.248**	0.238
<i>Age Group (35-44 omitted)</i>								
15-19	-1.664**	0.202	-2.987**	0.238	5.491**	0.265	5.328**	0.282
20-24	-3.854**	0.153	-6.360**	0.186	-0.292*	0.144	-2.000**	0.189
25-34	-2.365**	0.129	-3.057**	0.157	-0.574**	0.112	-0.814**	0.149
45-49	1.166**	0.157	1.979**	0.2	1.545**	0.157	3.265**	0.19
50-54	2.654**	0.166	3.647**	0.208	3.242**	0.158	5.602**	0.193
55-59	2.804**	0.165	4.677**	0.211	3.452**	0.154	6.601**	0.231
60-64	4.029**	0.173	5.886**	0.271	11.112	6.411	-	
Major city	-1.785**	0.088	-1.775**	0.11	-0.832**	0.087	-0.579**	0.112
Private Rent	2.368**	0.07	2.124**	0.095	2.235**	0.064	2.088**	0.092
<i>Place of Birth / Indigenous status (non-Indigenous Australian-born omitted)</i>								
Indigenous	6.117**	0.252	6.238**	0.275	7.940**	0.169	9.706**	0.247
ESB immigrant	-0.778**	0.145	-1.177**	0.193	-0.872**	0.156	-1.323**	0.205
NESB immigrant	2.364**	0.122	1.417**	0.15	4.622**	0.112	4.660**	0.147
<i>Partner status (Single omitted)</i>								
Has partner, not on IS	-12.149**	0.205	-9.914**	0.254	-9.882**	0.183	-7.634**	0.222
Has partner, on IS	-1.102**	0.128	-1.122**	0.164	3.645**	0.153	4.767**	0.19
<i>Dependent children (no children omitted)</i>								
Youngest child less than 5	-1.871**	0.177	-1.557**	0.221	0.235	0.149	1.515**	0.185
Youngest child 5-15	-2.694**	0.178	-2.667**	0.221	-3.066**	0.156	-2.888**	0.181
Youngest child 15 or older	3.573**	0.324	4.217**	0.275	-10.611**	0.349	-7.166**	0.318
<i>Benefit type (UB omitted)</i>								
Other Allowances	4.509**	0.237	0.515	0.303	9.896**	0.197	6.197**	0.227
DSP	12.846**	0.125	14.353**	0.155	19.668**	0.185	19.353**	0.199
Other Pensions	12.993**	0.314	11.157**	0.451	13.835**	0.217	11.263**	0.259
PPS	11.683**	0.286	7.962**	0.404	16.979**	0.215	11.388**	0.234
<i>Year (1995 omitted)</i>								
1996	-3.308**	0.113	-1.673**	0.117	-2.771**	0.105	-1.716**	0.113
1997	-3.785**	0.112	-3.748**	0.12	-3.307**	0.106	-2.332**	0.118
1998	-2.441**	0.111	-3.449**	0.124	-3.414**	0.106	-2.252**	0.122
1999	-3.749**	0.111	-3.463**	0.125	-3.432**	0.105	-2.341**	0.123
2000	-1.531**	0.118	-2.363**	0.133	-2.683**	0.113	-2.112**	0.128
2001	-2.469**	0.117			-3.218**	0.113		
2002	-2.536**	0.119			-2.721**	0.113		
<i>TTO in base year (TTO_H omitted)</i>								
TTO _M	-23.252**	0.133	-19.402**	0.143	-19.634**	0.129	-16.365**	0.135
TTO _L	-51.753**	0.13	-44.113**	0.147	-49.141**	0.137	-42.250**	0.146
Mean earnings (\$'00)	-8.396**	0.381	-5.574**	0.336	-7.980**	0.481	-4.150**	0.311
TTO _M *Earnings	2.994**	0.408	1.791**	0.361	1.129*	0.518	-0.248	0.367
TTO _L *Earnings	6.113**	0.379	3.725**	0.34	5.434**	0.472	2.116**	0.316
Interactions								
<i>Earnings with...</i>								
15-19	-7.987**	0.71	-5.350**	0.82	-3.407	3.035	-2.047	2.129
20-24	0.071	0.78	0.767	0.67	-1.238**	0.194	0.228	0.238
25-34	0.942*	0.424	0.824*	0.327	-0.019	0.117	0.610**	0.137
45-49	0.309	0.386	0.214	0.37	0.101	0.171	0.105	0.168
50-54	0.200	0.455	-0.147	0.403	-0.072	0.236	0.013	0.212
55-59	0.704	0.38	1.185**	0.366	-0.276	0.205	0.313	0.317
60-64	0.604	0.328	1.340**	0.487	1.007	10.959	-	
Major city	0.170	0.264	0.763**	0.242	0.141	0.104	0.197	0.11
Indigenous	-5.865**	1.66	-0.808	1.285	-2.639**	0.223	-1.534**	0.294
ESB immigrant	0.130	0.314	-0.172	0.39	0.236	0.204	0.341	0.207
NESB immigrant	-0.912	0.493	-0.439	0.39	-0.756**	0.176	-0.576**	0.157
Has partner, not on IS	3.357**	0.426	2.231**	0.361	1.269**	0.457	2.751**	0.407

Table 21 continued: Effects on reliance associated with earnings while on income support

	Males				Females			
	1 year interval		3 year interval		1 year interval		3 year interval	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<i>Earnings with...</i>								
Has partner, on IS	0.265	0.358	0.229	0.334	0.559	0.47	-0.105	0.495
Youngest child less than 5	2.028**	0.437	1.491**	0.409	0.240	0.248	-1.295**	0.25
Youngest child 5-15	0.995**	0.352	1.065**	0.318	0.056	0.254	-0.441*	0.214
Youngest child 15 or older	-0.918	1.107	-0.825	0.439	0.172	0.428	2.000**	0.231
Other allowances	-2.979**	0.455	-1.327**	0.455	-4.797**	0.571	-3.162**	0.519
DSP	-0.567*	0.27	-1.796**	0.275	-1.400**	0.408	-3.101**	0.315
Other pensions	-2.070**	0.384	-2.690**	0.557	-0.651	0.491	-2.053**	0.494
PPS	-1.921**	0.432	-2.616**	0.477	-1.946**	0.487	-2.148**	0.336
Post-2000	-1.230**	0.206	-0.762**	0.218	0.187	0.104	0.061	0.086
<i>TTO_M*Earnings with...</i>								
15-19	5.794**	1.524	3.805**	1.463	-0.066	3.295	-0.398	2.412
20-24	-1.813*	0.812	-2.048**	0.704	-0.011	0.289	-1.391**	0.323
25-34	-1.354**	0.437	-0.856*	0.346	0.040	0.16	-0.595**	0.195
45-49	-0.434	0.413	-0.440	0.399	0.219	0.268	-0.121	0.283
50-54	0.014	0.482	0.075	0.444	0.164	0.315	-0.047	0.335
55-59	0.136	0.463	-0.209	0.461	0.497	0.299	-0.614	0.459
60-64	1.238**	0.396	0.946	0.669	-	-	-	-
Major city	-0.666*	0.287	-1.170**	0.267	-0.211	0.157	-0.208	0.175
Indigenous	3.890*	1.652	-0.013	1.333	1.575**	0.266	0.731	0.386
ESB immigrant	-0.231	0.331	0.059	0.401	-0.174	0.228	-0.148	0.247
NESB immigrant	0.516	0.534	0.370	0.441	0.024	0.278	-0.179	0.288
Has partner, not on IS	-1.896**	0.458	-1.045*	0.415	-0.546	0.539	-2.109**	0.49
Has partner, on IS	0.442	0.389	0.386	0.375	-0.174	0.535	0.337	0.556
Youngest child less than 5	-1.217**	0.452	-1.043*	0.44	0.750*	0.371	1.741**	0.38
Youngest child 5-15	-0.248	0.377	-0.463	0.358	0.559	0.362	1.256**	0.324
Youngest child 15 or older	1.109	1.109	1.801**	0.492	0.074	0.564	-1.145**	0.386
Other allowances	1.701**	0.619	1.151	0.626	1.295*	0.635	0.970	0.589
DSP	1.093**	0.3	1.931**	0.347	2.173**	0.716	3.695**	0.751
Other pensions	1.814**	0.562	2.036*	0.935	0.722	0.518	1.000	0.544
PPS	1.134*	0.47	1.829**	0.565	1.063	0.556	1.011*	0.424
Post-2000	0.371	0.228	0.367	0.246	-0.209	0.156	0.091	0.139
<i>TTO_L*Earnings with...</i>								
15-19	6.572**	0.72	4.183**	0.831	0.804	3.004	-0.023	2.115
20-24	-0.299	0.772	-0.688	0.667	0.661**	0.2	-0.464	0.258
25-34	-0.880*	0.418	-0.632	0.328	-0.015	0.124	-0.481**	0.157
45-49	-0.295	0.382	-0.339	0.373	-0.363*	0.173	-0.399*	0.196
50-54	-0.106	0.452	0.113	0.41	-0.052	0.251	-0.086	0.259
55-59	-0.160	0.387	-0.449	0.388	0.705**	0.246	0.227	0.474
60-64	0.363	0.351	0.640	0.653	-	-	-	-
Major city	-0.273	0.261	-0.894**	0.243	-0.146	0.107	-0.352**	0.124
Indigenous	5.067**	1.638	0.529	1.308	2.064**	0.28	1.431**	0.403
ESB immigrant	0.057	0.313	0.413	0.391	0.025	0.21	0.046	0.228
NESB immigrant	0.523	0.488	0.075	0.393	0.163	0.182	-0.006	0.186
Has partner, not on IS	-1.825**	0.424	-1.042**	0.368	0.544	0.46	-1.444**	0.424
Has partner, on IS	0.165	0.357	0.202	0.34	-0.265	0.464	0.267	0.497
Youngest child less than 5	-1.678**	0.431	-1.092**	0.411	0.059	0.259	1.467**	0.291
Youngest child 5-15	-0.688*	0.349	-0.725*	0.324	-0.012	0.263	0.630*	0.251
Youngest child 15 or older	0.724	1.083	1.292**	0.457	0.084	0.412	-2.185**	0.281
Other allowances	2.557**	0.462	1.545**	0.482	2.881**	0.566	2.489**	0.53
DSP	0.530	0.306	1.395**	0.363	0.546	0.436	2.876**	0.493
Other pensions	1.069*	0.481	2.515**	0.822	-0.354	0.486	1.453**	0.52
PPS	1.168**	0.437	2.251**	0.509	1.092*	0.478	1.918**	0.356
Post-2000	0.916**	0.206	0.889**	0.225	-0.340**	0.108	0.295**	0.113

Table 21 continued: Effects on reliance associated with earnings while on income support

	Males		Females	
	1 year interval	3 year interval	1 year interval	3 year interval
Number of observations	1,104,065	799,097	1,209,633	864,019
Number of individuals	291,425	249,551	289,271	247,791
R-squared	0.4685	0.3568	0.4951	0.3401

Notes: The dependent variable is the individual's annual average TPI in a year subsequent to the year to which the explanatory variables relate (the base year). For the 1-year interval model, this is the year immediately following the base year; for the 3-year interval model, this is the year three years after the base year. Coef. – coefficient estimate; SE – standard error. Standard errors are adjusted for within-person correlations. * and ** indicate significance at the 5% and 1% levels, respectively.

Consistent with the findings earlier in this study, the coefficient estimates on the constant indicate that highly reliant individuals in one year are very much likely to remain so in subsequent years. For our default individual – who was on income support for the entire base year – the expected TPI one year after the base year is 82% for males and 75% for females, and three years after the base year, the expected TPI is still 78% and 71%, respectively. Inspection of the coefficient estimates on the TTO dummies shows that the expected TPI reduces in line with expectations. For example, for males, the expected TPI one year subsequent to the base year is 59% for those in the TTO_M category and 30% for those in the TTO_L category.

Coefficient estimates for earnings variables (including the interaction terms) imply that combining income support with earnings is associated with lower future reliance for most individuals. For our default individual, each \$100 increase in mean fortnightly earnings while on income support is associated with a reduction in TPI one year later of 8 percentage points for both males and females. Effects are less strong on TPI three years later, with each \$100 increase associated with a 5.5 percentage point reduction for males and a 4.2 percentage point reduction for females. Effects are also less strong the lower the proportion of time the individual was on income support in the base year. For example, for an individual who was on payments less than half of the base year, each \$100 increase in mean earnings reduces the expected TPI one year later by a little over 2 percentage points.

To examine how the effects associated with earnings differ across individuals, consider first persons on income support for the entire base year. For males in this group, positive effects of earnings (in terms of reducing reliance) are stronger for persons aged 15-19 years than other age groups, while for females differences across age groups are generally small.³¹ Effects on

³¹ Estimates are for persons below the minimum age of eligibility for the Age Pension at the end of the end year. This restricts the sample to males aged less than 64 years at the end of the base year for the one-year model and males aged less than 62 years at the end of the base year for the three-year model. For females, the progressive

reducing reliance are markedly stronger for indigenous persons, more so for males than females, and are slightly stronger for immigrants from non-English speaking countries than for non-indigenous natives and immigrants from English speaking countries.

Curiously, for males, having a partner who is not on income support is associated with a diminished effect of earnings in reducing reliance, compared with being single or having a partner who is on income support. The effect of each \$100 increase in mean earnings on the expected TPI one year later is 3 percentage points smaller than if the individual was single or had a partner who was on income support. This effect is also in evidence for females, but only for the TPI three years after the base year, with the presence of a partner not on income support diminishing the earnings effect by 1.7 percentage points compared with a single person and by 2.4 percentage points compared with a person with a partner on income support. Dependent children are associated with a reduced effect of earnings for males if the youngest child is below 15 years of age, more so if the youngest child is below five years of age. For females, by contrast, dependent children are associated with an increased effect of earnings in reducing future reliance.

Given the circumstances of recipients implied by their payment type, it might be expected that effects associated with earnings would be lower for those on PPS or a pension in the base year. However, this is not the case, with reliance-reducing effects of earnings for such recipients for the most part larger or no different than for allowance recipients.

Interactions between earnings, TTO_M and characteristics, and between earnings, TTO_L and characteristics, test for differences for those in the TTO_M and TTO_L groups compared with those in the TTO_H group. For example, a significant coefficient on the interaction between the aged 15-19, TTO_L and earnings variables implies that the effect of earnings for this age group is different if the individual was in the TTO_L group rather than the TTO_H group. There are indeed a number of differences by characteristics for those in the TTO_L and TTO_M groups compared with those in the TTO_H group, although many are quantitatively small. Most notable are that the greater effect of earnings for 15-19 year old males and indigenous males and females largely disappears for those not on income support for the entire base year.

Adverse effects associated with a partner not on income support and, for males, with young dependent children are also lower. Similarly, positive effects associated with young children

increase in the minimum age of eligibility over the sample period means that the age restriction depends on the timing of the base year. No females aged 60-64 in the base year are still below the pension age in the end year in the three year model because the pension age only reaches 62.5 years in our sample period; hence the absence of coefficient estimates for this age group in the three-year model for females.

for females are largely not present for these TTO groups. Furthermore, the slightly greater beneficial effect of earnings on subsequent reliance evident for PPS and pension recipients on income support for the entire base year generally does not exist for PPS and pension recipients who were not on income support the entire year. This likely reflects differences between allowance recipients, most of whom are unemployment benefit recipients, across the TTO groups. That is, unemployment benefit recipients on income support for the whole year may be a group with particular difficulty obtaining employment that facilitates sustained exit from income support. Thus, the relatively ‘better’ effects of earnings on subsequent reliance for PPS and pension recipients in the TTO_H group might derive from the relatively lower capacity of unemployment benefit recipients in this TTO group to exit income support.

The specification reported in Table 21 also allows for earnings effects on future reliance to differ by time period, achieved by interacting earnings with a dummy variable equal to one if the base year was 2000 or later. This is the same approach as for the time-interactions included in the panel models in Section 7. While in principle distinct earnings effects on reliance can be identified for every year, this would produce a large number of parameter estimates that would be difficult to interpret, and the July 2000 policy reforms would suggest that the pre- and post-2000 distinction is the most pertinent. The estimates imply that generally there are only small differences between the post-2000 and pre-2000 periods in the effects of earnings on future reliance. Post 2000, the earnings effect is slightly stronger for males heavily reliant in the base year, but is slightly weaker for males in the TTO_L category in the base year. For females, only for those in the TTO_L category in the base year is there a significant difference between the pre- and post-2000 periods, with a very slight strengthening of the effects of earnings in terms of reducing future reliance.

Models were also estimated that allowed differences in earnings effects post-2000 compared with pre-2000 to also differ by payment type, family situation and housing situation. These specifications are reported in Table A3 in the Appendix. While interpretation of estimates from these models is difficult because of the multitude of interaction terms (hence their consignment to the Appendix), some notable differences by payment type are evident. The estimates imply that, for both males and females, beneficial effects of earnings on future reliance for those in the TTO_H group were, all else equal, greater in the post-2000 period for unemployment benefit recipients, but not for other benefit recipients. Indeed, beneficial effects of earnings for PPS recipients in the TTO_H group were *lower* in the post-2000 period. Thus, the aggregate improvement after 2000 in the effects of earnings on future reliance for

males in the TTO_H group is driven by unemployment benefit recipients; while the absence of a difference between the pre- and post-2000 earnings effects for females in the TTO_H group is the net outcome of an improvement for unemployment benefit recipients and a worsening for PPS recipients. These changes are more or less consistent with expectations of the effects of the post-2000 changes in benefit levels and income tests.

9. Conclusion

There has been a steady decline in the proportion of working-age persons receiving income support in each year over the period 1996 to 2004, but changes in the composition of recipients towards longer-term payment types has meant that the proportion receiving income support at any one point in time has not correspondingly declined. This compositional change has acted to increase the proportion of recipients with an annual average TPI equal to one – that is, on payments all year and receiving no non-welfare income – leading to an overall increase in the extent of reliance of recipients as measured by the annual average TPI. However, at the same time, the proportion of recipients with earnings at any one point in time has increased since 1996, from 30% to 38% for males and from 34% to 43% for females.

The nature of administrative data on income support recipients creates important constraints on the ability to establish causal links between determining factors and welfare reliance. The most important source of these constraints is the absence of information on individuals when they are not in receipt of income support payments, but also important is the complete absence of (direct) information on factors likely to influence welfare receipt, such as educational attainment, health and employment history. Despite these limitations, some useful insights can nonetheless be garnered from the data.

First, from models estimated of average fortnightly TPI over a six-month period, it is reasonably clear that changes over time in macroeconomic conditions and welfare and income tax policies have generally acted to decrease the extent of reliance of income support recipients. For most types of recipients, the predicted average fortnightly TPI over a six-month period is, all else equal, significantly lower at the end of the sample period than at the start. There are indications that the July 2000 tax and welfare reforms have in particular been a significant factor in this decline. Effects have not been uniform across recipient types, however, ranging from an 11-13% decrease in predicted TPI across the full sample period for some recipients, to in fact being absent altogether for other recipients. In particular, changes in macroeconomic conditions and policy appear to have had stronger effects on

unemployment benefit recipients than on recipients of other payment types, and to have also impacted more favourably on renters in the private sector, persons with dependent children and on non-partnered persons. Also notable is that binary models of the probability of having a TPI equal to one show that the ‘year effects’ have not acted to decrease the proportion completely reliant on income support in a given six-month period.

Findings with respect to the effects of characteristics of recipients on six-monthly average TPI generally accord with prior expectations based on our descriptive evidence, as well as previous research (e.g., Tseng et al, 2004). Given income support receipt, reliance is higher for older persons, indigenous persons and immigrants from non-English speaking countries, and those residing outside the major cities. Renting accommodation, whether public housing or in the private rental market, increases reliance, possibly reflecting adverse incentive effects of rent assistance. Dependent children generally increase reliance, particularly for females. We find that lower participation requirements for unemployment benefit recipients act to increase reliance, but it is unclear the extent to which this is driven by unobserved characteristics of recipients. Certainly, for unemployment benefit recipients classified as ‘incapacitated’ we would be more inclined to attribute the increase in reliance to a work incapacity than the absence of a participation requirement. For unemployment benefit recipients with low participation requirements there is greater ambiguity on the extent to which this is a participation-requirements effect versus effects of unobserved characteristics. Our TPI models also show that increasing duration on income support itself increases reliance, which is consistent with spell duration effects found by Black et al (2005) for 25-44 year old male unemployment benefit recipients.

Our investigation of the implications of earnings while on income support for reliance suggests that earnings more usually serve a ‘stepping-stone to exit’ function than a ‘top-up’ function. Indeed, positive effects of earnings while on income support are greatest for those who are initially the most heavily reliant on income support. While effects are not uniform across different groups of recipients, we find that there will be few people for whom employment while on income support promotes entrenched welfare dependence.

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11. Appendix

Table A1: Variable descriptions

Variable name	Description
<i>Place of birth and ethnicity</i>	
Indigenous	Aboriginal or Torres Strait Islander
Other Australian-born	Born in Australia and is not indigenous
Foreign-born (ESB)	Immigrant from an English-speaking country
Foreign-born (NESB)	Immigrant from a non-English-speaking country
Major city	Resides in Sydney, Melbourne, Brisbane, Perth, Adelaide, Newcastle or Canberra.
<i>Housing/living circumstances</i>	
Private rent	Renting from private market
Home owner	Home owners, whether own outright or purchasing
Government rent	Renting from government housing authorities
Other living	Board and/lodging, free board and/or lodging, or no rent paid; or housing/renting information missing
<i>Partner status</i>	
Single	Have no partner
Partner not on IS	Partnered and the partner is not on income support
Partner on IS	Partnered and the partner is on income support
<i>Dependent children</i>	
Youngest child less than 5	Youngest dependent child aged under 5 years
Youngest child 5-15	Youngest dependent child aged over 5 and less than 15 years
Youngest child 15 or older	Youngest dependent child aged 15 years or over. A dependent child over 15 years of age must be in full-time education and under 25 years of age
Number of children	Number of dependent children
<i>Current payment type and job search requirements</i>	
Unemployment benefits	On unemployment benefits: Newstart Allowance, Youth Allowance(other), Job Search Allowance, Youth Training Allowance, Sickness Allowance, Newstart Mature Age Allowance and Mature Age Allowance
UB with high search req's	On unemployment benefits and has a reported activity type that requires significant job search or involves significant contact with the labour market through either part-time work, self-employment or other forms of employment
UB with low search req's	On unemployment benefits and has a reported activity type that involves minimal contact with the labour market because of such activities as education, training or voluntary work
UB with no search req's	On unemployment benefits and has a reported activity type that involves no job search requirements for the reasons of caring responsibilities, incapacity, or claiming DSP
Other allowances	Allowances other than unemployment benefits. Includes Parenting Payment Partnered, Partner Allowance and Widow Allowance.
DSP	Disability Support Pension
Other pensions	Pension other than DSP. Includes Carer Payment, Widow B Pension and Other Pension Payment.
PPS	Parenting Payment Single and (prior to April 1998) Sole Parent Pension
Pensions	DSP and Other pensions
Allowances	Unemployment benefits and Other allowances
Duration on IS	Continuous duration on income support in months, as reported in the administrative data, at the beginning of the 6-month interval
Local unemployment rate	Unemployment rate in the person's labour force statistical region
2 nd half of year	Dummy variable equal to one if it is the second-half of the year
Post July 2000	Dummy variable equal to one if the 6-month interval is the second-half of 2000 or later
Post-2000	Dummy variable equal to one if the year is 2000 or later
TTO _L	On income support for less than 50% of the year
TTO _M	On income support for at least 50%, but less than 100%, of the year
TTO _H	On income support for the entire year
Mean earnings	Meaning earnings in those fortnights on income support, expressed in units of one hundred dollars at June 2003 prices

Table A2. Panel Data Random Effect Models – Selection Bias Test

	Males (I)		Males (II)		Females (I)		Females (II)	
	Coef.	Std. Err.						
<i>Age (35-44 omitted)</i>								
15-19	-0.745	0.101	-0.759	0.101	5.437	0.104	5.434	0.104
20-24	0.577	0.085	0.627	0.085	4.479	0.082	4.509	0.082
25-34	-1.044	0.069	-1.004	0.069	1.449	0.061	1.479	0.061
45-49	1.296	0.081	1.242	0.081	1.758	0.074	1.735	0.074
50-54	3.794	0.094	3.677	0.094	5.825	0.091	5.766	0.091
55-59	7.098	0.100	6.885	0.099	11.815	0.103	11.719	0.103
60-64	15.497	0.105	15.213	0.105	15.315	0.158	15.179	0.158
<i>Place of birth/Indigenous status (Other Aus-born omitted)</i>								
Indigenous	-0.017 [#]	0.166	0.074 [#]	0.166	4.321	0.188	4.363	0.187
Foreign-born (ESB)	0.334	0.108	0.383	0.108	0.686	0.123	0.706	0.123
Foreign-born (NESB)	4.400	0.085	4.404	0.084	6.498	0.092	6.500	0.092
Major city	-0.264	0.057	-0.263	0.056	-0.306	0.058	-0.308	0.058
<i>State (NSW omitted)</i>								
ACT	-0.200 [#]	0.230	-0.201 [#]	0.230	-2.315	0.237	-2.326	0.237
Victoria	-0.339	0.076	-0.334	0.076	-0.470	0.081	-0.472	0.081
Queensland	-2.169	0.077	-2.134	0.076	-1.843	0.081	-1.831	0.081
South Australia	-0.855	0.108	-0.858	0.107	-1.154	0.117	-1.162	0.117
Western Australia	-2.789	0.104	-2.757	0.104	-2.322	0.112	-2.305	0.111
Tasmania	-0.229 [#]	0.164	-0.240 [#]	0.164	-0.750	0.178	-0.760	0.178
Northern Territory	-3.551	0.228	-3.505	0.227	-4.255	0.252	-4.250	0.252
<i>Residence (Private rent omitted)</i>								
Home owner	-3.660	0.098	-3.602	0.098	-5.123	0.084	-5.139	0.084
Private rent	-0.631	0.098	-0.593	0.098	-2.382	0.081	-2.406	0.081
Other living	-3.718	0.107	-3.659	0.107	-6.404	0.092	-6.413	0.092
<i>Partner (single omitted)</i>								
Partner not on IS	-10.705	0.128	-10.776	0.128	-6.420	0.109	-6.448	0.109
Partner on IS	-0.637	0.085	-0.619	0.085	0.972	0.090	0.997	0.090
<i>Dependent children (No children omitted)</i>								
Youngest child less than 5	1.164	0.137	1.168	0.137	2.852	0.112	2.840	0.112
Youngest child 5-15	0.825	0.134	0.818	0.134	1.799	0.113	1.782	0.113
Youngest child 15 or older	-0.517	0.192	-0.522	0.191	-2.541	0.150	-2.564	0.150
Number of children	0.278	0.045	0.270	0.045	1.109	0.033	1.096	0.033
<i>Benefit type (UB with high search req's omitted)</i>								
UB with low search req's	6.774	0.072	6.511	0.072	7.679	0.104	7.461	0.106
UB with no search req's	9.848	0.084	9.734	0.084	11.978	0.106	11.901	0.106
Other allowances	7.411	0.150	7.243	0.152	10.088	0.106	10.068	0.107
DSP	16.412	0.079	17.368	0.082	21.737	0.107	22.393	0.111
Other pensions	14.111	0.253	14.777	0.260	17.308	0.121	17.601	0.124
PPS	9.049	0.205	9.201	0.209	11.823	0.112	12.142	0.113
Duration on IS (months)	0.150	0.001			0.132	0.001		
UB x IS duration			0.183	0.001			0.161	0.002
Other allow. x IS duration			0.236	0.006			0.166	0.002
DSP x IS duration			0.087	0.002			0.093	0.002
Other pensions x IS duration			0.105	0.007			0.121	0.003
PPS x IS duration			0.164	0.006			0.115	0.002
Local unemployment rate	0.394	0.010	0.395	0.010	0.335	0.010	0.336	0.010
2 nd half of year	0.357	0.034	0.351	0.034	-0.064 ⁺	0.031	-0.067 ⁺	0.031
1996	-0.380	0.068	-0.425	0.068	1.139	0.064	1.123	0.064
1997	-2.432	0.069	-2.533	0.069	-0.201	0.064	-0.250	0.064
1998	-3.493	0.070	-3.628	0.070	-1.818	0.065	-1.889	0.065
1999	-2.905	0.074	-3.036	0.074	-2.386	0.068	-2.466	0.068
2000	-4.165	0.092	-4.291	0.092	-3.043	0.085	-3.127	0.085
2001	-3.361	0.127	-3.501	0.127	-3.641	0.116	-3.734	0.116
2002	-3.304	0.129	-3.409	0.129	-3.902	0.119	-3.983	0.119
2003	-2.440	0.131	-2.443	0.131	-3.370	0.121	-3.419	0.121
2004	-1.677	0.148	-1.632	0.148	-2.426	0.136	-2.458	0.136

Table A2 continued: Panel Data Random Effect Models – Selection Bias Test

	Males (I)		Males (II)		Females (I)		Females (II)	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Post July 2000	-0.704	0.118	-1.076	0.118	-0.259	0.117	-0.563	0.119
Post July 2000 x private rent	-0.976	0.074	-0.969	0.074	-0.030	0.067	-0.008 [#]	0.067
Post July 2000 x dep. child	-1.319	0.118	-1.322	0.118	-3.165	0.117	-3.143	0.117
Post July 2000 x ptrnr not on IS	2.900	0.177	3.085	0.177	5.627 [#]	0.148	5.655	0.148
Post July 2000 x ptrnr on IS	-0.861	0.098	-0.922	0.098	0.272 ⁺	0.111	0.295	0.111
Post July 2000 x other allow.	0.525	0.200	-0.020 [#]	0.209	3.950	0.144	3.640	0.150
Post July 2000 x DSP	-0.978	0.081	0.320	0.087	-0.529	0.109	0.302	0.115
Post July 2000 x other pensions	0.817	0.290	2.054	0.320	-0.506	0.137	-0.065 [#]	0.144
Post July 2000 x PPS	0.721	0.258	0.830	0.278	1.567	0.146	2.188	0.152
TT	2.294	0.006	2.267	0.006	2.180	0.006	2.166	0.006
Constant	34.486	0.179	34.592	0.179	29.071	0.173	29.118	0.173
R-squared								
within		0.036		0.036		0.043		0.043
between		0.567		0.569		0.535		0.536
overall		0.327		0.329		0.278		0.279

Note: ⁺ indicates coefficient statistically significant at 5% level; [#] indicates coefficient not statistically significant at 5% level. All other coefficients are statistically significant at 1% level. ‘R squared within’ is the proportion of the within-individual variation in TPI ‘explained’ by within-individual variation in the independent variables. ‘R squared between’ is the proportion of the across-individual variation in TPI ‘explained’ by across-individual variation in the independent variables. ‘R squared overall’ is the proportion of all variation in TPI ‘explained’ by the variation in the independent variables across and within individuals.

Table A3: Effects on reliance associated with earnings while on income support – including interactions between earnings, characteristics and the post-2000 dummy

	Males				Females			
	1 year interval		3 year interval		1 year interval		3 year interval	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
Constant	81.873**	0.179	78.100**	0.21	74.559**	0.223	71.192**	0.239
<i>Age Group (35-44 omitted)</i>								
15-19	-1.684**	0.201	-2.994**	0.237	5.357**	0.255	5.313**	0.28
20-24	-3.891**	0.151	-6.364**	0.185	-0.485**	0.142	-2.012**	0.188
25-34	-2.395**	0.127	-3.063**	0.157	-0.689**	0.111	-0.812**	0.149
45-49	1.183**	0.156	1.987**	0.199	1.564**	0.15	3.271**	0.189
50-54	2.667**	0.165	3.651**	0.207	3.190**	0.154	5.593**	0.193
55-59	2.817**	0.165	4.675**	0.211	3.336**	0.153	6.543**	0.231
60-64	4.038**	0.173	5.883**	0.271	10.411	6.435		
Major city	-1.795**	0.087	-1.778**	0.11	-0.852**	0.085	-0.585**	0.111
Private Rent	2.664**	0.085	2.190**	0.101	2.357**	0.079	2.169**	0.099
<i>Place of Birth / Indigenous status (non-Indigenous Australian-born omitted)</i>								
Indigenous	6.125**	0.246	6.246**	0.275	7.911**	0.168	9.690**	0.247
ESB immigrant	-0.791**	0.145	-1.180**	0.193	-0.865**	0.153	-1.317**	0.204
NESB immigrant	2.354**	0.121	1.409**	0.15	4.607**	0.11	4.655**	0.146
<i>Partner status (Single omitted)</i>								
Has partner, not on IS	-11.666**	0.247	-9.607**	0.273	-10.671**	0.227	-7.508**	0.24
Has partner, on IS	-1.246**	0.149	-1.196**	0.173	4.145**	0.193	4.847**	0.206
<i>Dependent children (No children omitted)</i>								
Youngest aged 0-4 years	-1.514**	0.2	-1.382**	0.228	0.987**	0.176	1.535**	0.19
Youngest aged 5-15 years	-2.449**	0.2	-2.497**	0.23	-2.790**	0.173	-2.870**	0.187
Youngest aged 16 or more years	3.823**	0.323	4.370**	0.279	-10.290**	0.335	-7.136**	0.322
<i>Benefit type (UB omitted)</i>								
Other Allowances	3.298**	0.298	-0.265	0.328	9.965**	0.234	6.093**	0.242
DSP	12.678**	0.138	14.259**	0.16	19.962**	0.202	19.384**	0.208
Other Pensions	12.831**	0.427	11.179**	0.496	13.279**	0.25	11.062**	0.275
PPS	12.267**	0.362	7.868**	0.441	17.578**	0.242	11.509**	0.245
<i>Year (1995 omitted)</i>								
1996	-3.311**	0.113	-1.679**	0.117	-2.638**	0.106	-1.720**	0.113
1997	-3.803**	0.112	-3.758**	0.12	-3.309**	0.107	-2.339**	0.118
1998	-2.468**	0.112	-3.460**	0.124	-3.458**	0.106	-2.269**	0.122
1999	-3.757**	0.111	-3.469**	0.125	-3.463**	0.105	-2.350**	0.123
2000	-1.320**	0.167	-2.338**	0.222	-1.075**	0.204	-1.404**	0.266
2001	-2.281**	0.165			-1.574**	0.203		
2002	-2.355**	0.166			-1.077**	0.204		
<i>TTO in base year (TTO_H omitted)</i>								
TTO _M	-23.253**	0.129	-19.401**	0.142	-19.685**	0.121	-16.370**	0.134
TTO _L	-51.754**	0.126	-44.114**	0.146	-49.238**	0.127	-42.270**	0.145
Mean earnings (\$'00)	-7.845**	0.446	-5.286**	0.33	-6.561**	0.539	-3.816**	0.32
TTO _M *Earnings	2.512**	0.481	1.530**	0.359	0.100	0.585	-0.403	0.382
TTO _L *Earnings	5.570**	0.444	3.408**	0.334	4.118**	0.53	1.816**	0.327
<i>Post 2000 with...</i>								
Private rent	-0.617**	0.137	-0.342	0.219	-0.256*	0.125	-0.635**	0.203
Dep. child	-0.824**	0.237	-1.138**	0.363	-1.755**	0.226	-0.191	0.335
Partner not on IS	-1.152**	0.358	-1.680**	0.56	2.321**	0.313	-0.741	0.475
Partner on IS	0.471*	0.193	0.537	0.3	-1.273**	0.243	-0.434	0.363
Other allowance	3.059**	0.434	4.480**	0.679	-0.490	0.311	0.490	0.464

Table A3 continued

	Males				Females			
	1 year interval		3 year interval		1 year interval		3 year interval	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<i>Post 2000 with...</i>								
DSP	0.434**	0.142	0.582**	0.21	-1.242**	0.205	-0.348	0.284
Other pensions	0.370	0.526	-0.020	0.792	1.035**	0.286	1.091*	0.427
PPS	-0.759	0.505	0.970	0.773	-1.508**	0.304	-0.722	0.445
<i>Earnings with...</i>								
15-19	-7.942**	0.699	-5.385**	0.82	-3.628	2.715	-2.171	2.056
20-24	-0.019	0.73	0.610	0.607	-1.010**	0.173	0.225	0.235
25-34	0.934*	0.404	0.810*	0.325	0.102	0.108	0.600**	0.135
45-49	0.260	0.368	0.168	0.358	0.061	0.145	0.098	0.162
50-54	0.169	0.442	-0.182	0.39	-0.043	0.21	0.020	0.204
55-59	0.602	0.374	1.153**	0.367	-0.196	0.191	0.358	0.308
60-64	0.484	0.326	1.350**	0.488	0.967	10.973		
Major city	0.172	0.251	0.742**	0.236	0.163	0.094	0.208	0.107
Indigenous	-5.534**	1.586	-0.804	1.266	-2.396**	0.207	-1.518**	0.294
ESB immigrant	0.208	0.321	-0.141	0.39	0.234	0.189	0.322	0.2
NESB immigrant	-0.931*	0.467	-0.419	0.383	-0.786**	0.152	-0.585**	0.152
Has partner, not on IS	2.788**	0.539	2.113**	0.389	1.142	0.626	2.434**	0.472
Has partner, on IS	-0.064	0.472	-0.011	0.364	-0.093	0.681	-0.341	0.564
Youngest aged 0-4 years	2.127**	0.513	1.434**	0.403	-0.009	0.319	-1.383**	0.264
Youngest aged 5-15 years	1.487**	0.425	1.023**	0.345	0.355	0.307	-0.531*	0.231
Youngest aged 16 or more years	-0.616	1.071	-0.787	0.442	0.305	0.412	1.896**	0.241
Other allowances	-3.777**	0.644	-1.575**	0.509	-5.798**	0.868	-3.079**	0.6
DSP	-1.590**	0.372	-2.108**	0.291	-2.596**	0.53	-3.431**	0.349
Other pensions	-3.181**	0.801	-3.329**	0.736	-1.436*	0.692	-2.089**	0.564
PPS	-4.472**	0.625	-2.911**	0.542	-4.068**	0.596	-2.491**	0.36
Post 2000	-2.316**	0.502	-2.025**	0.535	-4.175**	0.526	-2.331**	0.393
Post 2000 x private rent	-0.395	0.253	-0.104	0.442	-0.192**	0.066	0.230	0.15
Post 2000 x dep. child	-0.998*	0.451	0.072	0.502	-0.216	0.344	0.513	0.369
Post 2000 x partner not on IS	1.129*	0.493	0.557	0.546	0.512	0.614	1.762**	0.665
Post 2000 x partner on IS	0.658	0.487	1.158*	0.529	1.980**	0.699	1.465*	0.675
Post 2000 x other allowance	2.116*	0.874	1.366	1.207	3.079**	0.915	-0.171	0.795
Post 2000 x DSP	2.342**	0.447	1.554**	0.529	3.743**	0.533	2.087**	0.487
Post 2000 x other pensions	2.097*	0.887	2.261*	1.15	2.369**	0.722	0.416	0.702
Post 2000 x PPS	5.119**	0.814	1.483	0.829	5.898**	0.626	2.187**	0.531
<i>TTO_M*Earnings with...</i>								
15-19	5.727**	1.508	3.824**	1.459	0.090	2.989	-0.365	2.342
20-24	-1.700*	0.766	-1.890**	0.647	-0.129	0.275	-1.426**	0.319
25-34	-1.305**	0.418	-0.834*	0.344	-0.021	0.152	-0.608**	0.193
45-49	-0.406	0.396	-0.396	0.389	0.243	0.244	-0.125	0.275
50-54	0.038	0.47	0.113	0.433	0.191	0.289	-0.045	0.327
55-59	0.236	0.457	-0.169	0.461	0.555	0.285	-0.596	0.453
60-64	1.355**	0.393	0.948	0.665				
Major city	-0.653*	0.275	-1.146**	0.261	-0.238	0.147	-0.222	0.171
Indigenous	3.609*	1.582	-0.019	1.314	1.476**	0.254	0.753	0.387
ESB immigrant	-0.294	0.336	0.025	0.401	-0.179	0.212	-0.131	0.241
NESB immigrant	0.521	0.511	0.339	0.435	0.041	0.255	-0.163	0.28
Has partner, not on IS	-1.667**	0.592	-1.024*	0.449	-0.309	0.738	-1.886**	0.562
Has partner, on IS	0.747	0.523	0.652	0.409	0.351	0.764	0.496	0.632
Youngest aged 0-4 years	-1.446**	0.536	-1.067*	0.439	0.935	0.494	1.786**	0.403
Youngest aged 5-15 years	-0.732	0.462	-0.511	0.387	0.699	0.455	1.287**	0.35

Table A3 continued

	Males				Females			
	1 year interval		3 year interval		1 year interval		3 year interval	
	Coef.	SE	Coef.	SE	Coef.	SE	Coef.	SE
<i>TTO_M*Earnings with...</i>								
Youngest aged 16 or more years	0.808	1.081	1.683**	0.498	0.297	0.59	-1.118**	0.405
Other allowances	2.945**	0.845	1.633*	0.675	2.165*	0.941	0.904	0.671
DSP	1.788**	0.417	2.198**	0.377	3.652**	1.22	4.056**	0.908
Other pensions	2.595*	1.094	2.205	1.137	1.351	0.731	0.981	0.616
PPS	1.918**	0.699	1.700**	0.644	1.957**	0.703	1.097*	0.46
Post 2000	1.422**	0.549	1.565**	0.583	2.654**	0.586	1.196*	0.475
Post 2000 x private rent	0.038	0.279	-0.118	0.484	0.350**	0.101	-0.076	0.234
Post 2000 x dep. child	1.170*	0.499	0.566	0.593	-0.323	0.54	-0.141	0.676
Post 2000 x partner not on IS	-0.321	0.597	-0.067	0.73	-0.810	0.787	-1.099	0.936
Post 2000 x partner on IS	-0.697	0.564	-1.458*	0.638	-1.676*	0.809	-1.051	0.849
Post 2000 x other allowance	-3.331**	1.096	-2.996	1.569	-2.279*	1.023	0.044	1.071
Post 2000 x DSP	-1.865**	0.539	-1.625*	0.723	-3.611**	1.258	-1.734	1.133
Post 2000 x other pensions	-1.608	1.266	-0.828	1.925	-1.730*	0.793	0.058	0.921
Post 2000 x PPS	-2.352**	0.908	-0.110	1.076	-2.716**	0.773	-0.697	0.804
<i>TTO_L*Earnings with...</i>								
15-19	6.508**	0.71	4.221**	0.831	1.032	2.688	0.102	2.043
20-24	-0.193	0.722	-0.525	0.606	0.472**	0.182	-0.465	0.255
25-34	-0.848*	0.399	-0.613	0.326	-0.107	0.117	-0.475**	0.156
45-49	-0.257	0.364	-0.297	0.362	-0.322*	0.152	-0.386*	0.191
50-54	-0.086	0.44	0.150	0.398	-0.068	0.228	-0.092	0.253
55-59	-0.080	0.381	-0.414	0.389	0.678**	0.235	0.216	0.467
60-64	0.459	0.349	0.665	0.654				
Major city	-0.273	0.249	-0.871**	0.238	-0.164	0.099	-0.362**	0.122
Indigenous	4.754**	1.567	0.539	1.289	1.850**	0.272	1.423**	0.404
ESB immigrant	-0.019	0.319	0.385	0.391	0.018	0.196	0.059	0.222
NESB immigrant	0.546	0.463	0.057	0.386	0.194	0.161	0.004	0.182
Has partner, not on IS	-1.254*	0.538	-0.884*	0.397	0.800	0.629	-1.090*	0.488
Has partner, on IS	0.515	0.471	0.488	0.37	0.334	0.672	0.512	0.565
Youngest aged 0-4 years	-1.873**	0.507	-1.058**	0.406	0.272	0.329	1.538**	0.304
Youngest aged 5-15 years	-1.239**	0.422	-0.705*	0.35	-0.236	0.316	0.703**	0.269
Youngest aged 16 or more years	0.365	1.049	1.238**	0.461	0.001	0.404	-2.099**	0.292
Other allowances	3.633**	0.649	1.730**	0.535	3.965**	0.858	2.375**	0.609
DSP	1.574**	0.419	1.756**	0.399	1.873**	0.605	3.450**	0.563
Other pensions	1.880*	0.878	3.807**	1.077	0.545	0.686	1.535**	0.589
PPS	3.135**	0.636	2.364**	0.581	2.842**	0.587	2.175**	0.382
Post 2000	2.122**	0.498	2.334**	0.543	3.700**	0.518	2.395**	0.407
Post 2000 x private rent	0.110	0.253	0.006	0.454	0.105	0.083	-0.074	0.2
Post 2000 x dep. child	1.199**	0.45	0.097	0.526	0.257	0.375	-0.393	0.552
Post 2000 x partner not on IS	-1.222*	0.498	-0.808	0.594	-0.948	0.634	-2.203**	0.758
Post 2000 x partner on IS	-0.790	0.49	-1.462**	0.558	-1.913**	0.704	-1.609*	0.74
Post 2000 x other allowance	-2.928**	0.89	-0.649	1.385	-3.292**	0.919	0.540	0.912
Post 2000 x DSP	-2.398**	0.55	-1.734*	0.76	-3.801**	0.655	-3.263**	1.014
Post 2000 x other pensions	-1.642	1.044	-4.694**	1.705	-2.617**	0.735	-0.603	0.874
Post 2000 x PPS	-4.164**	0.831	-0.899	0.943	-5.064**	0.636	-1.783**	0.679
Number of observations	1,104,065		799,097		1,209,633		864,019	
Number of individuals	291,425		249,551		289,271		247,791	
R-squared	0.4688		0.3569		0.4960		0.3402	