

# *Final Report*

## **Previous Income Support Receipt of Entrants to the Disability Support Pension**

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## **Executive summary**

- Using a 10% sample of income support recipients over the period January 1995 to June 2004, we examine income support receipt of Disability Support Pension (DSP) recipients prior to commencement of DSP receipt. The report consists of two main components: descriptive analysis and econometric modelling.
- The descriptive analysis documents the characteristics of DSP entrants, the origins of DSP inflows, pre-DSP patterns of income support receipt, and labour market attachment and work incapacity when on non-DSP income support payments prior to entry to DSP.<sup>1</sup> In addition, a cohort of entrants to non-DSP income support payments is followed over time to examine the proportion that ends up on DSP and the routes to DSP they take. Taken as a whole, the descriptive analysis provides valuable information on the income support ‘journeys’ of individuals leading up to DSP entry.
- The econometric modelling analyses the risk of transition to DSP from other payments and identifies the factors that impact on the transition. This analysis facilitates investigation of who is more likely to transfer to DSP when on other income support payments and how the probability of transition varies with duration on income support.

## **Descriptive analysis**

### *Composition of DSP inflows*

- There were approximately 70,000 new grants of DSP in each year over the period 1995 to 2003. New grants to males exceeded those to females in every year, but the gap was considerably narrower in 2003 than in 1996, possibly reflecting the progressive increase in the female Age Pension age and the phasing out of some payments previously accessible to women, such as Widow Pension. The last two years saw a decrease in the total number of new DSP grants from the previous year, largely driven by a decline in male new recipients.
- More than half of male entrants to DSP, and more than 40% of female entrants, are aged over 50 years. The proportion of male new recipients aged 15-44 years shows a trend increase between 1996 and 2003. Inflows of females aged 60-64 years increased over the

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<sup>1</sup> ‘Non-DSP income support payments’ comprise all income support payments other than DSP. Also note that our analysis of pre-DSP income support receipt is restricted to persons over 21 years of age at entry to DSP.

period, consistent with the increases in the minimum age of eligibility for the Age Pension in the period.

- Approximately half of males entering DSP have a partner when granted DSP. For females, nearly 40% of those entering DSP in the period 1996 to 2003 had a partner. In the majority of cases, partners of DSP entrants are also on income support. Few new DSP recipients have dependent children and the proportion with dependent children is remarkably similar between male and female DSP recipients.
- 56% of male DSP inflows and 60% of female DSP inflows are direct transfers from other income support payments. Among transferrers, unemployment benefits are clearly the dominant payment type origin, although the majority had a work incapacity at commencement of the unemployment benefit spell and/or at the time of transfer to DSP. For example, for the period 1996-2003, 96% of all male transfers were from unemployment benefits, of which 70% were by persons incapacitated at the start of the unemployment spell and/or incapacitated at the time of transfer to DSP. Similarly, 63% of female transfers in the same period were from unemployment benefits, 76% of which were likewise incapacity related. For females, Partner Allowance and Parenting Payment Single are also significant payment type origins, each making up about 10% of female transfers.
- Predominant among the medical conditions of new DSP recipients are musculo-skeletal and connective tissue conditions, which apply to nearly 40% of both male and female new DSP recipients. Next most common are psychological and psychiatric conditions, into which category more than 20% of new DSP recipients fall.

#### *Pre-DSP income support receipt*

- When we examine the seven-year income support history of DSP entrants (aged over 21 years at entry), approximately three-quarters are found to have at least some income support receipt experience before entering DSP. The majority transfer from other payments, but it is significant that one-third of those who enter DSP from outside the income support system have nonetheless received income support within the seven years preceding DSP entry.
- Almost half of the inflows with a history of income support receipt in the five years preceding DSP entry had only one income support spell, on one payment type. Comparing direct transferrers with those from outside the income support system reveals that the

proportion in this single-spell group is higher among those from outside the income support system – 57% compared with 47% for male transferrers and 45% for female transferrers.

- On average, transferrers spend more than two years in the income support spell leading up to DSP entry, with male transferrers having a slightly longer average duration than female transferrers. Those who enter DSP from outside the income support system, but who received an income support payment within the preceding five years, have average pre-DSP spell durations ranging from seven months to sixteen months, depending on the length of the payment break. Specifically, the shorter the payment break, the greater the expected duration of the last income support spell, a pattern that extends to the case where the payment break is zero (transferrers), which is associated with the greatest expected pre-DSP spell duration.
- Comparisons of spell durations across payment types reveal that incapacity-related benefits are associated with the shortest pre-DSP spell durations.
- Switching the focus from the last spell preceding DSP entry to all income support receipt in the five years preceding entry, we find that DSP entrants with prior income support receipt in that five-year period are, on average, on income support for over half the period.

#### *Pre-DSP labour market attachment while on income support*

- We examine the extent to which DSP recipients were attached to the labour market when on income support payments in the period leading up to the transition to DSP, using reported earnings as a measure of attachment.
- We find that, in general, the more time an individual spent on income support in the period leading up to DSP entry, the more likely he or she was to have reported earnings in that period. For example, while fewer than 20% of the transferrers who had been on income support for less than one year had earned income, approximately 55% of the transferrers who spent three to four years on income support had earned income, and approximately 45% of the transferrers who spent four to five years on income support had earned income. Holding constant total time on income support prior to DSP entry, the incidence of earned income tends to be higher among those who do *not* directly transfer to DSP from another payment type (that is, enter DSP from outside the income support system).

- Among those who have reported any earnings in previous income support spells, the mean proportion of time with earnings is approximately one-fifth for males and one-third for females. This proportion is higher for those who enter DSP from outside the income support system than for those who transfer from other payments.

#### *Pre-DSP work incapacity while on income support*

- We measure observed work incapacity by receipt of incapacity-related income support payments (Sickness Allowance and unemployment benefits with an activity type of ‘incapacitated’).
- Among transferrers, 77% of males and 57% of females were incapacitated at some stage in the year leading up to DSP entry. For those who entered DSP from outside the income support system, 67% of males and 42% of females on income support in the year leading up to DSP entry had experienced work incapacity in that year. There is no clear relationship between total time on income support and the proportion with incapacity.
- Males have a larger proportion with observed incapacity experience than females, and males are also more likely than females to experience multiple ‘episodes’ of incapacity prior to DSP entry. This is possibly because females are more likely to receive payments other than unemployment benefits.

#### *A ‘follow-up’ approach*

- We use a descriptive ‘follow-up’ approach to document how many of the 1995 income support entry cohort ended up on DSP at different times after commencement on income support.
- For males who commenced a non-DSP income support spell in 1995, 1.8% were on DSP one year later, 4.2% were on DSP three years later, and 7.9% were on DSP eight years later. The proportion of females on DSP at each follow-up point of time is on average just over half that of males.
- The older the entry age, the higher the probability of ending up on DSP at each of the follow-up points in time. For example, among both males and females who enter income support at aged 50-54 years, the proportion on DSP at each follow-up date is approximately three times that of persons aged 35-44 years at commencement of the 1995 income support spell.

- Most of those who end up on DSP enter through either direct transfer from the first income support spell or through transfer from a subsequent income support spell (as opposed to entry from outside the income support system).

### **Econometric analysis**

- The econometric analysis models the risk of transition to DSP from other income support payments to investigate the patterns of income support receipt and personal characteristics associated with increased likelihood of making the transition. We take two complementary approaches to modelling the risk of transfer: estimation of duration models and estimation of multinomial logit models.
- Duration models examine the risk of transition from the current income support spell and have the advantages of permitting explicit consideration of the role of spell duration and the inclusion of time-varying variables (e.g., earnings). We implement duration analysis by estimating competing risk models, which simultaneously model the (competing) probabilities of exiting income support and transferring to DSP.
- The primary limitation of the duration model approach, which motivates the second approach we take, is that it does not capture individuals who move off income support and subsequently enter DSP from outside the income support system.
- The multinomial logit model estimates, for an entry cohort of income support recipients, the probability of ending up on DSP five years after commencing the income support spell. This approach therefore captures all routes to DSP entry, but at the cost of the inability to model duration effects and include time-varying variables.
- Inferences from the estimation results that are common to both approaches include:
  - The older an individual when entering income support, the higher the probability of ending up on DSP.
  - Male immigrants are less likely to move to DSP than are native-born males.
  - For males, having a partner who is on income support is associated with an increase in the probability of ending up on DSP.
  - The presence of a dependent child under 13 years of age lowers the probability of DSP receipt for both males and females, but to a greater extent for females.

- Renting public housing is associated with a significantly increased likelihood of moving on to DSP.
- Given a recipient has received income support payments in the three-year period preceding commencement of the non-DSP spell, the probability the recipient moves on to DSP is increasing in the total time spent on income support in that three-year period. However, this is only unambiguously the case for time spent on payment types other than unemployment benefits. Furthermore, the point estimates for both models imply that the net effect of time on non-unemployment income support prior to the current spell on the probability of moving on to DSP only becomes positive once it exceeds approximately four months for males, and approximately one year for females.
- Increased earnings while on income support are associated with a reduced probability of entering DSP for both males and females.
- Unearned income has little effect on probability of entering DSP.
- Receipt of incapacity-related benefits is associated with a much elevated probability of entering DSP compared with other payment types. For males, payment types other than unemployment benefits and incapacity-related benefits are associated with the lowest probabilities of entering DSP.
- The probability of entering DSP is increasing in the local unemployment rate – that is, all else equal, a person who commences a non-DSP income support spell in a high unemployment region is more likely to move on to DSP than a person who commences a non-DSP spell in a low unemployment region. However, the magnitude of this effect is small, with large changes in the unemployment rate producing only minor changes in the probability of entering DSP.
- The duration model results furthermore show an increasing risk of making the transition to DSP as spell duration increases up to approximately two years, after which the risk of transition is somewhat stable. They also show that, while the probability of transiting to DSP is increasing in age, this age effect is smaller the greater is spell duration.
- Additional findings are also forthcoming from the logit model that are not uncovered by the duration model. Differences between the findings from the two approaches include:
  - Female immigrants are found by the duration analysis to have significantly lower probabilities of making the transition to DSP than native-born females, yet the logit

model shows no significant differences in likelihood of being on DSP five years after spell commencement. The implication is that female immigrants are relatively more likely to enter DSP via an ‘indirect’ route involving exit from the income support system.

- The duration analysis shows that partner status significantly impacts on the risk of transition to DSP for females. Having a partner who is not on income support is associated with the lowest probability of transferring to DSP, while having a partner who is on income support is associated with the highest probability of transferring to DSP (with being single midway between these two extremes). By contrast, for the logit model we find no effects of partner status for females. Consequently, the differences by partner status in probability of transferring to DSP from the initial income support spell do not translate to differences in probability of ultimately ending up on DSP.
- A notable difference arises between the two approaches with respect to inferences on the effects associated with payment type. The duration analysis showed that payments other than incapacity-related and unemployment payments are associated with a lower risk of transfer to DSP than unemployment benefits. While the logit model results supported this finding for males, for females the logit results showed that these payment recipients are not in fact at a lower risk of eventually moving on to DSP than female recipients of unemployment benefits. That is, controlling for other observed characteristics, the probability of a female recipient of parenting or ‘other’ payments moving on to DSP within five years of spell commencement is approximately the same as for a female recipient of unemployment benefits. A recipient of parenting or ‘other’ payments is simply less likely to *directly transfer* to DSP than an unemployment benefit recipient.

## 1. Introduction

Each year, approximately 70,000 individuals commence receipt of the Disability Support Pension (DSP).<sup>2</sup> Prior to commencing on DSP, many of these individuals will have been on other income support payments. Indeed, using the FaCS Longitudinal Data Set (LDS) 1% sample, Cai and Gregory (2005) document that over the period 1995 to 2002, approximately 60% of individuals commencing a spell on DSP directly transferred from other income support payments. It is furthermore quite possible that many of the remaining 40% of new entrants also had experience of income support receipt at some stage prior to entering DSP.

The apparent regularity of pre-DSP income support receipt raises important questions about the extent and nature of income support receipt prior to DSP entry. These questions generally concern the implications of different patterns of income support receipt for likelihood of transferring to DSP. Dimensions of patterns of receipt of interest in this regard include the length of time on income support, the number of spells on income support, the payment types received, the extent to which income support is combined with paid work and the length of time a person is classified as ‘work incapacitated’ while on unemployment benefits. Furthermore, it is important to understand how the implications of different patterns of receipt depend on individuals’ personal characteristics, such as their sex, age, place of birth, location of residence and family situation.

Issues of this nature provide the motivation for this study, in which we examine in some detail the variety of income support routes that people have followed prior to grant of DSP. This includes consideration of prior spells for those who do not directly transfer to DSP from other income support payments. The report consists of two main components: descriptive analysis and econometric modelling.

The descriptive analysis represents a detailed and careful documentation of the characteristics of DSP entrants (e.g., age distribution), origins of DSP inflows (e.g., whether a new DSP entrant transfers from other income support payments or comes from outside the income support system), pre-DSP patterns of income support receipt (e.g., the number of income support spells and their duration), and labour market attachment and work incapacity when on

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<sup>2</sup> Administrative records show that the number of persons commencing a spell on DSP in each year over the period 1995 to 2003 fluctuated between 67,000 and 78,000.

pre-DSP income support payments. In addition, a cohort of entrants to non-DSP income support payments is followed over time to examine the proportion that ends up on DSP and the routes to DSP taken by cohort members. Taken as a whole, the descriptive analysis provides valuable information on the income support ‘journeys’ of individuals leading up to DSP entry.

The econometric modelling analyses the risk of transition to DSP from other payments and identifies the factors that impact on the transition. Questions of the form ‘who is more likely to transfer to DSP when on other income support payments?’ and ‘how does the probability of transition vary with the duration on income support?’ are investigated by this analysis.

The data used comprise a 10% random sample of individuals who received any income support payments in the period January 1995 to June 2004.<sup>3</sup> For each individual in the sample, a payment record is generated for every fortnight in which that individual received an income support payment in this period. Information included with each payment record includes sex, date of birth, postcode of residence, partner status and partner income support status, number of dependent children, age of youngest dependent child, earned income, unearned income, payment type, payment entitlement and, depending on the payment type, potentially other information (such as activity type for Newstart Allowance recipients). From May 1998, we also have available the main medical condition for those who go on to DSP.

The structure of the data allows detailed patterns of income support receipt and transition across payments to be identified, which is very important to the current project. However, there are some limitations of the administrative data, such as the absence of information when a recipient is off payments. The information on human capital and labour market activities is also very limited. For example, there is no information on working hours or wage rates; and information on education is only recorded for unemployment benefit recipients (and even here there are lots of missing values). Clearly these types of information are very important in analysing the transition to DSP from other payments. These limitations of the data should be kept in mind when interpreting the results.

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<sup>3</sup> Transitions from study-related payments (e.g. Austudy) are excluded, with such payments not treated as income support payments for the purposes of this study. Furthermore, transitions to DSP from the Age Pension are excluded because – although they are occasionally observed in the data – an individual cannot legally make such a transition. Also note that the data set used does not contain any information enabling identification of individuals in the sample.

The most directly relevant existing research on DSP recipients is the study by Cai and Gregory (2005) of transitions from unemployment payments to DSP.<sup>4</sup> Cai and Gregory investigate how duration of unemployment payment spells affects likelihood of transferring to DSP, finding the probability of transferring to DSP is increasing in unemployment spell duration – that is, the longer the unemployment spell, the more likely is transferral to DSP. The current project extends Cai and Gregory’s work in a number of ways. First, the scope of the analysis of the current project is broader than that in Cai and Gregory. While Cai and Gregory’s study focuses only on transition from unemployment benefit receipt to DSP, this project examines the transition to DSP from all other income support payments (including unemployment benefits). Second, the project also examines inflows to DSP by persons with previous income support receipt experience but who do not transfer directly to DSP from another income support payment. Third, this project examines pre-transition income support receipt patterns in considerable detail, a line of inquiry not explicitly addressed by Cai and Gregory. Furthermore, this project examines prior labour market attachment and restrictions on work incapacity among those who had pre-DSP experience of income support receipt.

## **2. Descriptive analysis**

The descriptive sections of the report examine characteristics of DSP entrants, with the emphasis being on patterns of behaviour and outcomes in the period leading up to DSP entry. We first document the demographic characteristics of DSP entrants and their origins in terms of income support payments. We then explore, in a number of ways, the extent and nature of income support receipt prior to DSP entry. This includes examining the incidence of prior experience of income support receipt, the length and frequency of prior spells, the extent of labour market attachment in those prior spells (as measured by earnings while on payments) and the extent to which entrants to DSP were identified as ‘work incapacitated’ while on other income support payments in the period prior to entering DSP. As a prelude to the econometric analysis presented in Section 3, we also present in this section some descriptive statistics on the extent to which transitions to DSP occur among all persons who commence a spell on income support at some stage.

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<sup>4</sup> For a review of other recent research on DSP recipients, see Wilkins (2006).

## 2.1. Composition of DSP inflows

### *Defining and identifying inflows*

Before proceeding to the analysis of inflows, we must first settle on a satisfactory definition of an inflow. Our starting point is to define inflows as ‘new grants’ of DSP, which exclude persons re-entering DSP following a suspension of DSP payments, but include all other DSP spell commencements. However, while it is clear that all DSP spell commencements are new grants for persons who have no recent history of DSP receipt, the administrative data at our disposal do not allow us to distinguish new grants from returns from payment suspension for entrants with a recent history of DSP receipt. We must therefore resort to using the length of the gap between two consecutive DSP spells to determine whether a subsequent DSP spell is treated as a new grant of DSP. The issue that then arises is how long this ‘off-DSP’ time gap should be before a re-entry into DSP is classified as a new grant. We propose to use a one-year-off-DSP rule to define new DSP grants. That is, if a person is observed to be off DSP for more than one year, the subsequent DSP entry is treated as a new grant. Needless to say, a shorter off-DSP time gap will lead to a larger number of grants and a longer off-DSP time gap to a smaller number. Given that DSP is a long-duration payment, and given the two-year maximum suspension rule, we think the ‘one-year off DSP’ rule is a reasonable compromise.

**Table 1: Proportion of new DSP grants (using the ‘one-year-off-DSP’ rule) where the individual has previously received DSP, by time elapsed since last on DSP**

	2001	2002	2003	2004 <sup>(a)</sup>	Total
<i>Were last on DSP...</i>					
1-2 years ago	2.9	2.2	2.9	2.7	2.7
2-3 years ago	1.1	1.1	1.1	1.2	1.1
3-4 years ago	0.7	0.6	0.7	0.7	0.7
4-5 years ago	0.4	0.4	0.5	0.7	0.5
Did not receive any DSP payment in the five years preceding DSP entry	95.0	95.7	94.7	94.8	95.1
<b>Total</b>	<b>7,760</b>	<b>7,360</b>	<b>7,170</b>	<b>3,128</b>	<b>25,418</b>

Note: (a) First six months only.

Using this decision rule, Table 1 shows the proportion of DSP new grants between 2001 and 2004 for which the individual concerned had prior DSP receipt experience in different time periods. The results show that only a small proportion (2.7%) received DSP in the interval 1-2 years prior to DSP spell commencement. Although there are some recipients with a history of DSP receipt when traced back for more than 2 years, their current re-entry should be a new application according to the two year maximum on payment suspension. Thus, Table 1

implies that the proportion of DSP spell commencements treated as new grants that are in fact not new grants is at most 2.7%.

### *Characteristics of DSP inflows*

Using the one-year-off-DSP rule, Table 2 presents the number of new grants of DSP broken down by gender for each year in the period 1996-2003.<sup>5</sup> Recalling that the sample used is a 10% random sample of income support recipients, the estimates imply that there were approximately 70,000 new grants of DSP in each year over this period. New DSP grants to males exceed those to females in every year, but the gap is considerably narrower in 2003 than in 1996, possibly reflecting the progressive increase in the female Age Pension age and the phasing out of some payments previously accessible to women, such as Widow Pension. The last two years saw a decrease in the total number of new DSP grants from the previous year, largely driven by a decline in male new recipients. Improving labour market conditions, and perhaps also stricter interpretation of eligibility criteria by programme administrators, may have played roles in this decline for males.<sup>6</sup>

**Table 2: DSP inflows 1996-2003**

	1996	1997	1998	1999	2000	2001	2002	2003	Total
<i>Number of new grants</i>									
Males	4,603	4,368	4,320	4,762	4,376	4,695	4,432	4,193	35,749
Females	2,475	2,566	2,801	2,953	2,800	3,065	2,921	2,979	22,560
Total	7,078	6,934	7,121	7,715	7,176	7,760	7,353	7,172	58,309
<i>Proportion of new grants (%)</i>									
Males	65.0	63.0	60.7	61.7	61.0	60.5	60.3	58.5	61.3
Females	35.0	37.0	39.3	38.3	39.0	39.5	39.7	41.5	38.7

Table 3 provides further information on the characteristics of individuals commencing DSP spells (i.e., DSP inflows) in each of four two-year periods: 1996-97, 1998-99, 2000-01 and 2002-03. For comparison purposes (as a reference point), information on the characteristics of the ‘stock’ of recipients at the beginning of the inflow period is also presented.

<sup>5</sup> Data for 2004 is only available for the first half of the year. To avoid the potential impact of seasonality in DSP inflows we therefore exclude 2004 inflows from most of the subsequent descriptive analysis.

<sup>6</sup> We have no evidence of a tightening of eligibility criteria, but it is consistent with the finding by Cai and Gregory (2004) that tightened eligibility criteria for the Invalid Pension in 1980 caused a reduction in both applications and grants. FaCS (2005) shows that new grants in 2003-04 were in fact higher than in 2002-03, thereby reversing the trend evident between the 2000 and 2003 calendar years. This increase in new grants was driven by an increase for females from 29,291 to 31,675, with new grants to males approximately unchanged.

The top panel of Table 3 shows the age distributions of inflows and existing recipients. Among males, more than half are 50 years or older for both inflows and the existing stock of recipients; among females more than 40% are 50 years or over. Age distributions of stocks and inflows are similar, aside from the somewhat predictable difference that a higher proportion of inflows are in the 15-24 years category and a lower proportion of inflows are in the 60-64 years category. This is to be expected, since long-term recipients are more likely to enter when young and to exit when they reach the Age Pension age. In terms of changes over the sample period, for males there has been a trend increase in the proportion in the 15-44 years age range and a decrease in the proportion aged 55 years and over. For females, there has been an increase in the proportion aged 60-64 years, reflecting both the closure of other payment types and the progressive increase in the female Age Pension age.

The place of birth and Indigenous status composition is similar for new and existing recipients for both males and females, particular in the most recent years, with about two-thirds being non-Indigenous Australian-born, about 20% immigrants from non-English speaking countries (labelled as NESB), just under 10% immigrants from English speaking countries (labelled as ESB) and about 3% being Indigenous Australian.

Social marital status is described in Table 3 by whether an individual is partnered or not, as well as the income support status of the partner. On average approximately half the males entering DSP have a partner when granted DSP, which is slightly smaller than the existing stock of male recipients. For females, nearly 40% of those entering DSP in the period 1996 to 2003 had a partner, which is significantly larger than the 25 to 30% of existing recipients who had a partner at the beginning of each period.

If an individual has a partner, in the majority of cases the partner is also on income support. Significantly, of those partnered, the proportion with partners on income support is higher for the existing stock of recipients than for new entrants, with the difference particularly pronounced for males. There are several potential explanations for this difference. First, there may be a tendency for partners of new entrants to DSP to subsequently enter income support receipt.<sup>7</sup> Second, it may be that entrants to DSP whose partners are not on income support are

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<sup>7</sup> There are in fact administrative processes that could in part be responsible for such a sequencing of entry to income support. In particular, eligibility for some income support payments likely to be accessed by partners of DSP recipients (such as Partner Allowance and Carer Payment) can be affected by whether the DSP claimant was in fact granted DSP. This could potentially show up in the data as the partner entering income support after the DSP claimant, even if the couple applied for income support simultaneously.

more likely to exit from the DSP program. Finally (and perhaps least importantly), entrants with partners not on income support may be more likely to change partner status (to single) than entrants with partners who are on income support.

Also notable with respect to partner income support status is that, among both new and existing DSP recipients, the proportion with partners on income support is much lower for females than males. This is due to both a lower proportion of female recipients having a partner and a lower proportion of partnered female recipients having a partner on income support. Both of these differences most likely reflect the generally stronger labour market attachment of male partners than female partners. A further contrast between males and females is that, among those with partners, the proportion of partners on income support shows a trend decrease for both new and existing male recipients, while for partnered females this is only true for inflows.

Few existing or new DSP recipients have dependent children and the proportion with dependent children is remarkably similar between male and female DSP recipients. For both males and females, the proportion with dependent children is slightly higher among inflows than among the current recipients.

Variables in Table 3 for housing circumstances distinguish renters in the private rental market, renters of public housing, home-owners (whether paying off a mortgage or not) and non-home-owners with no rental expenses. Home-owners and private renters are the two largest groups among new and existing DSP recipients. Home-owners comprise more than 40% of inflows for both males and females, and private renters over 30%. Home-owners are a larger proportion of inflows than existing stocks, while the opposite is true for both private and public renters. This may in part reflect an older age profile of home-owner entrants (who therefore tend to exit DSP earlier due to transferring to the Age Pension).

**Table 3: Characteristics of DSP stocks and inflows**

	1996-97		1998-89		2000-01		2002-03	
	Stock <sup>(a)</sup>	Inflow						
<b>Males</b>								
<i>Age<sup>(b)</sup></i>								
15-24	5.1	9.1	5.3	10.1	5.5	11.5	5.9	11.5
25-34	9.8	10.6	10.0	10.8	10.0	10.8	10.1	11.1
35-44	15.2	15.9	15.8	16.5	16.4	16.1	16.6	16.4
45-49	9.8	10.4	10.0	10.9	10.7	9.7	10.7	9.8
50-54	13.0	14.4	13.6	14.3	13.2	13.2	12.9	12.8
55-59	19.4	22.5	19.1	20.5	18.5	19.5	18.5	21.0
60-64	27.7	17.2	26.2	17.1	25.8	19.2	25.3	17.5
<i>Place of birth and Indigenous status<sup>(c)</sup></i>								
Indigenous	2.0	2.1	2.1	2.4	2.2	2.8	2.4	3.8
Other Aus- born	65.0	65.7	65.8	67.4	67.1	68.7	68.3	67.1
ESB	8.7	10.1	8.7	10.0	8.7	9.6	8.5	9.3
NESB	24.4	22.1	23.4	20.3	22.1	19.0	20.9	19.8
<i>Family circumstances</i>								
Single	48.9	47.2	51.5	49.1	53.9	50.9	56.6	54.1
Partner not on IS	1.2	13.1	2.7	13.3	3.7	13.9	4.2	13.8
Partner on IS	49.8	39.7	45.8	37.6	42.3	35.1	39.2	32.1
Dep. child(ren)	11.4	13.8	12.2	15.5	12.0	13.9	10.9	12.9
<i>Housing situation and region of residence</i>								
Private rent	34.4	33.0	34.4	33.4	35.5	31.9	35.5	33.7
Government rent	11.2	6.3	11.9	6.5	12.6	6.5	13.4	6.1
Home-owner	43.0	46.8	41.0	44.6	39.4	45.1	37.4	42.8
'Free' rent	11.4	13.9	12.7	15.6	12.5	16.5	13.6	17.4
Major city	55.5	57.7	55.1	55.6	54.6	54.0	54.0	53.4
<i>No. of obs.</i>	<i>32,269</i>	<i>8,971</i>	<i>34,747</i>	<i>9,082</i>	<i>37,083</i>	<i>9,071</i>	<i>39,242</i>	<i>8,625</i>
<b>Females</b>								
<i>Age<sup>(b)</sup></i>								
15-24	8.6	11.0	7.5	10.7	7.0	11.6	6.9	11.7
25-34	13.6	10.5	12.6	9.8	11.6	9.5	10.9	8.8
35-44	19.8	17.5	18.2	19.3	18.2	18.2	17.5	18.0
45-49	15.8	15.4	14.3	15.2	13.6	14.6	13.1	13.8
50-54	18.9	21.0	19.8	19.4	19.0	19.0	18.0	17.7
55-59	21.1	22.9	22.5	22.6	22.7	22.5	23.6	24.0
60-64	2.2	1.7	5.1	3.0	7.9	4.7	10.0	6.0
<i>Place of birth and Indigenous status<sup>(c)</sup></i>								
Indigenous	2.8	2.9	2.8	2.3	2.8	3.9	3.0	3.8
Other Aus-born	72.2	66.5	70.9	69.1	71.1	68.8	71.2	67.9
ESB	7.6	9.6	8.0	8.6	7.8	8.7	7.6	9.6
NESB	17.4	21.0	18.3	20.0	18.3	18.6	18.2	18.6
<i>Family circumstances</i>								
Single	75.2	62.3	73.2	61.4	71.6	60.3	70.2	60.5
Partner not on IS	7.2	11.6	6.5	13.4	6.8	14.4	7.1	15.6
Partner on IS	17.7	26.1	20.3	25.3	21.6	25.2	22.6	23.9
Dep. child(ren)	10.8	12.5	11.1	16.8	11.7	13.1	10.6	13.5
<i>Housing situation and region of residence</i>								
Private rent	39.5	30.9	36.7	31.6	36.1	29.3	35.0	29.9
Government rent	17.3	10.8	17.1	11.7	17.4	10.0	17.7	10.8
Home-owner	30.4	43.7	32.6	42.3	33.8	45.0	34.3	43.5
'Free' rent	12.8	14.6	13.5	14.5	12.7	15.7	13.0	15.8
Major city	59.5	60.6	59.2	59.4	58.4	56.4	57.3	57.7
<i>No. of obs.</i>	<i>14,789</i>	<i>5,041</i>	<i>17,843</i>	<i>5,754</i>	<i>21,026</i>	<i>5,865</i>	<i>24,024</i>	<i>5,900</i>

Notes: (a) Refers to stock of recipients at the beginning of the period. For example, for the period 1996-97, the initial stock of recipients comprises those receiving DSP in January 1996. (b) For inflows, age is that at entry into DSP. (c) ESB – immigrants from English speaking countries; NESB – immigrants from non-English speaking countries.

### *Origin composition of DSP inflows*

One of the more important questions for an analysis of DSP inflows concerns their origins, and in particular how many new recipients transfer directly from other income support payments. Since DSP is normally a long-term income support payment for working-age persons, a transition to DSP from other payments can usually be interpreted as a movement towards increased reliance on income support.

To identify whether a DSP recipient experiences a direct transfer from other payments, we first need to define direct transfers. If we observe that in the fortnight before entering DSP a person is on another income support payment, this person unambiguously experiences a direct transfer or transition from another payment to DSP. However, this definition of direct transfers is likely to be too narrow. Some new DSP entrants may have only a very short gap between the date the person is last observed on other payments and the date of entry to DSP. This payment break may sometimes reflect administrative factors rather than actual exit and subsequent re-entry to income support receipt. In practice, those with a short payment break should perhaps be regarded as direct transferrers. Similar to the issue with respect to the determination of new grants, the question is how long the maximum payment break should be.

**Table 4: Number of DSP entrants between 1996 and 2003, by length of payment break**

	<b>Males</b>	<b>Females</b>	<b>Total</b>
Payment break (fortnights)			
0	21,360	14,172	35,532
1	1,664	990	2,654
2	207	184	391
3	140	98	238
4	79	81	160
5	53	55	108
6	46	41	87
7	47	25	72
8	33	23	56
9	34	24	58
10	36	21	57
11	26	29	55
12	26	22	48
13+	12,022	6,791	18,813

Note: *Payment break* – Number of consecutive fortnights DSP entrant was off income support payments immediately prior to DSP entry.

Table 4 presents the number of new DSP recipients over the period 1996-2003 by the length of the payment break. Most of those who have a recent history of receiving other income support payments before entering DSP have no break in payments. Nonetheless, a significant

proportion of new recipients have a payment break of one fortnight, and even breaks of two or three fortnights are common enough to raise concerns that, for many of these individuals, administrative factors may be responsible for the break rather than actual exit from and re-entry to the income support system. Based on the results in Table 4, we think it is reasonable to use a three-fortnight rule. That is, ‘direct transferrers’ from other income support payments to DSP are defined as those who are observed to receive other income support payments in any of the three fortnights immediately prior to entering DSP.

In addition to treatment of payment breaks, a further issue with respect to defining direct transfers is that we observe in the data some DSP entrants with only a few fortnights on unemployment benefits prior to entering DSP. As a starting point for resolving this issue, we tried to use the activity test requirement for Newstart Allowance to identify those persons who were awaiting a decision on a DSP claim while receiving unemployment benefits. The activity test type *DSP pending* indicates that the person has applied for DSP. However, the number of people classified as *DSP pending* is very small, and a significant number of cases of individuals with a short period on unemployment benefits prior to DSP entry remain. For these individuals, we suspect that unemployment benefits may nonetheless be simply an interim benefit paid while administrative requirements for entry to DSP are in the process of being met. Although not commonly observed, it is also possible that other income support payments are used as interim payments. Consequently, we treat those who have no more than four consecutive fortnights on income support immediately prior to entering DSP as entrants from outside the income support system (i.e., they are not transferrers).

Several similar issues to those for defining transfers also arise with respect to determining the payment type origin of direct transfers to DSP. First, there are a number of cases where a transfer from one non-DSP payment type to another (usually unemployment benefits) occurs shortly before the transfer to DSP. Consistent with our approach to those entering DSP from outside the income support system, we treat individuals as transferring to DSP from the first payment type if the move to the second (interim) payment type occurred within four fortnights of the transfer to DSP.

Second, before March 1996, recipients of unemployment benefits who were temporarily incapacitated were transferred to Sickness Allowance.<sup>8</sup> After March 1996, this practice was terminated and temporarily incapacitated recipients of unemployment benefits remained on unemployment benefits (with activity test requirements not imposed during the period of incapacity). This policy change would introduce artificial origin composition changes, particularly among those from unemployment benefits and sickness benefits. To overcome this problem, we group together those identified in the data as incapacitated at the start of the unemployment benefit spell with those who are on sickness benefits, and refer to transition to DSP from these sources as transfers from incapacity-related benefits. Persons on unemployment benefits recorded as *DSP pending* at commencement of the unemployment benefit spell are also placed in this category on the basis that this is indicative of incapacity. For other persons who commence on unemployment benefits, we furthermore make a distinction between persons who had an incapacity or DSP pending activity test exemption immediately prior to transfer to DSP from unemployment benefits and unemployment benefit recipients who did not have an activity test exemption.

A third issue concerns young persons entering DSP at the minimum age of eligibility for DSP. Persons in this group do not have the ‘opportunity’ to transfer from other payments, and are therefore quite different from older persons entering DSP from outside the income support system. Consequently, on this basis, persons aged less than 16.5 years at entry are distinguished from other non-transfer entrants.

Based on our definition of direct transfers and regrouping of some payments, Table 5 presents the origin composition of new DSP recipients over the period 1996-2003. We see that, over the whole period, 56% of male DSP inflows and 60% of female DSP inflows were direct transfers from other income support payments (rows 3-9). Among transferrers, unemployment benefits are clearly the dominant payment type origin, although the majority had a work incapacity at commencement of the unemployment benefit spell and/or at the time of transfer to DSP. For example, for the period 1996-2003, 96% of all male transfers were from unemployment benefits (rows 3 and 4), of which 70% were by persons incapacitated at the start of the unemployment spell (row 4) and/or incapacitated at the time of transfer to DSP

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<sup>8</sup> In practice, this policy was not completely universal in its application. For example, if a medical certificate was presented after the episode of illness had concluded, an individual may not have ever been transferred.

(row 3b). Similarly, 63% of female transfers in the same period were from unemployment benefits, 76% of which were likewise incapacity related.

**Table 5: Pre-transfer payments of DSP inflows, by two-year period (%)**

	1996-97	1998-99	2000-01	2002-03	All years
<b>Males</b>					
1. Entered DSP aged ≤16.5 years	3.2	3.9	4.1	4.3	3.9
2. Other non-transfer entrants	38.2	39.7	42.9	41.0	40.5
3. Unemployment benefits <sup>(a)</sup>	34.9	36.9	32.7	31.9	34.1
3a Non-incapacitated at time of transfer	21.1	16.9	12.9	13.0	16.0
3b Incapacitated at time of transfer	13.8	20.0	19.8	18.8	18.1
4. Incapacity-related benefits <sup>(b)</sup>	20.9	17.0	18.0	20.1	19.0
5. Partner Allowance	0.3	0.4	0.6	0.7	0.5
6. Parenting Payment Partnered	0.4	0.4	0.5	0.5	0.4
7. Other Allowances	1.2	0.3	0.2	0.1	0.4
8. Parenting Payment Single	0.5	0.7	0.6	0.7	0.6
9. Other Pensions	0.6	0.8	0.6	0.7	0.7
<i>No. of observations</i>	8,971	9,082	9,071	8,625	35,749
<b>Females</b>					
1. Entered DSP aged ≤16.5 years	4.0	4.0	4.5	4.5	4.3
2. Other non-transfer entrants	32.4	34.1	37.3	38.6	35.7
3. Unemployment benefits <sup>(a)</sup>	22.3	24.2	20.7	18.6	21.4
3a Non-incapacitated at time of transfer	13.1	10.2	7.1	7.1	9.2
3b Incapacitated at time of transfer	9.2	14.0	13.5	11.5	12.2
4. Incapacity-related benefits <sup>(b)</sup>	18.2	15.1	16.7	16.8	16.6
5. Partner Allowance	7.7	6.5	6.1	5.5	6.4
6. Parenting Payment Partnered	2.6	3.3	3.4	3.4	3.2
7. Other Allowances	3.3	2.9	3.2	2.9	3.1
8. Parenting Payment Single	5.8	6.6	5.3	7.0	6.2
9. Other Pensions	3.7	3.4	2.9	2.8	3.1
<i>No. of observations</i>	5,041	5,754	5,865	5,900	22,560

Notes: (a) Unemployment benefits where the recipients are not recorded as incapacitated at the time of commencement of the unemployment benefit spell. (b) Incapacity-related benefits include sickness benefits and unemployment benefits when the recipients are identified as incapacitated or DSP pending at the time of entry to unemployment benefits.

For males, transfers from all non-unemployment benefit payment types combined (rows 5-9) only make up about 4% of all transfers. For females, new recipients from other payment types are of more significant proportions, accounting for 37% of transfer inflows. Most important of the other payment types are Partner Allowance and Parenting Payment Single, each making up about 10% of female transfers. In light of the fact that males have a lower proportion of transfers from non-unemployment related payments than females, we might infer that the lower proportion of all entrants to DSP via direct transfer that is evident for males compared with females reflects the relatively smaller number of males who receive non-unemployment related payments.

### *Medical condition composition of DSP inflows*

DSP is a payment aimed at providing income support to those with substantially diminished work capacities and as such, the presence of a medical condition is one of the key elements of the eligibility criteria. Although there is no detailed health or work capacity information in the data set, the main medical condition of DSP recipients is available from mid-1998 for those who were granted DSP from 1991 onward. For those who were granted DSP before 1991, or who exited DSP prior to mid-1998, the main medical condition is unknown.

Table 6 presents the medical condition composition of DSP inflows in 1999, 2001 and 2003, alongside the medical condition composition for the ‘stocks’ of recipients in January 1999 and in January 2004, presented for comparison purposes. Although the administrative data identify 20 different medical conditions, in Table 6 we aggregate these to 13 conditions, full definitions of which can be found in Table A2 in the Appendix.

Predominant are musculo-skeletal and connective tissue conditions, which apply to approximately 40% of both male and female new DSP recipients. Next most common are psychological and psychiatric conditions, into which category more than 20% of new DSP recipients fall. Comparing inflows with the stocks of recipients at the two endpoints of the period examined (January 1999 and January 2004) shows that the proportion with intellectual and learning problems is lower among inflows than among the total stock recipients, while the proportion with cancer or a tumour is higher in the former than in the latter. These patterns primarily reflect differences in DSP spell duration by medical condition, although changes in the main medical condition composition of existing recipients may also play a role. A further notable feature evident from Table 6 is that the proportion of recipients with psychological or psychiatric conditions increased between January 1999 and January 2004.

**Table 6: Medical condition profile of DSP recipients (%)**

	Stock	Inflow			Stock
	1999	1999	2001	2003	2004
<b>Males</b>					
Musculo-skeletal and connective tissue	38.0	38.3	39.9	39.3	36.9
Psychological/ psychiatric	21.7	22.5	22.8	23.9	25.6
Intellectual/ learning	9.9	5.4	5.5	6.2	10.6
Circulatory system	8.1	9.3	9.4	8.2	6.9
Cancer/tumour	2.0	6.6	6.4	6.3	1.8
Nervous system	3.1	2.5	2.5	3.0	3.0
Endocrine, (auto) immune system	2.3	2.3	2.4	2.4	2.3
Acquired brain injury	3.2	2.8	2.5	1.7	3.0
Visceral disorders	1.8	1.2	1.0	1.6	1.5
Respiratory system	3.9	4.0	2.7	3.0	2.9
Sense organs	2.5	1.9	2.2	2.4	2.4
Congenital abnormalities	1.6	0.8	0.7	0.7	1.6
Other	1.7	2.6	2.2	1.5	1.7
<i>No. of observations</i>	29,721	4,762	4,695	4,193	38,567
<i>No. unknown/granted prior to 1991</i>	6,132				2,304
<i>Total no. of observations</i>	35,853	4,762	4,695	4,193	40,871
<b>Females</b>					
Musculo-skeletal and connective tissue	31.4	37.4	39.7	40.7	34.0
Psychological/ psychiatric	26.5	26.5	26.8	25.0	27.8
Intellectual/ learning	13.5	5.3	5.6	5.6	12.1
Circulatory system	3.8	3.9	4.2	3.8	3.5
Cancer/tumour	2.5	6.2	5.8	6.1	2.2
Nervous system	4.7	3.7	2.9	3.7	4.2
Endocrine, (auto) immune system	2.3	2.8	2.6	3.5	2.6
Acquired brain injury	2.3	1.8	1.2	1.3	1.9
Visceral disorders	1.9	1.8	1.5	1.8	1.5
Respiratory system	3.8	2.8	3.0	3.3	3.1
Sense organs	2.5	2.0	1.9	2.5	2.6
Congenital abnormalities	2.2	1.2	0.9	0.8	2.0
Other	2.5	4.6	4.0	2.0	2.5
<i>No. of observations</i>	16,896	2,953	3,065	2,979	25,814
<i>No. unknown/granted prior to 1991</i>	2,403				941
<i>Total no. of observations</i>	19,299	2,953	3,065	2,979	26,755

Note: See Table A2 in the Appendix for full details on medical condition categories.

Table 7 presents the main medical condition composition of inflows in over the period 1999 to 2003 disaggregated by age at entry to DSP. As expected, the medical condition profiles of new DSP recipients are very different across age groups. Musculo-skeletal and connective tissue, cancer/tumour and circulatory system conditions are more likely among older entrants, while psychological and psychiatric conditions are more prevalent among younger entrants, particularly those aged 25-34 years. Furthermore, intellectual and learning difficulty conditions account for a large share of inflows of 16 year olds, but very few inflows for other age groups, which reflect the high proportion of these conditions acquired at birth.

**Table 7: Main medical condition of inflows to DSP 1999-2003, by age group (%)**

	Age at entry to DSP								Total
	≤16.5	16.5-24	25-34	35-44	45-49	50-54	55-59	60-64	
<b>Males</b>									
Musculo-skel. & connective tissue	4.0	7.5	24.1	38.7	43.3	46.8	49.5	50.7	39.3
Psychological/ psychiatric	14.0	48.6	50.2	34.8	26.0	17.1	10.4	5.8	23.2
Intellectual/ learning	61.9	25.8	5.1	2.3	1.3	0.9	0.5	0.1	5.7
Circulatory system	0.3	0.6	1.6	3.2	6.5	10.8	13.8	17.1	8.7
Cancer/tumour	0.7	1.9	2.6	4.3	6.7	7.5	9.0	9.2	6.3
Nervous system	3.1	1.9	2.9	2.5	2.5	2.3	2.5	2.9	2.6
Endocrine, (auto) immune system	0.4	0.8	2.6	3.2	3.1	2.9	2.4	1.9	2.4
Acquired brain injury	2.1	3.3	4.2	2.9	2.2	1.8	1.3	1.7	2.3
Visceral disorders	0.3	1.1	1.3	1.8	1.7	1.3	1.0	1.2	1.3
Respiratory system	0.7	1.2	0.8	1.1	3.1	4.3	5.0	5.3	3.3
Sense organs	4.3	2.6	1.6	1.6	1.2	2.1	2.4	1.9	2.0
Congenital abnormalities	7.7	2.5	0.5	0.4	0.1	0.1	0.2	0.4	0.7
Other/Unknown	0.4	2.2	2.6	3.1	2.4	2.0	2.2	1.8	2.2
<i>No. of observations</i>	<i>941</i>	<i>1,594</i>	<i>2,456</i>	<i>3,639</i>	<i>2,212</i>	<i>2,990</i>	<i>4,559</i>	<i>4,067</i>	<i>22,458</i>
<b>Females</b>									
Musculo-skel. & connective tissue	5.4	9.7	21.0	31.6	41.9	48.3	55.2	53.9	39.1
Psychological/ psychiatric	11.3	38.8	48.2	37.5	28.6	20.5	13.1	9.5	26.0
Intellectual/ learning	58.8	25.8	4.1	2.4	1.3	0.7	0.2	0.3	5.6
Circulatory system	0.8	1.8	1.9	2.8	3.9	5.3	6.4	6.6	4.2
Cancer/tumour	0.9	1.6	3.6	5.5	6.2	7.3	8.7	11.4	6.3
Nervous system	2.6	3.9	5.0	4.1	3.5	2.8	2.5	2.5	3.3
Endocrine, (auto) immune system	1.9	3.1	3.7	3.5	2.7	2.6	2.7	3.8	3.0
Acquired brain injury	1.9	3.3	1.7	1.6	1.1	1.1	0.9	1.8	1.4
Visceral disorders	0.6	1.3	1.0	2.0	1.5	1.4	1.4	1.8	1.5
Respiratory system	0.5	1.3	1.2	1.8	3.2	4.3	4.6	4.4	3.1
Sense organs	3.6	2.8	1.7	2.0	1.8	1.8	1.8	2.7	2.0
Congenital abnormalities	11.0	2.6	1.1	0.5	0.4	0.3	0.2	0.1	1.0
Other/Unknown	0.8	4.0	5.9	4.8	4.1	3.6	2.5	1.2	3.6
<i>No. of observations</i>	<i>645</i>	<i>1,041</i>	<i>1,360</i>	<i>2,686</i>	<i>2,117</i>	<i>2,732</i>	<i>3,408</i>	<i>729</i>	<i>14,718</i>

Note: See Table A2 in the Appendix for full details on medical condition categories.

### *Characteristics of recipients from different origins*

One of the reasons for identifying the origins of DSP recipients is to examine whether behaviour when on DSP differs by origin. For example, Cai (2004) finds that those who transferred to DSP from unemployment payments tend to leave DSP more slowly than those who enter DSP from other origins. One explanation for this difference might lie in the fact that the observable characteristics of recipients from different origins are different. In this section, we examine whether this is the case.

Table 8 compares the demographic characteristics and medical conditions of new DSP recipients by their origin in terms of pre-DSP income support receipt. In light of the relatively small numbers making direct transfers from income support payments other than unemployment and sickness benefits, all of these direct transfers are grouped together. Entrants to DSP transferring from 'non-incapacitated' unemployment benefits (hereafter

simply referred to as unemployment benefits) are presented separately from those who are identified as ‘DSP pending’ or incapacitated, who are grouped with sickness benefit recipients into the ‘incapacitated’ category. The focus here is, first, on whether characteristics differ between recipients who directly transfer to DSP and recipients who enter DSP from outside the income support system; and, second, on whether there are differences among transferrers by payment type origin.

Considering first the entry age distribution, as would be expected, no transferrer is aged less than 16.5 years of age at entry to DSP. That aside, age is more equally distributed among transferrers than among those who enter DSP from outside the income support system. The proportion aged 25 to 49 years is smaller among non-transferring entrants to DSP than among the transferrers, but the proportion younger than 25 years or older than 55 years is larger among the former than among the latter. There are also some differences in the age distribution across the three different payment type categories of transferrers. For example, for both males and females, transferrers from unemployment benefits and incapacity-related benefits have a larger proportion less than 35 years of age than do transferrers from other payments. For females aged 55-59 years, the proportions transferring from unemployment benefits and incapacity-related benefits are much smaller than the proportion transferring from other payments.

The place of birth and Indigenous status composition of new DSP recipients (second panel of Table 8) is broadly similar among transferrers from different payment types, although transferrers from ‘other’ payments are somewhat more likely to be non-English speaking background immigrants and less likely to be non-Indigenous Australian born than transferrers from the other two groups of payment types. Comparing transferrers with non-transferring entrants, we see that the latter group is more likely to be non-Indigenous Australian-born and less likely to be Indigenous or an immigrant of non-English speaking background.

Transferrers are more likely to be single than non-transfer entrants and, if partnered, it is much more likely their partner is also on income support (third panel of Table 8). Among transferrers, the proportion single is lowest for those who transfer from other payments and highest for those who transfer from unemployment benefits. In general, dependent children are not common among entrants to DSP, the exception being that slightly over one-third of those who transfer from ‘other’ payments have dependent children.

**Table 8: Demographic and medical condition composition of DSP inflows, by origin (%)**

	Males				Females			
	UB <sup>(a)</sup>	Incap. <sup>(b)</sup>	Other pmt	Non-transfer	UB <sup>(a)</sup>	Incap. <sup>(b)</sup>	Other pmt	Non-transfer
<b>Age at DSP entry</b>								
≤16.5	0.0	0.0	0.0	8.8	0.0	0.0	0.0	10.7
16.5-24	7.3	6.1	1.5	6.7	10.9	7.5	1.0	8.0
25-34	16.3	13.2	8.6	5.7	13.2	14.3	8.5	6.4
35-44	21.3	21.7	22.6	9.6	21.9	23.3	20.4	13.1
45-49	12.4	12.6	13.6	7.3	18.6	19.0	14.3	11.1
50-54	15.4	14.8	17.2	11.7	18.6	18.1	22.2	18.3
55-59	19.7	19.7	18.9	22.3	15.8	15.9	29.7	26.1
60-64	7.7	11.9	17.7	28.0	1.0	1.9	3.8	6.4
<b>Place of birth and Indigenous status<sup>(c)</sup></b>								
Indigenous	3.9	2.3	3.6	2.0	5.7	3.2	3.2	2.0
Other Aus-born	65.3	66.3	63.2	69.4	67.7	68.0	61.6	71.9
ESB	9.0	10.6	7.7	10.1	7.8	10.1	8.9	9.6
NESB	21.8	20.8	25.6	18.6	18.9	18.7	26.2	16.5
<b>Family circumstances</b>								
Single	59.2	54.4	48.5	41.7	80.7	78.2	51.4	48.8
Partner not on IS	3.3	5.9	6.7	25.2	3.5	4.8	3.8	28.7
Partner on IS	37.5	39.8	44.8	33.1	15.8	17.0	44.8	22.5
Have dependent children	16.2	16.6	34.9	10.1	4.3	5.5	34.4	11.6
<b>Housing circumstances and location of residence</b>								
Private rent	47.5	39.8	33.5	18.9	45.7	41.6	28.3	18.6
Government rent	10.2	7.2	13.9	2.5	15.6	12.1	18.0	3.6
Home-owner	30.4	40.1	44.5	58.2	25.0	34.0	47.4	55.6
Zero rent	12.0	13.0	8.1	20.5	13.6	12.3	6.3	22.1
Major city	54.1	57.2	50.8	55.4	55.5	61.5	56.5	59.8
<i>No. of observations</i>	<i>12,224</i>	<i>6,793</i>	<i>923</i>	<i>15,809</i>	<i>4,846</i>	<i>3,761</i>	<i>4,964</i>	<i>8,989</i>
<b>Main medical condition<sup>(d)</sup></b>								
Musc.-skel. & conn. tissue	37.7	41.9	45.7	39.1	34.4	37.1	44.5	39.4
Psychological/psychiatric	34.6	27.9	17.9	13.1	39.5	38.6	22.1	16.1
Intellectual/learning	3.5	1.5	1.6	9.3	4.3	1.5	1.5	10.0
Circulatory system	6.2	9.6	10.7	10.1	3.6	3.0	5.8	4.2
Cancer/tumour	3.3	5.2	5.4	9.0	2.3	4.2	5.9	9.4
Nervous system	1.8	2.1	2.2	3.3	2.4	2.3	3.7	4.0
Endocrine, immune system	2.3	2.5	3.1	2.4	2.8	2.2	4.2	2.7
Acquired brain injury	2.0	1.9	2.5	2.7	0.9	1.4	1.0	1.9
Visceral disorders	1.4	1.4	0.9	1.2	1.3	1.4	1.6	1.5
Respiratory system	3.3	2.3	4.7	3.5	3.3	2.4	4.0	2.8
Sense organs	1.5	1.0	2.4	2.8	1.2	0.9	2.1	2.8
Congenital abnormalities	0.3	0.1	0.7	1.3	0.4	0.3	0.5	1.9
Other/Unknown	2.2	2.5	2.4	2.1	3.8	4.8	3.1	3.4
<i>No. of observations</i>	<i>7,500</i>	<i>4,218</i>	<i>554</i>	<i>10,186</i>	<i>3,038</i>	<i>2,434</i>	<i>3,174</i>	<i>6,072</i>

Notes: Sample comprises inflows in the period 1996 to 2003. (a) Unemployment benefits where the recipients are not recorded as 'incapacitated' or 'DSP pending'. (b) Comprises recipients of sickness benefits as well as unemployment benefit recipients identified as 'incapacitated' or 'DSP pending' on entering unemployment benefits. (c) ESB – immigrants from English speaking countries; NESB – immigrants from non-English speaking countries. (d) Sample used for medical conditions is inflows to DSP over the period 1999-2003. Descriptions and detailed frequencies of medical conditions are reported in Table A2 in the Appendix.

Home-owners account for a smaller share of transferrers than they do of non-transferrers commencing DSP. On the other hand, the proportion privately renting is larger among the latter group than among the former. Among transferrers, those who transfer from

unemployment benefits have a lower proportion owning homes, and higher proportion renting in the private sector, than those who transfer from the other two groups of payments.

The last panel of Table 8 compares the medical conditions of the different groups of inflows. Note, however, that only inflows from 1999 to 2003 are used to construct this panel. For males, musculo-skeletal and connective tissue problems are the dominant medical condition type for all recipient origins. The proportion of males with musculo-skeletal and connective tissue conditions looks similar for transferrers and those from outside the income support system, but there are differences among transferrers by payment type origin. For example, male transferrers from unemployment benefits have a lower proportion with musculo-skeletal and connective tissue conditions than do other transferrers. For females, musculo-skeletal and connective tissue problems are only the dominant condition for non-transferrers and transferrers from ‘other’ payments. While musculo-skeletal and connective tissue conditions still account for a very large proportion of conditions for female transferrers from unemployment benefits (whether incapacitated or not), a slightly larger proportion has a psychological or psychiatric condition.

The finding with respect to psychological/psychiatric problems reflects a more general feature for both males and females, which is that the proportion with such conditions is much larger for transfers than non-transfer inflows. Among transferrers, this proportion is higher for unemployment and incapacity-related benefits than for other payments. The proportion with intellectual/learning problems is larger among non-transfer entrants than among transferrers, which is consistent with the high proportion of this group that acquired the medical condition at birth. Similarly, but for different reasons, the proportion with cancer/tumour conditions is also higher among non-transfer entrants than among transferrers.

## ***2.2. Pre-DSP income support receipt***

Having described the characteristics of new DSP recipients, in this section we examine in detail the income support receipt experience of these individuals in the period leading up to entering DSP. In particular, we examine the number of DSP entrants who have previously received income support, patterns of income support receipt history in terms of the number of spells and transfers across different payment types, and duration on income support prior to entering DSP. Among other things, this descriptive analysis helps us understand the extent to which entrants to DSP were relying on income support even before going on to DSP. To ensure each sample member has the same ‘opportunity’ for pre-DSP income support receipt,

we restrict to DSP entrants over 21 years of age. All members of our sample therefore have the potential to have received income support payments in each of the five years preceding DSP entry.

To begin the study of pre-DSP income support receipt, Table 9 shows the number of DSP entrants who received income support in different time periods prior to entering DSP, expressed as a proportion of all inflows. The first row in each panel shows the proportion who are direct transferrers. These individuals were on income support immediately prior to entering DSP and thus by definition have a history of pre-DSP income support receipt. The subsequent rows show the cumulative proportions of inflows with income support receipt history when traced back over different lengths of time. Consider, for example, male inflows in 2003: 57.8% were direct transferrers from other payments, while 61.5% of these new recipients received income support at some stage within one year of entering DSP (including transferrers), 67% received income support at some stage in the two years prior to entering DSP, and so on.

The longest period over which we trace back is seven years, which can only be done for the 2002 and 2003 DSP inflow cohorts. The results show that when we examine the seven-year history of DSP recipients, approximately 75% are found to have at least some income support receipt experience before entering DSP.

Since the first row is for those who directly transfer to DSP from other payments, the increment from the first row to subsequent rows tells us the proportion of inflows from outside the income support system with an income support history. For example, for female inflows in 2003, 60.5% were direct transfers and 65% received income support within one year of entering DSP. The 4.5% difference comprises non-transfer inflows of females who received income support at some stage of the year preceding DSP entry. This amounts to 11% ( $4.5/(100-60.5)$ ) of female non-transfer inflows. Over one-third of both male and female non-transfer inflows in 2003 involve individuals who received income support within seven years of entry to DSP. Nevertheless, the number of individuals who enter DSP from outside the income support system and who have received income support prior to entry is significantly smaller than the number of direct transferrers.

Comparing males and females, it appears that the proportion of female inflows with previous income support receipt is slightly larger than the corresponding proportion for male inflows.

However, this is driven by the fact that a larger proportion of female inflows are direct transfers than are male inflows.

**Table 9: Proportion of new DSP recipients with history of income support receipt, by length of pre-DSP period (%)**

	1996	1997	1998	1999	2000	2001	2002	2003
<b>Males</b>								
<i>Length of pre-DSP period</i>								
0 (direct transfer)	61.7	60.1	58.3	60.2	54.5	57.3	58.4	57.8
1 year	66.6	63.7	62.6	63.8	58.2	61.2	61.6	61.5
2 years	.	67.4	66.6	67.9	63.2	66.0	65.7	67.0
3 years	.	.	69.1	69.6	66.0	68.6	67.8	69.1
4 years	.	.	.	71.2	68.3	70.6	69.7	70.5
5 years	.	.	.	.	70.1	72.1	70.9	72.0
6 years	.	.	.	.	.	73.1	72.2	72.9
7 years	.	.	.	.	.	.	73.0	73.9
<b>Females</b>								
<i>Length of pre-DSP period</i>								
0 (direct transfer)	67.8	66.3	64.4	66.4	60.1	64.0	61.4	60.5
1 year	72.8	71.7	68.4	70.3	65.3	67.9	65.4	65.0
2 years	.	75.3	72.4	73.8	70.4	72.1	69.5	68.5
3 years	.	.	76.3	75.7	73.3	74.1	71.8	70.7
4 years	.	.	.	77.0	75.9	75.7	73.3	72.3
5 years	.	.	.	.	77.4	77.0	74.9	73.6
6 years	.	.	.	.	.	78.1	76.3	75.1
7 years	.	.	.	.	.	.	77.2	75.8

Note: Sample comprises DSP entrants over 21 years of age at entry to DSP.

Table 9 is informative in showing the incidence of pre-DSP income support receipt, but experiences of income support among those with any history of receipt may vary considerably. For example, some individuals may have only a single short spell on one payment type, while others may experience many different spells and payment types. While it is difficult to provide a full and complete description of patterns of pre-DSP income support receipt, various summary measures can provide a reasonably good characterisation of these patterns.

Restricting to those who received income support within five years of entering DSP, Table 10 characterises patterns of previous income support using the concepts of ‘churning’ and ‘transferring’. Examining income support receipt in the five years preceding DSP entry allows us to examine the 2000-2003 DSP entry cohort.<sup>9</sup> Churning is defined to occur when an

<sup>9</sup> Examining income support receipt over a longer pre-DSP period would be at the expense of a smaller entry cohort. For example, examining six-year histories would require us to restrict to the 2001-2003 entry cohort. We settled on five years for much of the subsequent analysis of prior income support receipt as a reasonable

individual has more than one income support spell in the five years prior to DSP entry. Transferring is defined to occur when an individual changes payment types within the one income spell, again within the five years prior to DSP entry.

**Table 10: Churning and transferring in the five years preceding DSP entry (%)**

	Males			Females		
	Transferrers	Non-transferrers	All	Transferrers	Non-transferrers	All
<i>Pre-DSP transferring and churning status</i>						
Neither churn nor transfer	47.3	57.1	49.3	44.5	57.3	46.9
Churn only	38.3	29.6	36.5	23.5	24.9	23.8
Transfer only	7.2	7.7	7.3	22.6	10.0	20.3
Churn & transfer	7.2	5.7	6.9	9.4	7.8	9.1
<i>No. of observations</i>	9,234	2,302	11,536	6,598	1,512	8,110
Proportion of all inflows (%)	57.0	14.2	71.2	61.6	14.1	75.7

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003 and received income support at some stage in the five years preceding DSP entry. A separate observation is generated for each new grant of DSP in the 2000-2003 period. Transferrers comprise entrants to DSP who directly transferred from another income support payment. Non-transferrers are all other entrants (who received income support in the five years preceding DSP entry).

Each DSP inflow in the sample is classified into one of four categories: ‘neither churn nor transfer’, ‘churn only’, ‘transfer only’ and ‘churn and transfer’. The ‘neither churn nor transfer’ category identifies inflows for which pre-DSP income support receipt comprised a single spell on one payment type. The ‘churn only’ category applies to those with more than one income support spell but no within-spell payment transfers in the five years preceding DSP entry. The ‘transfer only’ pattern captures those with only one income support, but who transferred between payment types in that spell.<sup>10</sup> Finally, ‘churn and transfer’ refers to those who have multiple income support spells in the five years preceding DSP entry and change payment type within at least one of these spells. As well as presenting the proportion in each of these four categories for inflows in the aggregate, Table 10 also presents these proportions separately for direct transfers to DSP (‘transferrers’) and inflows to DSP from outside the income support system (‘non-transferrers’).

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compromise between the competing goals of maximising the sample examined and maximising the pre-DSP period examined.

<sup>10</sup> In contrast to some other studies, such as Cai and Gregory (2005), a change of payment type without a payment break is treated as continuation of the same income support spell. That is, a change in payment types does not of itself precipitate a change in spells.

Those who neither churned nor transferred, who therefore had a single spell on one payment type in the five years leading up to DSP entry, comprise the single largest group, accounting for almost half of the inflows in our sample. Comparing direct transferrers with those from outside the income support system reveals that the proportion in the single-prior-spell group is higher among non-transferrers – 57% compared with 47% for male transferrers and 45% for female transferrers.

Relatively few DSP entrants both churned and transferred in the five years preceding entry, but a substantial proportion churned without transferring. Over one-third of male inflows and almost one-quarter of female inflows in our sample are in the ‘churn only’ category, corresponding to one-quarter of all male inflows and nearly one-fifth of all female inflows, respectively. The most important difference between males and females is that female new DSP recipients are more likely to have transferred between payment types prior to DSP entry. The incidence of pre-DSP transferring is, at 23% (or 14% of all female DSP inflows), particularly high for females who directly transferred to DSP from another payment.<sup>11</sup> This is likely to reflect a greater propensity to transfer for females more generally, for example between Parenting Payment Single and Parenting Payment Partnered.

To further explore the pre-DSP income support receipt patterns of the inflows for which there is an observed history of income support receipt, Table 11 presents the number of pre-DSP churns and transfers. The number of churns measures the frequency of a recipient cycling on and off the income support system, and is equal to the number of pre-DSP income support spells minus one. The number of transfers measures the frequency of recipients transiting across different payments while staying on the income support system. Both measures may or may not be directly related to duration on income support. As was the case for Table 10, statistics are presented for direct transfers and other inflows separately, as well as for all inflows collectively.

Consistent with the estimates in Table 10, among entrants to DSP who have received other income support payments in the five years leading up to DSP entry, in the majority of cases there is only one prior spell (i.e., zero churns) and one payment type (i.e., zero transfers) in that five-year period. Repeated transferring is very uncommon, particularly for males. Only

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<sup>11</sup> Recall that the transfer from another income support payment to DSP is not counted as a transfer for the purposes of describing *pre-DSP* patterns of income support receipt.

4% of male DSP entrants transfer more than once in the five years preceding DSP entry; the corresponding figure for females is 9.4%. Churning more than once is a relatively more frequent occurrence, more so for males than females.

**Table 11: Distribution of number of churns and transfers in the five years preceding DSP entry (%)**

	Males			Females		
	Transferrers	Non-transferrers	All	Transferrers	Non-transferrers	All
<i>No. of churns pre-DSP</i>						
0	54.6	64.7	56.6	67.1	67.3	67.2
1	26.5	22.4	25.7	21.9	23.4	22.2
2	11.4	7.9	10.7	7.6	6.2	7.3
3	4.6	3.6	4.4	2.4	2.5	2.4
4+	2.9	1.4	2.6	1.0	0.7	0.9
<i>No. of transfers pre-DSP</i>						
0	85.6	86.7	85.8	68.1	82.2	70.7
1	9.8	11.3	10.1	21.3	13.8	19.9
2	3.4	1.6	3.0	5.9	2.3	5.2
3	0.7	0.4	0.6	2.5	1.0	2.2
4+	0.5	0.1	0.4	2.3	0.7	2.0
<i>No. of observations</i>	9,234	2,302	11,536	6,598	1,512	8,110
Proportion of all inflows	57.0	14.2	71.2	61.6	14.1	75.7

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003 and received income support at some stage in the five years preceding DSP entry. A separate observation is generated for each new grant of DSP in the 2000-2003 period. Transferrers comprise entrants to DSP who directly transferred from another income support payment. Non-transferrers are all other entrants (who received income support in the five years preceding DSP entry).

Statistics on pre-DSP income support receipt presented in Tables 9 to 11, while providing important information on patterns of receipt, give little indication of the length of time spent on income support prior to DSP entry. In Tables 12 and 13 we therefore turn our attention to measures of time spent on income support in the five years leading up to DSP entry.

In Table 12 we first consider the length of the last spell on income support in the five year period leading up to DSP entry. The table presents the mean and standard deviation of the duration of the last income support spell, differentiated by payment type and the length of the payment break between the last spell and DSP entry. The sample comprises persons over 21 years of age who commenced DSP in 2002 or 2003 and received income support at some stage in the five years leading up to DSP entry. The duration information is derived from the income support spell duration data item supplied in the administrative data set. An individual is assigned to the payment type last received prior to DSP entry, with the exception that an unemployment benefit recipient is classified as on incapacity-related payments if he or she

had an activity type of incapacitated or DSP pending at the start of the unemployment benefit spell.<sup>12</sup>

On average, transferrers spend more than two years in the income support spell leading up to DSP entry, with male transferrers having a slightly longer duration than female transferrers. Those who enter DSP from outside the income support system, but who received an income support payment within the preceding five years, have average pre-DSP spell durations ranging from seven months to sixteen months, depending on the length of the payment break. Specifically, the shorter the payment break, the greater the expected duration of the last income support spell, a pattern that extends to the case where the payment break is zero (transferrers), which is associated with the greatest expected pre-DSP spell duration.

Comparisons of spell durations across payment types reveal that incapacity-related benefits are associated with shorter pre-DSP spell durations. Given that work-related incapacity is one of the most important eligibility requirements for DSP, this is perhaps not surprising with respect to direct transfers to DSP, although it is less clear why this should also be true of pre-DSP spells for those who enter from outside the income support system.

Aside from incapacity-related benefits, there are no clear patterns in pre-DSP spell durations across payment types among those who enter DSP from outside the income support system. However, among those who directly transfer to DSP, individuals who come from unemployment benefits tend to have the longest pre-DSP spells, averaging 33 months for both males and females. This is very unlikely to simply reflect administrative processes, such as placing persons on unemployment benefits while various administrative requirements for grant of DSP are met.<sup>13</sup> Rather, it is circumstantial evidence that a long spell on unemployment benefits substantially elevates the risk of entering DSP – whether because of a real or perceived decline in work-capacity as duration on unemployment benefits increases. Given the large number of individuals involved, the factors underpinning inflows to DSP via this route is clearly an important issue.

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<sup>12</sup> Note, therefore, the unemployment benefits category includes persons whose activity type changed to incapacitated prior to the end of the unemployment benefit spell.

<sup>13</sup> There is no publicly available information on the time required by Centrelink offices to process DSP applications. However, a performance indicator under the Business Partnership Agreement between FaCS and Centrelink specifies that 80% of DSP applications should be processed within 49 days of lodgement. It is therefore likely that most applications are processed within two months.

**Table 12: Duration of the income support spell immediately preceding entry to DSP, by payment type and length of payment break**

	Payment break				All
	0 (transfer)	0-1 year	1-3 years	3-5 years	
<b>Males</b>					
<b>Unemployment benefits</b>					
Mean duration (days) <sup>(a)</sup>	1,016	533	331	239	923
Std dev.	925	657	395	297	905
No. of observations	5,526	297	328	295	6,446
<b>Incapacity related benefits</b>					
Mean duration (days) <sup>(a)</sup>	505	266	244	177	470
Std dev.	510	363	288	212	497
No. of observations	3,264	229	191	81	3,765
<b>Other Payments</b>					
Mean duration (days) <sup>(a)</sup>	718	486	497	304	654
Std dev.	758	619	579	339	723
No. of observations	444	45	52	37	578
<b>Disability Support Pension</b>					
Mean duration (days) <sup>(a)</sup>			516	353	486
Std dev.			590	382	561
No. of observations			612	135	747
<b>All</b>					
Mean duration (days) <sup>(a)</sup>	821	422	420	262	733
Std dev.	830	568	513	317	795
No. of observations	9,234	571	1,183	548	11,536
<b>Females</b>					
<b>Unemployment benefits</b>					
Mean duration (days) <sup>(a)</sup>	1,028	436	385	203	941
Std dev.	942	578	453	231	923
No. of observations	2,200	104	123	94	2,521
<b>Incapacity related benefits</b>					
Mean duration (days) <sup>(a)</sup>	576	269	210	132	529
Std dev.	622	407	254	156	603
No. of observations	1,907	122	103	65	2,197
<b>Parenting Payment Single</b>					
Mean duration (days) <sup>(a)</sup>	647	632	283	202	613
Std dev.	892	691	419	317	852
No. of observations	724	73	49	25	871
<b>Other Payments</b>					
Mean duration (days) <sup>(a)</sup>	705	628	423	274	657
Std dev.	798	672	516	349	763
No. of observations	1,767	154	177	99	2,197
<b>Disability Support Pension</b>					
Mean duration (days) <sup>(a)</sup>			488	207	432
Std dev.			559	360	537
No. of observations			260	64	324
<b>All</b>					
Mean duration (days) <sup>(a)</sup>	769	488	400	211	697
Std dev.	837	611	495	294	800
No. of observations	6,598	453	712	347	8,110

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003 and received income support at some stage in the five years preceding DSP entry. A separate observation is generated for each new grant of DSP in the 2000-2003 period. (a) For spells commencing prior to January 1995 (left-censored spells), spell duration is obtained from a data item on income support spell duration in the data set.

A limitation of Table 12 is that it considers only the last spell preceding DSP entry. As shown in Table 10, this will not be the only spell in the five year period preceding DSP entry for over one-third of these inflows for males, and nearly one-quarter of these inflows for females. To address this limitation, Table 13 presents statistics on the *Total* proportion of *Time On* (TTO) income support for three different pre-DSP ‘window’ lengths: one year, three years and five years. For example, statistics for the three-year window relate to the proportion of time on income support in the three years immediately preceding DSP entry.

As might be expected, the proportion of time on income support is higher for direct transfers than for other inflows. For example, for the three-year window, the proportion of time on income support for male direct transfers is 67%, compared with 24.7% for other inflows. However, also consistent with expectations is that the proportion of time on income support is decreasing in window length for direct transfers, while it is increasing in window length for other inflows. Females on average spend a higher proportion of time on income support prior to entering DSP than males, but the proportion of time on income support is high for both sexes. Indeed, perhaps the most striking finding from Table 13 is that DSP entrants with prior income support receipt in the preceding five years are on average on income support for over half this five-year period. These DSP entrants are therefore generally characterised by a recent history of heavy reliance on income support prior to DSP entry.

**Table 13: Proportion of time (TTO) on income support prior to DSP entry (%)**

	Males			Females		
	Transferrers	Non-transferrers	All	Transferrers	Non-transferrers	All
<i>Length of pre-DSP window</i>						
<b>1 year</b>						
Mean	83.9	10.8	69.3	88.3	14.0	74.5
Std dev.	25.2	22.8	38.3	22.3	25.8	37.0
<b>3 years</b>						
Mean	66.8	24.7	58.4	76.1	28.4	67.2
Std dev.	32.7	24.7	35.5	30.9	28.3	35.6
<b>5 years</b>						
Mean	58.5	31.1	53.0	69.2	34.5	62.7
Std dev.	33.2	24.9	33.6	33.2	27.5	34.9
<i>No. of obs.</i>	9,234	2,302	11,536	6,598	1,512	8,110
Proportion of all inflows (%)	57.0	14.2	71.2	61.6	14.1	75.7

Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003 and received income support at some stage in the five years preceding DSP entry. A separate observation is generated for each new grant of DSP in the 2000-2003 period. The ‘pre-DSP window’ is the length of the period, traced back from the date of DSP entry, over which the proportion of time on income support is evaluated. Transferrers comprise entrants to DSP who directly transfer from another income support payment. Non-transferrers are all other entrants to DSP.

### ***2.3. Labour market attachment prior to DSP entry***

The extent and nature of labour market attachment of DSP recipients prior to entry to DSP has the potential to have important implications for both likelihood of DSP entry and length of time on DSP. In many instances, labour market attachment will be highest when an individual is off income support payments altogether. However, the nature of the administrative data is that labour market activity is not observed when an individual is off all payments. In this section we therefore consider, in the period leading up to the transition to DSP, the extent to which DSP recipients were attached to the labour market *when on income support payments*. Our approach is to assume there is some degree of attachment to the labour market in a given fortnight if a recipient has earnings recorded in that fortnight. Clearly, this a measure of labour market attachment conditional on being reliant on income support.<sup>14</sup>

Using our definition of labour market attachment, we examine the proportion of new recipients who were at some stage attached to the labour market when on income support, the proportion of time on income support individuals were attached to the labour market, and the level of earnings in those fortnights in which an individual had some attachment to the labour market. These measures serve to provide imperfect information on the earnings capacities of DSP recipients when on income support payments prior to DSP entry. As with the analysis of pre-DSP income support receipt, the sample is restricted to persons over 21 years of age at entry to DSP.

Table 14 presents, for individuals who commenced a spell on DSP in the period 2000-2003, the proportion with earned income when on income support payments in different periods prior to DSP entry. For example, the upper left cell shows that 15.7% of male direct transferrers had earned income while on income support at some stage in the year preceding DSP entry. Similarly, the cell below this indicates that 21.9% of male direct transferrers who were on income support at some stage in the one-year period ending a year prior to DSP entry had earned income in that period.

For both male and female transferrers, the more distant the observation window from the date of commencement of the DSP spell, the greater is the proportion of those on income support in that window who had earnings. For example, 31% of male transferrers who were on

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<sup>14</sup> It is consequently perhaps more accurate to characterise this section as an examination of the extent to which income support receipt is combined with employment.

income support 4-5 years prior to DSP entry had earnings while on income support in that period; by comparison, only 16% of male transferrers had earnings while on income support in the year leading up to DSP entry.

**Table 14: Pre-DSP earned income while on income support: Proportion of recipients with earned income, by period prior to DSP entry (%)**

	Transferrers		Non-transferrers		All	
	Proportion	Obs	Proportion	Obs	Proportion	Obs
<b>Males</b>						
<i>Period prior to DSP entry</i>						
0-1 year	15.7	9231	28.1	598	16.5	9829
1-2 years	21.9	7262	27.0	1198	22.6	8460
2-3 years	24.5	6282	27.7	1337	25.1	7619
3-4 years	28.0	5724	27.7	1386	27.9	7110
4-5 years	30.7	5378	28.6	1424	30.2	6802
<b>Females</b>						
<i>Period prior to DSP entry</i>						
0-1 year	17.4	6597	27.2	482	18.1	7079
1-2 years	21.2	5639	29.7	828	22.3	6467
2-3 years	24.5	5064	30.7	928	25.4	5992
3-4 years	25.7	4677	32.2	940	26.8	5617
4-5 years	27.9	4407	31.9	952	28.6	5359

Notes: Sample comprises DSP inflows in the period 2000-2003 by persons aged 21 years or over at entry to DSP. A separate observation is generated for each new grant of DSP in the 2000-2003 period. Statistics are for DSP entrants who received income support in the relevant period prior to DSP entry. *Obs* – Number of observations.

For those who enter from outside the income support system, but were on income support payments at some stage in the preceding five years, there is little evidence of a relationship between the incidence of earned income and the distance of the observation window for the date of DSP entry. For example, for male entrants to DSP from outside the income support system who received income support in the 4-5 year window prior to entry, 28.6% reported earnings in that window, compared with 28.1% of those on income support in the year leading up to DSP entry. Comparing transferrers with those from outside the income support system also suggests that those in the latter group are in general more likely to have earned income than those in the former group.

While Table 14 provides an indication of the rate of combining income support with earnings and how this varies by ‘distance’ from the date of DSP entry, it does not provide information on how combining income support with earnings depends on the length of time spent on income support prior to DSP entry. We therefore provide information of this nature in Table 15 by presenting incidence rates of earnings broken down length of time on income support in the five years preceding DSP entry.

Table 15 shows that the proportion of individuals with earned income while on income support is increasing in total duration on income support up to four years duration, after which the proportion falls. For example, while fewer than 20% of the transferrers who have been on income support for less than one year had earned income, over 50% of the transferrers who spent three to four years on income support had earned income. Holding constant the total time on income support, the incidence of earned income tends to be higher among those who enter DSP from outside the income support system. However, this is not uniformly the case across all the duration categories displayed in Table 15, and the aggregate difference between transferrers and non-transferrers in the incidence of reported earnings is quite small for both males and females. The finding that the proportion with earned income increases with total time on income support may at first glance seem counter-intuitive, but is perhaps not so surprising when one considers the greater opportunity for combining earnings with income support the greater is the time spent on income support, simply because there are more fortnights in which combining earnings and income support could occur.

**Table 15: Pre-DSP earned income while on income support: Proportion of recipients with earned income, by total time on income support in the five years preceding DSP entry (%)**

	Transferrers		Non-transferrers		All	
	Proportion	Obs	Proportion	Obs	Proportion	Obs
<b>Males</b>						
<i>Total time on IS</i>						
0-1 year	15.5	1728	33.8	1037	22.4	2765
1-2 years	36.2	1432	45.6	485	38.5	1917
2-3 years	47.5	1365	48.7	374	47.8	1739
3-4 years	55.8	1308	53.1	341	55.2	1649
4-5 years	46.8	3398	51.9	77	46.9	3475
All	40.7	9231	42.1	2314	41.0	11545
<b>Females</b>						
<i>Total time on IS</i>						
0-1 year	18.0	833	32.2	614	24.0	1447
1-2 years	36.1	796	46.4	323	39.1	1119
2-3 years	44.5	746	54.2	249	46.9	995
3-4 years	50.8	717	49.8	211	50.5	928
4-5 years	41.3	3505	51.2	125	41.6	3630
All	39.1	6597	42.8	1522	39.8	8119

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003 and received income support at some stage in the five years preceding DSP entry. A separate observation is generated for each new grant of DSP in the 2000-2003 period. *Obs* – Number of observations.

Tables 16 and 17 examine one measure of the *extent* of pre-DSP labour market attachment by presenting statistics on the proportion of time on income support payments that individuals

had earned income.<sup>15</sup> Mirroring Tables 14 and 15, Table 16 presents statistics broken down by period prior to DSP entry, while Table 17 disaggregates by total time on income support in the five years prior to DSP entry.

**Table 16: DSP entrants with earned income while on Pre-DSP income support: Mean proportion of time with earned income, by period prior to DSP entry (%)**

	Transferrers			Non-transferrers			All		
	Mean	Std dev	Obs	Mean	Std dev	Obs	Mean	Std dev	Obs
<b>Males</b>									
<i>Period prior to DSP entry</i>									
0-1 year	30.7	29.9	1453	41.3	32.1	168	31.8	30.3	1621
1-2 years	34.3	30.7	1587	49.5	36.6	324	36.9	32.3	1911
2-3 years	34.8	30.5	1539	48.0	35.5	370	37.3	32.0	1909
3-4 years	34.8	29.6	1601	48.7	35.0	384	37.5	31.2	1985
4-5 years	32.8	28.9	1649	45.6	34.9	407	35.3	30.6	2056
<b>Females</b>									
<i>Period prior to DSP entry</i>									
0-1 year	43.9	34.2	1148	51.3	33.6	131	44.6	34.2	1279
1-2 years	48.8	35.3	1196	59.7	35.5	246	50.6	35.6	1442
2-3 years	49.4	35.3	1239	58.9	35.3	285	51.2	35.5	1524
3-4 years	53.0	34.9	1203	56.8	35.3	303	53.7	35.0	1506
4-5 years	50.4	35.0	1230	59.8	34.4	304	52.2	35.1	1534

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003. A separate observation is generated for each new grant of DSP in the 2000-2003 period. Statistics are for DSP entrants who received income support in the relevant period prior to DSP entry. *Std dev* – Standard deviation; *Obs* – Number of observations.

Among male transferrers with earned income, the mean proportion of time having earned income when on income support is very similar across different observation windows (periods) prior to entry to DSP, at about one-third in all windows. Female transferrers have a larger mean proportion of time with earned income than male transferrers. For both males and females who at some stage combined income support with earnings prior to DSP entry, those from outside the income support system have a larger mean proportion of time with earned income than do transferrers. Consequently, there is evidence that non-transfer entrants have a greater capacity to participate in employment prior to DSP entry. That is, not only do we have indirect evidence of greater ability to participate in employment in the form of the time off income support immediately preceding DSP entry, during which time many will be employed, but also direct evidence in the form of the greater proportion of time these entrants are employed when on income support.

<sup>15</sup> We do not present the raw number of fortnights that a recipient has earned income because the duration on pre-DSP income support payments varies across recipients, and so therefore does the opportunity to have fortnights with earned income.

Table 17 considers, for those with earned income, the association between the proportion of time with earned income and total time on income support. It appears that those who have the shortest total time on income support prior to entering DSP have the largest proportion of time on income support with earned income. Specifically, those with less than one year on income support stand out as a group with a much higher mean proportion of time with earnings than the other groups (with longer total durations on income support). This is consistent with the intuition that, given an individual had earnings at some stage in a pre-DSP income support spell, the ‘opportunity’ for fortnights with *no* earned income will be smaller for those with shorter total durations on income support in the pre-DSP period. In light of this logic, it is therefore notable that this pattern is not very pronounced in comparisons across the other groups. For example, those with 4-5 years on income support payments in the five years preceding DSP entry do not have significantly lower proportions of time with earnings than those with 2-3 years on income support.

**Table 17: DSP entrants with earned income while on pre-DSP income support: Mean proportion of time with earned income, by total time on income support in the five years prior to DSP entry (%)**

	Transferrers			Non-transferrers			All		
	Mean	Std dev	Obs	Mean	Std dev	Obs	Mean	Std dev	Obs
<b>Males</b>									
<i>Total time on IS</i>									
0-1 year	28.1	26.5	268	33.9	27.8	351	31.4	27.4	619
1-2 years	21.0	21.3	518	26.4	26.0	221	22.6	22.9	739
2-3 years	17.3	19.2	649	25.6	30.1	182	19.1	22.3	831
3-4 years	15.5	18.1	730	28.1	30.7	181	18.0	21.8	911
4-5 years	15.0	20.4	1591	24.6	25.1	40	15.2	20.6	1631
All	17.3	20.7	3756	29.2	28.5	975	19.7	23.0	4731
<b>Females</b>									
<i>Total time on IS</i>									
0-1 year	38.7	30.9	150	42.6	29.3	198	40.9	30.0	348
1-2 years	28.5	26.0	287	35.6	32.0	150	31.0	28.4	437
2-3 years	27.9	25.8	332	37.5	31.6	135	30.7	27.9	467
3-4 years	25.0	25.9	364	36.1	31.9	105	27.5	27.7	469
4-5 years	26.1	27.3	1446	35.4	33.8	64	26.5	27.6	1510
All	27.2	27.1	2579	38.2	31.4	652	29.4	28.4	3231

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003 and received income support at some stage in the five years preceding DSP entry. A separate observation is generated for each new grant of DSP in the 2000-2003 period. *Std dev* – Standard deviation; *Obs* – Number of observations.

Consistent with the findings from Table 15, the results in Table 17 indicate that transferrers have a smaller mean proportion of time with earned income than those who are from outside but with income support history, and male new recipients have a smaller mean proportion of time with earned income than females, regardless of the total time on income support.

In addition to the proportion of time with earnings, a further dimension of the extent of labour market attachment while on income support is the *value* of earnings. Table 18 presents mean earnings per fortnight for those fortnights in which earnings were reported. Earnings have been adjusted for inflation using the quarterly Australian Bureau of Statistics (ABS) Consumer Price Index (CPI) and are expressed in September quarter 2004 prices. In all cases presented in Table 18, mean earnings in fortnights in which non-zero earnings are reported are well above \$300. This is well above the taper-free earned income threshold (‘free area’) of all payment types (which in 2005 is as low as \$62). However, it should also be noted that the standard deviation of earned income is very large.<sup>16</sup>

**Table 18: DSP entrants with earnings while on pre-DSP income support: Mean earnings in those fortnights in which non-zero earnings reported, by period prior to DSP entry**

	Transferrers			Non-transferrers			All		
	Mean	Std dev	Obs	Mean	Std dev	Obs	Mean	Std dev	Obs
<b>Males</b>									
<i>Period prior to DSP entry</i>									
0-1 year	379	412	1453	579	503	168	400	426	1621
1-2 years	465	581	1587	619	478	324	491	568	1911
2-3 years	502	557	1539	577	522	370	517	551	1909
3-4 years	510	682	1601	599	553	384	527	660	1985
4-5 years	467	556	1649	599	589	407	493	565	2056
<b>Females</b>									
<i>Period prior to DSP entry</i>									
0-1 year	335	401	1148	532	442	131	355	409	1279
1-2 years	351	396	1196	534	370	246	382	398	1442
2-3 years	353	282	1239	504	408	285	382	315	1524
3-4 years	365	406	1203	495	480	303	391	425	1506
4-5 years	346	297	1230	526	647	304	382	398	1534

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003. A separate observation is generated for each new grant of DSP in the 2000-2003 period. Statistics are for DSP entrants who received income support in the relevant period prior to DSP entry. *Std dev* – Standard deviation; *Obs* – Number of observations.

Non-transferrers with income support history in the preceding five years have a higher mean earned income than do transferrers, when holding constant the observation window. For both transferrers and non-transferrers with income support history, males have higher mean earned

<sup>16</sup> Mean earnings in fortnights earnings were reported is substantially higher than expected, but various checks did not reveal any errors in our derivation of earnings variables from the data. To some extent this reflects the effects of persons recorded as on payments but with zero benefit entitlement. For example, this is possible for up to three consecutive fortnights for Newstart Allowance recipients. In addition, although the LDS documentation states otherwise, we suspect that in some cases earnings correspond to a longer period than the fortnight to which they were assigned.

incomes than females. Thus, while female new recipients have a larger proportion of time with earned income when on income support (as shown by Table 16), they on average earn less than males who have earnings.

#### ***2.4. Observed work incapacity prior to DSP entry***

It is likely that many entrants to DSP have health problems limiting work capacity that existed some time before entering DSP. While there is not comprehensive information on health problems and associated work incapacity prior to DSP entry, the administrative data do allow for limited inferences. Specifically, we can infer that work incapacity exists for those on Sickness Allowance and those on Newstart Allowance or Youth Allowance who are exempted from job search requirements due to incapacity. In addition, some entrants to DSP will have already received DSP in the period leading up to the latest DSP entry. Consequently, in this section we examine such observed work incapacity when on income support prior to DSP entry.<sup>17</sup>

Results presented in Tables 19 to 22 are of a similar format to results presented in Tables 14 to 17 for the examination of earnings prior to DSP entry. Table 19 presents the proportion of entrants with a history of income support receipt with observed incapacity (as defined above) while on income support. As with Table 14, this is broken down by period prior to DSP entry – for example, the second row of each panel presents the proportion of persons on income support in the 1-2 year window preceding DSP entry that were at some stage incapacitated in that observation window. Among transferrers, 77% of males and 57% of females were incapacitated at some stage in the year leading up to DSP entry. Looking back further, the proportion with incapacity falls among those who were on income support during those time periods. For example, only 27% of male transferrers and 15% of female transferrers who were on income support 4-5 years prior to DSP entry were incapacitated in that period.

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<sup>17</sup> We exclude from our analysis in this subsection those identified as ‘DSP pending’. As before, we also exclude entrants aged less than 21 years.

**Table 19: Pre-DSP work incapacity while on income support: Proportion of recipients incapacitated, by period prior to DSP entry (%)**

	Transferrers		Non-transferrers		All	
	Proportion	Obs	Proportion	Obs	Proportion	Obs
<b>Males</b>						
<i>Period prior to DSP entry</i>						
0-1 year	77.1	9231	66.7	598	76.4	9829
1-2 years	55.3	7262	67.4	1198	57.0	8460
2-3 years	40.9	6282	65.8	1337	45.2	7619
3-4 years	32.2	5724	58.5	1386	37.3	7110
4-5 years	27.0	5378	52.1	1424	32.3	6802
<b>Females</b>						
<i>Period prior to DSP entry</i>						
0-1 year	57.2	6597	42.1	482	56.2	7079
1-2 years	37.4	5639	45.5	828	38.5	6467
2-3 years	26.1	5064	44.4	928	29.0	5992
3-4 years	19.4	4677	40.9	940	23.0	5617
4-5 years	15.0	4407	38.0	952	19.1	5359

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003. A separate observation is generated for each new grant of DSP in the 2000-2003 period. Statistics are for DSP entrants who received income support in the relevant period prior to DSP entry. *Obs* – Number of observations.

For those who entered DSP from outside the income support system, 67% of males and 42% of females on income support in the year leading up to DSP entry had experienced work incapacity in that year. Like transferrers, the incidence of work incapacity falls the further back is the period prior to DSP entry, but the rate of decline is much smaller. For example, 52% of male transferrers and 38% of female non-transfer entrants who were on income support 4-5 years prior to DSP entry were incapacitated in that period. Non-transferrers have a larger proportion with incapacity than transferrers, except for the year immediately leading to DSP entry. Males have a larger proportion with observed incapacity experience than females, possibly because females are more likely to receive payments other than unemployment benefits than are males.

Table 20 considers whether the incidence of work incapacity varies with total time on income support. It shows no clear relationship between total time on income support and the rate of incapacity.

**Table 20: Pre-DSP work incapacity while on income support: Proportion of recipients incapacitated, by total time on income support in the five years prior to DSP entry (%)**

	Transferrers		Non-transferrers		All	
	Proportion	Obs	Proportion	Obs	Proportion	Obs
<b>Males</b>						
<i>Total time on IS</i>						
0-1 year	80.5	1728	66.2	1037	75.1	2765
1-2 years	89.7	1432	76.7	485	86.4	1917
2-3 years	89.0	1365	84.2	374	88.0	1739
3-4 years	88.3	1308	90.9	341	88.8	1649
4-5 years	81.4	3398	64.9	77	81.0	3475
All	84.6	9231	74.9	2314	82.7	11545
<b>Females</b>						
<i>Total time on IS</i>						
0-1 year	67.1	833	53.1	614	61.2	1447
1-2 years	73.2	796	65.3	323	71.0	1119
2-3 years	71.4	746	64.7	249	69.7	995
3-4 years	71.4	717	70.1	211	71.1	928
4-5 years	56.5	3505	31.2	125	55.6	3630
All	63.1	6597	58.1	1522	62.2	8119

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003 and received income support at some stage in the five years preceding DSP entry. A separate observation is generated for each new grant of DSP in the 2000-2003 period. *Obs* – Number of observations.

Similar to the examination of labour market attachment in Section 2.4, we use the proportion of time an individual was incapacitated when on income support as a measure of the *extent* (duration) of incapacity.<sup>18</sup> Tables 21 and 22 present statistics based on this measure for those who at some stage in the relevant period were incapacitated, broken down by period prior to DSP entry in Table 21 and by total time on income support in Table 22.

Table 21 shows that male DSP entrants who were on income support and had incapacity experience within one year of entering DSP were on average incapacitated for 63% of the time they were on income support; for females the corresponding figure is 59%. There is little difference in the mean proportion of time incapacitated as the observation window becomes more distant. Comparing transferrers with entrants from outside the income support system shows a tendency for those with incapacity experience in the latter group to be incapacitated for a higher proportion of their time on income support, except for the year immediately preceding DSP entry. Thus, while Table 13 shows those from outside the income support system on average spend less time on income support prior to DSP entry than transferrers, and

<sup>18</sup> Of course, there will not be a direct correspondence between the proportion of time incapacitated and the *severity* of the incapacity, which is perhaps another important dimension of incapacity experience.

Table 20 shows they are also less likely to experience any incapacity in those prior spells, those that do experience incapacity are on average in that state for a greater proportion of their time on income support than are transferrers.

**Table 21: DSP entrants with observed work incapacity while on pre-DSP income support: Mean proportion of time incapacitated, by period prior to DSP entry (%)**

	Transferrers			Non-transferrers			All		
	Mean	Std dev	Obs	Mean	Std dev	Obs	Mean	Std dev	Obs
<b>Males</b>									
<i>Period prior to DSP entry</i>									
0-1 year	64.1	29.2	7115	45.3	40.3	399	63.1	30.1	7514
1-2 years	63.6	32.9	4016	87.6	24.0	808	67.6	32.9	4824
2-3 years	57.4	33.7	2567	87.2	25.5	880	65.0	34.4	3447
3-4 years	54.7	34.7	1842	85.7	27.3	811	64.2	35.6	2653
4-5 years	53.8	35.5	1452	83.8	29.0	742	63.9	36.3	2194
<b>Females</b>									
<i>Period prior to DSP entry</i>									
0-1 year	59.8	32.7	3774	43.8	43.2	203	59.0	33.5	3977
1-2 years	63.2	32.7	2111	86.5	26.8	377	66.7	33.0	2488
2-3 years	56.8	34.1	1323	86.1	26.3	412	63.8	34.7	1735
3-4 years	53.0	34.7	906	86.7	25.0	384	63.0	35.6	1290
4-5 years	54.2	35.1	660	84.0	28.7	362	64.7	35.9	1022

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003. A separate observation is generated for each new grant of DSP in the 2000-2003 period. Statistics are for DSP entrants who received income support in the relevant period prior to DSP entry. *Std dev* – Standard deviation; *Obs* – Number of observations.

Table 22 presents the proportion of time incapacitated for those who were incapacitated at some stage in the five years prior to DSP entry, broken down by total time on income support in that five-year period. It shows that for both males and females, this proportion is lower the greater the total time on income support. This is primarily driven by transferrers, there being little evidence of a relationship between total time on income support and the proportion of time incapacitated for non-transferrers.

**Table 22: DSP entrants with observed work incapacity while on pre-DSP income support: Mean proportion of time incapacitated, by total time on income support in the five years prior to DSP entry (%)**

	Transferrers			Non-transferrers			All		
	Mean	Std dev	Obs	Mean	Std dev	Obs	Mean	Std dev	Obs
<b>Males</b>									
<i>Total time on IS</i>									
0-1 year	69.0	25.3	1382	70.8	25.4	600	69.6	25.3	1982
1-2 years	59.2	29.3	1283	66.4	33.2	340	60.7	30.3	1623
2-3 years	47.0	29.3	1208	70.4	33.9	290	51.5	31.6	1498
3-4 years	37.3	26.7	1150	77.6	32.8	298	45.6	32.5	1448
4-5 years	27.9	23.2	2737	18.9	17.2	42	27.8	23.1	2779
All	44.7	30.5	7760	69.7	31.5	1570	48.9	32.1	9330
<b>Females</b>									
<i>Total time on IS</i>									
0-1 year	71.3	23.6	538	69.2	24.6	274	70.6	23.9	812
1-2 years	65.0	28.1	571	67.6	33.3	183	65.6	29.4	754
2-3 years	48.3	30.2	524	67.2	35.9	145	52.4	32.4	669
3-4 years	36.4	27.3	496	74.5	34.6	133	44.4	32.9	629
4-5 years	25.5	21.7	1786	22.4	25.4	23	25.4	21.8	1809
All	42.0	30.9	3915	67.9	32.0	758	46.2	32.5	4673

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003 and received income support at some stage in the five years preceding DSP entry. A separate observation is generated for each new grant of DSP in the 2000-2003 period. *Std dev* – Standard deviation; *Obs* – Number of observations.

As shown in Table 5 in Section 2.1, unemployment benefits (inclusive of those exempted from activity test requirements due to work incapacity) are the predominant payment type of those with prior income support receipt, whether they directly transfer to DSP or enter DSP from outside the income support system. It is therefore informative to consider separately the incapacity experience of those who received unemployment benefits prior to entering DSP. Table 23 presents the proportion of recipients who have experienced incapacity when on unemployment benefits by total time on benefits prior to entering DSP.

More than 80% of transferrers and about half of non-transferrers experienced incapacity when receiving unemployment benefits. For both transferrers and non-transferrers the proportion with incapacity is larger for those with a total time on unemployment benefits of more than one year before entering DSP. Comparing estimates with those reported in Table 20, we see that the proportion of recipients at some stage incapacitated is larger among female transferrers when we restrict to unemployment benefits, but is not significantly different among male transferrers. The absence of a difference for male transferrers may be because most male transfers are from unemployment benefits, whereas female transfers are relatively more likely to be from other payment types. By definition, payment types other than unemployment benefits can never involve ‘observed’ incapacity because this is derived from

the ‘activity type’ variable, which is only recorded for unemployment benefits. Indeed, when we restrict to unemployment benefit receipt, the female incidence of incapacity is very similar to the male incidence of incapacity.

**Table 23: DSP entrants with observed work incapacity while on unemployment benefits: Proportion of recipients incapacitated, by total time on unemployment benefits in the five years prior to DSP entry (%)**

	Transferrers		Non-transferrers		All	
	Proportion	Obs	Proportion	Obs	Proportion	Obs
<b>Males</b>						
<i>Total time on UB</i>						
0-1 year	74.1	2148	41.9	1698	59.9	3846
1-2 years	86.8	1494	63.3	332	82.5	1826
2-3 years	88.3	1294	67.1	155	86.0	1449
3-4 years	88.8	1170	71.1	83	87.6	1253
4-5 years	84.0	2602	73.3	45	83.8	2647
All	83.3	8708	48.3	2313	76.0	11021
<b>Females</b>						
<i>Total time on UB</i>						
0-1 year	68.7	1584	45.4	821	60.7	2405
1-2 years	88.9	914	72.9	133	86.9	1047
2-3 years	91.9	619	72.7	55	90.4	674
3-4 years	93.6	470	75.9	29	92.6	499
4-5 years	86.1	956	70.0	10	85.9	966
All	82.2	4543	51.4	1048	76.4	5591

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003 and received unemployment benefits at some stage in the five years preceding DSP entry. A separate observation is generated for each new grant of DSP in the 2000-2003 period. *Obs* – Number of observations.

A further dimension to the issue of incapacity experience prior to DSP entry is the number of ‘episodes’ of incapacity. Incapacity exemptions are designed to be temporary, with such exemptions limited to 13 weeks duration (although recipients can apply for another exemption at the expiration of an existing exemption). This increases the likelihood that multiple distinct episodes of incapacity will be observed for individuals, even though an individual episode can be longer than 13 weeks. Table 24 shows the distribution of the number of incapacity episodes in the five years preceding DSP entry for DSP entrants with prior incapacity experience in that five-year period. An incapacity episode is defined to be a period of one or more fortnights in which only incapacity-related benefits are received, bounded by fortnights in which other payments are received or the individual was off payments altogether.

The incidence of multiple incapacity episodes is much more common among transferrers than non-transfers. Only 3% of non-transferrers had more than one episode, compared with 46% of male transferrers and 34% of female transferrers. As these numbers indicate, multiple

incapacity episodes are more frequent among males than females. This primarily reflects a higher rate of multiple incapacity episodes for male transferrers than for female transferrers, since male and female non-transferrers have similarly low incidences of multiple episodes.

**Table 24: Distribution of the number of incapacity spells prior to DSP entry (%)**

	Males			Females		
	Transferrers	Non-transferrers	All	Transferrers	Non-transferrers	All
<i>Number of incapacity spells</i>						
1	53.6	96.6	71.4	65.8	97.3	77.5
2	26.9	2.5	16.8	19.7	2.0	13.1
3	12.8	0.8	7.9	9.4	0.6	6.1
4	4.7	0.1	2.8	3.8	0.1	2.4
5+	1.9	0.04	1.2	1.3	0.03	0.9
<i>Number of obs.</i>	8,627	6,060	14,687	6,069	3,597	9,666

Notes: Sample comprises DSP entrants over 21 years of age who entered DSP in the period 2000-2003 and received incapacity-related payments at some stage in the five years preceding DSP entry. A separate observation is generated for each new grant of DSP in the 2000-2003 period. *Obs* – Number of observations.

### 2.5. The transition to DSP: A ‘follow-up’ approach

Sections 2.1-2.4 have investigated DSP inflows in terms of *history* of income support receipt. The sample in scope for that analysis comprised those who entered DSP during a specified time period. We then traced back for a specified period of time to examine their income support receipt experience, including labour market attachment and incapacity while on income support. While providing important information, this sampling approach does not provide an appropriate sample for analysis of the transition process to DSP. This is because the resulting sample includes only those who enter DSP, not those who are *at risk* of making the transition to DSP. As such, important questions of who is more likely to transfer to DSP from other income support payments, and how the transition probability varies with duration on income support, cannot be answered by the ‘tracing back’ approach.

To analyse the transition process, we require a cohort of recipients who enter the income support system and are then followed for a given period. While formal modelling of the transition process is left to the econometric analysis in Section 3, in this subsection we use a descriptive ‘follow-up’ approach to document how many members of an income support entry cohort end up on DSP at different elapsed durations after commencement on income support. For example, adopting this approach, we can identify the proportion of individuals who commence a non-DSP income support spell that is found to be on DSP five years later, and how this proportion depends on the payment type of the initial income support spell.

The sample examined comprises those who commenced a non-DSP, non-Age Pension income support spell in 1995. Since the data set spans the period January 1995 to June 2004, this sample selection rule provides the maximum period over which destinations can be tracked for a cohort of entrants to income support payments. We exclude persons aged 60 years and over at commencement of the income support spell in 1995 to limit the potential for transitions to the Age Pension.<sup>19</sup>

Table 25 presents the proportion of the 1995 income support entry cohort observed to be on DSP at selected points in time after commencement of the 1995 spell.<sup>20</sup> For example, the upper right cell shows that 1% of females who commenced a non-DSP spell in 1995 were on DSP exactly one year after commencement of that spell; while the cell below shows that 2.4% were on DSP exactly three years after commencement.<sup>21</sup> In addition to presenting results for all income support payment types collectively, Table 25 also presents results disaggregated by initial payment type, distinguishing three types: unemployment benefits, Sickness Allowance and other payments.<sup>22</sup>

The estimates in Table 25 show that, for males who commenced a non-DSP income support spell in 1995, 1.8% were on DSP one year later, 4.2% were on DSP three years later, and 7.9% were on DSP eight years later. The proportion of females on DSP at each point of time is on average about half that of males. This reflects lower rates of subsequent DSP receipt for those who started the 1995 spell on unemployment benefits or ‘other’ payments, with females who started on sickness benefits having very similar rates of subsequent DSP receipt to males. Not surprisingly, for both males and females, those who started on sickness benefits have the largest proportions on DSP at each follow-up point in time.

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<sup>19</sup> DSP eligibility criteria do not permit individuals to enter DSP once they reach the minimum age of eligibility for the Age Pension, although it is possible for existing DSP recipients to remain on DSP once they reach this age.

<sup>20</sup> While the discussion in this section may suggest the analysis is of destinations subsequent to an individual’s *first* income support spell, clearly this is not the case. Given the limited data window, we in general do not know when a recipient first received income support payments.

<sup>21</sup> Note that these ‘snapshots’ are not equivalent to the number of *transitions* to DSP, since persons who enter and subsequently leave DSP prior to the end of the observation window (including those who exit due to death) are not reflected in the estimates. Information on the number of transitions is reported in Table 27.

<sup>22</sup> In 1995, all unemployment benefit recipients who were temporarily incapacitated due to ill health were placed on Sickness Allowance. The activity type ‘incapacitated’ did not exist for unemployment benefit recipients.

**Table 25: Persons who commenced a non-DSP income support spell in 1995: Proportion receiving DSP at specified points in time after commencement of non-DSP spell, by initial payment type (%)**

	Males				Females			
	UB	Sickness Allowance	Other Payments	All	UB	Sickness Allowance	Other Payments	All
<i>Elapsed time after commencement</i>								
One year	0.9	11.0	3.6	1.8	0.6	10.1	0.7	1.0
Three years	2.9	19.2	5.1	4.2	1.9	19.3	1.6	2.4
Five years	4.7	21.9	6.0	6.0	3.0	21.3	2.5	3.4
Eight years	6.7	22.4	7.9	7.9	4.3	22.5	3.8	4.7
<i>No. of obs.</i>	<i>49,761</i>	<i>4,119</i>	<i>4,059</i>	<i>57,939</i>	<i>22,997</i>	<i>2,000</i>	<i>28,817</i>	<i>53,814</i>

Note: DSP recipient status is evaluated only at the point in time indicated by the row heading. Estimates therefore exclude individuals who are not on DSP at that point in time but received DSP in the intervening period (i.e., persons who entered and then exited DSP prior to the elapsed duration indicated by the row heading).

Table 26 presents the same information as Table 25, but disaggregated by age rather than initial payment type. Comparing across different entry age groups, it is evident that the older the entry age, the higher the probability of ending up on DSP at each of the follow-up points in time. For example, for both males and females, the proportion of 50-54 year olds on DSP at each follow-up date is approximately three times that of 35-44 year olds (where age is measured at commencement of the 1995 spell). It should be noted this does not imply younger entrants are less likely to end up on DSP, just that they are less likely to do so within the timeframes examined. The relationship identified in Table 26 may reflect pure age effects, or it may derive from the effects of other factors that are related to age, such as health and degree of labour market attachment. Econometric analysis will to some extent enable separate identification of these effects.

**Table 26: Persons who commenced a non-DSP income support spell in 1995: Proportion receiving DSP at specified points in time after commencement of non-DSP spell, by age at commencement of 1995 spell (%)**

	Age at commencement of non-DSP spell					
	15-24	25-34	35-44	45-49	50-54	55-59
<b>Males</b>						
<i>Elapsed time after commencement</i>						
One year	0.4	0.9	1.8	3.3	6.8	13.3
Three years	1.2	2.6	4.8	9.1	14.5	21.1
Five years	2.2	3.9	7.0	12.7	20.3	24.8
Eight years	3.5	6.0	10.0	17.6	27.1	14.7
<i>No. of obs.</i>	<i>21,359</i>	<i>17,109</i>	<i>10,815</i>	<i>3,641</i>	<i>2,696</i>	<i>2,319</i>
<b>Females</b>						
<i>Elapsed time after commencement</i>						
One year	0.4	0.4	0.9	2.3	4.7	4.1
Three years	0.9	1.2	2.7	6.8	9.6	6.2
Five years	1.2	2.0	4.3	10.3	13.0	4.8
Eight years	2.0	3.0	6.8	15.1	15.5	0.5
<i>No. of obs.</i>	<i>17,961</i>	<i>16,391</i>	<i>10,943</i>	<i>3,448</i>	<i>2,621</i>	<i>2,450</i>

Note: DSP recipient status is evaluated only at the point in time indicated by the row heading. Estimates therefore exclude individuals who are not on DSP at that point in time but received DSP in the intervening period (i.e., persons who entered and then exited DSP prior to the elapsed duration indicated by the row heading).

Individuals who commence a spell on a non-DSP income support payment can end up on DSP via different routes. For example, some recipients may directly transfer to DSP from the payment they start with; others may transfer to another payment type and subsequently transfer to DSP; while others may exit income support payments altogether and then enter DSP from outside the income support system. The ‘snapshot’ approach to documenting DSP receipt status at different follow-up points in time presented in Tables 25 and 26 does not provide information on the different routes of income support recipients who enter DSP. Since there are too many possible routes for each to be examined individually, we define the following four routes of DSP entry to provide a sense of how income support recipients end up on DSP:

1. Transfer to DSP from the first income support spell in 1995 (referred to as ‘single spell, transfer’);
2. Experience more than one income support spell prior to DSP entry and eventually transfer to DSP from an income support payment (referred to as ‘multiple spells, transfer’);
3. Exit the first income support spell and subsequently enter DSP from outside the income support system (referred to as ‘single spell, from outside’);

4. Experience more than one income support spell, and eventually enter DSP from outside the income support system (referred to as ‘multiple spells, from outside’).

Table 27 shows the proportion of the 1995 income support entry cohort that ends up on DSP through different routes at different follow-up periods. It also provides information on the total proportion of the 1995 income support entry cohort making the transition to DSP within each follow-up period. Considering this dimension first, the last column of Table 27 shows that, within eight years of commencement of the 1995 non-DSP income support spell, 10.1% of males and 5.9% of females had made such a transition. This compares with 7.9% of males and 4.7% of females in this cohort actually being on DSP eight years after commencement of the non-DSP spell in 1995 (Table 25). Thus, approximately 20% of those who made the transition to DSP within the eight-year follow-up period subsequently exited DSP prior to the end of the eight-year period. As would be expected, the gap between the proportion on DSP at the end of the follow-up period and the proportion making a transition to DSP at some stage within the follow-up period declines as the follow-up period is shortened. For example, these proportions are identical when the follow-up period is only one year.

The first four columns of Table 27 show the proportions at some stage making the transition to DSP within different follow-up periods via the four different routes. For example, among males who started income support spells in 1995, at the five-year follow-up point, 3.9% had transferred to DSP from the first income support spell, 2.2% transferred to DSP from a spell subsequent to the first spell, 0.5% left the first spell and then entered DSP from outside the income support system, and 0.3% experienced multiple income support spells before entering DSP from outside the income support system.

It is evident that most of those who end up on DSP do so via either direct transfer from the first income support spell or through transfer from a subsequent income support spell. In total, those entering through transfers (first two columns of Table 27) account for more than 80% of all those who at some stage make the transition to DSP (last column), no matter the length of the observation window. This provides some empirical support for employing duration analysis methods for the econometric analysis. Duration models will not capture exit from income support followed by subsequent entry to DSP, but this is relatively uncommon.<sup>23</sup>

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<sup>23</sup> Note, however, that the large proportion of these transfers that are via the multiple spell route implies that it is important to include variables for recent history of income support receipt.

**Table 27: Proportion of the 1995 income support entry cohort entering DSP via each route, by length of follow-up period (%)**

	DSP entry routes				All
	Single spell, transfer	Multiple spells, transfer	Single spell, from outside	Multiple spells, from outside	
<b>Males</b>					
<i>Time since IS entry</i>					
1 year	1.7	0.1	0.1	0.0	1.8
2 years	2.7	0.4	0.2	0.1	3.3
3 years	3.3	0.9	0.4	0.1	4.6
4 years	3.7	1.6	0.4	0.2	5.9
5 years	3.9	2.2	0.5	0.3	6.9
6 years	4.1	2.9	0.6	0.4	7.9
7 years	4.3	3.7	0.7	0.5	9.1
8 years	4.4	4.3	0.7	0.6	10.1
<i>No. ending up on DSP</i>	2,546	2,495	431	365	5,837
<b>Females</b>					
<i>Time since IS entry</i>					
1 year	0.9	0.0	0.1	0.0	1.0
2 years	1.5	0.2	0.2	0.0	1.9
3 years	1.9	0.4	0.3	0.0	2.7
4 years	2.2	0.7	0.3	0.1	3.4
5 years	2.5	1.0	0.4	0.1	4.0
6 years	2.6	1.3	0.5	0.2	4.6
7 years	2.8	1.7	0.5	0.3	5.3
8 years	3.0	2.0	0.6	0.4	5.9
<i>No. ending up on DSP</i>	1,599	1,082	313	199	3,193

An alternative picture on entry routes to DSP is provided by examining, for each route, the distribution of DSP entrants by the elapsed time between the date of commencement of the first income support spell and the date of DSP entry. This provides a sense of the length of time taken from commencement of the non-DSP income support spell to entry to DSP. Table 28 presents this distribution for persons who commenced a non-DSP income support spell in 1995 and who ended up on DSP within eight years of commencement of that spell. Note that for single spell transfers, this is also the distribution of the duration of the first income support spell before the transition to DSP.

Among all those who end up on DSP within eight years, nearly one-third enter within two years of commencement of the income support spell in 1995, while 60% enter within four years. The duration distribution does, however, differ across the entry routes. For example, single-spell transfers are concentrated in the first two years, while multiple-spell transfers and multiple-spell entries from outside are rare within the first two years. Those in the ‘single spell, from outside’ group are distributed relatively equally over the follow-up years. The different patterns may reflect any number of factors, including differences in the nature of the

health conditions. For example those who enter through single-spell transfers may have serious health problems, while those who enter through other routes may initially not have so severe health problems, but may experience deterioration in health over time.

**Table 28: Distribution of DSP entrants by elapsed time since entering income support – 1995 income support entry cohort (%)**

	DSP entry routes				All
	Single spell, transfer	Multiple spells, transfer	Single spell, from outside	Multiple spells, from outside	
<b>Males</b>					
<i>Time since IS entry</i>					
1 year	38.1	1.2	13.2	0.3	18.1
2 years	22.4	7.9	16.7	7.1	14.8
3 years	14.5	11.4	16.9	8.8	13.0
4 years	8.8	15.6	11.8	14.0	12.2
5 years	5.3	14.5	11.4	15.9	10.3
6 years	4.1	15.7	11.4	15.6	10.3
7 years	4.2	18.4	10.0	18.6	11.6
8 years	2.8	15.4	8.6	19.7	9.7
<i>No. of observations</i>	2,546	2,495	431	365	5,837
<b>Females</b>					
<i>Time since IS entry</i>					
1 year	29.8	2.0	8.3	0.0	16.4
2 years	20.8	8.5	18.5	2.5	15.3
3 years	14.2	11.6	16.9	9.1	13.3
4 years	9.4	14.4	13.4	12.1	11.7
5 years	8.1	14.1	9.3	10.1	10.4
6 years	6.0	15.5	12.5	17.6	10.6
7 years	6.6	17.0	11.8	26.6	11.9
8 years	5.1	16.8	9.3	22.1	10.5
<i>No. of observations</i>	1,599	1,082	313	199	3,193

### 3. Transitions to DSP from other payments: Econometric modelling

The fact that the majority of DSP inflows are transfers from other income support payments raises some basic questions, such as:

- What are the characteristics of the income support recipients that increase the likelihood (risk) of transferring to DSP?
- Is the risk of transfer related to duration on income support, or indeed other patterns of receipt of income support?
- Do payment types (or the recipient characteristics they embody) matter in terms of affecting the risk of transfer to DSP?

In this section we seek to answer these questions by modelling the risk of transition to DSP from other income support payments. While the question of *why* people transfer to DSP from other income support payments is also important, the data used for the current project do not contain information allowing us to answer this question. One can at best speculate as to the reasons, as suggested in the introduction of this report.

We take two complementary approaches to modelling the risk of transfer: estimation of duration models and estimation of multinomial logit models. The duration model is a natural choice for modelling transition processes such as transfers from other income support payments to DSP. It directly models the probability an event occurs (e.g., transition to DSP) conditional on having remained in a particular state for a given time period (e.g., on income support). There are several key advantages of duration models. First, duration models can easily incorporate variables that vary with time, such as labour market conditions, attachment to the labour market, and payment type. Second, they can directly examine how the risk of transition changes with duration. Third, inferences are not adversely affected by the presence of right-censored observations – that is, individuals who are not observed to exit the initial state (i.e., on non-DSP income support) prior to the end of the available data window.

Duration models do, however, have their disadvantages. The descriptive analysis in Section 2 showed that direct transfers to DSP from the first observed income support spell are not the only route through which recipients enter DSP. One group that, although observed to receive income support prior to DSP entry, completely escapes capture by the duration modelling approach is individuals who move off income support and subsequently enter DSP from outside the income support system. Because the duration model examines the transition to

DSP from the state of being on income support, individuals in this group fall out of the scope of the modelling exercise.

A further limitation of the duration modelling approach is that spells, not people, are the subject of analysis. This tends to reduce the value of duration models in understanding the role of multiple non-DSP spells in affecting risk of DSP entry. This is quantitatively a more important issue than the failure to model DSP entry from outside the income support system. Table 27 showed that over 80% of individuals who commenced a non-DSP spell in 1995 and then entered DSP within the next eight years individuals did so via the transfer route. Of these, nearly half did *not* transfer to DSP from the (first) spell commenced in 1995. That is, nearly half of the 1995 entry cohort who transferred to DSP had more than one income support spell prior to the transfer to DSP. This is therefore an important group of individuals. The duration models we estimate do incorporate information on previous spells on income support in an attempt to capture the effects of multiple spells on risk of the transition to DSP. Nonetheless, the nature of duration models does constrain the insights that can be generated from this approach on the role of multiple spells.<sup>24</sup>

The use of the multinomial logit model is aimed at compensating for the deficiencies of duration models. It involves modelling, for an entry cohort of income support recipients, the probability of ending up on DSP within a specified (follow-up) time period. This approach therefore captures all routes to DSP entry. What is important for this approach is whether a recipient enters DSP within, say, five years of commencement of an income support spell. Another advantage of the multinomial logit model is that the subject of analysis can be the individual, rather than the spell. An obvious disadvantage of this model is that time-varying variables cannot be used in the model. In addition, inferences are conditional on the specific follow-up point in time adopted, since the outcome (income support receipt status) can differ depending on this choice.

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<sup>24</sup> It should also be noted that the econometric methods employed take into account multiple spells of recipients in making statistical inferences. That is, standard errors of the estimates are calculated taking into account multiple spells.

### 3.1. Duration model approach

#### *The competing risk model*

For the purposes of this study, transitions from non-DSP income support payments involve two alternative destinations: DSP; and exit from the income support system. In duration analysis parlance, this constitutes a ‘competing risk’ scenario, whereby an individual is at risk of transition to DSP *or* transition off all income support payments. Thus, to model two potential destinations we adopt a competing risk duration model, allowing us to identify the factors influencing the transition to DSP and the factors influencing exit from the system. Clearly, an important focus is on comparing factors associated with exiting to DSP with factors associated with exit from the income support system.

As discussed in the introduction, instead of modelling the transition from a specific payment (e.g., Cai and Gregory (2005) model the transition to DSP from unemployment benefits only), we model duration on all non-DSP income support payments as a whole. Modelling duration on the one payment type would treat a transfer to another payment type as an alternative destination to transferring to DSP. We believe it is more appropriate to treat transfers between non-DSP payments as explanatory factors affecting the likelihood of transition to DSP. For example, the descriptive analysis suggests that many of those who transfer to unemployment benefits appear to increase their chances of transferring to DSP. Our approach can investigate whether this is in fact the case, whereas an approach that models duration on a single payment type could not.

One way of formulating a competing risk model with  $K$  exit routes is to postulate that there are  $K$  latent durations for each individual,  $T_1, \dots, T_K$ , which are independent random variables.<sup>25</sup> The destination actually reached is determined by whichever of the  $\{T_k\}$  is the least, with the duration to exit given by this lowest duration. Denote the route-specific hazard at time  $t$  for route  $k$  as  $\lambda_k(t)$ , which measures the probability of leaving for route  $k$  in the next infinitesimal period, given  $T_k \geq t$ . The commonly used hazard function takes the proportional hazard form:

$$\lambda_k(t | x(t)) = \lambda_{k0}(t) \exp(x(t)' \beta_k) \quad (1)$$

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<sup>25</sup> Given the information in the data, models based on dependent latent durations cannot be identified (Florens, Fougère and Mouchart, 1996).

where  $\lambda_{k0}(t)$  is the baseline hazard at time  $t$  for exit route  $k$ , which is common to all individuals;  $x(t)$  is a vector of covariates which can be time dependent; and  $\beta$  is a vector of unknown parameters.

In a discrete-time context, the probability that  $T_k$  will last until time  $t+1$ , given that it has lasted until  $t$  – that is, the probability of *not* exiting to destination  $k$  at time  $t+1$ , given exit to that destination has not already occurred – can be written as:

$$\begin{aligned} P(T_k \geq t+1 | T_k \geq t) &= \exp\left[-\int_t^{t+1} \lambda_k(u) du\right] \\ &= \exp[-\exp(x(t)' \beta_k + \gamma_k(t))] \end{aligned} \quad (2)$$

assuming that  $x(t)$  is constant between  $t$  and  $t+1$ , and where  $\gamma_k(t) = \ln\left\{\int_t^{t+1} \lambda_{k0}(u) du\right\}$  (Meyer, 1990).<sup>26</sup> The survival function of  $T_k$  is then:

$$\begin{aligned} S_k(t) &= \prod_{j=0}^{t-1} \exp[-\exp(x(j)' \beta_k + \gamma_k(j))] \\ &= \exp\left[-\sum_{j=0}^{t-1} [\exp(x(j)' \beta_k + \gamma_k(j))]\right] \\ &= \exp[-\Lambda_k(t)] \end{aligned} \quad (3)$$

where  $\Lambda_k(t) = \sum_{j=0}^{t-1} [\exp(x(j)' \beta_k + \gamma_k(j))]$ .

Given the independence assumption on the latent durations, if an individual is observed to be right-censored at  $t$  (that is,  $t$  is the end of June 2004 and the individual is still on a non-DSP payment), the contribution to the likelihood function is  $L_c = \prod_{l=1}^K S_l(t)$ . If an individual is

observed to leave for route  $k$  at  $[t, t+1)$ , the contribution to the likelihood function is

$$L_k = [S_k(t) - S_k(t+1)] \prod_{\substack{l=1 \\ l \neq k}}^K S_l(t+1).$$

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<sup>26</sup> This specification for the baseline hazard is known as piece-wise constant baseline hazard (Prentice and Gloeckler, 1978; Meyer, 1990; Lancaster, 1990). It is a non-parametric specification that avoids the potential for misspecification of the baseline hazard, which has been shown to be a major source of error in inferences concerning both the presence of duration dependence (Blank, 1989; and Manton, Stallard and Vaupel, 1986) and the impact of covariates (Dolton and van der Klaauw, 1995; and Heckman and Singer, 1985).

Each individual will leave the non-DSP payment through at most one exit route. Define  $r_{ik} = 1$  if individual  $i$  exits through route  $k$  and  $r_{ik} = 0$  otherwise. Then,  $\sum_{k=1}^K r_{ik} = 1$  if individual  $i$  is observed to exit, and  $\sum_{k=1}^K r_{ik} = 0$  if individual  $i$ 's non-DSP spell is right-censored. The log likelihood function for a sample of  $n$  is:

$$L_1 = \sum_{i=1}^n \left\{ \sum_{k=1}^K r_{ik} \ln(L_{ik}) + (1 - \sum_{k=1}^K r_{ik}) \ln(L_{ic}) \right\} \quad (4)$$

Many variables that are likely to affect transitions from income support payments are not available in the data. As a result, there may be a bias in the hazard function estimation (Heckman and Singer 1984a, 1984b). To address this issue, an unobserved heterogeneity term can be incorporated into each route-specific hazard function (Cai and Gregory, 2005). These terms are then integrated out by assuming a specific functional form for their distribution. A Gamma distribution for unobserved heterogeneity is frequently adopted because this produces a closed form solution after integration. We tried this approach but failed to identify the unobserved heterogeneity term. Specifically, the estimates for the variances of the unobserved heterogeneity terms were always close to zero with extremely large standard errors. Furthermore, allowing for unobserved heterogeneity had little effect on the estimation results or the value of the log-likelihood function. We also attempted to estimate the model by incorporating unobserved heterogeneity non-parametrically. With two support points – the simplest specification of this kind of model – the model failed to distinguish between the two points.<sup>27</sup> Consequently, we only report the results from the basic model (i.e., without including unobserved heterogeneity).

### *Sample*

The cohort used for the duration model analysis is individuals who commenced a non-DSP spell during the period July 1998 to June 2001. The starting date for the cohort (July 1998) was selected as an optimal trade-off between the length of the follow-up period and the length of the period pre-dating the non-DSP income support spell. Maximising the follow-up period increases the opportunity for transitions. Maximising the length of the period observed prior

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<sup>27</sup> One interpretation of this is that unobserved heterogeneity is not impacting on inferences with respect to included explanatory variables.

to the non-DSP spell increases the known history of income support receipt, allowing examination of how income support receipt history affects transitions off non-DSP payments.<sup>28</sup>

The sample is also restricted in terms of the age-range of individuals. We exclude from our analysis recipients under 25 years of age at commencement of the non-DSP spell because, as shown in Section 2, transitions to DSP by this group of recipients are very rare. At the other end of the age spectrum, we exclude males over 60 years and females over 55 years at spell commencement because many of these individuals would transfer to the Age Pension during the follow-up period. We furthermore exclude spells that end due to death of the recipients, since this destination is not accounted for in the model employed.

Separate models are estimated for males and females on the basis that their interactions with the income support system are quite different and there is policy interest in understanding the distinct transition behaviours of males and females. The male sample comprises 104,726 spells, representing 75,288 persons. Of these spells, about 4% are observed to end in a transfer to DSP, 90% are observed to end in complete exit from income support and 6% are still in progress in June 2004, and are therefore right-censored. The female sample comprises 82,458 spells, representing 65,661 persons. Of these spells, about 3% are observed to end in a transfer to DSP, 80% are observed to end in exit from income support and 17% are right-censored.<sup>29</sup>

Given the information available in the data set, in addition to examining the effects of spell duration on the risk of transferring to DSP, we also examine the impacts of the following factors:

- standard demographic characteristics, such as gender, age, marital status, presence of dependent children and the age of the youngest child, location of residence and housing situation;

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<sup>28</sup> In principle, all non-DSP spells commencing after July 1998, including those commenced after June 2001, could have been included in our estimation sample. However, constraints imposed by available computational resources meant that spells commencing after June 2001 needed to be excluded to limit the number of observations. That is, we were unable to estimate models with larger sample sizes.

<sup>29</sup> For the male sample, 67,260 individuals had one spell, 7,678 had two spells, 355 had three spells and 5 individuals had four spells. For the female sample, 61,304 had one spell, 4,187 had two spells, 163 had three spells, 6 had four spells and 1 had five spells.

- partner's income support status;<sup>30</sup>
- recent history of income support receipt, where recent is defined to be the three year period immediately preceding commencement of the income support spell;
- labour market attachment, as measured by earned income while on income support;
- unearned income while on income support;
- payment type and work incapacity; and
- local labour market conditions, as measured by the local (ABS Labour Force Statistical Region) unemployment rate.

All variables other than those for sex, age, place of birth, Indigenous status and income support history are time-varying. Summary statistics for the variables created for these characteristics are presented in Table 29, for all members of the sample and broken down by spell destination: exit from income support; still on non-DSP income support (i.e., spell is right-censored); and entry to DSP.

Several prominent points stand out from the table. The age distribution at commencement of the non-DSP spell differs markedly by destination. Persons transferring to DSP have the oldest age profile, while persons who exit income support have the youngest age profile. For example, 53% of males who transferred to DSP were over 45 years of age at commencement of the non-DSP spell, compared with 38% for males who were still on non-DSP income support payments at the end of the sample period, and 20% for males who exited income support. Similarly, for females, 50% of those who transferred to DSP were over 45 years of age at commencement of the non-DSP spell, compared with 24% of those still on non-DSP income support at the end of the sample period, and 18% of those who exited income support.

Indigenous males are relatively less likely to transfer to DSP, and are more likely to remain on other income support payments. For both males and females, immigrants from non-English speaking countries are relatively less likely to exit income support, and are more likely to transfer to DSP or remain on other income support payments.

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<sup>30</sup> Initially, we proposed to include partner's earned income as an explanatory variable. However we found that up to June 2001 the values of this variable were set to zero due to lack of reliability.

**Table 29: Summary statistics of the duration model sample – By destination**

Destinations:	Males				Females			
	Exit IS <sup>(a)</sup>	Still on IS	DSP	All	Exit IS	Still on IS	DSP	All
<b>Age at entry (%)</b>								
25-34	49.6	31.7	20.3	47.4	49.0	43.4	18.8	47.3
35-44	30.3	30.6	27.2	30.2	33.2	32.6	31.0	33.1
45-49	9.5	12.4	15.4	9.9	10.3	9.7	22.4	10.5
50 plus	10.7	25.3	37.1	12.6	7.5	14.3	27.8	9.2
<b>Place of birth and Indigenous status (%)</b>								
Non-Indigenous Aus-born	68.1	59.7	63.7	67.5	70.3	64.4	64.1	69.2
Indigenous	4.4	8.7	3.9	4.7	3.1	4.6	4.4	3.4
ESB	10.6	8.7	9.9	10.5	10.1	8.4	8.3	9.8
NESB	16.8	22.9	22.5	17.4	16.5	22.7	23.3	17.7
<b>Partner status (%)</b>								
Single	60.1	58.3	56.3	59.8	54.8	57.8	64.7	55.6
Partner on IS	27.1	32.9	33.7	27.7	28.3	28.0	27.0	28.2
Partner not on IS	12.8	8.9	10.0	12.5	16.9	14.2	8.3	16.2
<b>Dependent children (%)</b>								
No dependent children	49.5	69.9	20.3	47.3	45.3	31.6	77.1	43.8
Youngest child aged 0-5	18.2	15.7	8.6	17.7	30.2	41.4	5.7	31.5
Youngest child aged 6-12	8.8	11.5	7.9	9.0	17.6	23.6	7.5	18.4
Youngest child aged over 12	3.2	2.9	4.58	3.23	6.9	3.5	9.6	6.4
<b>Housing circumstances (%)</b>								
Renting privately	52.9	46.5	43.5	52.1	43.8	39.4	39.1	42.9
Renting public housing	3.2	6.1	5.3	3.4	4.0	6.5	7.8	4.5
No rent (non-owner)	16.8	19.2	16.0	16.9	13.8	12.6	15.2	13.6
Home-owner	27.2	28.2	35.3	27.6	38.4	41.5	37.9	38.9
Major city	56.3	53.8	57.2	56.2	56.7	57.2	60.4	56.9
<b>Three-year income support history</b>								
Have IS history (%)	65.6	64.5	58.1	65.2	59.6	56.6	56.7	59.0
Time on IS if have history (yrs)	1.09	1.56	1.31	1.12	1.18	1.48	1.46	1.24
<i>std dev.</i>	0.78	0.87	0.87	0.80	0.84	0.90	0.91	0.86
No. of IS spells if have history	1.75	1.52	1.56	1.73	1.52	1.36	1.39	1.49
<i>std dev.</i>	0.93	0.77	0.82	0.92	0.78	0.63	0.67	0.76
Time on UB if have hist. (yrs)	0.95	1.31	0.96	0.97	0.38	0.31	0.56	0.37
<i>std dev.</i>	0.76	0.90	0.83	0.78	0.64	0.66	0.78	0.64
<b>Earned income</b>								
Have earned income (%) <sup>(b)</sup>	16.9	14.0	5.0	16.3	23.5	22.3	8.0	22.9
Amount (\$100) <sup>(c)</sup>	6.08	4.06	4.09	5.88	4.89	4.19	3.55	4.69
<i>std dev.</i>	5.06	3.41	3.98	4.97	3.16	2.54	2.58	3.02
<b>Unearned income</b>								
Have unearned income (%) <sup>(b)</sup>	22.7	25.1	27.2	23.0	31.5	32.3	30.2	31.6
Amount (\$100) <sup>(c)</sup>	0.75	0.87	0.81	0.76	0.57	1.00	0.42	0.69
<i>std dev.</i>	4.44	4.04	9.26	4.77	2.00	3.42	3.56	2.51
Prop. of spell incapacitated (%)	10.1	9.2	50.9	11.7	6.0	2.7	41.7	6.4
<b>Payment type (%)</b>								
Unemployment benefits	81.9	72.2	53.9	80.2	37.1	16.4	33.1	33.5
Incapacity-related benefits	10.2	8.7	42.0	11.4	6.4	3.7	35.9	6.7
Parenting payments	5.9	11.2	2.1	6.1	50.9	65.0	19.1	52.5
Other payments	2.0	7.8	2.0	2.4	5.7	14.8	11.9	7.4
<b>Entry cohorts (financial year)</b>								
1998/1999	32.3	22.8	35.2	31.8	34.2	25.9	35.5	32.8
1999/2000	32.9	32.0	33.9	32.9	34.8	34.2	34.7	34.7
2000/2001	34.8	45.2	30.9	35.3	31.1	39.9	29.8	32.5
Unemployment rate	7.2	7.3	7.4	7.2	7.2	7.3	7.3	7.2
<i>No. of observations</i>	95,184	6,361	4,191	105,736	66,661	13,988	2,084	82,733

Notes: (a) IS – income support. Statistics are sample means unless otherwise indicated. (b) Percentage of fortnights have positive income. (c) Average income in those fortnights with positive income.

For males, partner status and partner's income support status characteristics are similar for those who transferred to DSP and those who were still on other income support payments in June 2004. Both groups have a relatively low proportion single and a relatively high proportion with a partner who is also on income support. For females, by contrast, transferrers to DSP have the largest proportion single, followed by those still on non-DSP income support in June 2004 and then those who exit income support. Also notable for females is that, in the event that a partner is present, that partner is considerably more likely to also be on income support for transferrers to DSP. Over three-quarters of the partners of female transferrers to DSP are on income support, compared with two-thirds for females still on income support at the end of the sample period and 63% for females who exit income support.

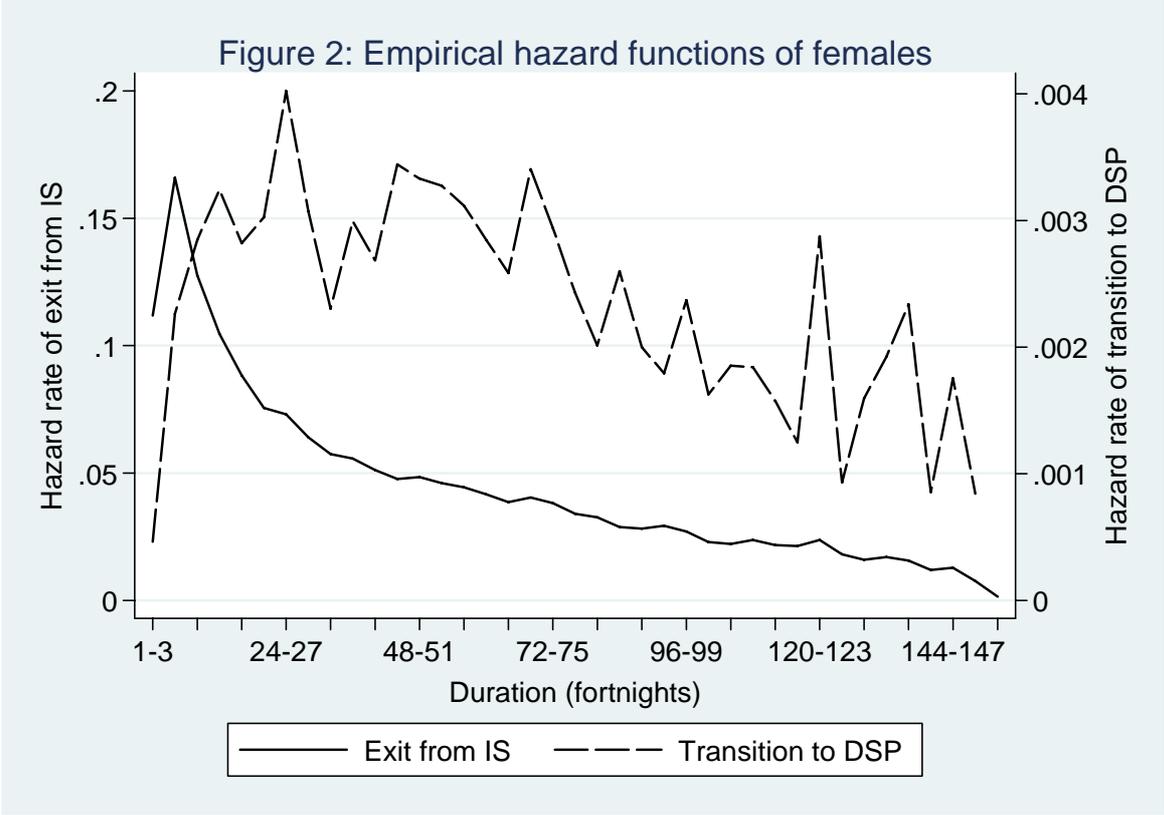
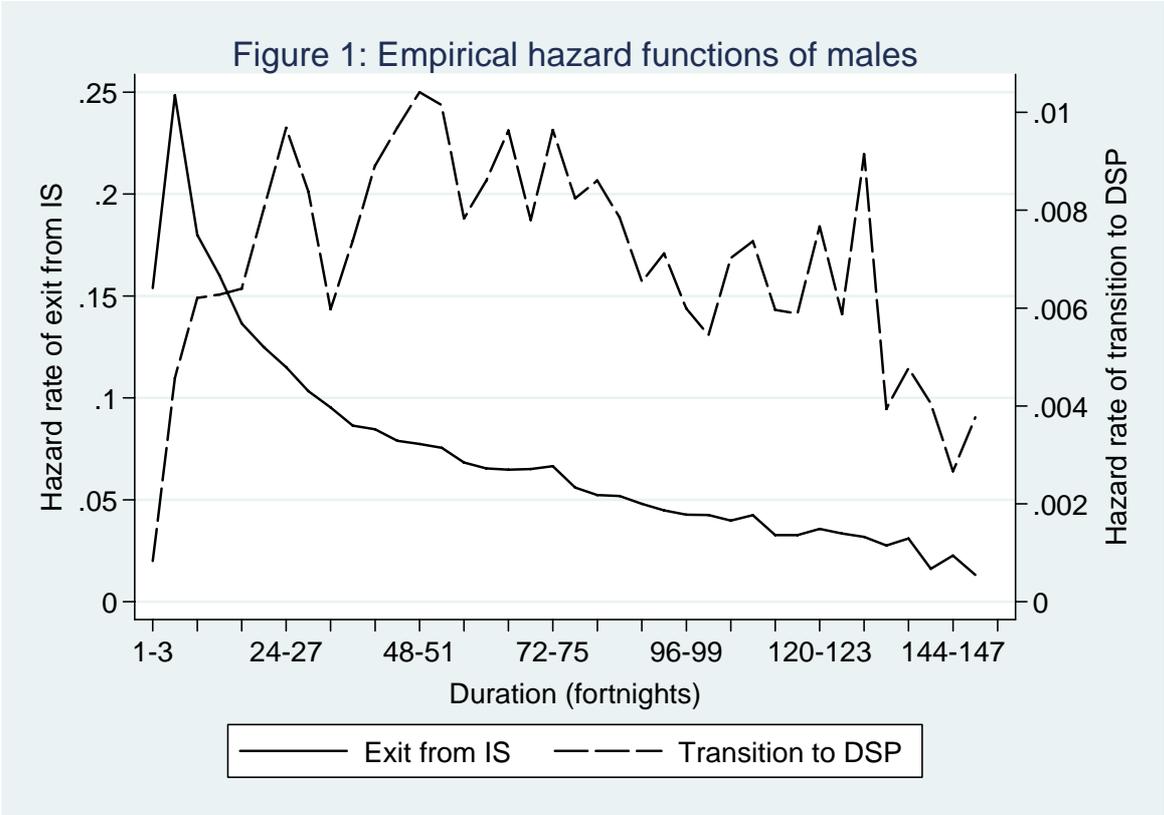
With regards to the presence of dependent children, a significantly larger proportion of those transferring to DSP have no dependent children. The gap is particularly large for females. In addition, if dependent children are present, the age of the youngest child tends to be older for those who transfer to DSP. Housing situations are somewhat similar across destinations for females, but for males the rate of home-ownership is higher for transfers to DSP than other destinations.

Perhaps somewhat surprisingly, the proportion with a history of income support receipt in the three years preceding commencement of the non-DSP spell is not higher among those who transfer to DSP compared with the other groups. Proportions with a history of income support receipt are reasonably similar across the three destinations. Differences are more pronounced in the average duration of receipt of those who did receive income support in the three-year period. The average duration is highest for those still on non-DSP income support at the end of the sample period, and lowest for those who exited income support.

Not surprising is that the proportion with earned income during the non-DSP spell is lowest for those who transfer to DSP, while those who exit income support payment have the highest incidence of earned income. In terms of payment type, also consistent with expectations is that incapacity-related payments are a much bigger share of the spells that transfer to DSP than the spells that end in the other two destinations.

Further descriptive information is presented in Figures 1 and 2. They show empirical hazard rates for exit from a non-DSP income support spell to each of the possible destinations: off income support altogether; or entry to DSP. The empirical hazard rate at time  $t$  shows the proportion who leave at the time interval  $[t, t+1)$  among those who 'survived' in the non-DSP

spell until  $t$ . That is, the empirical hazard gives the probability at each spell duration of exiting to each destination, given an individual has not already exited.



The empirical hazard rates for transition to DSP (right-hand axes of Figures 1 and 2) appear to have a trend increase up to a spell duration of approximately two years for males and one year for females, after which a slight decrease is evident. In contrast, the empirical hazard rates for exit from income support increase initially up to seven fortnights and then decrease almost monotonically. Of course, the empirical hazard rates of Figures 1 and 2 do not control for observed characteristics, which is the task of the duration model.

### *Estimation results*

The duration model estimation results are presented in Table 30. Due to the non-linear nature of the hazard function the coefficients cannot be interpreted in the usual way, but the sign of each estimate does indicate the direction of impact of the covariate. For example, a positive sign implies that an increase in the explanatory variable is associated with an increase in the hazard rate. The baseline hazard variables are dummy variables for spell duration. For example,  $d_{1-3}$  is equal to one if it is the first three fortnights of the spell, and zero otherwise. Given this study's focus on individuals making the transition to DSP, primary interest is in the estimates for this destination. However, we also spend some time discussing estimates for the hazard for exit from income support, because this is important to interpreting the results with respect to transitions to DSP.

Taking the results in Table 30 in the sequence presented, the first panel contains the estimates for the baseline hazard parameters. The estimates suggest there is an important role for spell duration in affecting both the likelihood of making the transition to DSP and the likelihood of exiting all income support payment. However, the precise nature of this role is difficult to discern from the coefficient estimates. To obtain a clear picture of the role of spell duration, we plot the model's predicted baseline hazard rates in Figures 3 and 4.

There are some similarities between the empirical hazard rates and the estimated baseline hazard rates. For both males and females, after controlling for observed heterogeneities (i.e., as captured by the other explanatory variables), the exit-from-income-support hazard rates still exhibit monotonic decrease after seven fortnights on income support. Also similar to the empirical hazard functions is that the predicted transition-to-DSP hazard rates are increasing in duration up to quite high durations. However, the trend increase in the hazard rate is smoother, and more easily discerned. Furthermore, it is clear that the progressive increase in the transition-to-DSP hazard rate is sustained up to spell durations of two years, not only for males, but for females also. A further important difference from the empirical hazards is that

the subsequent trend decrease in the empirical transition-to-DSP hazard is not in evidence for the predicted baseline hazards. The implication is that the declines in the empirical hazards derive from observed heterogeneity and not from effects of spell duration per se.

**Table 30: Duration model estimation results**

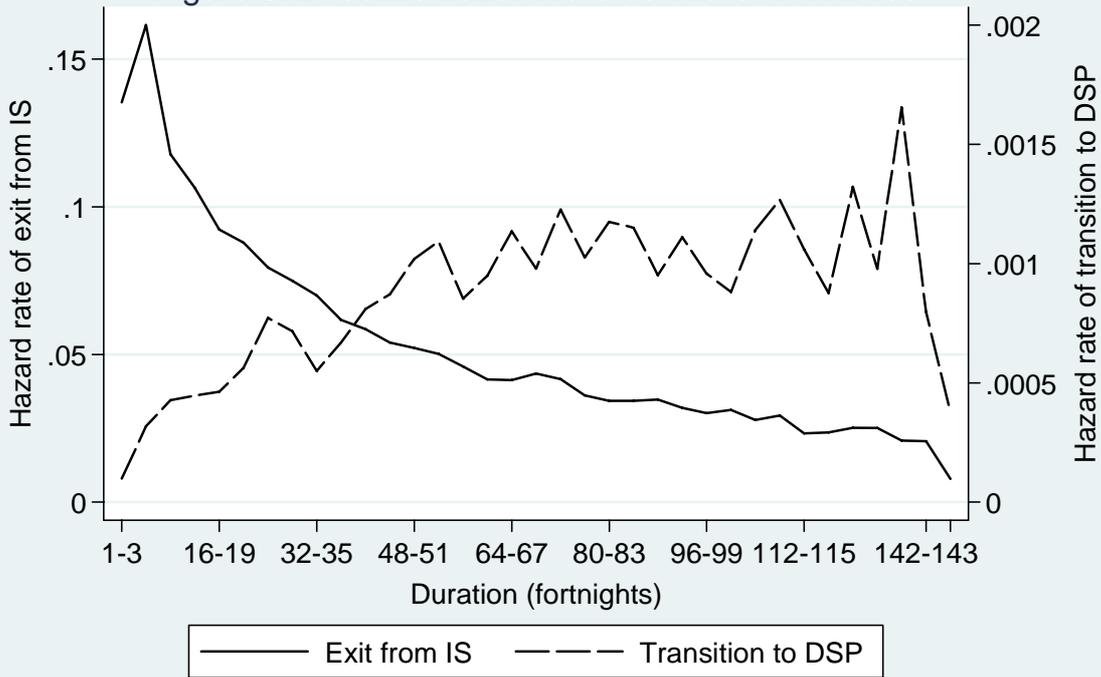
	Males				Females			
	Exit IS		Transition to DSP		Exit IS		Transition to DSP	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
<i>Baseline hazard parameters (duration interval in fortnights)</i>								
d1-3	-1.988***	0.021	-10.365***	0.196	-1.723***	0.024	-10.415***	0.261
d4-7	-1.815***	0.021	-8.244***	0.124	-1.620***	0.024	-8.469***	0.172
d8-11	-2.130***	0.022	-7.833***	0.122	-1.877***	0.025	-8.156***	0.174
d12-15	-2.231***	0.023	-7.788***	0.125	-2.020***	0.026	-7.963***	0.172
d16-19	-2.376***	0.024	-7.697***	0.127	-2.157***	0.027	-8.012***	0.177
d20-23	-2.425***	0.024	-7.461***	0.125	-2.269***	0.028	-7.794***	0.173
d24-27	-2.526***	0.026	-7.129***	0.124	-2.347***	0.029	-7.486***	0.169
d28-31	-2.584***	0.027	-7.171***	0.129	-2.437***	0.030	-7.611***	0.182
d32-35	-2.655***	0.029	-7.415***	0.138	-2.526***	0.032	-7.846***	0.192
d36-39	-2.776***	0.030	-7.223***	0.135	-2.630***	0.034	-7.563***	0.180
d40-43	-2.830***	0.032	-7.055***	0.134	-2.681***	0.035	-7.641***	0.188
d44-47	-2.912***	0.034	-6.999***	0.137	-2.768***	0.036	-7.227***	0.179
d48-51	-2.948***	0.035	-6.833***	0.133	-2.775***	0.037	-7.241***	0.182
d52-55	-2.983***	0.037	-6.733***	0.135	-2.827***	0.038	-7.339***	0.190
d56-59	-3.071***	0.039	-6.997***	0.145	-2.896***	0.040	-7.263***	0.193
d60-63	-3.171***	0.042	-6.886***	0.146	-2.937***	0.041	-7.275***	0.197
d64-67	-3.181***	0.044	-6.698***	0.140	-2.999***	0.043	-7.353***	0.202
d68-71	-3.126***	0.044	-6.853***	0.150	-2.974***	0.043	-7.056***	0.193
d72-75	-3.171***	0.046	-6.658***	0.148	-3.031***	0.045	-7.184***	0.200
d76-79	-3.308***	0.051	-6.785***	0.155	-3.103***	0.047	-7.307***	0.212
d80-83	-3.366***	0.055	-6.681***	0.163	-3.098***	0.049	-7.365***	0.224
d84-87	-3.362***	0.058	-6.717***	0.167	-3.256***	0.054	-7.161***	0.213
d88-91	-3.351***	0.061	-6.885***	0.182	-3.263***	0.056	-7.290***	0.233
d92-95	-3.438***	0.067	-6.710***	0.183	-3.168***	0.056	-7.692***	0.272
d96-99	-3.495***	0.072	-6.847***	0.198	-3.291***	0.062	-7.158***	0.240
d100-103	-3.455***	0.076	-6.953***	0.217	-3.473***	0.070	-7.517***	0.279
d104-107	-3.571***	0.085	-6.733***	0.211	-3.518***	0.075	-7.344***	0.271
d108-111	-3.524***	0.089	-6.592***	0.215	-3.422***	0.076	-7.325***	0.283
d112-115	-3.755***	0.108	-6.803***	0.246	-3.486***	0.082	-7.550***	0.322
d116-119	-3.742***	0.114	-6.993***	0.282	-3.501***	0.088	-7.608***	0.348
d120-123	-3.676***	0.119	-6.585***	0.257	-3.460***	0.091	-6.983***	0.295
d124-127	-3.678***	0.129	-6.890***	0.311	-3.594***	0.106	-7.793***	0.439
d128_131	-3.865***	0.155	-6.370***	0.265	-3.795***	0.128	-7.324***	0.381
d132_143	-3.876***	0.106	-7.101***	0.255	-3.838***	0.090	-7.311***	0.280
d144_156	-4.829***	0.335	-7.843***	0.715	-4.536***	0.251	-8.061***	0.724

**Table 30 continued: Duration model estimation results**

	Males				Females			
	Exit IS		Transition to DSP		Exit IS		Transition to DSP	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
<b>Age at entry (25-34)</b>								
35-44	-0.185***	0.008	0.332***	0.047	-0.144***	0.010	0.430***	0.066
45-49	-0.311***	0.013	0.613***	0.057	-0.266***	0.015	0.698***	0.073
50 plus	-0.468***	0.014	1.221***	0.061	-0.415***	0.021	1.067***	0.093
<b>Interactions between age and duration (50+ &amp; duration &lt;= 1 yr)</b>								
50+ & duration 1-3 yrs	-0.355***	0.028	-0.435***	0.067	-0.199***	0.036	-0.125	0.107
50+ & duration 3 yrs+	-0.682***	0.064	-0.785***	0.113	-0.584***	0.077	-0.382**	0.160
<b>Place of birth and Indigenous status (non-Indigenous native-born)</b>								
Indigenous	-0.263***	0.017	0.068	0.081	-0.298***	0.025	0.134	0.112
ESB	0.032***	0.011	-0.149***	0.055	0.045***	0.014	-0.268***	0.082
NESB	-0.146***	0.009	-0.208***	0.043	-0.252***	0.011	-0.137**	0.057
<b>Partner status (partner not on IS)</b>								
Single	-0.474***	0.013	-0.020	0.080	-0.885***	0.012	0.319***	0.099
Partner on IS	-0.582***	0.013	0.145*	0.078	-0.670***	0.014	0.610***	0.102
<b>Dependent children (no children)</b>								
Youngest under 6	-0.003	0.013	-0.463***	0.069	-0.517***	0.026	-1.681***	0.192
Youngest 6-12	0.002	0.015	-0.142**	0.066	-0.430***	0.027	-1.347***	0.175
Youngest over 12	0.103***	0.021	-0.010	0.086	-0.063**	0.027	-0.009	0.142
<b>Housing circumstances (Renting privately)</b>								
Renting public housing	-0.141***	0.018	0.379***	0.063	-0.149***	0.020	0.329***	0.081
'Free' rent	0.014	0.010	-0.002	0.053	0.076***	0.013	-0.109	0.078
Home-owner	0.083***	0.009	0.070	0.043	0.053***	0.010	-0.065	0.058
Major city	0.067***	0.007	-0.170***	0.035	0.065***	0.009	-0.026	0.049
<b>Income support history in 3 years prior to entry</b>								
Have IS history	0.033***	0.011	-0.097*	0.059	0.045***	0.015	-0.161*	0.088
Total time on IS (years)	-0.229***	0.012	0.278***	0.039	-0.163***	0.007	0.155***	0.035
No. of spells on IS	0.096***	0.004	0.039	0.026	0.139***	0.007	0.040	0.045
Total time on UB (years)	-0.090***	0.012	-0.332***	0.041	-0.185***	0.009	-0.195***	0.044
<b>Financial year of spell commencement (1998-99)</b>								
1999-2000	0.041***	0.008	-0.087**	0.038	-0.025***	0.010	-0.023	0.052
2000-01	0.049***	0.008	-0.137***	0.040	-0.050***	0.010	-0.121**	0.056
<b>Earned income</b>								
Have earned income	-0.289***	0.010	-0.919***	0.087	-0.285***	0.013	-0.805***	0.101
Earned inc. amt. (\$'00)	0.062***	0.001	-0.038***	0.007	0.088***	0.002	-0.052***	0.013
<b>Unearned income</b>								
Have unearned income	0.017**	0.009	0.066*	0.039	-0.005	0.009	-0.178***	0.053
Unearned inc. amt. (\$'00)	-0.006***	0.002	0.006	0.008	-0.010***	0.004	0.000	0.003
Proportion of spell incap.	0.416***	0.020	1.804***	0.079	0.272***	0.031	2.068***	0.119
Unemployment rate	-0.029***	0.002	0.009	0.007	-0.017***	0.002	0.021**	0.010
<b>Income support payment type (UB)</b>								
Incapacity benefits	-0.841***	0.018	1.150***	0.071	-0.851***	0.028	0.800***	0.108
Parenting payments	-0.660***	0.017	-0.981***	0.127	-0.570***	0.025	-0.465***	0.163
Other payments	-0.669***	0.025	-0.706***	0.111	-1.049***	0.021	-0.891***	0.091

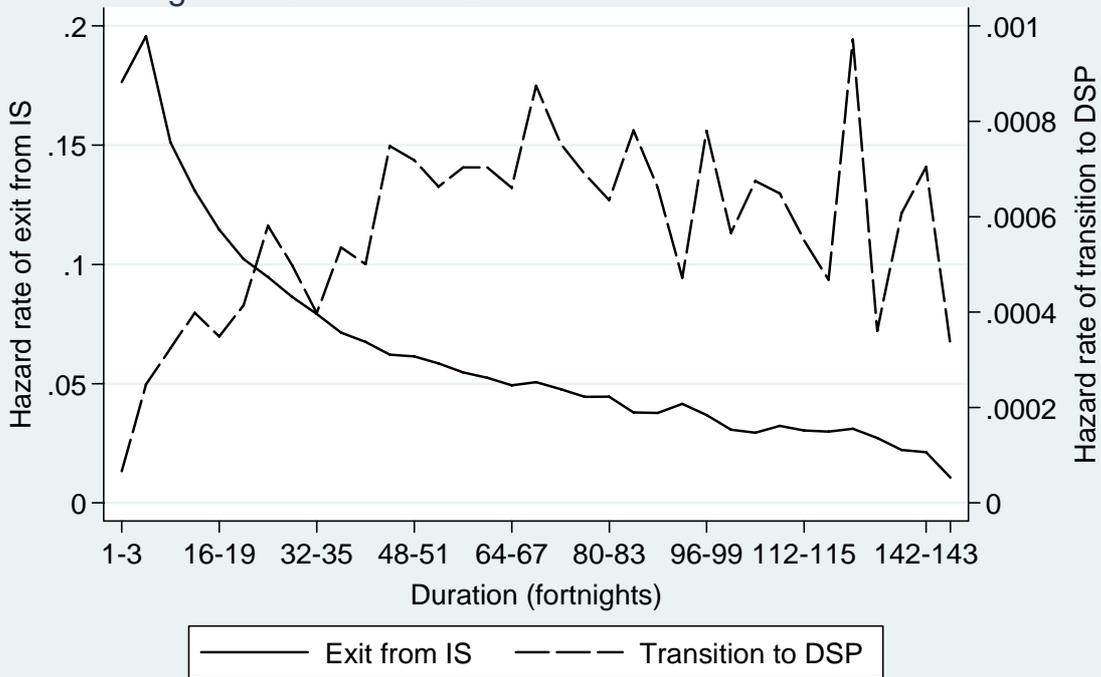
Notes: *IS* – income support; *Coef.* – coefficient estimate; *S.E.* – standard error. Variable names in parentheses denote the omitted dummies. \*\*\* Significant at 1% level, \*\* 5% level, and \* 10% level.

Figure 3: Baseline hazard rate estimates for males



Note: The last point is for duration 144-156 fortnights

Figure 4: Baseline hazard rate estimates for females



Note: The last point is for duration 144-156 fortnights

Turning to the effects of the explanatory variables, the first panel for these variables contains estimates of the effects associated with age at spell commencement. Age effects reflect differences in the nature of payment receipt by age due to lifecycle factors and also due to differences across birth cohorts. For ease of interpretation, and to allow for nonlinear age effects, the variables for age comprise four dummy variables, with the omitted age group those aged 25-34 years. The results show that compared with the omitted age group, holding all else constant, both males and females in all other age groups have a higher hazard rate for the transition to DSP. Indeed, the older an individual on commencing a non-DSP spell, the higher is the transition-to-DSP hazard rate. These results are in contrast to the hazard function for exit off income support, which is decreasing in age. These age effects are consistent with expectations.

Age effects may differ by spell duration – or, equivalently, duration effects may differ by age. We investigate this possibility in a parsimonious fashion by interacting the ‘aged 50 years or more’ categorical dummy variable with three spell duration dummies: less than one year, one to three years, and more than three years. Differences in age effects by spell duration are indeed evident. For both males and females, the (positive) effect of being aged 50 years or older on the exit-to-DSP hazard rate is weaker the longer is spell duration, which implies that age is a less important predictor of transition to DSP the longer is the non-DSP spell. Interestingly, however, the effect of being aged 50 years on the hazard rate for exiting income support is greater (more negative) the longer is the spell duration. It in fact appears that the reduced effects of older age-of-entry on the exit-to-DSP hazard rate as spell duration increases are associated with a corresponding reduction in the probability of exiting income support. As a result, the net negative effects of older age on exiting *all* income support payments are sustained as spell duration increases (and actually increase for females).

The results for the place of birth and Indigenous status variables show that, all else equal, compared with non-Indigenous native-born Australians, immigrants have a lower hazard rate for transferring to DSP, regardless of whether the person is from an English speaking country or a non-English speaking country. The lower hazard rate for transitions to DSP by immigrants may in part reflect DSP residency requirements that will apply to many

immigrants.<sup>31</sup> Immigrants from non-English speaking countries also have a lower probability of exiting income support than non-Indigenous native-born persons, but immigrants from English-speaking countries have a higher exit probability. This difference perhaps reflects additional barriers to labour market participation associated with English-language disadvantages and/or cultural barriers faced by immigrants from non-English speaking countries. Indigenous Australians have a lower hazard rate for exit from income support than do non-Indigenous native-born Australians, but they do not have a significantly different risk of transferring to DSP.

Partner status and partner's income support status are combined to produce three dummy variables: single; partner who is on income support; and partner who is not on income support, the last of which is the omitted dummy. Compared with being single or having a partner who is not on income support, a partner on income support increases the risk of transition to DSP for both males and females. For females, being single is also associated with an increased risk of transition to DSP compared with having a partner who is not on income support (but, as mentioned, a reduced risk compared with having a partner who is on income support). In addition, for both males and females, a partner who is not on income support increases the exit-income-support hazard compared with being single or having a partner who is on income support.

The estimates for the variables for the presence of dependent children imply that the probability of making the transition to DSP is, all else equal, lower for those with young dependent children, particularly if the youngest child is less than 6 years of age. This effect may in part reflect income support entitlements of persons with dependent children acting to reduce their 'demand' for DSP. In particular, sole parents with disabilities may be less likely to apply for DSP because they can access Parenting Payment Single, which had the same payment rate and income test as DSP in the period we examine. For females, the presence of dependent children is also associated with a decreased probability of exit from income support, but the reduction in exit probability is smaller the older is the youngest child. In fact, if the youngest child is over 12 years of age, the exit-income-support probability is, all else equal, no different from a female without dependent children. This pattern with respect to the

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<sup>31</sup> Eligibility criteria specify a ten-year minimum period of residence in Australia (or countries with which Australia has an International Social Security Agreement) if the incapacitating condition existed prior to migration. Migrants admitted under the humanitarian migration program are exempted from this requirement.

age of the youngest child is likely to reflect the reduction in caring responsibilities, and hence increase in ability to participate in employment, associated with ageing of children, and it perhaps also in part derives from individuals becoming ineligible for parenting payments once the youngest reaches 16 years of age.

The variables included in the model for housing circumstances distinguish home-owners (whether paying off a mortgage or not), renters in the private market, renters of public housing and non-home-owners who do not pay rent, with the omitted category private renters. The results show that, holding all else constant, both males and females residing in public housing have an elevated risk of transition to DSP compared with all three other groups. As might be expected, the story is quite different for the hazard function for exit from the income support system. Point estimates of coefficients are broadly similar for males and females, with renters of public housing having the lowest probability of exit from income support, and home-owners having the highest probability of exit.

Living in a major city (Sydney, Melbourne, Brisbane, Perth, Adelaide, Newcastle or Canberra) acts to decrease the likelihood of transferring to DSP for males, but has no effect on the likelihood of transferring to DSP for females. The effect of living in a major city on the hazard rate for exit from income support is positive for both males and females.

Recent history of income support receipt prior to commencement of the non-DSP spell is captured by four variables that relate to the three years immediately preceding the non-DSP spell. First, the presence of an effect from any recent receipt is identified from a dummy variable equal to one if the person was on income support at all in that period. Second, a continuous variable equal to the number of years on income support in that three-year period allows the effect of past receipt to depend on the amount of receipt. Third, effects of past churning – cycling on and off payments – are captured by a variable for the number of income support spells in the three years prior to commencement of the non-DSP spell. Finally, we include a variable for the amount of time spent on non-incapacity-related unemployment benefits. This variable identifies the incremental effect of income support receipt that is a direct function of difficulty successfully participating in the labour market, compared with receipt of payment types which do not necessarily reflect inability to obtain substantive employment.

The estimates for the first two history variables imply conflicting effects of recent receipt. The fact of having received income support in the three years prior to the current spell decreases

the probability of transferring to DSP, but as the time spent on income support in that three-year period increases, this effect reverses. For males, the point estimates imply that once more than four months have been spent on income support, the net effect of past receipt on the probability of transfer to DSP becomes positive. For females, it is only when more than one year has been spent on income support that the net effect becomes positive. Note, however, that these effects hold only for payment types other than unemployment benefits. The estimates for ‘total time on IS’ and ‘total time on UB’ together imply that increased duration on unemployment benefits in the three years preceding the current spell has a small negative effect on the probability of making the transition to DSP for both males and females. The implication is that *past* labour market difficulty is not of itself a predictor of subsequent transition to DSP. It is, however, a predictor of increased likelihood of failing to exit the current non-DSP income support spell: increased duration on unemployment benefits in the pre-spell period decreases the probability of exit by significantly more than does increased duration on other payment types in that pre-spell period.

With regards to the variable for number of income support spells in the three years preceding commencement of the current spell, the estimates imply that a recent history of churning is not a predictor of transition to DSP, but is associated with an increased probability of exit from income support.

Dummy variables are included for the financial year of commencement of the non-DSP spell, which control for cohort and/or year effects. All else equal, males were more likely to exit income support and less likely to transfer to DSP the later was the year of spell commencement. Females, by contrast, were less likely to exit income support and more likely to transfer to DSP the later the year of spell commencement.

Two variables measure contemporaneous labour market attachment: whether the individual has earned income; and the amount of earned income. The estimates imply that the presence of earnings lowers the risk of transition to DSP, and this effect is greater the higher the level of earnings. The biggest effect is found in going from no earnings to a small positive amount of earnings, which is indicated by the substantial negative coefficient for the dummy variable for the presence of any earnings. Increased earnings are also associated with an increase in the hazard function for exit from income support, a finding which is consistent with the intuition that greater labour market attachment is likely to increase the probability of exit to substantive employment. As with the transition-to-DSP hazard rate, in addition to the variable for level of

earnings, the dummy variable for the presence of any earnings significantly affects the exit hazard. However, this effect is in fact negative. The estimates imply that a male needs to earn over \$450 per fortnight, and a female needs to earn more than \$300 per fortnight, before the net effect of earnings is to increase the probability of exit.

Variables of the same kind as employed for earned income are included for unearned income. Unearned income is not associated with any significant effects on the transition to DSP for males, but does reduce the risk of transition to DSP for females, although the effect for females does not depend on the *amount* of unearned income. The reasons for this effect for females are unclear. For both males and females, unearned income affects the probability of exit from income support, with increases in unearned income associated with reductions in the probability of exit.

Effects of incapacity experience in the spell on likelihood of transiting to DSP are captured by the variable ‘proportion of spell incapacitated’, which is equal to the proportion of fortnights in the spell to date that the individual has been on incapacity-related benefits. Consistent with expectations, this has a strong positive association with the probability of making the transition to DSP. It is also positively associated with the probability of exiting income support, which reflects the role incapacity-related benefits play in providing income support to persons temporarily afflicted by illness or injury. Significantly, however, an increase in the proportion of the spell with observed incapacity is associated with a much stronger effect on the probability of transferring to DSP than on the probability of exiting income support, implying incapacity-related benefits more often serve as a conduit to long-term disability-related receipt than a support for temporarily incapacitated persons.

Local labour market conditions are captured by the unemployment rate in the ABS Labour Force Statistical Region in which the individual resides.<sup>32</sup> All else equal, the higher the local unemployment rate, the greater the transition-to-DSP hazard and the lower the exit hazard, although the effect on the male transition-to-DSP hazard is not statistically significant.

Considering the roles played by payment type, the models estimated contain (time-varying) dummy variables that distinguish four payment types: non-incapacity-related unemployment benefits (the omitted category), incapacity-related payments (Sickness Allowance and unemployment benefits with an activity type of ‘incapacitated’), Parenting Payment (both

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<sup>32</sup> There are 64 of these regions and the unemployment rate is available on a monthly basis.

Single and Partnered) and a final category for all other payments. Results are quite similar for males and females. The estimates show that incapacity-related payments are associated with a much greater risk of transition to DSP than all other payment types. Parenting payments and other benefits are associated with the lowest risks of transition to DSP. Effects of payment type on the exit hazard are somewhat different to their effects on the transition-to-DSP hazard. Non-incapacity unemployment benefits are associated with the highest probability of exit, which is not surprising given the job search requirements for this payment type.

### ***3.2. Multinomial logit model approach***

To address limitations of the duration model approach, which essentially treats the income support spell rather than the individual as the subject of analysis, we employ the multinomial logit model in this subsection to further analyse the factors associated with an income support recipient (ultimately) going on to DSP. Specifically, the model investigates the probability that five years after commencement of a non-DSP income support spell an individual is on DSP, on another income support payment or off income support altogether. The model estimated in the previous subsection emphasised transitions, whereas here we adopt a ‘comparative statics’ approach, whereby the outcome is simply income support receipt status five years after the date of commencement of the income support spell. As such, income support spells experienced by recipients within the five-year observation window are not (directly) considered.

#### *The multinomial logit model*

The probability a non-DSP income support recipient is in outcome state  $j$  five years after commencement of the non-DSP spell is modelled as a function of the individual’s characteristics and other factors  $X$ , i.e.,

$$P_j = P(X, \beta_j) \tag{5}$$

where  $\beta_j$  is a vector of parameters. The multinomial logit model is defined by letting  $P(\cdot)$  take a logit probability function. It is identified by normalising the parameters  $\beta$  to zero for one outcome (the base category) and is described by the system of equations:

$$\Pr(y = 1) = \frac{1}{1 + \sum_{j=2}^J e^{X\beta_j}}$$

$$\Pr(y = m) = \frac{e^{X\beta_m}}{1 + \sum_{j=2}^J e^{X\beta_j}}, \quad m = 2, \dots, J \quad (6)$$

where  $y$  is the outcome of interest (with  $J$  distinct values, and equal to one for the base category),  $X$  is a vector of explanatory variables and  $\beta_j$  is the coefficient vector for outcome  $J$ .

Logit coefficient estimates are not readily interpretable, as the model is non-linear and the effects of individual explanatory variables on the outcome variable depend on the values of the explanatory variables at which they are evaluated. Consequently, rather than report coefficient estimates, ‘mean marginal effects’ of the explanatory variables are reported.<sup>33</sup>

The marginal effect of continuous explanatory variable  $x_k$  on the probability outcome  $m$  occurs for a person with characteristics  $\mathbf{x}^i$  is given by:

$$ME_{m,k}^i = \frac{\partial \Pr(y = m | \mathbf{x}^i)}{\partial x_k} = \Pr(y = m | \mathbf{x}^i) \left[ \beta_{k,m|J} - \sum_{j=1}^J \beta_{k,j|J} \Pr(y = j | \mathbf{x}^i) \right] \quad (7)$$

while the *mean* marginal effect is given by:

$$MME_{m,k} = (1/n) \sum_{i=1}^n ME_{m,k}^i \quad (8)$$

where  $MME_{m,k}$  is the mean marginal effect of variable  $x_k$  on the predicted probability  $\Pr(y = m | x)$ , and the summation is over the  $n$  individuals in the sample. This is, as the name suggests, the mean marginal effect of the explanatory variable on the predicted probability a person is in category  $m$ , evaluated over all individuals in the sample, and holding all other explanatory variables constant at their actual values. Its interpretation is ‘the average effect on the probability of outcome  $m$  per unit increase in  $x_k$ ’.

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<sup>33</sup> Coefficients estimates are reported in Table A4 in the Appendix.

For a binary explanatory variable, the marginal effect of explanatory variable  $x_k$  on the probability outcome  $m$  occurs for a person with characteristics  $\mathbf{x}^i$  is given by:

$$ME_{m,k}^i = \Pr(y = m | \mathbf{x}_{-k}^i, x_k = 1) - \Pr(y = m | \mathbf{x}_{-k}^i, x_k = 0) \quad (9)$$

where  $\mathbf{x}_{-k}^i$  represents the vector of characteristics of person  $i$  for all variables other than  $x_k$ . The *mean* marginal effect is as defined by Equation (8). This is obtained by changing the explanatory variable  $x_k$  from zero to one for every individual, holding all other explanatory variables at their actual values, and calculating the mean change in the predicted probability.

For related sets of binary variables, such as those for age groups, we also take account of the dependencies between these variables in calculating mean marginal effects. Specifically, we first set all of the interdependent dummy variables equal to zero before calculating the effect of changing the specific dummy variable from zero to one for each individual. For example, to calculate the mean marginal effect for the ‘aged 35-44’ dummy, we first set all age dummies to zero for each individual before applying Equation (9) to the ‘aged 35-44’ dummy, thereby giving us the effect of changing a person’s age from 25-34 (the omitted dummy) to 35-44.

The correspondingly modified version of Equation (9) is therefore:

$$ME_{m,k}^i = \Pr(y = m | \mathbf{x}_o^i, \mathbf{x}_g = 0, x_k = 1) - \Pr(y = m | \mathbf{x}_o^i, \mathbf{x}_g = 0, x_k = 0) \quad (10)$$

where  $\mathbf{x}_o^i$  comprises a vector of characteristics of person  $i$  for all variables other than those in the group of dummy variables to which variable  $x_k$  belongs, and  $\mathbf{x}_g$  is the vector of other dummy variables in the group to which  $x_k$  belongs.

Note that the mean marginal effect of a variable sums to zero across the  $J$  possible outcome categories, i.e.  $\sum_{j=1}^J MME_{j,k} = 0$ . This implies that the MME can be inferred for one category if the MMEs are known for all other categories. However, all outcome categories are reported, since the standard errors for the omitted outcome cannot be inferred from the other outcomes.

Rather than attempt to derive analytic standard errors, standard errors for the estimates of mean marginal effects are derived from 400 bootstrap samples. The standard error of any statistic  $M$  is computed from the bootstrap distribution as:

$$SE_M = \sqrt{\left(\frac{1}{B-1}\right) \sum_{i=1}^B \left[ \hat{M}^i - \left( \left(\frac{1}{B}\right) \sum_{i=1}^B \hat{M}^i \right) \right]^2} \quad (11)$$

where  $B$  is the number of bootstrap iterations and  $\hat{M}^i$  is the value of  $M$  in the  $i$ th bootstrap sample.

*Sample and outcome examined*

To maximise comparability with the duration model approach, we attempt where possible to apply the same sample selection rules and include the same or similar explanatory variables. The sample comprises individuals who commenced a non-DSP income support spell in the period July 1998 to June 1999. The start-date for spell commencements is the same as for the duration model, but an earlier end-date is required in order to observe income support status five years later. As before, recipients under 25 years of age, and over 60 years for males and over 55 years for females, are excluded, as are individuals known to die during the five year observation window.

The outcome variable is income support receipt status exactly five years after commencement of the non-DSP spell: on DSP; on other income support payment; or off income support. The explanatory variables are similar to those employed in the duration analysis, the main differences being the absence of duration variables and the modification of time-varying variables so that they are time-invariant. The variables affected comprise those for partner status, dependent children, housing circumstances, earned income, unearned income, incapacity experience, the local unemployment rate and payment type.

Variables for partner status, dependent children, housing circumstances and payment type are evaluated at commencement of the non-DSP spell in 1998-99. Earned and unearned income each have two variables: 'time' and 'amount'. The 'amount' variable is the mean fortnightly earned (unearned) income in the fortnights in which the individual was on non-DSP income support payments in the five-year period and had earned (unearned) income. The 'time' variable is the ratio of the number of fortnights with earned (unearned) income when on non-DSP payments to the total number of fortnights on non-DSP payments. The variable for incapacity experience is analogous to that employed in the duration analysis, being the proportion of the five-year window that the individual was observed to be incapacitated (but

evaluated only over that part of the five-year window the individual was *not* on DSP<sup>34</sup>). Similarly, the local unemployment rate is the mean unemployment rate over the five-year window.<sup>35</sup>

Table 31 reports the sample statistics broken down by the three outcomes, for males and females respectively. The summary statistics are not expected to be the same as in the duration model section because the sample is restricted to spells commencing between July 1998 and June 1999, the subject of analysis is different (individuals instead of spells), the outcome (destination) variables are defined differently, and a several of the variables are measured differently. Despite these differences, the summary statistics are very similar to those for the duration model samples. For example, those who transfer to DSP tend to be older when starting the new income support spell, are more likely to have a partner who is also on income support, are less likely to have earned income when on income support, and are more likely to be on incapacity-related benefits.

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<sup>34</sup> To give an example of how the variable is calculated, if an individual spent one year on incapacity-related benefits and two years on DSP in the five-year window, then the variable would be equal to 1/3, since the individual was incapacitated for one of the three years he or she was not on DSP in that window.

<sup>35</sup> A detailed description of the explanatory variables is reported in Table A3 in the Appendix.

**Table 31: Summary statistics of the multinomial logit sample – By destination**

	Males				Females			
	Off IS	Non-DSP IS	DSP	All	Off IS	Non-DSP IS	DSP	All
<b>Age at entry (%)</b>								
25-34	50.4	45.1	22.7	47.2	50.0	48.5	20.9	48.2
35-44	31.2	29.8	28.1	30.6	33.5	30.0	31.2	32.2
45-49	9.3	9.6	14.8	9.7	10.2	9.3	22.2	10.4
50 plus	9.2	15.5	34.3	12.4	6.4	12.2	25.7	9.3
<b>Place of birth and Indigenous status (%)</b>								
Non-Indigenous Aus born	69.0	62.5	63.9	67.1	71.5	64.7	62.9	68.7
Indigenous	2.5	8.3	3.8	4.0	1.9	4.5	4.3	2.9
ESB	11.0	8.9	10.2	10.5	9.7	8.8	9.0	9.4
NESB	17.5	20.3	22.1	18.5	16.8	22.0	23.8	18.9
<b>Partner status (%)</b>								
Single	54.9	61.7	54.5	56.5	53.0	53.5	62.6	53.6
Partner not on IS	15.4	9.7	12.1	13.8	17.9	14.9	9.7	16.5
Partner on IS	29.7	28.6	33.4	29.7	29.1	31.6	27.7	29.9
<b>Dependent children (%)</b>								
No dependent children	65.3	72.4	76.9	67.8	44.8	36.8	72.8	43.2
Youngest child aged 0-5	21.0	16.8	9.9	19.2	29.7	39.6	6.8	32.2
Youngest child aged 6-12	10.0	8.4	8.4	9.5	17.7	19.6	9.7	18.0
Youngest child aged over 12	3.7	2.4	4.9	3.5	7.7	4.0	10.7	6.6
<b>Housing circumstances (%)</b>								
Renting privately	50.3	52.0	42.9	50.2	41.6	42.6	40.0	41.9
Renting public housing	2.8	5.1	5.5	3.5	3.3	5.7	7.3	4.4
'Free' rent	16.7	19.2	16.1	17.2	15.0	13.4	15.8	14.5
Home-owner	30.2	23.7	35.5	29.0	40.1	38.3	36.9	39.3
Major city	57.7	53.7	57.6	56.7	58.8	55.6	61.7	57.8
<b>Income support history in 3 years prior to entry</b>								
Have IS history (%)	58.5	72.4	60.4	62.0	53.3	60.0	57.1	55.8
Time on IS if have IS history (years)	1.01	1.37	1.28	1.12	1.12	1.42	1.37	1.24
Std dev.	0.74	0.79	0.82	0.78	0.81	0.86	0.84	0.84
Time on UB if have IS history (years)	0.89	1.20	1.02	0.98	0.36	0.36	0.57	0.37
Std dev.	0.72	0.79	0.80	0.76	0.60	0.65	0.74	0.63
No. of IS spells if have history	1.6	1.7	1.6	1.7	1.5	1.4	1.5	1.5
Std dev.	0.9	0.9	0.8	0.9	0.7	0.7	0.7	0.7
<b>Earned income</b>								
Time (%)	18.8	14.5	7.3	17.0	24.7	21.6	10.6	23.0
Amount (\$)	686	507	542	631	562	470	428	523
Std dev	509	397	480	486	369	298	342	346
<b>Unearned income</b>								
Time (%)	25.7	20.2	26.9	24.5	34.0	29.2	30.4	32.1
Amount (\$)	48	59	55	51	46	51	56	48
Std dev	176	230	126	187	125	137	123	129
<b>Payment type (%)</b>								
UB	83.0	81.9	63.0	81.4	38.8	25.6	36.2	34.0
Incapacity-related benefits	9.2	8.6	32.5	10.7	5.5	4.1	29.1	6.0
Parenting payments	4.5	3.1	1.7	4.0	50.8	59.3	22.2	52.5
Other payments	1.5	3.1	1.6	1.9	38.8	25.6	36.2	34.0
Time incapacitated (%)	1.8	6.1	15.1	3.7	1.0	2.0	12.1	1.9
Unemployment rate (%)	7.8	7.9	7.9	7.8	7.8	7.9	7.9	7.8
Std Dev	2.4	2.5	2.4	2.4	2.5	2.4	2.4	2.4
<b>Number of individuals</b>	<b>21,343</b>	<b>7,242</b>	<b>2,129</b>	<b>30,714</b>	<b>15,475</b>	<b>9,056</b>	<b>1,139</b>	<b>25,670</b>

### *Estimation results*

The estimation results are reported in Table 32. As with the duration analysis, given this study's focus on individuals taking up DSP receipt, the emphasis of our discussion is on the estimates for the DSP destination.

Considering first lifecycle differences captured by the age dummy variables, for both males and females, significant differences in the probability of ending up at each destination are evident depending on lifecycle stage at commencement of the non-DSP spell. The signs of the mean marginal effects estimates indicate that, compared with those who enter income support aged 25-34 years, those who enter at older ages have a higher probability moving to DSP or still being on income support, and also a lower probability of moving off the income support system. Indeed, consistent with the duration model results, the probability of moving to DSP or still being on income support is almost monotonically increasing in age. Effects of entry age are greater for males than females. For example, an increase of the entry age from 25-34 years to 50 or more years increases the probability of moving to DSP by 15.3 percentage points for males, while for females the increase is 8.7 percentage points.

Indigenous status does not impact on the probability of ending up on DSP for males, but is associated with an increased probability of ending up on DSP for females. Immigrant status, by contrast, has no impact on the probability of ending up on DSP for females, but does have an impact for males: all else equal, male immigrants having a lower probability of ending up on DSP than other males.

Compared with recipients with a partner not on income support, recipients with a partner on income support tend to be more likely to move to DSP, but the estimated effects are very small and only for the male sample is the estimate significant at the 10% level. Partner status is, however, a predictor of being off all income support payments five years after spell commencement. An individual with a partner not on income support is, all else equal, more likely to be off all income support payments five years after spell commencement than either a single person or a person with a partner on income support.

**Table 32: Multinomial logit mean marginal effects**

Destination:	Males						Females					
	Off IS		Non-DSP IS		DSP		Off IS		Non-DSP IS		DSP	
	Effect	S.E	Effect	S.E	Effect	S.E	Effect	S.E	Effect	S.E	Effect	S.E
<b>Age group (25-34)</b>												
35-44	-0.057***	0.006	0.018***	0.006	0.039***	0.004	-0.024***	0.007	-0.009	0.007	0.033***	0.005
45-49	-0.116***	0.010	0.029***	0.010	0.087***	0.008	-0.081***	0.011	0.018	0.011	0.063***	0.007
50 plus	-0.260***	0.010	0.107***	0.010	0.153***	0.009	-0.249***	0.012	0.163***	0.013	0.087***	0.009
<b>Place of birth &amp; Indigenous status (non-Indigenous Aus-born)</b>												
Indigenous	-0.217***	0.015	0.209***	0.014	0.009	0.008	-0.167***	0.019	0.148***	0.019	0.019**	0.009
ESB	0.028***	0.008	-0.018**	0.008	-0.010**	0.004	0.009	0.011	-0.004	0.010	-0.005	0.004
NESB	-0.027***	0.007	0.035***	0.006	-0.008**	0.003	-0.081***	0.008	0.080***	0.008	0.001	0.003
<b>Partner details (Partner not on IS)</b>												
Single	-0.060***	0.009	0.064***	0.009	-0.004	0.005	-0.113***	0.008	0.108***	0.008	0.005	0.004
Partner – on IS	-0.068***	0.009	0.060***	0.010	0.008*	0.005	-0.038***	0.009	0.033***	0.009	0.005	0.005
<b>Children (No dep. child)</b>												
Youngest 0-5	0.029***	0.009	-0.007	0.009	-0.022***	0.004	-0.154***	0.018	0.190***	0.018	-0.036***	0.005
Youngest 6-12	0.039***	0.010	-0.025**	0.010	-0.014***	0.005	-0.094***	0.018	0.116***	0.018	-0.021***	0.005
Youngest 13+	0.101***	0.012	-0.092***	0.011	-0.008	0.006	0.099***	0.017	-0.100***	0.016	0.001	0.006
<b>Housing (Private renting)</b>												
Public rent	-0.073***	0.014	0.043***	0.013	0.030***	0.009	-0.049***	0.015	0.032**	0.015	0.017**	0.007
‘Free’ rent	-0.013**	0.007	0.009	0.006	0.004	0.004	0.008	0.009	-0.012	0.009	0.004	0.004
Home-owner	0.019***	0.007	-0.022***	0.006	0.003	0.004	0.023***	0.008	-0.018**	0.008	-0.005	0.003
Major city	0.025***	0.005	-0.020***	0.005	-0.005	0.003	0.022***	0.006	-0.026***	0.006	0.004	0.003
<b>Income support history in 3 years prior to entry</b>												
Have previous IS	0.016**	0.008	-0.007	0.008	-0.009*	0.005	0.016	0.011	-0.011	0.011	-0.005	0.005
Time on IS (yrs)	-0.064***	0.008	0.040***	0.008	0.024***	0.004	-0.068***	0.005	0.062***	0.005	0.007***	0.002
Time on UB (yrs)	-0.029***	0.008	0.042***	0.008	-0.013***	0.004	-0.026***	0.007	0.026***	0.007	0.001	0.003
No. of IS spells	-0.006*	0.003	0.004	0.003	0.002	0.002	0.014**	0.006	-0.017***	0.006	0.003	0.002
<b>Earned income</b>												
Time (10%)	0.011***	0.001	-0.005***	0.001	-0.007***	0.001	0.005***	0.001	-0.003**	0.001	-0.003***	0.001
Amount (\$'00)	0.003***	0.001	0.001*	0.001	-0.004***	0.000	0.004***	0.001	0.001	0.001	-0.004***	0.001
<b>Unearned income</b>												
Time (10%)	0.002***	0.001	-0.002***	0.001	0.000	0.000	0.005***	0.001	-0.005***	0.001	-0.001*	0.000
Amount (\$'00)	-0.004	0.003	0.005*	0.003	-0.001	0.001	-0.012**	0.005	0.012**	0.005	0.001	0.001
<b>Payment type (UB)</b>												
Incapacity-related	0.071***	0.007	-0.101***	0.006	0.030***	0.004	0.048***	0.015	-0.086***	0.014	0.038***	0.006
Parenting pmts	-0.091***	0.014	0.111***	0.015	-0.021***	0.007	-0.088***	0.016	0.079***	0.016	0.009	0.007
Other payments	-0.160***	0.020	0.186***	0.020	-0.026***	0.007	-0.269***	0.013	0.269***	0.014	0.000	0.005
Time incap (10%)	-0.140***	0.004	0.103***	0.004	0.037***	0.001	-0.150***	0.009	0.124***	0.008	0.026***	0.001
Unemployment rate	-0.004***	0.001	0.002**	0.001	0.002***	0.001	-0.005***	0.001	0.004***	0.001	0.001**	0.001
No. of obs.	30,714						25,670					

Notes: SE: Standard errors derived from 400 bootstrap samples. Variable names in parentheses denote the omitted dummies. \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10% levels respectively.

For both males and females, a dependent child under 13 years of age significantly reduces the probability of ending up on DSP, with the effect even greater if the youngest child is under 6 years of age. The impacts of dependent children on the other two outcomes are quite different between male and female recipients. For males, having dependent children increases the probability of exiting from the income support system and decreases the probability of being still on the system. These effects are stronger the older is the youngest child. For female

recipients, a dependent child under 13 years of age increases the probability of being on a non-DSP income support payment five years later. This possibly reflects the fact that many women are on parenting-related payments and have associated ongoing caring responsibilities. Adding weight to this explanation is that if a female's youngest child is over 13 years of age, the probability of being off all income support payments five years later is increased by 10 percentage points compared with a similar female without dependent children. That is, this is consistent with there being a reduction in caring responsibilities associated with the youngest child becoming at least 18 years of age.

With regard to housing circumstances, renting public housing at commencement of the income support spell is associated with a significantly increased probability of being on DSP at the follow-up point, while all other housing situations are associated with similar probabilities of being on DSP. Specifically, compared with other housing situations, renting public housing on average increases the probability of being on DSP five years after spell commencement by 1.7 percentage points for females and by 3 percentage points for males. Living in a major city decreases the probability of being on income support and increases the probability of moving off the income support system, but does not have strong effects on the likelihood of going on to DSP.

Recent income support history prior to commencing the non-DSP spell is associated with effects on the probability of being on DSP five years later. Each year on income support in the three years preceding commencement of the non-DSP spell is associated with an average increase in the probability of subsequent DSP receipt of 2.4 percentage points for males and 0.7 percentage points for females. For males, consistent with the duration analysis, this effect is smaller for unemployment benefits than for other payment types, the estimates implying that each year on unemployment benefits on average increases the probability of subsequent DSP receipt by 1.1 percentage points. For both males and females, there is no (significant) independent effect of having received *any* income support payments in the three year period, and the number of spells also does not appear to matter – thus, two six-month spells have approximately the same effect as a single one-year spell.

Total duration on income support in the preceding three years also acts to increase the probability of being on a non-DSP payment five years later. As with the duration analysis, this effect is greatest if the individual was receiving unemployment benefits. Each year of past unemployment benefit receipt on average increases the probability of ending up on non-DSP

income support by 8.8 percentage points for females and by 8.2 percentage points for males; the corresponding figures for other payment types are, for females and males respectively, 6.2 and 4 percentage points.

Given the presence of significant effects of income support history in both the duration and logit models, a question arises of how these effects should be interpreted. One interpretation is that a history of non-DSP income support receipt itself makes DSP receipt more likely. However, another interpretation is that a history of income support receipt derives from unobserved characteristics of individuals, such as health and ability to successfully participate in the labour market, and it is these characteristics that cause both the history of receipt *and* the subsequent DSP receipt.

Labour market attachment while on income support is measured by the percentage of time on income support in the five-year window in which an individual reported earnings, and the mean value of an individual's earnings in those periods in which earnings were reported. As would perhaps be expected, both the probability of being on DSP and the probability of being on another income support payment at the end of the follow-up period are decreasing in the proportion of time with earnings, with the magnitude of the effects very similar for the two destinations. Effects are stronger for males, with a 10 percentage point increase in proportion of time with earnings reducing the DSP probability by 0.7 percentage points for males, compared with 0.3 percentage points for females.

As with the 'time with earnings' measure of labour market attachment, the 'amount of earnings' measure also implies greater labour market attachment reduces the likelihood of ending up on DSP. Each \$100 increase in mean earnings per fortnight in those fortnights earnings are reported on average reduces the probability of being on DSP at the end of the five-year window by 0.4 percentage points. Thus, the greater the proportion of time with earnings, and the higher are earnings, the lower the probability of moving on to DSP, although the magnitude of these effects does not appear to be particularly large.

Unlike earned income, unearned income cannot be interpreted as a measure of labour market attachment. It is therefore not entirely surprising that we find no significant effects of unearned income on the probability of ending up on DSP. However, unearned income is nonetheless associated with effects on the probability of non-DSP income support receipt, which is decreasing in the proportion of time the recipient reports unearned income, but increasing in the level of unearned income. Reasons for these conflicting effects are unclear.

Initial payment type is a strong predictor of likelihood of ending up on DSP. As was found in the duration analysis, albeit using variables for contemporaneous rather than initial payment type, incapacity-related benefits are associated with the highest probability of ending up on DSP. The probability of ending up on DSP five years after spell commencement is 3 percentage points higher for males, and 3.8 percentage points higher for females, if they commence on incapacity-related benefits rather than unemployment benefits. Note that this is the independent effect of *commencing* on incapacity-related benefits, since we also include a variable for the proportion of the entire five-year window the individual was on incapacity-related benefits (*Time incap*). Indeed, the strong positive association between incapacity-related benefit receipt and moving on to DSP becomes even more apparent when the estimates for this variable are considered. Specifically, each 10 percentage point increase in the proportion of the five-year window on incapacity-related payments is associated with an average increase in the probability of ending up on DSP of 3.7 percentage points for males and 2.6 percentage points for females.

With regard to other payment types, for males, parenting payments and ‘other’ payments are associated with the lowest probability of being on DSP at the end of the five-year window. For females, unemployment benefits, parenting payments and other payments are all associated with similar effects on the probability of ending up on DSP. It is significant that, for females, parenting and ‘other’ payments are associated with the same probability of ending up on DSP as unemployment benefits. This is an important insight from the logit approach compared with the duration model approach, which found the probability of making the transition to DSP was significantly greater for females on unemployment benefits than females on parenting or ‘other’ payments. The logit model results imply that the duration model approach understates the extent to which recipients of parenting and ‘other’ payments ultimately make the transition to DSP, because many of them do not directly transfer to DSP. They either first transfer to another payment type, such as unemployment benefits, or leave income support altogether before moving on to DSP.

Local labour market conditions, as measured by the mean unemployment rate in the individual’s local labour market over the five-year window, are a significant predictor of being on DSP – and indeed on any other payment type – at the end of the window. Individuals living in regions with high unemployment rates are significantly more likely to be on DSP or another income support payment at the end of the five-year period. Effects appear small in magnitude however, with each percentage point increase in the mean local

unemployment rate, on average increasing the probability of being on DSP by 0.2 percentage points for males and by only 0.1 percentage points for females.

### ***3.3. Comparing the results from the two approaches***

Given that DSP inflows are the focus of the report, we limit our comparison of the results from the two approaches to the outcome that involves moving to DSP. Reassuringly, despite the important differences between the approaches that have been documented, the results are qualitatively quite similar, in the sense that there is a high degree of commonality in variable coefficient estimates that are both significant and of the same sign in both models. Inferences common to both approaches include:

- The older an individual when entering income support, the higher the probability of ending up on DSP for both males and females.
- Male immigrants are less likely to move to DSP than are native-born males.
- For males, having a partner who is on income support is associated with an increase in the probability of ending up on DSP.
- The presence of a dependent child under 13 years of age lowers the probability of DSP receipt for both males and females, but to a greater extent for females.
- Occupying public housing is associated with a significantly increased likelihood of moving on to DSP.
- Residing in a major city has no effect on the probability of moving on to DSP for females.
- Given a recipient has received income support payments in the three-year period preceding commencement of the non-DSP spell, the probability the recipient moves on to DSP is increasing in the total time spent on income support in that three-year period. However, this is only unambiguously the case for time spent on payment types other than unemployment benefits. Furthermore, the point estimates for both models imply that the net effect of time on non-unemployment income support prior to the current spell on the probability of moving on to DSP only becomes positive once it exceeds approximately four months for males, and approximately one year for females.

- Increased earnings while on income support are associated with a reduced probability of entering DSP for both males and females. This is captured by the combined effects of the ‘have earned income’ and ‘earned income amount’ variables in the duration model, while in the logit model it is captured by the combined effects of the variables for the ‘proportion of time with earnings’ and the ‘mean amount of earnings in those fortnights positive earnings were reported’.
- Unearned income has little effect on probability of entering DSP.
- Receipt of incapacity-related benefits is associated with a much elevated probability of entering DSP compared with other payment types. For males, payment types other than unemployment benefits and incapacity-related benefits are associated with the lowest probabilities of entering DSP.
- The probability of entering DSP is increasing in the local unemployment rate, although the magnitude of this effect is small.

These similarities inspire confidence in inferences on the importance of the common factors identified by the two approaches in affecting the likelihood of moving on to DSP.

While there is clearly broad agreement on many of the factors impacting on income support recipients’ subsequent transition to DSP, there are some notable differences which demonstrate the independent value of each approach. First, the duration approach provides valuable information on the role played by spell duration in a manner that the logit model, by construction, cannot.<sup>36</sup> The duration model shows an increasing risk of making the transition to DSP as spell duration increases up to approximately two years, after which the risk of transition is somewhat stable. It furthermore shows that effects of age on the probability of transition to DSP weaken as duration of the non-DSP spell increases.

Differences are also evident for some of the variables common to both approaches. These will derive from two main sources. First, the logit model captures entry to DSP via indirect routes

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<sup>36</sup> While in principle it is possible to estimate a logit model that includes variables for income support receipt between commencement of the non-DSP spell and entry to DSP, in practice estimates for such variables would be difficult to interpret. For example, a person who transfers to DSP shortly after commencement of the non-DSP spell will have little non-DSP income support receipt in the five-year window, while a person who never transfers to DSP may be on income support for a substantial segment of the five-year window. This type of empirical regularity might lead to the inference that the likelihood of transferring to DSP is decreasing in the extent to which non-DSP income support was received in the five-year window. However, as the duration analysis shows, this would be an incorrect inference to draw.

– for example, via exit from income support and subsequent movement on to DSP – whereas the duration model only captures direct entries to DSP from the first non-DSP spell. This difference in the nature of the models also impacts on effects attributed to variables that are time-varying in the duration model. For example, if a person commences on unemployment benefits, transfers to PPS and then transfers to DSP, the duration model will ‘attribute’ the DSP transition to PPS, whereas the logit model will attribute it to the unemployment benefit. The second main source of differences is that the logit model does not capture transitions to DSP that are not sustained to the end of the five-year window. For example, if an individual transfers to DSP and then subsequently exits DSP before expiry of the five year window, the transition is not captured by the logit model, but would be identified by the duration model. However, given the long-term nature of DSP receipt, this is likely to be a less important source of differences in inferences than the first-mentioned source. Consequently, it is often reasonable to attribute the differences to the logit model capturing movements to DSP that are not captured by the duration model because they involve exit from income support between commencement of the non-DSP spell and entry to DSP.<sup>37</sup>

With this interpretation of differences in findings between the two models in hand, we note the following significant contrasts between the models:

- Female immigrants are found by the duration analysis to have significantly lower probabilities of making the transition to DSP than native-born females, yet the logit model shows no significant differences in likelihood of being on DSP five years after spell commencement. The implication is that female immigrants are relatively more likely to enter DSP via an ‘indirect’ route involving exit from the income support system.
- The duration analysis shows that partner status significantly impacts on the risk of transition to DSP for females. Having a partner who is not on income support is associated with the lowest probability of transferring to DSP, while having a partner who is on income support is associated with the highest probability of transferring to DSP (with being single midway between these two extremes). By contrast, for the

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<sup>37</sup> A further potential source of differences in findings for variables common to both models is that the models were estimated over different samples, with the duration model including spells that commenced between July 1998 and June 2001, and the logit model only including spells that commenced between July 1998 and June 1999.

logit model we find no effects of partner status for females. Consequently, the differences by partner status in probability of transferring to DSP from the initial income support spell do not translate to differences in probability of ultimately ending up on DSP.

- As noted in the discussion of the logit model results, a notable difference arises between the two approaches with respect to inferences on the effects associated with payment type. The duration analysis showed that payments other than incapacity-related and unemployment payments are associated with a lower risk of transfer to DSP than unemployment benefits. While the logit model results supported this finding for males, for females the logit results showed that these payment recipients are not in fact at a lower risk of eventually moving on to DSP than recipients of unemployment benefits. We can therefore infer that female recipients of parenting and ‘other’ payments are more likely to transfer to other payment types and/or exit income support prior to moving on to DSP than are female unemployment benefit recipients, and are *not* less likely to end up on DSP.

#### **4. Conclusion**

Receipt of income support may be relevant to subsequent entry to DSP for two main reasons. First, it may reflect non-disability related difficulties faced by an individual in the labour market before disability arose. Since DSP eligibility criteria require an assessment of work incapacity, and not just the presence of disability, the ability of the individual to participate in employment independent of disability will be an important determining factor of entry to DSP. Second, income support receipt may causally affect entry on to DSP, for example because it precipitates or exacerbates disability and/or because of skill atrophy and general reductions in ‘employability’ associated with periods of non-employment that often accompany income support receipt.

While we are unable to separately identify the roles of these two sources of associations between income support receipt and subsequent DSP entry with the data at our disposal, we can nonetheless examine the patterns of receipt more commonly associated with entry on to DSP. This study has attempted to do this, examining the extent and nature of income support receipt of DSP recipients in the years leading up to DSP entry and the characteristics of

income support recipients, inclusive of patterns of non-DSP income support receipt, that are associated with an increased likelihood of moving on to DSP.

From an inflows viewpoint, we find that nearly 60% of DSP inflows are direct transfers from other income support payments, while a further 10-12% of inflows are by individuals who have received income support at some stage in the three years preceding DSP entry. If we take the alternative viewpoint of considering an entire cohort of entrants to non-DSP income support payments, then we find (for the 1995 entry cohort) that 8% of males and 5% of females are on DSP eight years later. Significantly, while most of these individuals enter DSP via transfer from another income support payment, most do not enter DSP directly from the *first* income support spell (in 1995).

Econometric analysis of income support recipients' 'risk' of entering DSP shows that the probability of making the transition from a non-DSP income support payment to DSP is, all else equal, increasing in duration on payments up to a spell duration of approximately two years, after which the likelihood of moving on to DSP remains fairly constant. The analysis also shows that a recent history of income support receipt prior to the current spell, being older, residing in public housing, residing in a high unemployment region, and receipt of work-incapacity related payments, and to a lesser extent receipt of unemployment benefits, are all associated with an increased probability of moving on to DSP; while young dependent children and earnings while on income support are associated with a reduced probability of moving on to DSP.

Comparison of duration model and logit model estimation results reveals that some differences by recipient characteristics in the probability of transferring to DSP from the first non-DSP spell do not translate into differences in the probability of ending up on DSP five years after commencement of that spell. Similarly, some differences by recipient characteristics in the probability of ending up on DSP are found that are not evident for the probability of transferring to DSP from the first non-DSP spell. Either or both of these two situations arise with respect to the variables for place of birth, partner status and payment type. We infer this to mean that, holding all else constant, the incidence of direct transfer to DSP vis-à-vis indirect entry to DSP (e.g., via exit and subsequent re-entry to income support) differs by place of birth, partner status and payment type.

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## 6. Appendix

**Table A1: Grouping of payment types**

Level 1	Level 2	LDS codes	Description	
Unemployment Benefits (excluding incapacity-related benefits)	Unemployment Benefits	YTA	Youth Training Allowance	
		YAL	Youth Allowance: not on full-time education	
JSA		Job Search Allowance		
NSA		Newstart Allowance		
Incapacity-related benefits: Sickness Allowance & UB with activity type of 'incapacitated' or 'DSP pending')		Sickness Allowance	MAA	Newstart Mature Age Allowance
			NMA	Mature Age Allowance
Parenting payments	Parenting Payment Partnered	SA	Sickness Allowance	
		SKA	Sickness Allowance	
		PGY	Partner of dependent YTA/YAL recipient	
		PGL	Partner of person on low income	
		PGP	Partner of Pension recipient	
		PGN	Partner of Newstart recipient	
		PGA	Parenting Benefit	
	Parenting Payment Single	PGU	Unknown	
		PGC	Crisis Payment	
		PPS	Parenting Payment Single	
Other payments	Partner Allowance	SPP	Sole Parent Pension	
		PA	Partner Allowance	
	Widow Allowance	PTA	Partner Allowance	
		WA	Widow Allowance	
	Special payment	WDA	Widow Allowance	
		DR	Drought Relief Payment	
		DRP	Drought Relief Payment	
		FFR	Farm Family Restart Scheme	
		ECP	Exceptional Circumstances Payment	
		NSC	Crisis Payment*	
		SPL	Special Benefit	
	Disability Support Pension	SPB	Special Benefit	
		DWS	Disability Wage Supplement	
	Age Pension	DSP	Disability Support Pension	
		AGE	Age Pension	
	Wife/partner Pensions	WFR	Wife Pension Rehabilitation Allowance	
		MPA	Mature Age Partner Allowance	
		WFA	Wife's Pension Age	
		WFD	Wife's Disability Support Pension	
		DWF	Wife's Disability Wage Supplement	
	Carer Payment	CAR	Carer Payment	
	Other Pension	BVA	Bereavement Allowance	
		REH	Rehabilitation Allowance	
		RHB	Rehabilitation Allowance	
		WID	Widow B Pension	
		EMG	Emergency and General Assistant	
		OTH	Other Pension Payment	
PNC		Crisis Payment		
WDA	Widow Allowance			
Student	AUS	Austudy, YAL: full-time students		

\* Crisis Payment is recoded to the payment which recipients were eligible for at that time, as indicated by payment type received within six fortnights of receipt of Crisis Payment. Only when no other payment type is received within six fortnights are recipients of this payment type treated as receiving a Special Payment.

**Table A2: Classification of medical conditions**

Main medical condition aggregated		Codes as in LDS	Frequency <sup>38</sup>
Code	Description		
MUS	Musculo-skeletal and connective tissue (MUS)	MUS	15,817
PSY	Psychological/ psychiatric (PSY)	PSY	9,829
INT	Intellectual/ learning (INT)	INT	2,302
CIR	Circulatory system (CIR)	CIR	2,794
CAN	Cancer/tumour (CAN)	CAN	2,562
NER	Nervous system (NER)	NER	1,170
EIS	Endocrine, auto immune and immune system (EIS)	EIS	1,050
ABI	Acquired brain injury (ABI)	ABI	782
VIS	Visceral disorders (VIS)	VIS	532
RES	Respiratory system (RES)	RES	1,274
CGA	Congenital abnormalities (CGA)	CGA	331
SEN	Sense organs (SEN)	SEN	814
	Amputation (AMP)	AMP	79
	Chronic fatigue syndrome/post viral syndrome (CFS)	CFS	357
	Chronic pain (CRP)	CHR	419
	Endocrine and Immune system	GIS	41
OTH/UNK	Reproductive System	REP	4
	Skin disorders and burns (SDB)	SDB	120
	Unknown (UNK)	UNK	56
	Urogenital system.	URO	16
	Not recorded ( )		36

<sup>38</sup> This represents frequencies for inflows to DSP in the period 1999-2003.

**Table A3: Description of explanatory variables**

Variable name	Description
<b>Age group</b>	
(25-34)	25-34 years of age
35-44	35-44 years of age
45-49	45-49 years of age
50 plus	50 or more years of age
<b>Place of birth &amp; Indigenous status</b>	
(Non-Indigenous Aus-born)	Non-Indigenous Australian-born
ESB	Immigrant born in one of the main English speaking countries
NESB	Immigrant born in a non English speaking country
Indigenous	Aboriginal, Torres Strait Islander or South Sea Islander
<b>Partner status</b>	
(Partner not on IS)	Have a partner and that partner is not in receipt of income support
Single	Do not have a partner
Partner on IS	Have a partner and that partner is in receipt of income support
<b>Dependent children</b>	
(No dep. children)	No dependent children
Youngest 0-5	Youngest dependent child aged 0-5 years
Youngest 6-12	Youngest dependent child aged 6-12 years
Youngest $\geq 13$	Youngest dependent child aged 13 years or over
<b>Housing circumstances</b>	
(Renting privately)	Renter with private landlord
Renting public housing	Renter in public housing
'Free' rent	Do not own home and do not pay rent or board
Home-owner	Home-owner outright or with mortgage
Major city	Indicator that the individual lives in Sydney, Melbourne, Brisbane, Perth, Adelaide, Newcastle or Canberra (all cities with more than 300,000 inhabitants)
<b>Income support history in 3 years prior to entry</b>	
Have IS history	Indicator of having received an income support payment within the 3 years preceding commencement of the non-DSP spell.
Total time on IS (years)	Total time in years on income support payments in the three years immediately preceding the non-DSP spell.
Total time on UB (years)	Total time in years on unemployment benefits with an activity type other than 'incapacitated' or 'DSP pending' in the three years immediately preceding the non-DSP spell.
No. of spells on IS	Number of income support spells in the three years immediately preceding the non-DSP spell.
<b>Earned income (a)</b>	
Have earned income	Indicator equal to 1 if earned income reported in that fortnight; equal to 0 otherwise
Earned income amount	Amount of earned income (1 unit = \$100)
<b>Unearned income (a)</b>	
Have unearned income	Indicator equal to 1 if unearned income reported in that fortnight; equal to 0 otherwise
Unearned income amount	Amount of unearned income if have unearned income (1 unit = \$100)
<b>Earned income (b)</b>	
Time	Proportion of fortnights on non-DSP income support payments during the observation period in which earned income reported (1 unit = 10%)
Amount	Mean earned income in fortnights in the observation period in which individual was on non-DSP income support and reported earnings (1 unit = \$100)
<b>Unearned income (b)</b>	
Time	Proportion of fortnights on non-DSP income support payments during the observation period in which unearned income reported (1 unit = 10%)
Amount	Mean unearned income in fortnights in the observation period in which individual was on non-DSP income support and reported unearned income (1 unit = \$100)

**Table A3 continued: Description of explanatory variables**

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Proportion of spell incapacitated (a)	Proportion of the non-DSP spell to date the individual has been on incapacity-related benefits (1 unit = 100%)
Time incapacitated (b)	Proportion of the five-year period following commencement of the non-DSP spell in 1998-99 that the individual was on incapacity-related benefits, evaluated only over that part of the five-year period that the individual was <i>not</i> on DSP (1 unit = 10%)
Unemployment rate	ABS Labour force statistical region monthly unemployment rate (1 unit = 1%)
<b><i>Payment type</i></b>	
Unemployment benefits (UB)	On unemployment benefits and do not have an activity type of ‘incapacitated’ or ‘DSP pending’ (or similar)
Incapacity-related benefits	On Sickness Allowance or on unemployment benefits with an activity type of ‘DSP pending’, ‘incapacitated’ or similar
Parenting payments	On Parenting Payment Single or Parenting Payment Partnered
Other payments	On an income support payment other than unemployment benefits, incapacity-related benefits and parenting payments

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Notes: Categories in bracket are the omitted dummies in the regressions. (a) Variables specific to the duration models. (b) Variables specific to the multinomial logit models.

#### A4: Multinomial logit coefficient estimates

	Males				Females			
	Non-DSP IS		DSP		Non-DSP IS		DSP	
	Coef.	S.E	Coef.	S.E	Coef.	S.E	Coef.	S.E
<b>Age group (25-34)</b>								
35-44	0.218***	0.036	0.758***	0.071	0.028	0.035	0.827***	0.098
45-50	0.409***	0.055	1.371***	0.090	0.236***	0.055	1.381***	0.113
51plus	1.033***	0.053	2.277***	0.083	1.005***	0.062	2.076***	0.119
<b>Place of birth &amp; Indigenous status (Non-Indigenous Australian-born)</b>								
Indigenous	1.169***	0.067	0.717***	0.134	0.754***	0.084	0.844***	0.178
ESB	-0.149***	0.051	-0.263***	0.087	-0.054	0.048	-0.178	0.120
NESB	0.208***	0.040	-0.076	0.070	0.418***	0.038	0.226**	0.088
<b>Partner status (Partner not in IS)</b>								
Single	0.413***	0.058	0.081	0.094	0.563***	0.044	0.407***	0.122
Partner on IS	0.403***	0.054	0.319***	0.088	0.176***	0.044	0.217*	0.124
<b>Children (No dep. child)</b>								
Youngest 0-5	-0.102*	0.057	-0.499***	0.104	0.838***	0.081	-0.950***	0.210
Youngest 6-12	-0.204***	0.067	-0.372***	0.109	0.513***	0.082	-0.452**	0.193
Youngest 13+	-0.725***	0.099	-0.430***	0.136	-0.532***	0.088	-0.193	0.166
<b>Housing (Private rent)</b>								
Public rent	0.343***	0.076	0.628***	0.125	0.193***	0.070	0.509***	0.145
'Free' rent	0.071*	0.040	0.103	0.074	-0.054	0.044	0.088	0.103
Home-owner	-0.136***	0.041	0.003	0.070	-0.101***	0.035	-0.189**	0.088
Major city	-0.144***	0.032	-0.147***	0.056	-0.122***	0.030	0.050	0.074
<b>Income support history in 3 years prior to entry</b>								
Have IS history	-0.072	0.052	-0.197**	0.093	-0.065	0.053	-0.182	0.131
Time on IS (years)	0.323***	0.050	0.587***	0.076	0.323***	0.024	0.332***	0.060
Time on UB (years)	0.239***	0.051	-0.146*	0.078	0.128***	0.036	0.076	0.075
Number of IS spells	0.030	0.020	0.058	0.039	-0.079***	0.026	0.060	0.061
<b>Earned income</b>								
Time (10%)	-0.047***	0.007	-0.145***	0.018	-0.020***	0.006	-0.086***	0.018
Amount (\$'00)	-0.004	0.004	-0.081***	0.008	-0.006	0.005	-0.123***	0.016
<b>Unearned income</b>								
Time (10%)	-0.014***	0.004	-0.006	0.007	-0.025***	0.004	-0.029***	0.009
Amount (\$'00)	0.030**	0.012	-0.014	0.026	0.060***	0.018	0.046	0.038
<b>Payment type (UB)</b>								
Incapacity-related benefits	-0.674***	0.057	0.265***	0.068	-0.369***	0.076	0.690***	0.101
Parenting payments	0.603***	0.072	-0.165	0.157	0.422***	0.076	0.440**	0.177
Other payments	0.959***	0.096	-0.109	0.193	1.278***	0.066	0.678***	0.130
Time incap. (10%)	0.770***	0.022	1.016***	0.025	0.682***	0.033	1.045***	0.039
Unemployment rate	0.020***	0.006	0.039***	0.011	0.024***	0.006	0.040***	0.014
Constant	-2.300***	0.086	-3.889***	0.150	-1.986***	0.079	-4.281***	0.205
Pseudo-R-squared	0.158				0.112			
Number of observations	30,714				25,670			

Notes: 'Off income support' is the base outcome for which coefficient estimates are normalised to zero. Variable names in parentheses denote the omitted dummies. *SE* – Standard error. \*\*\*, \*\* and \* indicate significance at the 1%, 5% and 10% levels respectively.